ABSTRACT

# Prospective space-time analysis of the 2007 cryptosporidiosis outbreak, Salt Lake County, Utah

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## Objective

The objective of this study was to investigate if prospectively applied space-time surveillance could have detected significant, emerging clusters as cryptosporidiosis, cases were reported to the Salt Lake Valley Health Department during the 2007 outbreak.

## Introduction

Cryptosporidiosis is a gastrointestinal illness due to a protozoan parasite that is highly contagious, and resistant to multiple disinfectants.[1] Utah experienced a large, community-wide outbreak of cryptosporidiosis between June and December of 2007.[2,3] During this time period, the Utah Department of Health received reports of 1,902 laboratory-confirmed cryptosporidiosis cases across the state.[2] Nearly 40% of these cases occurred in Salt Lake County (SL County), Utah. In past years, SL County averaged fewer than five cases annually;[2] however, the incidence rate in the county for this entire outbreak was 125.9 per 100,000 person–years.[3]

## Methods

This study utilized a space-time scan statistic implemented in SaTScan[4] to test for the occurrence and location(s) of cryptosporidiosis clusters using time-periodic prospective surveillance, and a Poisson probability model. The study area included the jurisdictional purview of the Salt Lake Valley Health Department, which is SL County. Although true disease outbreaks should be characterized by the onset date of each case, onset dates are not collected until after an investigation is started, and the date of the case reported is generally the first piece of case-specific information available to many health departments. Therefore, report dates were used in the prospective space-time analysis to replicate the realistic surveillance processes that occur in health departments, and to mimic a near real-time surveillance system.

## Results

The first cluster signaled approximately 20 days after the first reported case in SL County. This cluster occurred two days before a statewide press release was issued, and 21 days before the implementation of major intervention measures. From August through mid-September, many significant clusters were detected throughout SL County (Figure 1).

## Conclusions

The results of this study suggest that there were distinct spatial-temporal patterns throughout the outbreak period. Therefore, space-time analysis would have been a valuable and complementary tool to temporal surveillance because it could have detected spatial clusters and high-risk areas of disease as they were reported, or emerged. In addition, it may have been useful for targeting intervention strategies and prioritizing investigations during this large community-wide outbreak.

## Acknowledgements

## References

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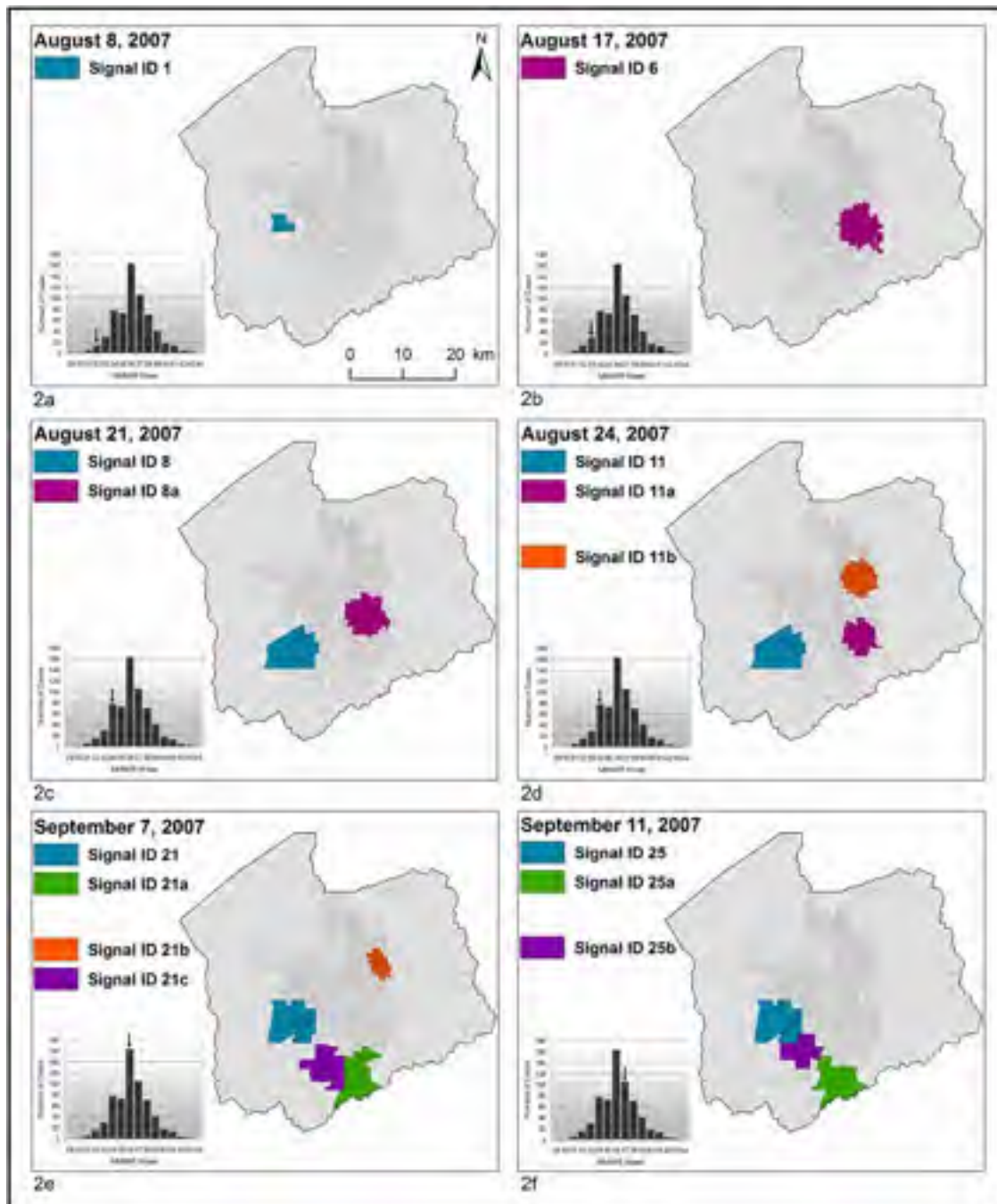
**Figure 1** Significant space-time clusters detected during six 28-day time steps from 8 August 2007 to 11 September 2007.