Medicine and the Bomb

Attitudes towards civil defence and the psychological effects of nuclear war

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Under the worst assumptions of those whose job it is to play war games millions of people in the USA, USSR, and Europe would be killed in a major nuclear attack against military and industrial targets. Under a different set of assumptions, when shelters from blast and fallout are available and there is time for people to take refuge in them, or time for people to be evacuated to safe areas, far fewer would be killed or injured. There is disagreement over the numbers, owing to the assumptions made. These uncertainties in the assumptions and disagreements over the effects are reflected in similar differences in attitudes, ranging from the preparedness of the Swiss to the inaction of successive British governments.

Philosophy of civil defence

The Soviet Union seems to have no doubts about the value of civil defence—it is an integral part of Soviet military planning; but among Western nations attitudes are ambivalent. Many argue against civil defence measures because the suggestion that a nuclear war may be survivable may make it more thinkable and therefore more likely; others argue that strong civil defence increases the ability of an attacked nation to retaliate and hence strengthens the notion of deterrence. But whatever the arguments—and cost has also been a factor—the comprehensiveness of civil defence in different countries does not seem to be related to the likelihood of being attacked.

The general policy throughout the NATO countries of Western Europe seems to be for the population to stay put, largely because of the difficulty of identifying safe areas and because of the problems caused by having large numbers of people moving through countries that are being fought over. Nevertheless, most governments concede that the populations of their cities are not likely to stay put, especially if they think themselves a target. West Germany, for example, has legal provisions to prevent people moving from their homes but they also have plans to evacuate people living close to the borders with Warsaw Pact countries. West Germany has invested heavily in civil defence, with an extensive warning and monitoring system, plans for civil defence advisers for each community to instruct on protection from nuclear, chemical, and biological weapons, and plans to subsidise shelters in new buildings. But the shelters approved by the government will not provide maximum protection simply because of the cost. The UK's position as one of the hubs of NATO's communications and an offshore aerodrome for US reinforcements to Europe must also make her vulnerable to attack, but plans for protecting the population concern only shelter from fallout and rely not on specially constructed communal shelters but on what individual families can do at home. As well as being cheap, makeshift home-

based fallout shelters are based on the idea that people sheltering with their families would be less susceptible to infection than in a communal shelter and also less subject to the psychological and social strains of enforced confinement with strangers. There are underground shelters for government ministers and some civil servants and local government officers which will provide them with a more substantial degree of protection and a communications system so that they can govern supplies and services after an attack. The system does have its weaknesses, however; some of the shelters have fallen into disrepair and a few local authorities have refused to appoint civil defence planning officers because they oppose the concept of civil defence against a nuclear attack.

The current assumptions foresee a period of tension before an attack during which the people of Britain could be given instructions on how to construct a simple fallout shelter (under the stairs or the kitchen table) and generally fend for themselves after an attack. As in the rest of Europe, attacked cities would

Electromagnetic pulse

Any nuclear explosion also produces an electromagnetic pulse—a surge of electromagnetic radiation covering a broad range of frequencies but mainly in the radiofrequency (long wave) region. The radiation is collected by radio antennas but also by long runs of cables and wiring, overhead power cables, and long expanses of metal and is converted into strong electric currents. These currents may give a severe shock to anyone in contact with a collector and will damage any electrical or electronic equipment attached to the collector or close to it, such as radiocommunications and telephone systems and electric power supplies. Computers and other equipment with solid-state components are most vulnerable to damage from the electromagnetic pulse, as is any component connected to a large collector. Equipment with small collectors is much less at risk. Thus portable battery-operated radios with ferrite core antennas are not easily damaged unless they are close to a collector.

The area affected by the electromagnetic pulse varies with the height of the burst. A one-megaton surface burst would produce an intense pulse near ground zero and the area of its damage would extend to that where pressures from the blast reached two pounds per square inch. An airburst high in the atmosphere—over 100 miles—could disrupt telecommunications over an area of 1000 miles or more in radius. Military communications systems can be (and in some cases have been) “hardened” to protect them against this effect.

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Around 70% of Swedes have access to purpose-built shelters against blast and fallout.

be written off because the resources, people, and plans to mount a rescue are not expected to be available.

The UK has an impressive warning and monitoring force, though it is sometimes medieval at the periphery of the system—policemen with handbells—and much of the communications system is vulnerable to the electromagnetic pulse released by a nuclear explosion, which could destroy unprotected radio communications and leave people huddled under their kitchen tables listening to a silent radio. As the plans assume a period of tension during which people could be told what to do, a surprise attack would result in many deaths from fallout that might have been avoided had people known how to protect themselves.

Training and information

Those countries that take civil defence seriously, such as Norway, the USSR, and the neutral states of Switzerland and Sweden, not only build shelters against blast, fire, and fallout, and have plans for evacuation: they also train substantial proportions of their populations in defence measures. The Swiss, for example, train all men aged 20 to 60, and in Sweden everyone aged 16 to 65 is liable for civil defence work, and many of them have been trained. These countries all have military conscription and most of the civil defence instruction is given as part of military training, though in Sweden it may also be extended to groups not normally called up for military service, such as women. The problems of disseminating useful information and instruction to a civilian population are more formidable: without a framework for learning, such as military service, or an immediate need to know, such as an impending war, many people are likely to forget the information. Nevertheless, the recent parliamentary and public pressure that has prompted the British Government to release its basic protection booklet *Protect and Survive* suggests that there is an interest in the subject; and the information given at the time of an impending attack might be more effective if the ground has already been prepared. The derision that has greeted the suggestions in *Protect and Survive* for building shelters under the stairs and painting the windows white, which may provide a considerable degree of protection from nuclear fallout and thermal radiation respectively, indicates the degree of ignorance about the subject and suggests that a more open debate about the principles and policy of protection might produce a more informed population.

Paradoxically the neutral states of Sweden and Switzerland, which seem less likely than the UK and some other European countries to be attacked have shelters to protect most of their populations against blast as well as fallout. Since 1960 Switzerland has required all new buildings to include fallout shelters, and there are now enough to protect 90% of the population.

There are also about 73 000 protected hospital beds with nearly 100 underground operating theatres plus many more medical stations and first aid posts. Sweden provides shelters against blast, fire, fallout, and chemical and biological weapons for nearly 70% of the population, while Norway has shelters for about 60% and a tested evacuation plan. Among other European nations the Netherlands requires all new homes over two storeys to include a basement shelter against fallout, but Belgium seems to have even less provision than the UK—there are not even shelters for the government or civil defence communications.

USA and USSR

Both the USA and the USSR have the advantage of large land masses and areas where the population could reasonably expect to be safe from blast and fire because of the lack of targets. With no civil defence a major attack on either country could kill well over 100 million people within 30 days of attack; comprehensive civil defence measures are considered to be able to reduce the numbers to the low tens of millions. The Americans are increasingly looking towards a policy of evacuation—they call it Crisis Relocation—and have identified potential fallout shelters in host areas and started to protect emergency radio stations against the effects of the electromagnetic pulse. But because of

Some Americans have been given detailed advice on converting their cellars into fallout shelters.

changes in policy, reorganisations of the civil defence bodies, and a general lack of commitment, the USA's civil defence is thought to be ineffective. There is no such lack of commitment in the USSR, which has detailed plans to evacuate the cities and provide blast and fallout shelters for their national and local leaderships and for workers at key industrial plants. The Russians have also tried to protect industrial plant against attack, recognising its importance for economic recovery afterwards.

The aftermath: psychological problems

The task of coping with the aftermath of a nuclear war and promoting economic recovery would be massive—many would echo Field-Marshal Lord Carver's comment that he would not want to survive a nuclear attack—and the problems would be aggravated by psychological problems among the survivors.

After a large nuclear attack the psychological problems of a bombed population may create as many problems as the physical injuries, particularly as they may affect otherwise uninjured survivors on whom reconstruction will depend. Psychological reactions to the threat of attack, a period in a fallout shelter, the large numbers of dead and injured who will not be rescued, and eventual emergence into a society where normal services and

supplies are disrupted may well disable otherwise healthy survivors and hamper their efforts at recovery.

All the data on the psychological effects of a nuclear attack obviously come from Hiroshima and Nagasaki, though studies of people's behaviour in other disasters, during tornado warnings, and when confined in small spaces for long periods provide some indication of their responses in the period before an attack and during their stay in shelters. Behaviour after a limited disaster, where relief comes from outsiders, may not provide a proper comparison. After a major nuclear attack, which destroys communications, fuel pipelines, and industries, there may be no outside help and survivors may emerge into a society where the patterns of authority of a high-technology society have disappeared.

People at greatest risk of attack—those in cities—are also those who rely most on facilities and resources that demand complex and centralised organisation. Small rural populations are likely to show greater resilience and be better able to fend for themselves when these sorts of organisation break down. Indeed, community initiatives in preparing civil defence in Britain have occurred in villages, not cities.

In the warning period before an attack people may not behave as calmly or as rationally as their governments would like. In Britain, despite exhortations to stay put, stock up, and build a shelter, the planners expect that large numbers of people will try to leave the cities, and there may be civil unrest as they find major roads closed, as those who try to stock up find food requisitioned by the authorities, and through resentment of those who go underground. A study during the short warning period before a tornado showed that some people became incapable of doing anything to help themselves or others while a more general reaction was for men to go home to their wives and for women to go to their mothers. Most civil defence plans rely on those civilians with jobs to do after an attack curbing their instincts to protect their families and instead reporting for duty and taking shelter without them.

Social disorganisation seems to be greatest when the warning time is short, the effects of the agent of disaster or its magnitude relatively unknown, its destructiveness greater, and its period of action longer—all likely characteristics of a nuclear attack. Fear may inhibit rational behaviour and make the victim incapable of making even minor decisions, while in a minority of people breakdowns may result in uncontrolled movements, apathy, or stunned behaviour. People who suffer such reactions may later become abnormally anxious.

Discomforts of a fallout shelter

Dangers that cannot be seen, heard, smelt, or felt—such as radiation—have a strong psychological impact. Individuals will

British policy relies on last-minute construction of boy-scout play houses. (Adapted from *Protect and Survive* with permission from HMSO.)

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have to rely on radio broadcasts to tell them when it is safe to emerge from their fallout shelters, but this assumes that everyone will be in range of a working broadcasting station and that each household will have a working radio—assumptions that may not be true in all cases. Even if the radio does work the isolation experienced by those trapped at home by fallout may engender fears; some of those not affected by radiation may well imagine that they have been and develop “symptoms.”

The effects of being confined for several days in a fallout shelter, probably in cramped and unhygienic conditions, include depression, anxiety, claustrophobia, and hallucinations as well as anti-social behaviour. Studies with volunteers have shown that these reactions and tensions between members of the group can be lessened if there is a shelter manager and if people in the shelter can occupy themselves doing useful tasks. Some of these tensions may be reduced in a shelter based at home, where the occupants would be used to living with each other, but conditions are likely to be cramped, uncomfortable, and smelly.

If only one or two bombs were exploded over Britain the undamaged regions could provide conventional medical treatment for the survivors, even though the numbers of injured may be very great. With wider destruction many people would have no source of specific advice on how to look after the injured. Destruction of hospitals and medical manufacturing plants would mean that surviving doctors would have to adapt their treatment to an indefinite period with no new supplies of drugs or equipment. Civil defence training for doctors should include advice on medical self-sufficiency—how to use alcohol, acupuncture, and hypnosis and a do-it-yourself herbal—and on public health priorities for communities with destroyed sewage systems, no piped water, and little fuel.

After the atomic explosions at Hiroshima and Nagasaki people were shocked and stunned, some searched aimlessly for their wives and husbands, and others drifted out of the cities with no real thought for where they were going. Many more looked more purposefully for their families, dug people out of the wreckage, built makeshift shelters in the ruins of their homes, and tended for the injured as best they could until help, including medical supplies and equipment, started to arrive some days after the attacks. A nuclear attack would never again come as such a complete surprise as it did to the people of Hiroshima. But a major attack that destroyed all normal services in large areas of Europe, the USSR, and the USA would preclude the possibility of help from outside. The survivors would have to continue to fend for themselves; their attitudes would have to change radically, with survival becoming the main priority. As the Office of Technology Assessment of the US Congress points out, the psychological impact of a major attack is imponderable, “but it is unlikely that the survivors would simply take it in their stride.”