

Dr. David Lakey
Commissioner
Texas Department of State Health Services
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Ebola in the Homeland: The Importance of Effective International, Federal, State and Local
Coordination

On October 8, 2014, Thomas Eric Duncan passed away as a result of contracting the Ebola virus in Liberia. Mr. Duncan was provided therapeutic care at Texas Health Presbyterian Hospital in Dallas, Texas, but he was unfortunately unable to recover from this often fatal disease.

Mr. Duncan's death is a reminder of the importance of disease prevention and control, and provides additional meaning to efforts in Texas to prevent further exposure to the disease. The goal in Texas is to continue to minimize risk, thus reducing the likelihood of another Ebola death within the state.

Every sympathy and concern is extended to Mr. Duncan's family, as they both grieve for their loved one and worry for their own health.

Background: Ebola Case in Dallas

On September 30, 2014, the Department of State Health Services (DSHS) Laboratory and Centers for Disease Control and Prevention (CDC) tested a specimen for Ebola virus, and found it positive. This is the first Ebola patient to be diagnosed in the country.

The patient contracted Ebola in Liberia, and was not symptomatic when travelling into the United States. Ebola is only communicable when an infected person is ill with symptoms. During the incubation period, when no symptoms are present, a person is not infectious.

Texas Presbyterian Hospital received the patient, and contacted the Dallas County Health and Human Services on September 28, 2014, after the patient was transported to the emergency room by ambulance. He had previously presented at the hospital on September 26, was evaluated, provided medications, and discharged. Dallas County contacted DSHS and the CDC, to allow for coordination. Texas Health and Safety Code, Chapter 81, requires that Viral Hemorrhagic Fever (Ebola) be immediately reported to the local health department, which in turn notifies state and federal partners, as warranted.

Once Ebola was suspected as a possible diagnosis on the 28th, Dallas County began a public health investigation to determine if others were exposed to the virus while the patient was symptomatic. After the patient's diagnosis, DSHS and CDC staff were on site to provide assistance in the epidemiological investigation. The initial investigation identified 114 individuals who may have had contact with the patient. Additional investigation narrowed this number down, and a total of 48 contacts of varying risk were identified for monitoring. The investigation is ongoing.

Ebola symptoms can become evident between two and 21 days after the initial infection. However, eight to 10 days is the most common time frame for Ebola symptoms to become apparent. Ebola is only transmittable through direct contact with blood or body fluid, or exposure through contaminated objects, such as needles. Direct contact requires exposure through broken skin or unprotected mucous membranes.

By determining whether contact with the patient occurred, and whether possible contact was direct or indirect, investigating epidemiologists concluded that ten individuals should be considered high risk exposures. All 48 identified contacts were placed under monitoring for symptoms, with regular visits from local, state, and CDC health department officials.

The 48 individuals will be monitored until they have passed the 21 day threshold for presentation of symptoms.

Infectious Disease Surveillance in Texas

The State of Texas is divided into eight DSHS health service regions. In areas where a local health department exists, DSHS health service regional offices provide supplemental or supporting public health services. In areas where there is no local health department, DSHS health service regional offices act as the local health authority.

Local health departments are of varying size, resources, and capacities. While some health departments, like Dallas County, support a full array of services, others have more limited functions. Approximately 60 health departments in Texas are “full service,” while 80 offer fewer services. DSHS’ role is to fill in, as needed, core public health services not offered at the local level.

For infectious disease, DSHS health service regions ensure that disease surveillance occurs in every Texas county through the continual and systematic collection, analysis, and interpretation of health data. This effort is dependent on disease reporting by providers, which is required by law. Currently, in Texas, over 60 conditions are subject to mandatory reporting, including: foodborne, vector-borne, respiratory, and sexually transmitted diseases. Viral Hemorrhagic Fever, or Ebola, is an immediately-reportable disease in Texas.

In order to allow real-time monitoring of disease surveillance data, the CDC provides and maintains the National Electronic Disease Surveillance Network (NEDSS) for use by local, regional and state health departments. NEDSS is used by nearly every local health department in the state, and allows DSHS to identify unusual increases or pattern shifts in disease numbers.

In concert with NEDSS, Electronic Laboratory Reporting (ELR) has improved the timeliness and comprehensiveness of diseases reporting. ELR electronically links laboratory test reports to NEDSS, allowing immediate access by DSHS or the local health department with legal jurisdiction.

Infectious Disease Investigation and Response in Texas

Timely disease reporting to the public health system is imperative for quick mobilization of public health investigation and response efforts. Since Texas is a home rule state, epidemiological investigations begin at the local level, unless there is no local health department. This local responsibility aids in effective epidemiological investigations by ensuring that investigations are based on close understanding of the community and its residents. While local entities have the statutory responsibility to lead infectious disease investigations, state and CDC guidance is available and widely used.

More complicated or widespread events can increase the state and federal roles. If an outbreak involves multiple jurisdictions, the state role becomes more prominent. If, at any time, an investigation goes beyond local capabilities, the state may take the lead. In turn, if an investigation exceeds state resources, the state may ask the CDC for assistance. Additionally, the CDC leads multi-state investigations. No matter the level of outbreak, the norm is for all three levels of government to work in cooperation, with varying levels of state and federal involvement depending on the size and type of infectious disease event, and the resources and expertise of the local entity. Throughout the event in Dallas, the state and local authorities have been supported by CDC, both in the field and by home office staff.

Support provided by the state and CDC can include a number of options, depending on the scope of an investigation and local needs. This support might consist of subject matter expertise and onsite assistance; state or CDC laboratory testing; provision of personal protection equipment; or mobilizing of DSHS Rapid Assessment Teams or CDC Epi-Aids. The state and CDC can also assist with administering questionnaires and interviews to cases and potential contacts, inspecting relevant hospital facilities or restaurants, and helping examine pertinent records.

In cases of large-scale outbreaks, the State Medical Operations Center (SMOC) at DSHS may be activated. The SMOC is staffed by DSHS Community Preparedness, Infectious Disease, and Communications staff. Its function is to ease the flow of information among multiple jurisdictions, provide dependable tracking of events, and facilitate requests for resources and supplies from local jurisdictions. For the Ebola case and investigation in Dallas, the SMOC has been activated.

Successful Infectious Disease Response in Texas

The public health response system in Texas, led by local entities and supported by state and federal government, has a long history of successful outbreak responses. Texas has effectively contained events involving disease like Tuberculosis, measles, hepatitis, and Middle East Respiratory Syndrome (MERS).

As an example, DSHS disease investigators are currently assisting the local health authority in El Paso, Texas, to track a number of exposures to Tuberculosis (TB) that occurred through a health care worker in the labor and delivery unit of a local hospital. This situation is a prime example of how, under the current system, all levels of government successfully work together to respond to an infectious disease event.

Once the index case was identified, local and state health department investigators meticulously examined hospital records to determine infants, parents, coworkers, and volunteers who were at risk of exposure. This investigation identified an initial 3,227 potentially-exposed newborns, and 69 potentially-exposed health care workers. Together, public health workers evaluated the index case's history to determine where exposure may have actually occurred. Then, they prioritized potential contacts by level of risk, decided on a contact investigation protocol specific to this incident, and executed the contact investigation. The CDC has been on site to provide assistance, and home office CDC staff has provided expertise and advice. International coordination took place due to the city's proximity to the U.S.-Mexico Border; interstate coordination with New Mexico was also necessary.

While the investigation is not yet complete, its results are already evident. Public health investigators were able to narrow down the initial 3,227 number to 757 infants who had some level of risk of exposure. Follow up with parents occurred, and testing was recommended, as appropriate, for potentially-exposed children. Additionally, DSHS gave providers guidance on treatment algorithms for possible cases. Of the 503 infants tested, six have tested positive for TB infection, and are being treated to ensure they do not develop active TB. Of the 58 health care workers tested, four tested positive for TB infection, and public health follow up will ensure that these positive cases do not develop into a risk for further community exposure.

Initial Lessons Learned: Ebola Case and Investigation in Dallas, Texas

The Ebola investigation is ongoing, but events like the TB exposure in El Paso and past infectious disease events reveal key themes to successful prevention and control of disease outbreaks in Texas and in the country.

The crux of infectious disease response is reporting. Providers must be aware of what diseases are reportable to their local health department, and promptly report contagious disease through the reporting system. Provider awareness of this responsibility allows for more effective disease surveillance, and more timely response to developing infectious disease events. DSHS works to reinforce this requirement through reminders, updates, and by making the reporting system user friendly.

Secondly, the Ebola case in Dallas highlights the need for providers to vigilantly take travel histories, and streamline sharing of this information while a patient is being diagnosed. Providers must be aware of outbreaks worldwide, to inform their consideration of patient travel history. Until the Ebola outbreak in West Africa is over, Ebola must be a differential diagnosis for those who have recently traveled from one of the outbreak countries. At the same time, moving forward, providers must be aware of what other outbreaks are occurring internationally. Electronic notifications from the CDC help providers stay informed, and these messages can be strengthened through state and local-level communications.

After Action Assessments

After the response to the Ebola case and investigation comes to a close, DSHS will perform an after action review of the response to this situation. Throughout the event, responders keep in mind how the response flows, what difficulties are encountered, and what successes are achieved. After the response, a thoughtful assessment brings all these experiences into one evaluation. An after action review is essential to close out any response effort, in order to improve future responses. The assessment will include input from local, state, and federal responders who were part of the effort, and will analyze each part of the response. The assessment will determine what worked, what can be improved, and how those improvements can be made. The final result will be enhanced preparedness plans for future infectious disease events.

In addition, Texas Governor Rick Perry has formed a Texas Task Force on Infectious Disease Preparedness and Response, the purpose of which is to assess and enhance the state's capabilities to respond to outbreak situations. The task force is composed of 17 members, headed by infectious disease and Ebola experts, and will be supported by DSHS and other state agencies. The Task Force will evaluate infectious disease response in Texas, and determine what recommendations can be made for improvements, either through agency or legislative action. The Task Force will make its report to the Texas State Legislature in December 2014.

Conclusion

The response to the Ebola case in Dallas is ongoing. Conclusion of this event will allow a systematic review of the response efforts, and the Governor's Task Force on Infectious Disease Preparedness and Response will facilitate an evaluation of the public health response system as a whole. It is evident from a long history of success that public health interventions work, and that infectious disease investigation and follow up can stop the spread of disease. However, each infectious disease event provides a new opportunity to make improvements to disease investigation response and coordination among public health entities. The current focus is on ensuring that no more Texans are exposed to the Ebola virus. When that mission is complete, the focus will shift to recommending and implementing improved plans for future infectious disease response in Texas.