

# Farewell to Arms: The Impact of the Arms Race on the Human Condition

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Over thirty years have elapsed since the founding of Physicians for Social Responsibility (PSR) and the publication of our initial series of articles on the medical consequences of thermonuclear war in the *New England Journal of Medicine* [1]. PSR and the International Physicians for the Prevention of Nuclear War (IPPNW), of which PSR is the U.S. affiliate, have continued to warn against the consequences of the use of nuclear weapons as the number and power of these weapons has dramatically increased. The world now has a total of 50,000 nuclear weapons, with an explosive power equivalent to 15 billion tons of TNT, three tons for every human being on the planet. The lesson we have learned and have widely taught is that since doctors can do almost nothing to deal with the destruction and the medical problems following the use of nuclear weapons, doctors, in a responsibility similar to their responsibility for the prevention of other medical problems that have no effective treatment, must work actively for the prevention of nuclear war. It was for this work of education and prevention that the Nobel Peace Prize was awarded to IPPNW in 1985 [2].

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Although prevention of nuclear war remains the central goal of PSR and IPPNW because of the irreparable devastation it would cause, in recent years many members of PSR and of the other national organizations affiliated with IPPNW have been studying, writing, speaking, and organizing on closely related topics. These include aspects of "destruction before detonation" [3], such as the health consequences of nuclear weapons production and testing, the health consequences of the production, storage, and even destruction of other weapons, and the health consequences of the diversion of resources to military purposes.

## NUCLEAR WEAPONS PRODUCTION

In the U.S., the Department of Energy (DOE) now administers directly or through private contracts a complex of over 280 facilities in 20 sites located in 13 states. The land mass of the complex comprises 3,350 square miles, more than the states of Delaware and Rhode Island combined [4].

Construction of nuclear weapons has caused vast environmental damage and hazards to health. The production of a single pound of plutonium creates 150 gallons of high-level radioactive waste together with hazardous chemicals, more than 25,000 gallons of low- to intermediate-level waste, and more than 1.1 million gallons of contaminated cooling water [5]. A recent report by a special commission of International Physicians for the Prevention of Nuclear War and the Institute for Energy and Environmental Research documents the ways in which the production of plutonium for nuclear warheads has left the U.S. and the U.S.S.R., and to a lesser extent the other nuclear pow-

ers, burdened with millions of tons of radioactive waste products [6].

At the Rocky Flats, Colorado, plutonium facility, a 1969 fire left nearby communities with the highest concentrations of plutonium ever measured near an urban area. In 1989 FBI investigators discovered that plant operators had improperly incinerated wastes, dumped toxic chemicals into a creek that feeds into the local drinking water supply, and possibly altered or destroyed records to conceal environmental violations [7,8]. A grand jury in Denver over the course of over two years heard evidence about the nature of the environmental despoilment of the site and the surrounding area. At the end of this period, the federal prosecutor reached a plea bargain calling for an \$18 million fine of the Rockwell International Corporation, the company that ran the plant for the DOE, but refused to charge five company employees and three DOE officials whom the grand jury considered responsible for environmental crimes. When member of the grand jury drafted their own indictments and made them public over the objections of the prosecutor and the court, the chief judge of the U.S. District Court in Denver asked the Justice Department to investigate whether the jurors should themselves be prosecuted for violating grand jury secrecy rules [9].

At the Fernald Feed Materials Production Center in Ohio, the DOE estimated that between 394,000 and 552,000 pounds of uranium dust and radon gas had been emitted into the atmosphere. In addition, the plant dumped 167,000 pounds of uranium by-products into a nearby river. In 1989 the DOE agreed to pay \$78 million to settle a lawsuit by area residents [7,8].

At the Hanford Reservation in Washington state, large quantities of radioactive iodine were reported to have been released from the site in the 1950s. An estimated 200 billion gallons of radioactive and chemical wastes have been dumped into ponds and unlined trenches, polluting the Columbia River and area drinking water. The nuclear reactors, after failing to meet safety requirements, were closed permanently in 1988, but leaking underground tanks containing high-level radioactive waste continue to damage the environment while awaiting cleanup [7,8].

At the Savannah River Plant near Aiken, South Carolina, the DOE acknowledged that serious accidents and environmental contamination had been kept secret since 1957. Nuclear reactors have been closed down since 1988 because of safety violations,

problems with the emergency cooling systems in the reactors, and structural cracks in the reactor vessels. Storage tanks containing highly radioactive liquids are leaking and contaminating surrounding soil and groundwater. Seepage basins continue to contaminate the soil with heavy metals and radioactive wastes [7,8].

Similar problems of radioactive and other toxic pollution from nuclear weapons production are known to have occurred in the territory of the former U.S.S.R. In October 1992, the Russian IPPNW affiliate released *The Atom Declassified* [10] documenting publicly for the first time all the major sites in the former U.S.S.R. affected by nuclear weapons production. There remains such a high level of secrecy in Russia, even between departments, that the Moscow staff of the IPPNW affiliate was approached by aides to the Ministers of Defense and of Energy seeking copies of the report for their supervisors.

A recent report by the Physicians Task Force on the Health Risks of Nuclear Weapons Production, organized by PSR, analyzed the deficiencies in studies conducted by the DOE of disease and death in the nuclear work force. The report demonstrates that the DOE studies offer no firm basis for the DOE's official position that the health of workers and the public has been adequately protected [4].

## NUCLEAR TESTING

Approximately 1,900 nuclear tests have been conducted since 1945, by six nations (the United States, Soviet Union, Great Britain, France, India, and China) at some 35 sites around the world. In 1963 the Limited Test Ban Treaty, which banned all but underground nuclear weapons tests, was signed by over 100 countries. The U.S., U.S.S.R., and Great Britain, signatories to the treaty, moved their tests underground. France and China did not sign the treaty; France continued atmospheric tests until 1974 and China until 1980. The 1,400 underground tests so far and the continued underground testing vent radiation into the atmosphere and leave underground large amounts of long-lived radionuclides such as strontium 90, cesium 137, and plutonium 239. Some of these will undoubtedly eventually make their way into the biosphere by leaching into groundwater or through other leakage [11].

## CHEMICAL AND BIOLOGICAL WEAPONS

Nuclear weapons are not the only weapons of mass destruction whose development, manufacture, and

storage can cause "destruction before detonation." In 1968 an accidental release of nerve gas near the Dugway Proving Ground in Utah killed an estimated 6,000 sheep 30 miles downwind. Partly as the result of concerns about the effects of chemical weapons tests on the environment, then-President Richard Nixon in 1969 declared a moratorium on U.S. chemical weapons production. He also declared that the U.S. would never use biological weapons and ordered that all U.S. biological weapons be destroyed. In 1972 the U.S., the U.S.S.R., and 100 other nations signed the Biological Weapons Convention, which prohibited manufacturing, testing, storage, and use of biological weapons. During the Reagan presidency, however, the United States began producing new chemical weapons and increased annual spending on "defensive" biological warfare research by more than 500%. There are approximately 150 public and private U.S. chemical and biological warfare (CBW) laboratories in more than 30 states and 15 foreign countries that are of questionable safety and that may be vulnerable to theft or sabotage and may pose environmental risks [7,12-14].

In May 1988 the Subcommittee on Oversight of Government Management of the Senate Governmental Affairs Committee issued a report on its 18-month investigation of CBW safety practices. The report detailed "serious deficiencies" and lapses in the management of safety issues and "completely inadequate" attention paid to potential safety problems. There have been laboratory fires, missing containers of viruses, lost or leaking shipments, assorted spills, infected workers, and even worker deaths. Workers and surrounding communities have not been adequately protected from the possible accidental release of deadly diseases and chemicals, and there is no system for reporting accidents [7,14].

At the Aberdeen Proving Ground, an Army facility near Edgewood, Maryland, where chemical weapons have been developed and tested for decades, in 1988 Maryland environmental officials reported finding 89 hazardous waste violations within a 15-month period. In a test case for the application of environmental laws to military facilities, three civilian managers were convicted in February 1989 of illegally storing, treating, and dumping deadly chemical wastes between 1983 and 1986. They had knowingly allowed dozens of flammable, lethal, and cancer-producing chemicals to be stored unlabeled in leaking containers and unauthorized areas and even to be tossed into drainage pools leading directly to sewers. A break in

one chemical retaining dike had resulted in the spillage of more than 200 gallons of hydrosulfuric acid into a nearby creek. According to the chief prosecutor in the Aberdeen case, "there was a sense at Aberdeen that the environmental laws didn't apply to the Army" [7,14].

The Rocky Mountain Arsenal near Denver, Colorado, was a chemical weapons production facility for over 40 years. It is now among the Department of Defense (DOD) installations most seriously in need of cleanup. Some government scientists have described the center of the arsenal as the most polluted square mile on earth. Pipes and tanks that once held ingredients for deadly mustard and nerve gases now are rusting. Toxic wastes were dumped into open and unlined basins and storage lagoons. According to the Army, surface soil and water at 80 different sites covering as much as a quarter of the complex have been contaminated. The surrounding area is heavily populated by wildlife, and evidence of chemical contamination has been discovered in some animals. Although offsite environmental damage at the Rocky Mountain Arsenal was noted as early as 1951, cleanup did not begin until 1988 [7,14].

With regard to chemical weapons stockpiles, the mean age of "old" U.S. chemical weapons (produced before 1969) is about 25 years. In 1988 Army officials told a congressional subcommittee that the stockpile includes "more than one thousand" leaking weapons and that the problem is likely to worsen in future years [7,14].

U.S. biological weapons production is said to have stopped and all stockpiles are said to have been destroyed, but "defensive" research on biological weapons is seen by many as "ambiguous and provocative" and continues to pose a health threat. The use of biological engineering techniques offers the "promise" of development of new weapons and "perfection" of others as effective weapons [12,13]. Again, similar problems for both chemical and biological weapons are known to have occurred in the former U.S.S.R.

## CONVENTIONAL WEAPONS

Weapons need not be considered weapons of mass destruction in order to cause widespread environmental damage and health problems even before they are used. The extensive destructiveness of the use of these weapons, either intended or "collateral," has been known since antiquity. In modern times, explosives, incendiaries, and defoliants destroy animals

and crops, crater the land, and denude vegetation. Damage may persist for many years. In addition, war delays economic development and prevents sound environmental management. The displacement of massive numbers of people may cause additional ecologic damage [5,15-20].

In Vietnam an estimated 2.2 billion hectares of forest and farmland were denuded as a direct result of bombing, mechanized land clearing, napalming, and defoliation by the U.S. and South Vietnam. Some 72 million litres of herbicides were used to destroy food crops and to deny forest cover to Vietcong forces; one of them, Agent Orange, was sprayed over 35% of southern Vietnam between 1961 and 1971. Dioxin contained in the spray persists, with elevated levels still found in soil, food, wildlife, human breast milk, and adipose tissue. An estimated 20 million square meters of commercial timber, 135,000 hectares of rubber plantations, and 124,000 hectares of mangroves were destroyed. Restoration and regeneration from this massive environmental damage is still at an early stage [15-17].

The United States used about 14 million tons of high explosives in Vietnam, creating around 25 million bomb craters covering about 200,000 hectares. Transport, agriculture, and forestry were disrupted; many craters filled with stagnant water, forming breeding sites for malaria-carrying mosquitoes. Vietnamese hospitals continue to report new victims, many of them children, from left-over munitions and mines [15,17]. Death and injury from land mines concealed in Cambodia also continue to occur [21]. Land mines left over from the 1988-1991 civil war have caused similar casualties in northern Somalia [22].

In the Persian Gulf, ecologic damage was caused by bombing and by oil-related pollution. In February 1991, Iraq ignited 752 oilwell fires in Kuwait; these were extinguished more rapidly than had been expected, but the health impact of the smoke produced is still largely unknown. In addition, huge pools of oil caused by leakage from sabotaged wells that did not ignite still cover large parts of Kuwait; the oil penetrates the soil and kills plants, birds, and insects [23,24].

## TOXIC POLLUTION

The U.S. military establishment is the world's largest industry. In 1986 the DOD estimated that the military produced about 400,000 tons of hazardous waste annually [25]. Since the DOD does not comply with the Environmental Protection Agency's Toxics

Release Inventory, there is no way accurately to evaluate the total amounts released. Some authorities place the figure as high as 500,000 tons, more than the top five U.S. civilian chemical companies combined. In the U.S., an estimated two-thirds of chlorofluorocarbon 113 emissions, a depleter of the ozone layer, are contributed by the military [5,7,15,26-31].

In a 1992 DOD report to Congress, more than 10,000 potential hazardous waste sites at more than 1,800 domestic military installations were listed, with at least one site in each of the 50 states [27]. Relatively few sites have been designated as being cleaned up. Of these sites, approximately 100 are listed as superfund National Priorities List sites, the most dangerous hazardous waste sites facing the nation. PSR has prepared a state-by-state listing of DOD and DOE installations that contain identified toxic waste sites hazardous to public health and the environment [32].

Military bases generate large quantities of a wide variety of toxic substances, including fuels, pesticides, solvents, polychlorinated biphenyls, and phenols. Tanks and airplanes are washed with caustic cleaning compounds and solvents that are drained onto the ground or into ditches. Electroplating shops that repair metal parts for military equipment generate cyanides, acids, and heavy metals. Chemical propellant bags used to fire artillery shells at firing ranges are regularly burned at military bases [7,28,29].

In 1985 the U.S. Air Force was required to provide bottled water to the residents of a town in California because neighboring McClellan Air Force Base had contaminated the groundwater with trichloroethylene. In the early 1980s, the Army failed to inform residents in Grand Island, Nebraska, about the contamination of their drinking water. High explosives such as TNT and RDX were detected in private wells surrounding the Cornhusker Ammunition Plant in 1983, but residents were not notified until more than a year later. The Army was eventually required to pay for a new public water system in the affected area [29].

Although the full details are still not known, military bases in the territories of the former U.S.S.R. and its Warsaw Pact allies were no less destructive to their surroundings. There is evidence that controls on environmental despoilment were even weaker than in the U.S. and that the pollution caused by military activities may have been even greater.

## HAZARDS OF WEAPONS DESTRUCTION

Not only production, testing, storage, and use, but even the process of destruction of weapons can lead

to environmental and consequent health damage. In 1989 the Senate expressed concern that the Department of Defense had devoted too little money and effort to finding ways to comply with nuclear arms reductions in "an environmentally benign manner." Pursuant to the Intermediate-Range Nuclear Forces (INF) Treaty, hundreds of Pershing missiles were burned in the open air or exploded on a test stand at the Pueblo Army Depot in Colorado. These procedures can release clouds of toxic hydrochloric acid when the missiles' solid fuel combines with moisture. The implementation of deeper arms cuts would mean destroying hundreds of additional nuclear missiles [7].

In 1985 Congress ordered the Army to destroy 90% of its old chemical weapons by 1994 (later extended to 1997). Tens of thousands of tons of chemical agents in bulk containers and in filled munitions are to be destroyed by incineration at nine storage sites (eight in the United States and one at Johnston Atoll in the Pacific Ocean). One method of incineration being tested requires the risky disassembly of chemical agents and munitions before burning. A second method, cryofracture, eliminates disassembly but not risk. Cryofracture deep freezes munitions with their chemical contents before they are crushed in a huge press and incinerated. Both methods produce hazardous ash and scrubber wastes. An additional risk of cryofracture is dispersal of deadly chemicals by explosion of a munition in the furnace. The Army acknowledged that emergency response planning is inadequate. Disposing of chemical weapons is perhaps second only to radioactive waste disposal among serious threats to the environment from military programs [7].

Similar problems exist in the former U.S.S.R. With a stockpile measuring at least 50,000 metric tons of chemical agents, the former Soviet Union must also find a safe method of incinerating the weapons. Local opposition forced the Soviet government to close a facility designed to destroy chemical weapons at Chapayevsk on the Volga River, and local opposition is blocking demolition at other sites [7].

### **COSTS OF THE ARMS RACE**

Perhaps the most immediate and in some ways the most devastating health impact of the arms race, and the one most directly relevant to those attending this meeting, is the diversion to military purposes of resources that might have been used to improve the condition of life and the health of the people of the

world. Between 1960 and 1990, almost \$20 trillion (valued in 1991 dollars) was spent on the world's military forces. Military expenditures have climbed to almost \$1 billion annually, an amount in constant dollars close to three times the level of 1960. Since 1945, some \$4 trillion has been spent on nuclear weapons and their delivery systems [33].

Among all the factors that interact to cause illness, which include genetic, infectious, degenerative, and traumatic factors, it is widely accepted that social, economic, and other environmental causes are the most important. These factors of course include poverty, homelessness, hunger, lack of education, and lack of family and community support. Similarly, among all the factors that lead to failure to obtain needed services, the most important are social, economic, and environmental. These barriers include out-of-pocket costs at the time of need for care, geographic maldistribution of services, and racial, sexual, and economic discrimination. We know, for example, from studies in less developed countries, that among the most important determinants of infant mortality are household income and literacy of the mother. And we know from detailed studies in the United States, for example, of the impact of the Women's, Infants', and Children's Supplemental Feeding Program (WIC), that measures to overcome social and economic deprivation among pregnant women, mothers, and their infants can make an enormous difference in the outcome of pregnancy and the growth and development of children [34].

### **IMPACT OF ARMS SPENDING IN INDUSTRIALIZED NATIONS**

Annual military spending in the U.S. rose steadily during the 1980s from \$140 billion to almost \$300 billion annually. After correction for inflation, the annual amount spent per U.S. resident on the military rose during the decade from approximately \$800 to \$1,200. The total spending on the military over the eight years of the Reagan administration was about \$2 trillion, over \$20,000 for each U.S. family. Of these expenditures, it is estimated that 20% to 25% were spent on nuclear arms and their delivery systems [33].

Federal budget deficits have soared along with military spending. Military spending under the Reagan administration, adjusted for inflation, was more than one-third greater than during the Ford and Carter administrations. The Reagan and Bush administrations' contribution of some \$3 trillion to the U.S. national debt, which now stands at close to \$4 trillion,

is greater than that of the Truman, Eisenhower, Kennedy, Johnson, Nixon, Ford, and Carter administrations combined.

The enormous expenditures of tax revenues on arms divert these resources from human services and other urgent needs. The U.S. economy provides one of the world's highest standards of living, but beneath this veneer of wealth lies the reality of America's destitute. The gulf between the rich and poor has widened. Some 29 million people lived below the poverty line in 1980; by 1991 that number had grown to 35.7 million, over 14% of the population [35]. One in five children, 14.3 million, lived in poverty in 1991, the highest number since 1965. The median income of all families with children and parents under 30 years of age fell 32% from 1973 to 1990 [36].

The gap between haves and have-nots in health indices has also been increasing [37]. In most of the U.S. fewer than 60% of two-year olds are fully immunized. Children have suffered six times the number of cases of whopping cough in 1991 as in the last years of the 1980s. In 1989, the proportion of babies born at low birth weight and the proportion born to mothers with late or no prenatal care were the largest proportions since 1978 [36].

Research and development is vital to improving public health and the quality of life. In the U.S., governmental research funding for health and human services pales in comparison to funding for military research. Just as a growing proportion of the federal budget has been devoted to the military, so too has the bulk of research and development funding been absorbed by the military. Of course, along with the diversion of revenue to support needed research, arms spending also diverts highly trained people from working to improve health and the quality of life to support military functions. It is estimated that 30% of U.S. scientists and engineers work on military projects [38].

An even greater impact was felt in the Soviet Union. Although the U.S. and the U.S.S.R. spent roughly similar amounts of resources on arms from 1960 through the 1980s, because of its lower GNP, the percentage of GNP spent on arms by the U.S.S.R. was considerably greater. It is estimated that in the 1980s the U.S. spent about 7% of its GNP for military purposes, compared to 12% spent by the U.S.S.R. [33]. Data on infant mortality rates and other health indices in the former U.S.S.R. suggest that the proportionately greater diversion of funds to military purposes did proportionately greater damage to the

health of its people and of course was one of the major factors in its economic collapse.

### IMPACT OF ARMS SPENDING IN DEVELOPING NATIONS

The almost \$1 trillion spent on arms annually by the world's nations is equivalent to the annual incomes of 2.6 billion people in the 44 poorest nations, one-half the world's population [33,39]. In 1960, world military expenditures totaled approximately 4.7% of world economic output; the expenditures now amount to over 6% of world output [33]. World expenditures on weapons research exceed the combined spending on developing new energy technologies, improving human health, raising agricultural productivity, and controlling pollutants [40].

This unforgivable waste of human and material resources takes place in a world that cannot stand by and permit it to continue. The many problems plaguing the third world, overwhelming poverty, political instability, crippling foreign debts, and human rights abuses, are only exacerbated by the diversion of disproportionate resources to the military. In developing countries, it has been estimated that close to 1 billion people are below the poverty line, 780 million people are undernourished, 850 million are illiterate, 1.5 billion have no access to medical facilities, an equally large number are unemployed, and 1 billion people are inadequately housed [41].

UNICEF has called the 1980s "The Decade of Despair." For the world's poorest people, average incomes have dropped by 10% to 25%. Today more than 1 billion, one in every five, live in absolute poverty. In the 37 poorest countries, spending on health has been reduced by 50% and on education by 25%. In over 50 nations, primary school enrollment has been falling [39].

Presidents and prime ministers from 71 nations agreed at the United Nations World Summit for Children on a series of affordable and achievable goals for the year 2000. Among these goals: the elimination of polio, neonatal tetanus, and guinea worm disease; a 90% reduction in measles; an 85% immunization rate among one-year-olds; a 50% cut in childhood diarrheal deaths and in malnutrition of five-year-olds; and a 33% reduction in child deaths from respiratory infection. Reaching these goals, UNICEF estimates, would require an additional \$20 billion per year. This represents reallocating 10% of military expenditures in the developing world and 1% in the industrialized world [39].

Small reallocations of the funds being spent on arms to spending on health could produce enormous benefits. The annual total of \$1 trillion is equivalent to \$2.5 billion each day, over \$100 million each hour, almost \$2 million each minute, and \$30,000 each second [3].

- The cost of one hour's world spending on arms is equivalent to the entire cost of the successful 20-year effort to eradicate smallpox from the Earth.
- The cost of three hours of world arms spending would pay for all of the World Health Organization's annual budget.
- The cost of one half-day of world arms spending annually could pay for the full immunization of all the children in the world against the common infectious diseases.
- The cost of four days of world military spending would pay for a five-year program to control malaria, probably the world's greatest cause of death due to illness.
- The cost of three weeks of world arms spending would pay for primary health care for every child in the poor countries of the world, including safe water supplies and full immunizations.

#### WHAT IS TO BE DONE?

National security is often invoked as the reason for increased military spending. Historically, as Professor Kennedy's analysis of 500 years of great power relationships demonstrates, true national security is not gained by mere military might [42]. Furthermore, the world's arsenals of nuclear weapons already contain destructive power equivalent to some three tons of TNT for every person on earth, ready to be used at any moment by accident or design. The overwhelming destructiveness of these weapons and the pervasive nature of their effects make them militarily useless. Such weapons do not increase national security; they simply put the world at greater risk.

The potential environmental consequences of use of weapons of mass destruction in the future may be even more devastating. There is excellent theoretical evidence that even moderately extensive use of nuclear weapons would cause large quantities of soot, smoke, and dust to be injected into the atmosphere, some stabilized beyond the troposphere and thus not amenable to clearance by rain. Consequent absorption or blockage of sunlight may result in a significant cooling of the earth's surface and devastating disruption of vital food crops [43]. Use of biological

weapons, particularly of new agents produced or modified by genetic engineering, could cause widespread disease among humans, other animals, or plants, disease that may not be treatable by any known methods [12].

PSR and IPPNW believe that the arms race poses a grave threat to public health, not just because the use of weapons of mass destruction threatens an end to civilization as we know it, but because the arms race itself pollutes the planet and deprives millions of people of the resources they need to escape desperate poverty and illness. By devoting excessive resources to the military at the expense of a vibrant economy, sound education system, poverty relief, health care, and meeting other pressing human needs, the nations of the world have neglected, and indeed undermined, their true security.

PSR and IPPNW believe that physicians and other health workers in every nation in this nuclear age have a responsibility to make a contribution to ending the destructive arms race.

First, we must work to rid the world of weapons of mass destruction. This includes support for: 1) total cessation of nuclear testing, which is now verifiable by seismographic methods; 2) strengthening of the Nuclear Nonproliferation Treaty; 3) rapid reductions in the stockpiles of nuclear weapons in all nations with a goal of eventual abolition; 4) full implementation of the 1993 Chemical Weapons Convention banning development, production, stockpiling, testing, transfer, or use of chemical weapons; and 5) strengthening of the 1972 Biological Weapons Convention by plugging the loopholes that permit so-called "defensive" research and instituting verification measures.

Changes around the world give us hope that these efforts will succeed. In the U.S.S.R., prior to its dissolution, President Gorbachev established an 18-month unilateral moratorium on nuclear testing and repeatedly stated his nation's eagerness to reduce production of both nuclear and nonnuclear arms [44]. Three of the four former Soviet Republics that retain nuclear arms (Russia, Belarus, and Kazakhstan but not as yet Ukraine) support the START I nuclear arms reduction framework. The only former republic that has nuclear testing capability (Russia) has agreed to a moratorium on nuclear testing. In the U.S., landmark legislation in 1992 imposed a moratorium on U.S. testing and provides the new administration with a framework for phasing out testing and achieving a Comprehensive Test Ban [45].

Second, we must work to rid the world of the environmental damage caused by the production, use or dismantling of "conventional" weapons. Strengthening of the United Nations capabilities to prevent war between nations and concomitant reduction in weapons production remains the only feasible immediate alternative to continued despoilment of the earth by preparation for war and by war itself. Again, there is some evidence that the United Nations has begun to act effectively to meet its global responsibilities.

Third, we must urge that our nation, whichever one we reside in, immediately initiate action to reallocate funds from arms to human services. The republics of the former U.S.S.R., driven by economic necessity, have begun sharply to curtail arms expenditures. Among the smaller nations, Costa Rica has consistently over the past three decades spent little on arms and has had these resources to spend on improvement in its health and social conditions.

In the U.S., in part as a result of the work of PSR and other groups, surveys up to the start of the Persian Gulf war showed that one-half the population felt that too much was being spent on the military; during the 1992 election campaigns that view seemed dominant. The Bush administration proposed budgets with even smaller increments in military expenditures than those needed to match the projected increase in costs due to inflation. The Clinton administration must be pressed to achieve much deeper cuts in the military budget and to use these funds for the improvement of the human condition in the U.S. and throughout the world.

The International Conference on the Relationship Between Disarmament and Development has summarized our goals

The world can either continue to pursue the arms race with characteristic vigour or move consciously and with deliberate speed towards a more stable and balanced social and economic development within a more sustainable international economic and political order; it cannot do both [41].

Physicians and other health workers, we believe, have a special responsibility to help ensure that these goals are achieved.

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