Harnessing Mother Nature against your fellow humans

How prepared is Britain for terrorist attempts to use zoonoses as weapons? **Geoff Watts** reports

Anthrax, plague, tularaemia, and the haemorrhagic fevers—these are four of the six microbes or groups of microbes classed by the US Centers for Disease Control and Prevention (CDC) as being of greatest potential value to would be bioterrorists. These “category A” agents, as they’re known, are all easily disseminated or transmitted from person to person, cause high mortality, and are likely to engender social chaos. The four also have one other feature in common. All are zoonoses: the meeting point between human and veterinary medicine.

Bioterrorists need not, of course, rely on zoonoses. Attacking a nation’s agriculture can by itself create mayhem. The economic and social damage caused in the United Kingdom by the entirely natural outbreak of foot and mouth disease in 2001 is testament to that.

But, naturally enough, it is bioterrorism involving human disease that prompts the sharpest fear. “It’s corny and it’s a cliché, but Mother Nature is the world’s worst bioterrorist,” says Paul Gibbs of the University of Florida’s College of Veterinary Medicine. Hence the widely held view that if you prepare for natural zoonotic epidemics you’re probably well prepared to face an intentional threat. “Once the initial outbreak has occurred, it becomes a natural epidemic anyway,” Professor Gibbs adds.

That’s true—up to a point. The difference is that in bioterrorist incidents there’s an extra ingredient: human intelligence. The point was emphasised with some force in a 2002 report (*Countering Agricultural Bioterrorism*) from the US National Research Council’s Committee on Biological Threats to Agricultural Plants and Animals. “The perpetrators,” it says, “will have the advantage of selecting unanticipated and covert means, including control of the time of introduction of the agent, introducing agents into remote areas, multiple introductions of the same agent, and simultaneous release of different agents.”

Jim Scudamore, the UK’s chief veterinary officer at the time of the foot and mouth outbreak, adds one further ingredient that a scientifically minded terrorist might stir into the pot: “The other issue is whether they might use genetically manipulated as opposed to naturally occurring organisms.”

The Department for Environment, Food and Rural Affairs (DEFRA) does, of course, have detailed plans for dealing with outbreaks of animal disease of whatever origin. In the case of zoonoses the plans involve formal liaison at all levels between the State Veterinary Service, the Health Protection Agency, the Department of Health, and an alphabet soup of other government agencies.

As with the outbreak of any zoonotic disease, in the first instance local veterinary and medical staff would handle it, with referral upward to regional or national committees, depending on how far the infection had spread. Any hint that a particular episode might be initiated by bioterrorists would shortcircuit the chain of command. Top DEFRA officials would immediately be alerted. Depending on its severity, says the deputy chief veterinary officer, Fred Landeg, the response to an incident might even be centrally coordinated at the highest level: the Civil Contingencies Secretariat run by the Cabinet Office.

But would the system work? Indeed, would an incident attributable to bioterrorism rather than to nature necessarily be recognised as such? Most of the arrangements linking vets and health professionals were created to deal with naturally occurring outbreaks of salmonella and the like, not with bioterrorism. Indeed, Nigel Lightfoot, director of the Health Protection Agency’s Emergency Response Division doubts whether most staff tackling a particular problem on the ground would initially pause to wonder whether it was a natural event or not. They’d just get on and deal with

it. “Let’s face it,” he says, “the bioterrorism threat is much lower than nature’s threats.”

As you might expect of someone who works at the Porton Down defence laboratory, Dr Lightfoot does occasionally think in more conspiratorial terms. Discussing the risks of bioterrorism with medical and veterinary colleagues is part of his job. As far as zoonoses in CDC’s highest risk category are concerned, the UK’s best protection lies in the fact that all are exceedingly rare in, or absent from, this country. Vets or doctors encountering them in any but the most obviously innocent circumstances could hardly fail to be suspicious.

In the end, though, the effectiveness of any untested system has to remain a matter for speculation.

Anyone sceptical of the value of cross disciplinary links between vets and doctors might care to recall the 1999 outbreak of fever, headache, confusion, and muscle weakness among a small group of people in New York. After a period of less than conclusive testing carried out in collaboration with CDC, the state’s public health laboratory concluded that it was probably facing an outbreak of the mosquito-borne St Louis encephalitis.

In the meantime, a veterinary

pathologist working for New York’s Bronx Zoo, Tracey McNamara, had been puzzling over an increasing number of dead crows that were turning up in her state and in two of its neighbours. Some of her zoo’s exotic birds also began to die. As with the crows, they showed signs of encephalitis. Might there be some connection with the human cases, she wondered?

She contacted an initially sceptical CDC and sent them some of her bird material. They identified the West Nile virus and then retested the human patients. They too turned out to have contracted it. Their diagnoses were revised accordingly.

Although the story prompted some wild rumours of a terrorist plot, no such evidence was ever adduced. It was the subsequent anthrax mail scare, says Professor Gibbs, and the outbreak of foot and mouth disease in the UK, together with the events of 11 September 2001, that focused many US minds on bioterrorism. “From that point on bioterrorism and other forms of terrorism have perhaps been addressed in a more aggressive manner than in the UK.” Whether the Americans’ more aggressive approach to bioterrorism will be more effective remains to be discovered. □

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The events of 11 September 2001 and the subsequent anthrax mail scare (pictured in Baltimore above) have resulted in a “more aggressive” approach to bioterrorism in the US than in the UK