

Use of Rapid Testing Sites to Enhance Laboratory-Based Surveillance for Influenza

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Background

Laboratory-based surveillance for influenza viruses confirms the presence of influenza viruses in the community, identifies the type, subtype and strain of circulating viruses, and provides earliest detection of novel strains of influenza.

The majority of influenza testing is performed at diverse sites using simple "rapid" tests, but these sites remain a largely untapped reservoir of samples and data for influenza surveillance.

The Wisconsin State Laboratory of Hygiene (WSLH) has collected testing data and has provided confirmatory testing of selected positive samples from a pool of 366 influenza rapid test sites (RTS) for several years. This system has provided early detection of seasonal influenza and a reliable data source for monitoring influenza activity.

The WSLH conducted a study during the 2008-9 influenza season to improve RTS-based influenza surveillance and develop a model that could be transferable to other states.

The project included a survey of previously identified clinical sites, the selection and use of a web reporting tool, and test result data provided by RTS, however, this poster will focus on the sample submission by the RTS.

Methods

- Fifteen regionally distributed RTS were recruited to submit their first five influenza specimens each week (positive and negative) to the WSLH for influenza A and B PCR testing ("**structured**" submissions). Those specimens that were negative for influenza A and B were then tested in a respiratory virus panel PCR test.
- Influenza-positive specimens submitted for confirmatory testing by other RTS and specimens submitted directly to the WSLH by healthcare providers ("**unstructured**" submissions) were tested following the same algorithm.
- The WSLH provided guidance and fee-exempt specimen transport and testing for all sites.
- Results of specimens received from both structured and unstructured submission sites were compared for detection of influenza and other respiratory viruses.

Results

- Of the fifteen sites selected, one site did not submit specimens, and two discontinued specimen submission when they changed their specimen collection and testing protocols.
- Of 1290 specimens from structured sites for which results were available, 694 (54%) were positive.
 - 384 of the 694 (55%) were positive for influenza, 316 (46%) were positive for other respiratory viruses, including 17 that were positive for more than one virus.
- The testing trends and positivity patterns generated by both structured and non-structured specimen submission sites were very similar for influenza (Figure 1).
- The relative number and types of non-influenza viruses identified were also similar for structured and non-structured sites (Figure 2).

Figure 1. Comparison of Influenza Testing by Structured and Non-Structured Submission Sites

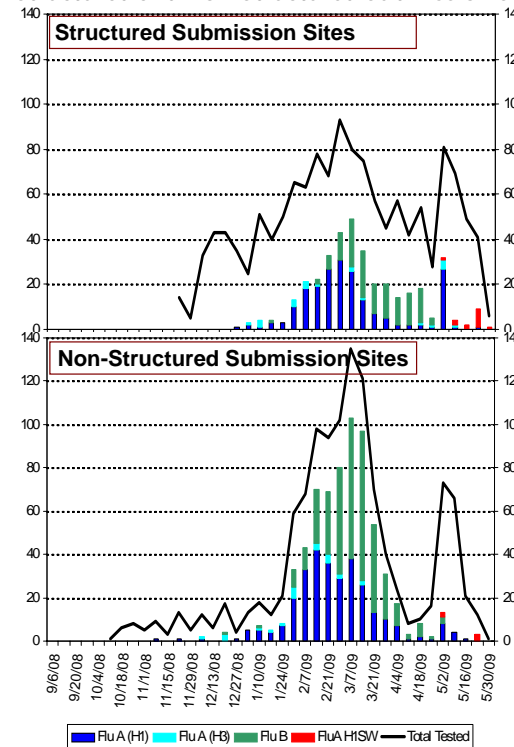
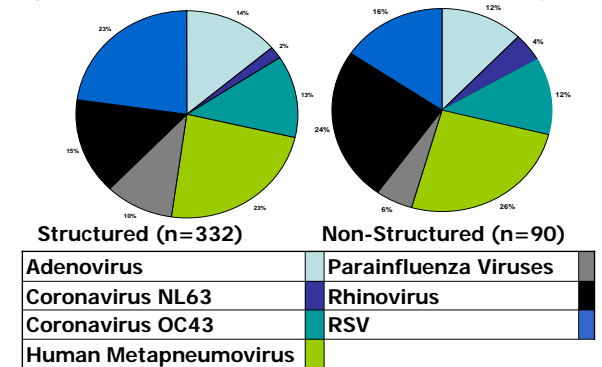


Figure 2. Detection of Non-Influenza Respiratory Viruses



Conclusions

- Enlisting rapid influenza test sites to submit specimens (positive and negative) on a regular, "structured" basis can provide an easily accessed and highly productive (>50% positivity) specimen source to identify influenza and other respiratory viruses.
 - A variety of respiratory viruses can cause "influenza-like illness".
- Monitoring of the influenza-positivity of RTS-submitted specimens at the state public health laboratory can provide a measure of influenza activity in the state.
- Test results of specimens from structured submission sites, combined with new testing technology, revealed patterns of seasonal activity of human metapneumovirus and coronavirus OC43 which had not been previously observed; both viruses were involved in several institutional outbreaks during this season.

Limitations

- Specimens may not be available consistently throughout the year, as influenza rapid test sites often discontinue testing through the late spring through early autumn, however, the appearance of novel influenza A(H1N1) virus in late season 2009 may alter testing practices.
- Patient demographic and clinical information were not collected during this project and are likely to be difficult to collect routinely.

Discussion

Incorporating rapid influenza test sites into influenza surveillance systems as a specimen and data source provides an increased opportunity for connecting public health to the clinical community. In addition, the widespread availability and use of these tests provides access to improved geographic and social representation in sampling. Finally, these sites provide a resource for intensified and focused surveillance during outbreak investigations.