Legionnaires' Disease Outbreak at the Luxor Hotel and Casino, Las Vegas, NV, 2011
Interim Report #5
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INTRODUCTION:

Since our interim report #4, dated February 6, 2012, the SNHD investigation and control team has continued to make considerable progress.

Epidemiologic Investigation:

No new cases of legionellosis have been identified since interim report #4 was published. SNHD received the results of the additional testing being conducted by CDC on the clinical and environmental isolates. Sequence based typing revealed the clinical isolate from the December 2011 case matched three of five environmental isolates, including one from the Jacuzzi tub located in the case's room. The case had used the tub while staying at the Hotel A prior to becoming ill.

Environmental Investigation

As of February 11, 2012, the Luxor Hotel Management completed their emergency disinfection procedures for all of the hot water systems that serve the guest rooms located in both the pyramid and the tower buildings. All steps of the emergency disinfection process were observed by SNHD staff.

The SNHD received final results from the sampling that occurred on the day following the emergency remediation procedures for the two hot water risers that served floors 17-30 of the pyramid. Prior to the conducting an emergency disinfection of each hot water system, Luxor Hotel Management randomly selected four percent of the rooms served by the system that was scheduled for disinfection including the proximal and distal rooms. In the morning after the emergency disinfection process occurred, using the randomly selected rooms, samples of hot water were taken from the fixtures and tested as specified in the Luxor Hotel Management emergency disinfection procedures. The sampling was conducted by both Luxor staff and staff from the Luxor's Water Management Plan contractor and observed by SNHD. Testing for the presence of *Legionella pneumophila* was conducted by Luxor's Water Management Plan

contractor. The results from the testing of the two hot water systems indicated that *Legionella pneumophila* was not present in the two hot water systems.

As mentioned above, the SNHD also received DNA sequencing results from the CDC for the five environmental isolates obtained from sampling that occurred on January 11 and January 17. The results indicated that three of the five environmental samples matched the sequence-based typing of the case isolate. One of the three matching environmental isolates was obtained from a swab of the Jacuzzi tub located in the room where the case stayed. The case reported using the Jacuzzi tub during the stay. The two remaining isolates from the case's room had very similar sequence based typing to the other three isolates. The two isolates differed by having a single nucleotide mutation on one gene.

Discussion:

The SNHD will continue to work closely with the Luxor Hotel management and continue enhanced surveillance. The post remediation results indicate that the remediation was successful in removing the presence of *Legionella pneumophila* from the system.

The matching of the DNA sequencing of three of the five *Legionella pneumophila* environmental isolates with the case *Legionella pneumophila* isolate is further evidence that the case was exposed to *Legionella pneumophila* during their stay at the Luxor. This hypothesis is strengthened by the additional finding that the isolate found on the tub swab matches the DNA sequencing of the case. The remaining two isolates both had matching DNA sequencing were also very similar to the matching three environmental isolates and case isolate. The two environmental isolates varied from the other four isolates by having one nucleotide mutation on one gene. The CDC reported that this change probably represents a single change in the original *Legionella pneumophila* population.