The challenge of preparation for a chemical, biological, radiological or nuclear terrorist attack

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ABSTRACT

Terrorism is not a new phenomenon, but, in the contemporary scene, it has established itself in a manner which commands the most serious attention of the authorities. Until relatively recently, the major threat has been through the medium of conventional weaponry and explosives. Their obvious convenience of use and accessibility guarantees that such methods will continue to represent a serious threat. However, over the last few years, terrorists have displayed an enthusiasm for higher levels of carnage, destruction and publicity. This trend leads inexorably to the conclusion that chemical, biological, radiological and nuclear (CBRN) methods will be pursued by terrorist organisations, particularly those which are well organised, are based on immutable ideological principles, and have significant financial backing. Whilst it is important that the authorities and the general public do not risk over-reacting to such a threat (otherwise, they will do the work of the terrorists for them), it would be equally ill-advised to seek comfort in denial. The reality of a CBRN event has to be accepted and, as a consequence, the authorities need to consider (and take seriously) how individuals and the community are likely to react thereto and to identify (and rehearse in a realistic climate) what steps would need to be taken to ameliorate the effects of such an event.

The Role of Terror

Terrorism is psychological warfare. Thus, the strategy in terms of preparation and planning rehearsed by the authorities must focus on the psychosocial dimension. This raises a number of major issues and challenges which will be addressed in this article.

The use of terror has throughout history been recognised as an effective method (at least in the short term) of achieving political, criminal, religious, and ideological aims. The underlying rationale to the use of terror was captured by the 4th Century (BC) Chinese strategist, Sun Tzu, “...kill one, frighten ten thousand”.

Bio-chemical terrorism is not a new phenomenon. Sinclair provides fascinating examples of the early use of biological and chemical agents as means of evoking terror. These include the use of poison gas by the Spartans during the siege of Plataea in 428 BC and the use of smallpox infected materials by the Pilgrim Fathers, from England, to overcome the indigenous populations of North America. More recent examples of the military use of toxic and infectious agents are represented by the dissemination of pulmonary agents and vesicants during the 1st World War, and the distribution of containers of anthrax, typhus and cholera by the Japanese against the Chinese in the 2nd World War. Civilian examples include the use of chemical weapons by Saddam Hussein against the Kurds; the deliberate contamination of salad bars in the US state of Oregon with Salmonella typhimurium by the Rajneeshee cult; the sarin gas attack by the Japanese cult, Aum Shinrikyo, on the Tokyo underground rail system, and the anthrax “scare” through the US postal services, which followed the attack on the World Trade Center and the Pentagon.

However, to the possible repertoire of the terrorists must now be added nuclear and radiological methods. A nuclear incident might include an attack on a nuclear installation, and a radiological one would be represented by a “dirty bomb” (ie, a conventional explosive device containing radioactive material).

Thus, preparation for a non-conventional attack by terrorists must anticipate the possible use of chemical, biological, radiological or nuclear (CBRN) means. Whilst conventional
explosives and weaponry remain at present the terrorists’ preferred options, recent events confirm their determination to seek even more audacious, potent and dramatic methods of achieving their ends. “Unthinkable” does certainly not translate into “impossible”. The terrorists’ choice of methods will be influenced by various factors including ease of access to specific agents, their safety and detectability in storage, their toxicity, and their ease of distribution.[2,3]

Alexander & Klein[4] have highlighted what are the widely agreed advantages offered by CBRN agents. Most are not identifiable through normal sensory experiences (thereby evoking primitive fears of unknown and undetectable forces); their effects may be delayed and unpredictable; scientific knowledge about them and their effects is often incomplete; antidotes are likely to be in limited supply, and there is no clearly delineated “low point”[5] from which things will improve. In summary, therefore, CBRN agents share a potential to foster widespread anxiety and uncertainty both among victims and the authorities. This represents a formidable challenge to those responsible for the response strategy.

Aims of Terrorism

Whatever is their modus operandi, terrorists share very similar aims. These are to:

• create widespread fear, anxiety and panic
• generate a communal and individual sense of helplessness, vulnerability and hopelessness
• demonstrate the incompetence and/or inability of the authorities to afford security and protection against such opponents
• provoke the authorities into errors or overreactions which will disaffect the general public or specific influential bodies

The last aim is particularly important as evidenced by the widespread concerns following the recent shooting of an innocent man by the Metropolitan Police in London (following false information that he was a “suicide bomber”), the incarceration of “terrorist suspects” in prisons of Guantanamo Bay and Belmarsh, and the introduction of repressive legislation. Moreno[6] has persuasively demonstrated how easy it is in a democratic society to subordinate hard-earned civil liberties to the need to introduce counterterrorist legislation.

Psychopathology and Terrorist Incidents

The authorities in their preparations must consider what might be the nature and level of mental health needs after a CBRN incident. Since there has never been a major incident of this kind, it is necessary to extrapolate from a number of incidents, including what terrorist incidents there have been, other major trauma, and industrial accidents including those involving nuclear and radioactive materials (eg, the Chernobyl accident in Russia, the Three Mile Island incident in the USA, and the Goiania incident in Brazil).

Generally, terrorist incidents cause a higher level of psychopathology than is occasioned by natural disasters.[7,8] The latter group of researchers predict that, following such events, for every single physically injured casualty there will be between 2-10 psychiatric casualties. In a comparative study of the Nairobi and Oklahoma bombings, North and her colleagues[9] noted a similar level of psychopathology (25.8% and 19.5% for males; 35.1% and 34% for females respectively). There is also evidence that psychiatric effects may be enduring; three years after the Aum Shinrikyo sarin attack one half of the casualties reported ongoing mental health problems.[10] Whilst post-traumatic stress disorder (PTSD) is an important and often chronic condition, all authorities agree that other psychomorbidity must also be identified, especially depression, anxiety and substance misuse. These are very common post-traumatic conditions in their own right, and are often comorbid ones to PTSD.[11]

How children and adolescents respond to terrorist incidents will in part reflect their parents’ reactions, but it is clear that they are particularly vulnerable,[12] even if they themselves were not directly exposed to such an event and were not related to anybody who had either been injured or killed in such an event. Pfefferbaum’s team[13] emphasise the potentially traumatising role of the media, particularly in the case of bereaved children. The authorities need also to be alert to the heightened physical risk of children and adolescents (with the attendant psychological consequences) to CBRN effects due to their higher respiratory rate and greater skin/surface mass ratio.

Multiple Unexplained Symptoms (MUS)

A number of authors, including Pastel,[14] have recommended that this term be used to replace other terms which are inaccurate and/or pejorative, such as “mass hysteria”, “mass psychogenic illness”, and “the worried well”. (The last is particularly inappropriate since many individuals so diagnosed have good cause to be worried and may be so “worried” that they are not well!)

The term refers to the widely reported phenomenon whereby individuals present, very persuasively and in complete sincerity, with a range of physical symptoms without any objective evidence and often without the individuals themselves having been directly exposed to the noxious agent. Such episodes are usually observed in communal settings (eg, schools and workplaces) and in response to rumours or to unexpected smells. In the 1st World War, the term “gas neurosis” was coined to describe this phenomenon, which resulted in soldiers reporting for medical care even although they had not been directly exposed to a toxic gas.[15] Similarly, in the Vietnam War, many combatants sought help because they believed (wrongly) that they had been exposed to dioxin (“Agent Orange”), a toxic defoliant.[16] These authors also confirmed a similar reaction among peacekeepers in Croatia who believed they had been exposed to depleted uranium.[17]
Among civilian populations comparable reactions have been noted after, for example, nuclear and radiation accidents,[17] after the SCUD missile attacks on Israel[18] and after the demolition of the World Trade Center (which gave rise to the “World Trade Center Syndrome” characterised by respiratory and cardiac symptoms.[19]

In terms of a preparation strategy, it is vital planners and first line responders are familiar with the phenomenon particularly in view of its possible scale. After the Tokyo underground incident the ratio of those who sought medical help (but who had not been contaminated) to those who did require physical care (because of exposure to the sarin) was 450:1.[19] As DiGiovanni[20] (1999) has emphasised, such a circumstance could lead to health care systems being overwhelmed.

Individuals presenting with MUS will need to be dealt with tactfully and sensitively. A crude dismissal of their symptoms is likely to exacerbate the problem and merely encourage them to make more persuasive attempts to convince health care workers of the genuineness and seriousness of their symptoms. [21] One has to consider only the intense political, social and medico-legal debate surrounding the so-called “Gulf War Syndrome” to realise how sensitive and delicate would be the problem after a major CBRN incident. Moreover, the authorities have to ensure that actions they themselves initiate do not contribute to the development of this phenomenon. After the pipe bomb explosion at the Centennial Olympic Park (in the USA) in 1996, it was wise of the authorities to resist the temptation of sending the investigation team to the site attired in their protective “moon suits”.[22] A helpful set of management guidelines has been prepared.[23]

Normal Individual and Community Reactions

Typical individual and community reactions have now been identified after a miscellany of traumatic events. Those who plan a disaster response and those who implement one, must be familiar with such reactions to ensure that perfectly normal and healthy reactions do not become labelled as “post-traumatic psychopathology”. Moreover, an optimistic view should be adopted; psychopathology is not the norm – resilience is. No single traumatic event is guaranteed to trigger a psychopathology in all exposed to it. The outcome will be shaped by three groups of factors.[24] The first group comprise those which are “pre-trauma”, eg, personality (introverts are more vulnerable), age (young children and the elderly are at greater risk), and gender (women of child bearing age are also at more risk). The second group of factors are “peri-trauma”, eg, an extreme acute reaction (including dissociation) and being trapped. The third group of influences are those which exert their effects after the trauma, and these include the availability of support, concurrent life stressors, and the reactions of others. Holloway and colleagues[25] also suggest that in relation to CBRN agents important determinates of outcome are, for example, their incubation period and their toxicity.

Brewin and his colleagues[26] and Yehuda[27] have also identified risk factors for the development of post traumatic psychopathology, but it is also important for response planners to recognise that first responders and others who will have to provide care for those caught up in a CBRN incident may themselves become psychological casualties. Whilst selection, training and experience may afford such individuals a high degree of protection against psychological trauma, much research has shown that, even in the face of “routine” trauma, a significant number of such personnel may themselves suffer emotionally.[25-28] More specifically, Simon[10] noted that among the primary victims of the Tokyo sarin incident were rescue and emergency personnel. This emphasises the need for realistic preparation and training for such personnel; preparation and training which includes the use of protective clothing (which can itself be a stressful experience), the identification of normal and pathological reactions in primary victims, and the development of self awareness, particularly with regard to their own emotional reactions.[31]

Normal individual reactions include the following.

**Emotional**
- shock, numbness, denial (in the acute phase)
- fear, anxiety (but not panic; see below)
- guilt (either at surviving or at believing one did not do one’s best to help others)
- helplessness, hopelessness
- anger (may be displaced anger and directed unfairly at the authorities and even rescuers and caregivers; may give rise to “scapegoating”)

**Cognitive**
- dissociation, confusion
- intrusive thoughts, images, memories[1]
- hypervigilance (ie, exaggerated sense of risk)[1]
- impaired memory and concentration
- false attributions (as occurs in “MUS”)

**Social**
- withdrawal
- irritability (very destructive in family relationships)
- loss of trust in others[12]
- avoidant behaviour (of reminders of the trauma)[1]

**Physical**
- autonomic hyperarousal[1]
- insomnia
- loss of appetite

[1]NB: whilst these reactions are “normal” in the first few weeks post-trauma, should they continue for about a month they would constitute the core symptoms of PTSD (according to the DSM-IV and the ICD-10).

Community responses have been well described by Tyhurst[31] (1951). His is a three phased model of response which has stood the test of time, although others[19] have offered...
supplementary observations.

According to Tyhurst in the first (“impact”) phase the prevailing reaction is likely to be that of being stunned and numbed. There may also be signs that the level of risk is being underestimated. North and her colleagues observed in their follow-up of the postal “anthrax scare”, involving the US Capitol Hill staff, a number of individuals failed to adhere to the recommendations for antibiotic prophylaxis. Also, in the aftermath of the Chernobyl accident, Skryabin and team reported that, among the Belarus community, dietary advice regarding contamination was widely ignored. In their planning, therefore, in the wake of a CBRN incident the authorities would need to identify methods of combating denial. Of equal importance would be their need to address two findings reported by the American Psychological Society: (a) case studies are more influential than bald statistics, and (b) statistical probabilities carry less weight than do individual, subjective perceptions of risk. Allen and colleagues have relevantly emphasised, moreover, that changes in lifestyle, which may be necessary to accommodate perceived threat, could themselves become a source of stress. CBRN contingency planning must recognise that perfectly appropriate protective measures may generate psychological issues which cannot be ignored or overridden. For example, barrier environments, restrictions on travel and quarantine are alien to most citizens, and they are unlikely to acquiesce readily to these. Indeed, the general value of quarantine has been challenged partly because of its limited inherent value but also because of its unwanted “side effects”, including the consequences of separating families (just at a time when familial support might be most necessary – particularly for children). Also, it should be noted that, following the Tokyo sarin attacks, there was widespread disquiet at the crudity of the decontamination methods used and at the apparent lack of concern for the survivors’ privacy and dignity.

Those responsible for preparing a response to a CBRN incident should, however, draw comfort from a number of observations about human behaviour in response to major trauma.

Despite what is widely described in the media, panic is not a common reaction. It does occur but usually only when individuals feel trapped, vulnerable and helpless. Even in conditions of extreme duress individuals are more likely to behave rationally and constructively; heroism and altruism may also be evident. Evidence of such reactions derives from reviews of individuals subjected to regular bombing; those who survived the Kings Cross (London) underground fire, evacues from the World Trade Center disaster site and those who survived the recent London terrorist bombings.

Planners would be well advised, therefore, to maintain a positive view of how individuals typically react and consider the general public as competent allies in their planning.

In Tyhurst’s second (“recoil”) phase individuals typically seek meaning and order as well as reunion with family and friends. Since these are well recognised as potent sources of support, the authorities should make every effort to facilitate such reunions by, for example, effective communications, the setting up of “helplines”, social activities, and by the support of various community agencies including the Church and schools.

In the third (“recovery”) phase there are likely to be alternating phases of positive progress and relapse with regard to community adjustment. Factors which might retard or compromise adjustment are misrepresentations by the media (see below) and prolonged legal proceedings.

The Media

A certainty in the wake of a major CBRN attack will be the extensive and rapid deployment of media personnel. Contemporary IT and high speed travel ensures this. An equally well-founded observation is the symbiotic relationship the media have with terrorists. Dramatic terrorist events raise viewing and sales figures; the media at the same time provide an opportunity for terrorists to publicise their cause and provide a “justification” for their deeds, however apparently barbarous.

Civil contingency planning must involve the media as allies not only because their presence is inevitable but, more constructively, because the media are experts in mass communication. Most authorities emphasise the signal importance of communication with the public after a terrorist incident.

The active involvement of media representatives at the strategic planning stage is likely to achieve a number of dividends, including:

• a reduced level of sensationalist reporting
• a lower risk of retraumatising survivors (through the gratuitous repetition of graphic and gruesome imagery etc)
• the prompt and wide dissemination of accurate information (eg, about what has happened, what is happening, and what will happen; how to get help and where)
• an emphasis on resilience and coping rather than on psychopathology and helplessness

Covello et al have emphasised the importance of education, information and risk communication in the reduction of fear, anxiety, and panic. The media can make a major contribution to this end, but only if they are treated as genuine allies from the outset. A major challenge for the media, however, is their selection of credible harbingers of important information: in the contemporary climate politicians may not be the best choice. Valuable guidelines have been set out as to how best to communicate with the public.

Psychosocial Interventions

In anticipation of a CBRN incident the authorities need to identify a range of psychosocial interventions. These could include basic “psychoeducation” about normal reactions and how to cope with them through the media and well-prepared
References

21. Hamer NM. If you have to prove you are ill, you can’t get well. Spine 1996;21:2397-400.