Mobile Monitoring for Variant Influenza A/H3N2

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On August 1, 2016, a pig exhibited at the Muskegon County Fair tested positive for influenza. The sample was later characterized as swine influenza A H3N2. Subsequently, ill swine exhibitors were tested for influenza and on August 5, the Michigan Department of Health and Human Services (MDHHS) reported Michigan's first case of variant influenza A/H3N2 (H3N2v) infection for 2016. One additional exhibitor at the fair also tested positive for H3N2v. Public Health Muskegon County alerted providers of the potential for H3N2v transmission and reached out to exhibitors to identify additional illnesses. Although additional illness were identified, none tested positive for H3N2v.

MDHHS also received notification on August 5, 2016 that a pig from the Ingham County Fair had died and tested positive for H3N2. The fair, which took place from August 1 to August 6, 2016, housed swine in the large animal building, along with cattle and sheep. Upon receiving the positive laboratory results, the fair director immediately closed the large animal building to children and visitors. Twenty swine that were exhibited at the Ingham County fair were tested and all samples were positive for H3N2. During the same week, swine at the Cass County Fair tested positive for influenza. One human H3N2v case associated with the Cass County Fair was also detected.

Due to the H3N2v activity at county fairs, the Centers for Disease Control and Prevention (CDC) requested assistance from select local health departments (LHDs) in Michigan to pilot their Text Illness Monitoring (TIM) system to monitor fair exhibitors. This system had previously been tested in Michigan in May 2016 as a system that could potentially be used for monitoring workers exposed to highly pathogenic avian influenza.

Ingham County Health Department opted to participate in the TIM system to monitor swine exhibitors. Letters were sent out to 405 large animal exhibitors to notify them about their exposure and request their participation in the TIM system. Monitoring began on August 10 and continued through August 16 (ten days after the fair ended). Eleven individuals from six separate households associated with the Ingham County Fair participated in the TIM mobile monitoring. All 11 individuals reported illness, two of which later tested positive for H3N2v. In total, nine confirmed H3N2v cases associated with the Ingham County Fair were identified. No secondary cases were reported.

The TIM system was found to be beneficial to the outbreak investigation and it was recommended that the system be used again in the future. Because this was the first time that the TIM system was used in an outbreak situation in Michigan, it took several days to become operational and Ingham County Fair exhibitors did not start participating until a week after the end of the fair. Had monitoring been initiated sooner, it is possible that additional cases associated with the Ingham County Fair may have been identified.

Due to the success of the TIM system and the ongoing fair season, MDHHS, LHDs, county fair boards, 4-H clubs, and the CDC piloted the TIM system to *prospectively* look for illness in swine exhibitors and their family members for nine additional fairs. Text messages were sent daily to individuals who volunteered to be part of the pilot for the duration of the fair and for ten days following the end of the fair. The daily text message asked if anyone in the household who visited the fair had experienced flu-like illness. Households that reported illness were contacted by the LHD and asked about their activities and symptoms. If appropriate, ill individuals were recommended to be tested for influenza.

Based on estimates provided by 4-H coordinators and LHD staff, there were approximately 1,000 swine exhibitors at the nine participating fairs. At the peak of enrollment, 85 households, representing an estimated 384 individuals, were being monitored for illness. Reports of illness were actively investigated by LHD staff.

As a result of this prospective monitoring project, the TIM system identified 11 suspect cases from participating fairs. These detections demonstrate the ability of the TIM system to increase active surveillance and case finding during an outbreak.