



Can Analysis of Routine Viral Testing Provide Accurate Estimates of Respiratory Syncytial Virus (RSV) Disease Burden in Adults?

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BACKGROUND

Respiratory Syncytial Virus (RSV) is a RNA virus first identified in 1956. RSV is being recognized more often as a significant cause of respiratory illness in older adults. Disease usually averages over two weeks, and symptoms are consistent with an upper respiratory tract infection but some high-risk adults, such as those with certain chronic illnesses or immunosuppression, may have more severe symptoms consistent with a lower respiratory tract infection, such as pneumonia. There is growing evidence that rates of health care utilization, hospitalization, morbidity and mortality among adults with RSV infection may be similar to those observed with influenza infection. Most studies to date which focus on disease burden in adults utilize data derived from RSV testing done as part of research. Notably, many commercial influenza PCR assays are multiplexed with RSV and Rochester general Hospital (RGH) uses such a test (Simplexa®). Thus, adult RSV cases are incidentally detected as a result of influenza testing. If such data are used to confirm adult RSV disease burden it will be necessary to examine such data bases for bias.

METHOD

- Results of the Simplexa® Influenza/RSV Polymerase Chain Reaction (PCR) assay ordered for routine rapid diagnosis of viral infection in adults seen in the emergency room (ER) or admitted to Rochester General Hospital (Monroe County, NY) from October 2015- April 2016 were reviewed.
- Charts of adults testing positive for influenza or RSV were reviewed for discharge diagnoses (ICD-10).
- Total number of Respiratory illnesses at Rochester General Hospital during the same period (ER visits and inpatient) were compared to test conducted.
- Common respiratory illnesses - ICD-10 codes for Viral illness, URI, Bronchitis, COPD exacerbation, Asthma exacerbation, Pneumonia, Acute respiratory Failure.

RESULTS

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3956 Total PCR assays

536 Positive

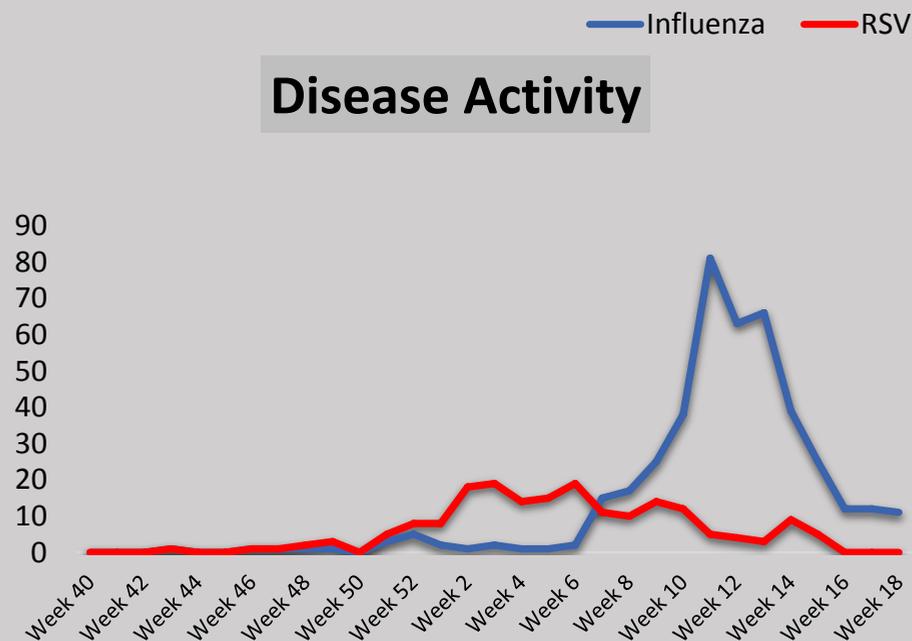
133 RSV

30 Emergency Room
103 Hospitalized

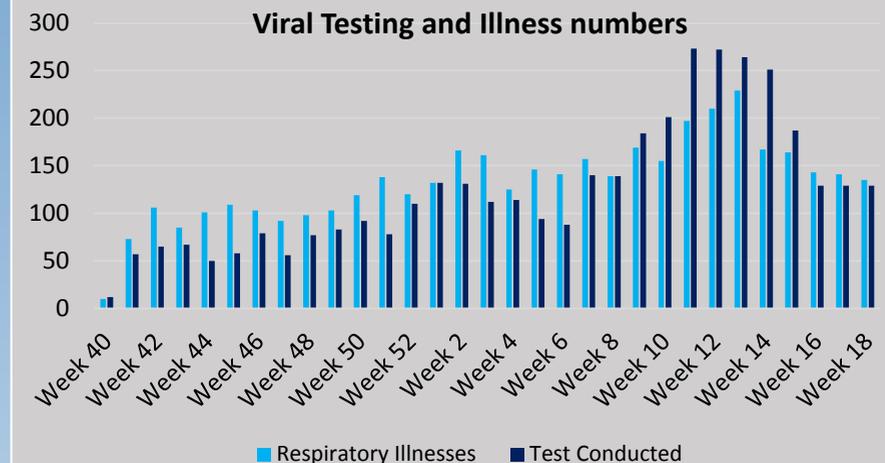
403 Influenza

215 Emergency Room
188 Hospitalized

Disease Activity



Viral Testing and Illness numbers



- Viral testing increased greater than 2 fold during peak influenza activity compared to peak RSV activity. However respiratory illnesses increased by only 1.2 times during peak influenza activity.
- The ratio of viral test/respiratory illness was 0.72 during the 5 weeks of peak RSV activity compared to 1.3 during the peak influenza activity

CONCLUSIONS

- Routine viral testing to estimate RSV disease burden in adults may be useful but certain limitations should be kept in mind.
- The role of RSV as a cause of hospitalization among internists and hospitalist is not well appreciated so that mining ICD-10 databases for RSV discharge diagnoses is problematic.
- Testing bias remains a concern. Viral testing was nearly twice as common during periods of high influenza activity compared to periods of RSV activity. Estimates of RSV disease burden using routine viral testing will likely underestimate RSV cases.

ICD 10 Diagnosis	RSV (n=103)	Influenza (n=188)	p value
Primary Discharge Diagnosis	5 (5%)	56 (30%)	<i>p</i> <0.005
Other Discharge Diagnosis	51 (50%)	149 (79%)	<i>p</i> <0.005
No Mention of Respiratory Disease	52 (50.5%)	39 (21%)	<i>p</i> <0.005