Timeliness of electronic laboratory reporting vs. traditional laboratory reporting in Southern Nevada from 1999-2012

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Background
Electronic laboratory reporting (ELR) has been implemented in many parts of the United States, and is perceived to be faster than traditional reporting. One large commercial laboratory provides the Southern Nevada Health District (SNHD) with 70-90% of its electronic and traditional laboratory reports, including reports of gastrointestinal (GI) illnesses. GI illnesses are a concern in Southern Nevada due to the transient population and short incubation periods of these illnesses.1,2

Objective
This project aims to compare timeliness between traditional laboratory reporting, ELR, and reporting after the implementation of TriSano, a modern electronic surveillance system, for common GI illnesses in Southern Nevada, with a prediction that ELR will be faster than traditional reports, and TriSano will be faster than the other two methods.

Methods
Data
In this descriptive study, reports of campylobacteriosis, salmonellosis, and shigellosis were examined for timeliness in days:
- Traditional reports from January 1999 – May 2004 (n = 751)
- Electronic reports from July 2004 – August 2010 (n = 915)
- TriSano reports from September 2010 – May 2012 (n = 114)
- Timeliness for public health response was measured from onset of symptoms to when the result was reported to SNHD. Incubation time of diseases was compared to assess appropriate response time.
- Timeliness for compliance with state laws was measured from time of laboratory result to report to SNHD (Figure 1)

Analysis
- Median days were calculated
- Kruskal-Wallis tests for difference across report test type
- Post hoc tests: Mann Whitney U tests with Bonferroni corrections to control for Type I error (significant at p < .017)

Results
Public health response time
Median days (Figure 2)
- Traditional reporting = 6 days
- Regular ELR = 9 days
- TriSano reporting = 10 days
Kruskal-Wallis test, public health response time
- Statistically significant difference in time across the three methods (χ² = 24.329, p < .001).
Post hoc tests
- Difference in time between traditional reporting and ELR is statistically significant (p < .001)
- Difference between traditional reporting and TriSano is statistically significant (p = .001) (Table 1)

Legal compliance time – Median days (Figure 2)
- Traditional reporting = 5 days
- Regular ELR = 6 days
- TriSano = 1 day

Legal requirement time
Timeliness for legal compliance (24h)
- Traditional/ELR = 6 days
- Traditional/TriSano = 8 days
- ELR/TriSano = 10 days

Table 1. Post hoc analyses

Post hoc analyses

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<th>Public Health Response Timeliness</th>
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Kruskal-Wallis test, compliance with state law
- Statistically significant difference in time across the three methods (χ² = 345.928, p < .001).

Median Report Days

Discussion
The three diseases in this analysis of this laboratory are all tested using culture which can take 72 hours to develop a result.3 State law mandates results after 24 hours; diseases tested with culture have a legal requirement of 96 hours.4 This analysis demonstrates that public health response time in Southern Nevada is not fast enough with any system.

All methods can take longer than the incubation periods for all three diseases (campylobacteriosis incubation period = 2-5d, salmonellosis incubation period =1-3d, shigellosis incubation period = 1-3d) (Figure 3). Therefore, with the current methods, it may be impossible to prevent secondary infections of these three illnesses in Southern Nevada. The TriSano system looks promising and SNHD should continue to use it. Additionally, different testing methods should be explored by the laboratory.

Acknowledgments
Thank you to Brian Labus, Jeffrey Kriseman, Shawn Gerstenberger, and to the Southern Nevada Health District Office of Epidemiology.

References