Nuclear weapons and medicine: some ethical dilemmas

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Authors' abstract

The enormous destructive power of present stocks of nuclear weapons poses the greatest threat to public health in human history. Technical changes in weapons design are leading to an increased emphasis on the ability to fight a nuclear war, eroding the concept of deterrence based on mutually assured destruction and increasing the risk of nuclear war. Medical planning and civil defence preparations for nuclear war have recently been increased in several countries although there is little evidence that they will be of significant value in the aftermath of a nuclear conflict. These developments have raised new ethical dilemmas for those in health professions.

If there is any risk of use of weapons of mass destruction, then support for deterrence with these weapons as a policy for national or global security appears to be incompatible with basic principles of medical ethics and international law. The primary medical responsibility under such circumstances is to participate in attempts to prevent nuclear war.

It is perhaps surprising that it should be necessary to discuss medical ethics in relation to use of weapons of mass destruction. Before World War II it was considered by many that inflicting damage on civilians as a matter of deliberate military strategy was shocking and unacceptable. Mass destruction violates the rules of war including the Hague and Geneva Conventions which forbid the attack of undefended towns and cities and place a duty on military forces to respect hospitals and safety zones for the sick, the aged and children. Yet in countries which possess nuclear weapons, deterrence by threat of mass destruction is tolerated and even supported by large sections of the population, including many in the health professions.

The development of sophisticated weapons of mass destruction has been an extraordinary technical achievement, paralleling the quality of medical innovations over the past forty years. Like many advances, however, 'improvements' in weapons technology have brought with them risks and responsibilities which

have far-reaching social and ethical implications. Doctors and other health professionals are directly involved in the ethical dilemmas posed by nuclear and other weapons of mass destruction both as members of the community with responsibility for health, and more specifically because of their involvement in plans for the organisation of health services in the event of nuclear war.

The ethical issues cannot be divorced from consideration of both the effects of nuclear weapons and technical developments which appear to make nuclear war more likely.

The nuclear arms race and nuclear strategy

It is the sheer destructive power of nuclear weapons and their potential for far-reaching effects on the global environment which transform them into instruments of genocide. The two major alliances, the North Atlantic Treaty Organisation (NATO) and the Warsaw Pact, are estimated to hold about 50,000 nuclear weapons ranging from battlefield weapons of about one kiloton explosive power (1,000 tons of TNT equivalent) to strategic weapons, ie those capable of reaching the opposing superpower's territory, of 10 megatons (10 million tons of TNT equivalent) or more (1). The total explosive force in world nuclear stockpiles is in excess of 12,000 megatons, representing at least 3 tons of TNT for each person in the world.

In 1968 Robert McNamara, then United States Secretary of Defence, stated:

Four hundred of these weapons delivered in the Soviet Union would be sufficient to destroy over one third of her population (2).

This estimate referred to 400 megatons of explosive power and included short-term casualties only. It was in his opinion sufficient for deterrence. More recently, Zuckerman (3) has argued strongly from his experience as Chief Scientific Adviser to the British Government that deterrence was operative early in the decade 1960-1970 and that subsequent changes have made the situation progressively more dangerous and expensive. The present grotesque overkill strongly suggests either that the accumulation of nuclear arms is largely out of control or that current policies are motivated by objec-

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tives very different from deterrence.

The development of nuclear war fighting scenarios in NATO has followed from the probably unrealistic requirement that the US launches its strategic weapons in response to a conventional attack on its allies. The doctrines of 'flexible response' and limited nuclear war imply that nuclear weapons are usable in some circumstances. Recently it has been suggested that NATO should develop the capability to withstand protracted nuclear conflict in order to prevail over the Soviet Union (4). Improvements in the speed and accuracy of weapons have been associated with the evolution of first strike counterforce strategies (5) in which one side attempts a pre-emptive strike against the main weapons systems of the other. New weapons systems about to be introduced will make this technically feasible, in theory at least.

Yet, most authorities consider that any use of nuclear weapons between the major nations would carry a very high risk of all-out conflict. Command, control and communication (C3) systems are likely to break down rapidly after the start of a nuclear exchange (6), preventing the enactment of the ordered scenarios used in training exercises. Since, in time of war, each side may attempt to obliterate the other side's nuclear weapons before they are used, very rapid, large-scale mobilisation of the major nuclear weapons systems will be necessary.

A further destabilising spiral of the arms race appears to be inevitable unless present policies are reversed. In addition, the deployment of many mobile nuclear weapons of small size but great power and range are likely to make the arms race irreversible simply because it will no longer be technically possible for one side to verify the other's forces.

The reduction of missile flight times to a few minutes invites the response of a computerised 'launch on warning' policy. This would ensure that the future of civilisation rests on a hair trigger.

Nuclear deterrence in its original form of 'Mutually Assured Destruction' (MAD) effectively requires either side to be prepared to commit genocide. Those in political and military authority are prepared to 'press the button' should the need arise, on the basis of a perception of what the 'enemy' is about to do. They have to suppress thoughts of what will happen to the targets in order that military responses function automatically. Thus the most important decision in the history of human-kind will rest with a handful of people, already able to tolerate thoughts of mass civilian destruction with apparent equanimity, and subject to all the physical and psychological stresses that their roles engender.

The alliance of technological advance and nuclear deterrence leads to the reciprocal implementation of an escalating military threat that can be used both in response to and in the initiation of an attack. Yet, so effective is the psychology of deterrence, so obvious the need for a powerful response to the enormous threat posed by such weapons in the hands of an enemy

perceived as demonic in intent, that the need for accurate assessment of the dangers inherent in the overall policy is often ignored or minimised.

In these circumstances, to suggest that certain weapons are unacceptable is seen by some both as tantamount to surrendering to an enemy and as a naive response to political and military realities. An alternative view is that the superpowers are locked together in a process which they cannot control but which depends on ever more desperately threatening realities, that those who maintain deterrence have been overtaken by technical changes and military strategies which go far beyond minimal deterrence, and that nations will only survive by co-operating to avert the common enemy - the nuclear threat.

These are relatively new circumstances in which to evaluate medical ethics in relation to the possession and use of weapons.

Weighing risks and benefits

In considering the medical response to nuclear weapons it is much more important to evaluate their potential risks and benefits than to indulge in the futile trade in political slogans which characterises much of the public debate on this subject.

Although to our knowledge no authoritative and detailed attempt to quantify the risk of outbreak of nuclear war has been published, it can be argued that the breakdown of deterrence may occur either because of unforeseen political developments, or through military accident or error.

There is considerable evidence that command and control systems for nuclear weapons are as open to human and technical error as any other highly complex activity. A recent editorial in the *New England Journal of Medicine* (7) quoted a report that over a recent 18-month period there had been 151 false alerts of Soviet attack on the USA, and that four of these had resulted in an increase in the state of alert of bomber crews and missile units. There have already been various accidents involving nuclear weapons. For instance, in 1961 a plane carrying two 24 megaton bombs crashed in North Carolina and five of the six safety mechanisms failed (8). Consumption of alcohol is widespread in military circles both in the US and USSR and there have been well authenticated instances of personnel with responsibility for nuclear weapons being under the influence of drugs (9). In addition, history is replete with examples of psychological and medical factors causing major errors in decision-making by politicians and military commanders (10). A combination of technical and human error at a time of international tension is one possible way in which nuclear war might start. Many technical 'advances' have markedly decreased the margin for human and technical error. Political negotiations, even using the 'hot line', are unlikely to get very far in the duration of a missile flight-time.

Even if a low probability of a major nuclear exchange is assumed for any one year, the cumulative risk during the potential lifetime of young people may be considerable. Opinion polls suggest that about 50 per cent of young people consider nuclear war to be probable in their lifetime (11). The psychological effects of living under such a threat have been insufficiently studied but could have far-reaching implications for mental health, particularly for young people (12).

If there is a significant risk of use of nuclear weapons, then the person who supports deterrence assumes responsibility for the possible destruction not only of many millions of people in other countries but also of his own family and society. For those involved in medical care, this includes responsibility for the potential destruction of their own patients.

At the same time, nuclear weapons might provide great benefits. If it could be guaranteed that armed conflict between nations with nuclear weapons would not occur, that deterrence would be 100 per cent effective, then support for deterrence might be medically justifiable. If other benefits followed, such as reduction in military budgets and solutions to the health hazards involved in the nuclear fuel cycle, then possessing nuclear weapons could even be attractive, although it would remain morally repugnant to many individuals.

Each of the possible benefits requires detailed consideration. The argument that nuclear deterrence has been responsible for preserving peace in Europe for 37 years and between the US and USSR is open to conjecture. It ignores the political importance of the settlements at the end of World War II. Temporal correlation between events does not necessarily imply causation.

The proposition that nuclear deterrence prevents attacks upon territory claimed by nations possessing nuclear weapons has been weakened by the example of the Argentinian attack on the Falkland Islands. Nuclear weapons had no part to play in the military engagement, reflecting Lord Mountbatten's assertion that they have no military role:

'Wars cannot be fought with nuclear weapons. Their existence only adds to our perils because of the illusions they have generated' (13).

It is sometimes stated that nuclear weapons save resources because they obviate the need to compete with the enemy for conventional forces. However, NATO and the Warsaw Pact each have a total military manpower of nearly five millions (14). It is in fact difficult to determine the full cost of nuclear weapons, partly because the delivery systems and research and development costs are frequently not itemised separately from conventional weapons.

Immense human resources are being consumed by arms expenditure (15). It has been conservatively estimated, for example, that one third of all scientists and engineers in the USA are engaged on defence-related

work (16). The relationship between economic decline and military spending has been extensively documented and the potential benefits from the conversion of industry from military to civilian expenditure have been described (16). It is quite clear that global public health is being sacrificed while the potential for global destruction continues to expand. World expenditure on armaments has increased four-fold in real terms since World War II, and amounts to approximately \$1 million per minute. The possible medical value of the resources diverted to military outlay has been well illustrated (15,17). Thus medical professionals should not be indifferent to the imbalance between expenditure on public welfare and on weaponry.

In weighing the risks, even a low probability of nuclear conflict becomes significant because of the immense destructiveness of nuclear weapons. We believe that it is impossible to exclude the possibility of nuclear war, and that consequently support either for the continued build-up of weapons of mass destruction or for nuclear deterrence as a credible policy for global security is incompatible with medical ethics. To give support for nuclear deterrence under such circumstances is to accept potential responsibility for the greatest foreseeable source of avoidable morbidity and mortality.

In addition, accepting deterrence without further question may, as indicated, involve tacit support of military policies which are very different in nature from deterrence and involve deliberate nuclear war fighting strategies.

The effects of nuclear war

The effects of single nuclear explosions are largely understood but the effects of nuclear war are much more difficult to quantify with accuracy. Multiple detonations are likely to have synergistic effects which could result in more casualties than those due to the effects of individual warheads. As well as the short and longer-term medical consequences of blast, heat and radiation which have been extensively described in several texts (18), it is possible that there would be profound damage to the ecosphere. This could include depletion of the ozone in the upper atmosphere with consequent climatic changes (19) or severe pollution of the atmosphere with particulate debris, either of which might seriously impair food production and post-attack survival.

In order to calculate casualties in the event of a nuclear attack, it is necessary to make certain assumptions about the ranges of blast overpressures for a given size of weapon, the relationship between blast overpressures and casualties, the likelihood of survival at given levels of radiation exposure, and the degree of radiation protection in those who survive the thermal and blast effects of nuclear attack. In the United Kingdom, Home Office officials have used assumptions which appear seriously to underestimate blast casualties (20) compared with calculations using other sources of data

(21). Additionally, insufficient attention may be being paid by the Home Office to the effects of thermal injury and other important sources of mortality and morbidity such as infectious disease, starvation and thirst (22). Since these data are being used for guidance of civil defence staff, and to demonstrate the possible value of civil defence, it seems entirely unethical that conservative estimates are used without sufficient qualification and without open publication and discussion in the scientific and medical press.

Civil defence

In parallel with a trend towards nuclear war fighting strategies and in the context of recent suggestions that it may be possible to 'prevail' in a nuclear war, increasing attention has been given to civil defence. Recently for instance, T K Jones, US Deputy Under Secretary for Defence, has argued that:

'If we used the Russian methods for protecting both the people and the industrial means of production, recovery time could be two to four years . . . If there are enough shovels to go round, everybody's going to make it' (4).

However, the findings of some authoritative studies are quite to the contrary: there is little chance for adequate protection in the event of direct attack (23). Similarly, the opinion of many eminent bodies independent of government, is, in the words of Sir Douglas Black, that 'effective civil defence against nuclear attack is impossible' (24). Some would go further and state that such plans are extremely dangerous since they create the illusion of security where none exists.

It is possible to construct scenarios of direct attack in which civil defence plans may save some lives, for instance using unrealistic attack patterns with small numbers of weapons, long periods of warning permitting preparation, and optimistic assumptions of survival which ignore longer-term effects of nuclear war. It is also quite possible to envisage situations in which civil defence plans could lead to an increase in casualties. For example, the activation of civil defence plans at a time of increasing international tension may suggest to the opposing side that pre-emptive strikes were being planned and help to precipitate conflict. Similarly, civil defence plans could result in a change in targeting by the opposing side, with a larger number of warheads using more surface bursts to maximise fallout. Nuclear power stations could also be targeted since the radionuclides in fallout from a nuclear weapon detonated on a nuclear power station have a longer half-life than those from a warhead alone.

It appears to be both inconsistent and immoral to increase civil defence measures against attack while simultaneously urging the introduction of larger numbers of nuclear weapons with potential first-strike capability since present levels of armaments appear to be far beyond those required for deterrence and are

thus likely to invoke pre-emptive responses or heavier strikes in the event of use of the weapons. In a non-nuclear country hoping to protect its citizens against fallout from neighbouring countries, on the other hand, civil defence may provide some benefit and certainly cannot be perceived as part of an offensive posture.

The medical response

The development of health service plans for the event of nuclear war raises several ethical issues. At the present time the Department of Health and Social Security in the UK is in the process of developing such plans and the problems should be widely discussed with full opportunity for professional involvement. For instance, health professionals may be dispersed throughout a health district during a pre-attack period. Would this be acceptable to them or in the event would many consider that their responsibilities to their families were paramount? It is stated in a United Kingdom Department of Health and Social Security Circular (25) that doctors should not enter areas of high fallout. Many in those areas would then die without even the most rudimentary attention. Such a principle appears to violate the responsibility of doctors to attend their patients even at personal risk, and should surely be left to individual conscience.

The ratio of casualties to medical staff in many areas is likely to be so great as to make even triage impossible. In this case, should medical staff conserve supplies until the population has fallen to manageable numbers and then intervene medically? Should they consider euthanasia, knowing that many will die after protracted and unrelieved suffering? If so, could the use of valuable drugs be countenanced for such purposes? If medically useful drugs are not to be used for this purpose, toxic agents specifically for euthanasia would have to be stockpiled, a measure probably unacceptable to wide sections of the public and medical profession.

There are many similarly complex issues for which no simple answers are apparent but which require clarification and open debate. It is greatly to be deplored that plans are being developed without consultation at all levels in health services. In view of the contentious nature of such plans, staff should be given the opportunity to consider the part they wish to play on an individual basis.

It can also be argued, as with civil defence, that it is unethical to introduce such plans while supporting the purchase of increased numbers of weapons with war fighting capability. Since treatment of the effects of nuclear war is likely to be ineffective, health professionals should be more actively engaged in prevention. The first step in this direction is for all concerned to understand the nature of the threat and its causes, and the second to identify means to prevent it from happening. Although some may consider such a stance too 'political', it is a logical extension of the medical profes-

sion's concern with major public health issues. The current public health campaigns in developed countries are concerned with avoidable sources of morbidity and mortality which are relatively small when compared with the acute and long-term effects of nuclear war.

Preventive measures might include an endorsement of a freeze on the construction, testing and deployment of nuclear weapons as a first step to reducing the risk of nuclear war. This is a non-partisan measure which has already been endorsed by several medical organisations, particularly in the USA, including the American Nursing Association, the American Medical Students Association, the Institute of Medicine, the American Pediatric Society, the Society for Research and Education in Primary Care and Internal Medicine, Physicians for Social Responsibility, The Medical Campaign Against Nuclear Weapons and International Physicians for the Prevention of Nuclear War. The last organisation includes representatives from the medical professions of over thirty countries including those in the Warsaw Pact and NATO. Some joint medical initiatives on issues related to nuclear war have already been undertaken, including a television programme, made in the USSR, with American and Russian doctors explaining the medical consequences of nuclear war.

Several parts of the codes of medical ethics (26) appear to be particularly relevant to questions raised by the possession of weapons of mass destruction.

Firstly there is the overriding principle that the doctor should be concerned with reasonable preservation of life, which carries the corollary that he should neither cause harm nor support policies which inflict harm on his patients.

The second principle of medical ethics is that medical care should be given impartially. The codification of Regulations in Time of Armed Conflict by several international bodies including the Research Committee of the Red Cross and the World Medical Association (27) affirmed the following principles: a) that in time of war 'the doctor must always give the required care impartially and without consideration of sex, race, nationality, religion, political affiliation or any other similar criterion', b) that 'the primary task of the medical profession is to preserve health and save life', and c) that 'in performing his professional duty, the doctor's supreme guide is his conscience'.

Central to tolerance of threatened use of weapons of mass destruction is a readiness to see people in other countries in such a degraded way that their large-scale, agonised destruction is personally acceptable. This means one must be able to approve the vaporisation of babies and children, the infliction of burns, blast trauma, blindness, deafness, acute radiation sickness and long-term consequences of radiation exposure, starvation and disease, the destruction of civilised social organisation, and the possible long-term destruction of the environment. Without acceptance of such consequences, the deterrence posture could not be maintained.

By what form of psychological dissociation is it possible for many people who are ordinarily humane, intimate and tender in their daily lives voluntarily to participate in such a posture? While there are many reasons for denial of the realities of the nuclear threat, and of responsibility for it, perhaps the most compelling answer is the simple biological one that during our past evolution such a mechanism has conferred great advantage. For an organism to defend itself against threat it has to feel that damage inflicted on the attacker is not a source of concern but rather of satisfaction and even rejoicing. The overriding motivation under threat is nullification of the danger. Such a psychological posture makes great sense in the context of individual defence against personal attack or in small groups competing for resources in a hostile environment, under which circumstances it confers survival value. Projected onto the operations of large social groups with massive technical abilities, on an overcrowded Earth largely under human control, however, such a mechanism may clearly become the source of extreme biological disadvantage. This is particularly the case when both sides are driven by precisely the same psychological mechanisms, reinforced at many social levels, and when the weapons themselves greatly magnify the perceived threat.

Nowhere, perhaps, have the contrasts between individual caring and hostile dehumanising sets of values been more apparent than in medical and nursing roles in time of war. While all those around them are intent on destroying 'the enemy', those in the medical role must stand aside from group identities and attend only to the needs of individuals.

Here, we would argue, lies the crux of both the special role which the medical professions have to play in society's responses to the dilemmas posed by weapons of mass destruction, and the derived problems confronting medical ethics. The medical role is to value and care for the individual and for the life which he or she represents. This must include concern for the potential victims of nuclear weapons in any national group. Thus it is difficult to see how the medical profession can avoid voicing its concern and disapproval for both threatened and actual use of nuclear weapons.

Codes of ethics appear never to have attempted to define in detail the relationship between the conscience of the individual doctor and the political pressures of the society in which he functions. In practice there are numerous instances where doctors have a responsibility to protect the community as well as the individual, perhaps the most obvious being the community physician's role in preventive medicine of various kinds, and the legalised restriction of patients when of unsound mind. Recent reviews of the implications of nuclear weapons have noted the particularly poignant ethical dilemmas which are posed for those specialising in community medicine (28).

If his national group requires a doctor to collude with atrocities on a scale far greater than those involved in, for example, torture or abuse of people for medical

research, should he acquiesce? The possession of weapons with mass destructive capability makes this question unavoidable.

Measures are currently being prepared in Britain to require local authority workers to participate in civil defence preparations for nuclear war. Will that provision also be extended to those working in the health service? A large group of West German doctors have recently issued a statement which includes

'as a matter of individual conscience, I will refuse to participate in any medical preparations for nuclear war' (29).

Their recent national history perhaps makes them aware of the extent to which it is possible for people to find themselves sliding into collaboration with policies which are in conflict with medical ethics.

Whether we continue to possess weapons of mass destruction or not, from the medical point of view war between the superpowers cannot be regarded as an acceptable option under any circumstances. Societies have to evolve to cope with this new reality or face possible extinction. The possibility of complete loss of human life in Britain in the event of use of nuclear weapons, for example, cannot be excluded: not enough is known about the consequences of damage to the atmosphere, the effects on food chains or water supplies to be confident that human life would continue in this country following a nuclear attack.

Whether it ignores the issues or not, the medical profession may be directly implicated in mass destruction since the possession of nuclear weapons and the introduction of new weapons which may undermine deterrence have been, in principle at least, the subject of public appraisal. To accept them without concern or protest is, in the circumstances, to bear responsibility for the course of events.

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Editor's note

The journal has sought, and seeks, a reasoned response representing the opposing medico-moral standpoint. The medical department of the British Ministry of Defence was

unable to furnish such a response on the grounds that serving officers are precluded from entering into contentious political argument. Surgeon Vice Admiral R J W Lambert, Medical Director General (Naval), at the Ministry of Defence offered a brief personal response:

'Like any other doctor, the doctor in the Armed Forces is primarily concerned with preserving the health and saving the lives of his patients. His responsibility to potential patients, in time of war, can only be met by preparing for all eventualities including nuclear warfare. Indeed, restriction of his ability to treat all forms of casualties would itself be unethical.'

Contributors to this issue

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