



## Psychological implications of chemical and biological weapons

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tered to people thought to have been exposed on the same day as the diagnosis was made. There is no role for widespread use of antibiotics where no deliberate release has occurred or is suspected.

The disadvantage of raising awareness is the inevitable rise in false alarms and hoaxes. Suspect packages are a matter for the police, and must be dealt with in the same way as a bomb threat. If an opened package contains a suspicious powder (or a note threatening anthrax) it should be left alone. But the person who opened it should remain in the room and shut the door to avoid spreading possible contamination. The air conditioning should be switched off and help summoned via the local police. If the powder is found to contain anthrax, prophylactic antibiotics need to be started within a few hours, but this does allow time to make a proper assessment.<sup>6</sup>

The initial public health response to the current anthrax incidents in Florida and New York city has been exemplary. The initial Florida patient became ill one weekend; a diagnosis of pulmonary anthrax was made on the day he died. Once the diagnosis was made, the response was almost instantaneous, with the central state authorities and Centers for Disease Control in Atlanta immediately starting intensive case finding. This was because after 11 September the Centers for Disease Control and state public health departments had put most emergency rooms and hospitals on high alert through electronic alerting systems. Fortunately anthrax is not transmitted person to person, and to date in the Florida release only two cases of disease have been found.

The United Kingdom has been preparing to deal with the deliberate use of chemical or biological agents since the Toyko incident. No system will be able to mitigate the effects of a release completely, but our excellent public health systems and infrastructure give us a good start.

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## Psychological implications of chemical and biological weapons

*Long term social and psychological effects may be worse than acute ones*

The ostensible purpose of chemical and biological weapons is to endanger lives. Biological agents, however, are particularly ineffective as military weapons, while chemical weapons have only limited uses. This may be why armies have generally acquiesced in international treaties to contain these unpredictable weapons and feel capable of waging war without them. Instead, chemical and biological weapons are quintessentially weapons of terror. The now routine journalistic association between chemical and biological weapons and the word terror confirms that the purpose of these weapons is to wreak destruction via psychological means—by inducing fear, confusion, and uncertainty in everyday life.<sup>1 2</sup> These effects will take two forms, acute and long term. It is customary to expect largescale panic if such weapons are ever effectively deployed or thought to be deployed.

We do not, however, know whether such panic would materialise. Media stories emerging from the United States in the past few days are not encouraging, but we should remember that history teaches us that civilian populations have been able to withstand previous "terror" weapons such as aerial bombing, despite warnings to the contrary. However, one psychological

reaction that can be anticipated, because it has already started to materialise, is mass sociogenic illness. On 29 September 2001 paint fumes set off a bioterrorism scare at a middle school in Washington state, sending 16 students and a teacher to the hospital.<sup>3</sup> On 3 October over 1000 students in several schools in Manila, Philippines, deluged local clinics with mundane flu-like symptoms such as cough, cold, and mild fever after rumours spread via short text services that the symptoms were due to bioterrorism.<sup>4</sup> On 9 October a man sprayed an unknown substance into a Maryland subway station, resulting in the sudden appearance of nausea, headache, and sore throat in 35 people. It was later determined that the bottle contained window cleaner.<sup>5</sup>

Examples of mass sociogenic illness remind us of the dangers of inadvertently amplifying psychological responses to chemical and biological weapons and thus adding to their impact. One example is the routine use of investigators clad in space suits to assess possible terrorist attacks. Another is that the United States government is considering placing detectors to identify chemical warfare agents on the Washington DC subway system. It is possible that these alarms will in practice

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cause greater disruptions to transport systems than the attack itself, given the high probability that such detectors may give false alarms. There were 4500 such alerts in the Gulf war and none was associated with a confirmed attack.

The long term social and psychological effects of an episode of chemical or biological attack, real or suspected, would be as damaging as the acute ones, if not more so.<sup>6</sup> For example, a serious physical impact of the accidental discharge of sarin nerve agent during the destruction of an Iraqi weapons depot after the end of the Gulf war has not been documented, but the psychological, social, and political consequences have been substantial and continuing.<sup>7</sup> Even if the short term consequences of an attack with chemical or biological weapons turn out to be less than some of the apocalyptic scenarios currently being aired by the media, the long term disruptions may be worse than anticipated. Experience from other incidents involving confirmed or alleged incidents of toxic contamination suggests that these might cluster around four major health concerns: chronic injuries and diseases directly caused by the toxic agent; questions about adverse reproductive outcomes; psychological effects; and increased levels of physical symptoms.<sup>8-10</sup>

The general level of malaise, fear, and anxiety may remain high for years, exacerbating pre-existing psychiatric disorders and further heightening the risk of mass sociogenic illness.<sup>11 12</sup> The current uncertainty over the chronic health effects of low level exposure to toxic agents will further increase anxiety in the affected communities.<sup>13</sup> Because health officials cannot provide blanket assurances that no harm will result from brief or non-symptom producing exposure to toxic agents, frustration and then a growing distrust of medical experts and government officials may result, robbing state institutions of the trust they need to manage recovery. Lastly, unconfirmed or controversial hypotheses about the health effects of exposure to chemical and biological weapons will probably become contentious scientific and media issues in the years ahead, as has occurred

after numerous chemical and radiological incidents, the Gulf war, and the Balkans deployment.<sup>14 15</sup>

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## Neurodegenerative disorders

*This major cause of chronic suffering is reason enough for a theme issue*

“Now begin the journey that will lead me into the sunset of my life,” was how Ronald Reagan described his remaining life.<sup>1</sup> That was seven years ago when he told the world that he had Alzheimer's disease. The sunset has been a prolonged one, as is usual in most neurodegenerative disorders, of which Alzheimer's is a prototype. All have an insidious onset, progress slowly over years, and death is usually due to an intercurrent illness and not directly due to the disease itself. Predictably the global burden of diseases like Alzheimer's will rise with increasing longevity. Much of the burden is also borne by carers and relatives. Reagan's daughter, Maureen Reagan, summed up what the illness means to carers. “Ronald's wife Nancy is the one who wakes up with it every morning and goes to sleep with it every night.”<sup>2</sup> Unfortunately Nancy

Reagan's burden does not figure in any report of global health.

Neurological and psychiatric disorders taken together account for more chronic suffering than all other disorders combined.<sup>3</sup> Neurodegenerative disorders have largely contributed to the neurologist's reputation for being accurate in diagnosing illnesses but hopeless at treating them. Research on prions, amyloid deposits, and  $\beta$  sheet breaker peptides may change all that.

The pathogenesis of many neurodegenerative disorders is now known to be associated with the accumulation of protein deposits within brain parenchyma.<sup>4</sup> In these diseases a normal soluble cellular protein is converted into an abnormal insoluble aggregated protein rich in  $\beta$  sheets that is toxic—for example,