

ANTHRAX AND OTHER SUSPECT POWDERS: INITIAL RESPONSES TO AN OUTBREAK OF HOAXES AND SCARES

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Between 14 October and 16 November 2001, NSW Health was involved in the response to over 500 incidents where people were exposed to powdery materials suspected to contain spores of *Bacillus anthracis*. A public health response was established across NSW, to collate information about exposed people, and to provide them with the results of laboratory tests and to reassure them. This response relied heavily on the resources and staff of public health units, and on the cooperation and coordination of a range of government agencies. This article describes the number and characteristics of the incidents involving 'suspicious white powders', and draws conclusions about the public health implications of the procedures for communicating microbiological results to exposed people.

BACKGROUND

Anxiety became a background element in the lives of many people, after the terrorist attacks in the United States on 11 September, 2001. Perceptions that our lives were not as safe as had been assumed were widely discussed.

In early October 2001, the media reported that a 63 year-old man in Florida, who worked for a newspaper publisher, had died from anthrax. The discovery of *B. anthracis* spores at the man's workplace, and in an envelope on his desk, led to a fear of 'suspicious white powders' and the prospect of renewed terrorist activity.¹ Large numbers of reports of suspected *B. anthracis* spores were subsequently received by police around the world. Some related to malicious hoaxes, while others represented the fear of individuals faced with an improbable but unpredictable threat.

Anthrax is a disease caused by infection with the bacterium *B. anthracis*. The bacteria can lead to three forms of anthrax: cutaneous, pulmonary, and intestinal. Anthrax occurs among grazing animals in many parts of the world, including livestock along the 'anthrax belt' in eastern Australia, which extends from Queensland to Victoria. Anthrax is considered a possible weapon of biological warfare, as the pulmonary form of the disease has a very high fatality rate and is difficult to treat.

In Sydney, the first publicised 'white powder' incident occurred at Kingsford Smith Airport on 14 October 2001, but earlier incidents had been reported to the police from

11 October. An attendant found an amount of white powder on a piece of luggage and alerted airport security staff. The material was soon found not to be *B. anthracis*. The discovery of suspicious powders that followed was abetted by a number of deliberate hoaxes.

The NSW Government opened the Police Operations Centre (POC) in Surry Hills to help deal with the threat of terrorist activity. This communication facility allowed the collation of information from all the relevant events and provided a venue for meetings between representatives of NSW Police, NSW Fire Brigades, the Ambulance Service of NSW, and NSW Health.

NSW Health's responsibility was to provide appropriate prevention, treatment, and guidelines, should a genuine case of anthrax be identified. NSW Health was also to report laboratory results to affected people and to help abate the fear caused by the exposure. Given the low risk that this threat posed, the preventive use of antibiotics was not recommended by NSW Health.

METHOD

Reporting of incidents

People who were concerned that they had been exposed to suspicious powders generally sought help by calling emergency services on '000'. The emergency service response included attendance at the site, initial assessment of the risk, recording of personal details, collection of the suspect items, and the decontamination of affected people and surfaces. Three levels of exposure were recognised in the response: people who had touched a suspicious powder; people who had been close to a suspicious powder; and people who had been in the same room as a suspicious powder. The suspicious powders were transported to the NSW Police Forensics Services Group (FSG) laboratory where a sample was extracted for microbiological assay at the Institute of Clinical Pathology and Medical Research (ICPMR) at Westmead Hospital.

Collection of forensic specimens

On receipt at the FSG laboratories, specimens were stored until they could be checked for the presence of irritant, toxic, or explosive chemicals or radioactive materials. Where such chemicals or materials were absent, a sample of any suspicious material was taken to ICPMR. FSG carried out full criminal investigations on any specimen that came from a deliberate hoax.

A system of assigning priority to samples was initiated in cooperation between NSW Health and NSW Police. This gave a high priority to samples from incidents in which a person had come into contact with the suspicious powder, a medium priority for incidents where the material was loose but had not been touched, and a low priority to

incidents where a suspicious package had been received but not opened.

Microbiological testing

All samples were processed in a physical containment Level 3 (PC3) laboratory within the ICPMR. Gram and spore stains were performed directly on powder as a rapid presumptive test. Samples were inoculated on to a variety of media designed to detect the presence of other potential biohazard agents (such as *Yersinia pestis*) as well as *B. anthracis*. Plates were examined after 24 and 48 hours incubation. Gram positive, spore-forming rods that were non-motile and non-haemolytic, underwent further identification by PCR, cellular fatty acid analysis as well as standard biochemical tests to exclude *B. anthracis*. All results were sent to the POC via secure fax.

Public health follow up of potentially exposed persons

Public health units (PHUs) responded to the first of these incidents on an ad hoc basis. This provided some models with which to adapt the existing NSW Health DISPLAN to the peculiarities of these events. Information about the activities of the emergency services was also gathered and a protocol for the uniform transfer of information was established.

Microbiological results were communicated to the POC where they were matched with the contact details of exposed people collected by the police. This information was collated by health liaison officers and sent to the relevant PHU for communication to the exposed person. An Access database to store the data about exposed people was developed during the response period. This database received information from the FSG, the emergency services incident reports, and the laboratory results.

The PHUs contacted people who had been exposed to the suspect materials to provide results of testing and to offer counselling or other mental health services. The PHUs provided summaries of the numbers of people contacted for each incident and how many had undergone prophylactic treatment or had accepted counselling.

Descriptive analyses were performed on the collected data using Microsoft Access and Excel software. We examined the temporal and spatial distributions of incidents, and the proportions of different responses. The analysis was limited to the study period 14 October to 16 November 2001.

RESULTS

Incidents

Between 11 October and 16 November, approximately 990 'white powder' incidents were reported by members of the public to emergency services. Police reported that 1,534 people had been potentially exposed to these substances both directly and by proximity. Samples from 535 incidents (54 per cent) were received for testing at the FSG laboratories and the following results are based on this group of events. These incidents were more frequently reported on a weekday, and during the weeks

beginning 14 October and 21 October (Figure 1). Sydney and its suburbs was the source for 415 of these incidents (77 per cent). However, incidents were experienced in every area health service. Police estimated that about one third were hoaxes. The remainder were precautionary calls about powder in legitimate postal items or in unexpected places including tissue boxes and elevators.

Forensic samples and microbiological test results

Of the 535 samples, 151 (28 per cent) yielded no material suitable for microbiological assay, and 375 samples (70 per cent) had been through the full 48-hour culture period and the results reported to the POC. The remaining nine samples had either not been cleared by the FSG or had not been finally processed by ICPMR at the end of the study period. No positive result for *Bacillus anthracis* was identified. Among some of the substances submitted, further analysis identified talcum powder, cleaning agents, sugar, and starch. Anecdotal reports from emergency services personnel indicated that observations of powders at the site of incidents identified cement, dust from gyprock, and laundry detergent.

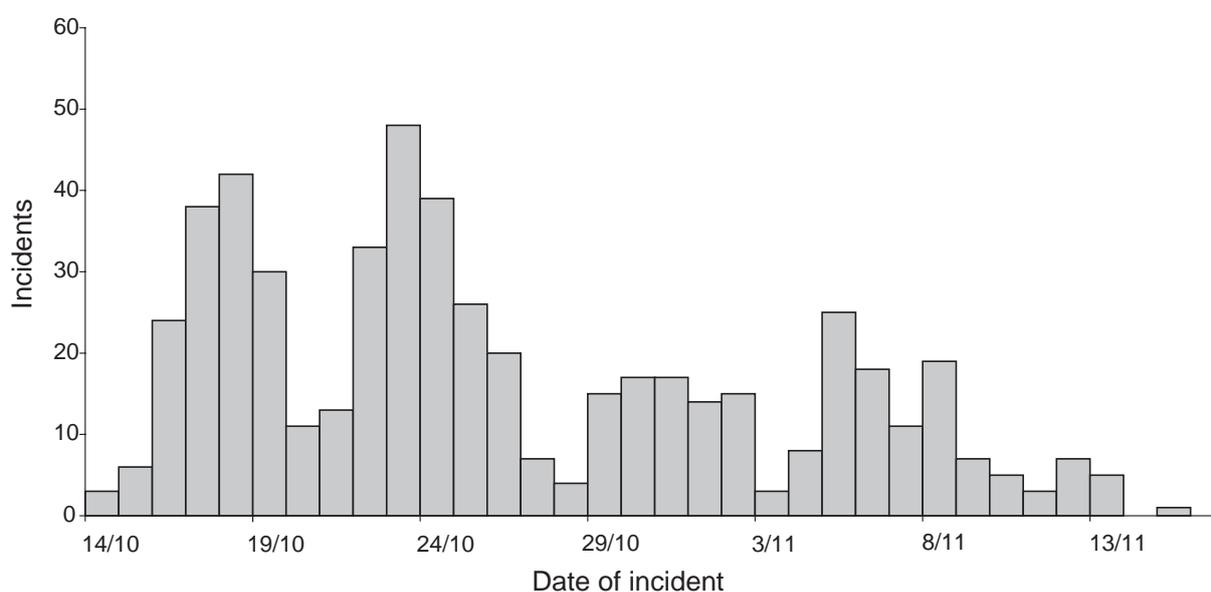
Public health

Of 1,534 exposed people, 853 (55.6 per cent) were reported to have been contacted by PHU staff. Of these, five (0.3 per cent) received prophylaxis from hospitals—which was not consistent with public health advice—and 31 (2.0 per cent) were referred for counselling to an area mental health service.

DISCUSSION

No incidents of exposure to anthrax-containing substances were identified in NSW, or elsewhere in Australia, during the study period. However, in the United States, postal delivery of *B. anthracis* spores led to the infection of 22 individuals, of whom five eventually died.² Anthrax scares occurred throughout Australia and the world during October and November 2001. Positive tests for *B. anthracis* from the post were announced from Kenya, the Bahamas, Greece, Brazil, Russia, India and Pakistan, all of which were retracted after further testing. The only confirmed positive result was an environmental sample found in Argentina. The spores were of the Sterne variety, used for making vaccines for animals, and were found in a letter.

The Health Services Disaster Control Centre (HSDCC) at Rozelle was opened from 22 October to coordinate the overall health response (ambulance, public health, mental health, hospital, and laboratory). NSW Health made use of existing plans for dealing with terrorist actions and events of biological warfare, as outlined in DISPLAN, to respond to the 'suspicious white powder' incidents. These plans had been developed or made more detailed in preparation for the 2000 Olympics; however, the 'suspicious white powder' incidents were smaller and more frequent than those planned for in DISPLAN.

FIGURE 1**DISTRIBUTION OF 'WHITE POWDER' INCIDENTS BY DATE, NSW, BETWEEN 14 OCTOBER AND 16 NOVEMBER 2001**

Source: NSW Police Forensics Services Group.

The investigation and follow-up of these incidents provided a huge challenge for NSW Health. Coordinating information from different sources, provided by multiple agencies, through incompatible information systems, was difficult. Although the liaison officers at the POC tried to keep PHUs informed about incidents in their areas as they occurred, this was not sustainable and the work shifted to concentrating on those incidents for which results were available.

During the process of checking for the presence of dangerous substances, 151 samples proved to have no material amenable to microbiological assay. According to comments from PHU staff, reporting this to exposed people required a particular sensitivity because some exposed people remained concerned in the absence of a definite identification of the material to which they had been exposed. Similarly, anecdotal reports suggest that exposure to 'suspicious white powders' caused substantial stress for some people. It would be valuable, in any future events of such an unusual nature, to establish an evaluative process to assess the mental health effects of public health responses to those events.

After the first three weeks of the response to the outbreak of anthrax scares in NSW, as it became clear that none of the exposures had involved a real threat, the NSW Health response was scaled down, to become less intensive. This reduced demand on staff, while maintaining a service to ensure the public's health. To facilitate this, the emergency services staff attending the incidents were provided with a detailed fact sheet, to give to exposed people, explaining

the circumstances under which they would or would not be contacted with laboratory results.

In the absence of a positive result, the main concern of NSW Health was the reduction of anxiety among people who had been involved in incidents. Anecdotal evidence suggests that the action of decontaminating people who were exposed to 'suspicious white powders', which was expected to reduce their anxiety, instead seemed to increase it. Similarly, it was suggested that reporting results had the potential to reawaken anxiety, especially when no tests had been conducted or when there had been a long wait for the results.

CONCLUSIONS

This outbreak demonstrated the ability of NSW Health to work cooperatively with other agencies, and reinforced the importance of regular dialogue between agencies. Regular consultation and reporting within NSW Health was important, since many different tasks were undertaken in isolation from each other and the individuals involved needed to know the requirements and constraints of those engaged in other tasks.

At the time, it seemed that placing health liaison officers in the police facilities was worthwhile, to facilitate communication between the different agencies and to ensure appropriate and effective responses. Critical to this was explaining the priorities of the different agencies to each other. However, this complicated the coordination of the NSW Health response, and was associated with increased stress among those staff. Instead, the collation

and coordination of information could probably have been conducted in the offices of NSW Health, from data provided directly from the Police Forensics Services Group and the laboratories of the ICPMR.

ACKNOWLEDGEMENTS

Assistance in the preparation of this paper was provided by Dr Ian Webster, NSW Police Forensics Services Group; and by Dr David Mitchell, NSW Institute of Clinical Pathology and Medical Research.

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LABORATORY INVESTIGATION OF SUSPECTED BIOTERRORISM INCIDENTS, NSW, OCTOBER 2001 TO FEBRUARY 2002

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In October 2001, the threat of bioterrorism became a reality, following identification of a case of inhalational anthrax in the United States. This was the first case in a bioterrorism-related outbreak, caused by exposure to mail contaminated with spores of *Bacillus anthracis*. This provoked a worldwide spate of hoaxes and scares related to suspicious 'white powders'. In New South Wales, between October 2001 and February 2002, more than 1,000 incidents were investigated and 594 samples of suspicious substances were submitted for microbiological examination to the Centre for Infectious Diseases and Microbiology, Institute of Clinical Pathology and Medical Research, Westmead. This article describes the laboratory investigation of those suspicious substances.

BACKGROUND

In preparation for the Sydney Olympic Games in 2000, the Centre for Infectious Diseases and Microbiology Laboratory Services (CIDMLS) developed procedures for the culture and identification of infectious bacterial agents known to be potential weapons of bioterrorism. These include *Bacillus anthracis* (anthrax), *Brucella melitensis* (brucellosis), *Yersinia pestis* (plague), *Francisella tularensis* (tularemia), and *Burkholderia pseudomallei* (melioidosis). Procedures were established for the management of a bioterrorism-related outbreak, and for communication between relevant agencies including: the

Australian Defence Force, the Defence Science and Technology Organisation, the NSW Police Forensic Services, the NSW Fire Brigade, and the NSW Department of Health.

These procedures were reactivated in mid-October 2001, following the report of a case of inhalational anthrax in the United States on 4 October and of laboratory confirmation of a second case on 12 October. These cases were the first in a bioterrorism-related outbreak of anthrax in the United States that eventually involved 22 cases and five deaths due to exposure to finely milled spores of *Bacillus anthracis* sent through the mail.¹ This outbreak led to widespread laboratory testing for environmental contamination in the United States, and a worldwide spate of hoaxes and perceived threats of bioterrorism involving possible exposure to suspicious 'white powders' and other suspicious substances.^{2,3}

METHODS

Organisation of the NSW response

The CIDMLS received the first specimens of suspicious substances for analysis on 12 October 2001. Procedures for the handling of suspicious substances, and identification of agents of bioterrorism (that is, the bacteria isolated from suspicious substances), established before the Sydney Olympic Games in 2000, were reactivated. A team of staff was formed to deal with large numbers of specimens as rapidly as possible.

Initially, the CIDMLS received a number of large objects—such as mailbags, parcels, other potentially contaminated articles, and quantities of suspicious powders—in