

Monkey on Our Backs: Identifying and Containing an Outbreak of Monkey Pox on a Regional Basis.

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Abstract

In the spring of 2003, it was discovered that prairie dogs originating from a pet distributor became infected with Monkeypox (MP). The infected prairie dogs had been sold directly to distributors who in turn sold them to consumers in several neighboring states. Communicable disease personnel at various local health departments and the State Department of Public Health began contacting pet owners to investigate possible MP cases in humans. Personnel from the State's Department of Agriculture and investigators from the Centers for Disease Control and Prevention were also involved in the investigation. Since this was the first time that MP had been seen in the Western Hemisphere, staff at all levels had many questions and came to the situation with a great deal of zeal and energy. All persons involved made every effort to be thorough, but this had the unintended effect of creating redundancy, uncoordinated effort and lack of information sharing. As investigators worked with family members of infected individuals, they found that one investigator was literally leaving through the side door as another was coming in the front door. Pieces of information known to one agency, which potentially could have been critically important to the human investigation, had to be accidentally discovered at a later time by personnel from another agency. Fortunately, all of the persons exposed to MP made a full recovery and the cases were not widespread.

This case study will examine the events leading up to the incidents of human cases of MP and the events surrounding the investigation, containment and remediation of the cases. The case will present policy questions surrounding legal authority to act, when to seek legal counsel, coordinating the activities within and between agencies and developing Incident Command and Unified Command approaches as applied to public health investigations.

The focus of this case study is to address the core function of policy development. According to the three core functions, this case study will explore the need for developing policy to address the steps needed to take action when a public health emergency that needs immediate and effective response arises.

Introduction and Background

Even before the catastrophic events of September 11, 2001, public health began to recognize the need for emergency preparedness plans related to potential bioterrorism events. For many state and local health departments, emergency preparedness and planning were neglected. Post 9-11, emergency response plans and training were accelerated. While new funding was in the pipeline for many of these activities, policy makers tried to emphasize that preparedness for an emergency should be a process of strengthening the overall infrastructure and competency of the public health system and should not become an activity divorced from day-to-day public health functions.

The investigation of a new or unknown disease and that of a potential bioterrorism event have many parallels. Both share a number of the same assumptions, procedures and resources. Much of the training made available to local health departments (LHDs) emphasized the need to communicate and cooperate across various agencies and jurisdictions through the use of Incident Command. The rationale behind this concept was that an investigation might have already been initiated before knowing if an event was related to terrorism. Consistent communication on a regular basis with other agencies will facilitate more efficient and effective action when a public health emergency occurs.

Monkeypox is a rare viral disease caused by *Monkeypox virus* which belongs to the orthopoxvirus group of viruses. (Other orthopoxviruses that cause infections in humans include variola (smallpox), vaccinia (used for smallpox vaccine), and cowpox viruses.) It occurs mainly in the rain forest countries of central and west Africa. The disease was first discovered in laboratory monkeys in 1958. Blood tests of animals in Africa later found evidence of monkeypox infection in a number of African rodents. The virus that causes monkeypox was recovered from an African squirrel. Laboratory studies showed that the virus also could infect mice, rats, and rabbits. In 1970, monkeypox was reported in humans for the first time. In June 2003, monkeypox was reported in prairie dogs and humans in the United States. (CDC)

In humans, monkeypox is similar to smallpox, although it is often milder. Unlike smallpox, monkeypox causes lymph nodes to swell (lymphadenopathy). The incubation period for monkeypox is about 12 days (range 7 to 17 days). The illness begins with fever, headache, muscle aches, backache, swollen lymph nodes, a general feeling of discomfort, and exhaustion. Within 1 to 3 days (sometimes longer) after the appearance of fever, the patient develops a papular rash (i.e., raised bumps), often first on the face but sometimes initially on other parts of the body. The lesions usually develop through several stages before crusting and falling off. (CDC)

Brief description of scenario

On June 7, Midwest State Department of Public Health (MWSDPH) informed the Simian County Health Department (SCHD) that it was investigating a potential exposure of Monkeypox (MP) to customers of a pet shop in Primate County (a county in the same

state about 60 miles west of Simian County. SCHD was asked to follow up with customers in its jurisdiction. SCHD was provided with information specific to its jurisdiction and was not made aware that similar investigations would be taking place in other counties. The only information shared between all parties was that the suspected exposure was through Gambian rats and prairie dogs, which had been sold by Rod's Pox Pets in Primate County.

On June 8, Simian County Health Department (SCHD) personnel contacted the family in their jurisdiction, which had bought a prairie dog at a swap meet. The prairie dog had originated from Rod's Pox Pets. The nine-week-old prairie dog appeared healthy when bought on 5/18/03. Sonny, the 10 year old boy in the family, was the primary care taker of the prairie dog and regularly played with and cuddled the prairie dog, in addition to the one year old prairie dog he had raised. Upon arrival at the family's house, SCHD Communicable Disease (CD) investigators learned that inspectors from the State Department of Agriculture (SDOA) had already been working with the family for more than a week. One week after purchase, the new prairie dog had become ill showing aggressive behavior, loss of appetite, eye discharges and lesions on its face. Three days later the new prairie dog died and the father disposed of it in the trash. SDOA personnel had instructed the family to isolate the surviving prairie dog from other animals but had not given any instructions about human contact.

CD personnel educated the family on MP and took health histories of all family members. The family was strongly advised not to travel and to limit contact with others as much as possible until the incubation period for MP had passed in two more weeks. The family was somewhat upset because of a planned vacation the following week. Investigators were unsure if they had authority to "officially quarantine" the family or otherwise restrict their movements. The SCHD contacted the States Attorneys office to get clarification on the health department's authority to quarantine. The State's Attorney's office said they would check into the matter. Ironically, this happened to be an election year. SCHD was told the State's Attorney would not be taking a position on this matter.

SCHD personnel followed up with the family by phone on a daily basis to monitor the family's health. On June 11, the CDC issued its first case definition of human MP for this incident. None of the family members reported any illness.

On June 12, SCHD personnel were unable to contact the family by phone. Investigators were sent to the family's home but no one was present. Neighbors told the investigators the family, father, mother and their 3 sons, had left that morning on vacation to Montana for 2 weeks. When asked about the remaining prairie dog, the neighbor said the family told her that "some government agency" had taken the prairie dog and put it to sleep. SCHD personnel were not able to confirm this with SDOA until 3 days later.

The investigators then called the MWSDPH for recommendations on the situation, with the family going on vacation. During the course of the conversation, the MWSDPH advisor informed SCHD personnel of several cases of MP in Primate County. SCHD

personnel were somewhat disturbed that they had not been informed of these cases. SCHD wanted more details on the signs and symptoms experienced to better detect a case and to provide physicians with this information. The MWSDPH advisor indicated that he thought CDC had contacted SCHD with this information since they were running the investigation.

Later that day, SCHD learned that several dead mice had been discovered at the family's residence a week earlier and were taken by CDC for examination. SCHD Environmental personnel were concerned that the mice might have been infected. The disease could potentially spread throughout the community and become permanently established in the rodent population. Results ultimately showed that the mice had died of rat poisoning and were not diseased.

In the meantime, the MWSDPH issued a press release on the Monkeypox situation, including the current number of cases and the precautions being implemented. One of the cases included a 17 year old youth in Primate County. The family contacted the television media, who in turn made assumptions prior to confirming facts with the Primate County Health Department (PCHD). The PCHD responded with a press conference to clarify the situation and provide accurate information. Daily updates were then provided.

On June 18, the family, who left Midwest state against medical advise, visited the Mountain County Health Department (MCHD) in Montana. Sonny had developed approximately 20 lesions on his trunk and complained of tender cervical lymph nodes. Sonny had pharyngeal lesions, which increased the chance of spreading the virus by air transmission whenever Sonny coughed. The MCHD strongly advised the family not to travel back to Midwest State but rather to seek medical care in Montana. The family decided to return to Midwest State, ignoring a health department advice for the second time. This meant the family would spend over 24 hours in a car together, with the potential of spreading the virus to other family members by air transmission from coughing. The family also stopped frequently at fast food establishments en route.

The MCHD contacted SCHD to inform them of the contact with the family and that the family was en route to the mid west against MCHD recommendation. On June 19, the family called SCHD and informed them they should be arriving the next day. They mentioned Sonny had a fever and was quite uncomfortable with the lesions and would need to see a doctor right away. The family informed SCHD that their insurance would only allow them to go to Simian Community Hospital (The Hospital).

SCHD personnel immediately contacted The Hospital to prepare for an infectious patient. While The Hospital had an infectious disease plan and had been participating in the County's Emergency Preparedness activities, including smallpox exercises, no personnel at the hospital had received the smallpox vaccine prophylactically. The Hospital was reluctant to admit a patient with MP. Prior to this event, the hospital had withdrawn their phase I emergency response smallpox vaccination program. After much deliberation and negotiation, The Hospital allowed a non-affiliated physician who had received the

smallpox vaccine to have temporary treatment privileges at their hospital to administer healthcare services to Sonny.

The family arrived at The Hospital and after initial examination, the child was admitted. The mother, exhausted from the long trip, became upset when seeing her child in pain and connected to multiple tubes and monitors. The distraught mother removed the tubes from the child. She attempted to leave with the child against medical advice and without signing required release forms. Security was called and physically blocked the exit, at which point the mother reluctantly complied with medical treatment. Four days later the child was discharged and eventually made a full recovery without any long term effects.

Conclusion

Even though this was a fictional account with a factual basis, the local health departments responded well and effectively within their jurisdiction. Each responding agency had a protocol for responding to such an event; however, there was an initial lack of communication and coordination within and between the agencies involved and a lack of an Incident Command Structure. The situation was further complicated by misinformation in the media, family non-compliance with medical advice, questions on legal authority in the investigation protocols, political consideration expressed by the State's Attorney's Office during election year, the lack of regulation of exotic pets, the lack of a timely response to address the wild mice population as a potential reservoir for MP and questionable hospital adherence to their own emergency response plan.

Discussion questions:

1. How would implementation of an Incident Command Structure and/or Unified Command Structure have improved the progress of the investigation?
2. Would implementation of an Incident Command Structure have prevented or reduced the impact of any of the disease cases?
3. Who should be the lead agency for incidents which: a) cross county boundaries; b) cross state boundaries?
4. What were the difficulties which arose by following the family via phone contact only? Would there have been an advantage to face-to-face follow up and what criteria should be considered in making that decision?
5. How does the lack of legal quarantine authority impact public health disease investigations and control? What can we learn about developing legal protocols as they relate to public health interventions?
6. How would the reaction of the State's Attorney been different if this had not taken place during an election year?
7. What is the relationship between the local Health Authority and the hospital in making decisions about treatment of patients with communicable diseases? Is there a conflict between the hospital's medical goals and profit goals? (Taking in a "highly dangerous" communicable disease might turn away other patients – fear, etc.)
8. Should the hospital and/or health department have legal authority to detain patients with potentially communicable diseases against the desire of the parents? What conditions should exist in order for this authority to be in effect?