

Can Monitoring Telehealth Ontario Respiratory Call Volume be a Component of an Effective Public Health Influenza Surveillance Strategy?

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Objective

This paper will explore the possibility and utility of monitoring Telehealth Ontario respiratory calls as an efficient public health influenza strategy for early warning by comparing this data source to provincial viral lab data.

Background

Influenza epidemics occur seasonally, impose a high economic burden on the health care system, and are responsible for substantial morbidity and mortality (1). The past century has seen three influenza A pandemics with variable severity. The recent outbreaks of avian influenza involving different virus strains in Asia, North America and the Netherlands, indicates the increasing potential of a new influenza pandemic (2). Public and political awareness needs to be strengthened while public health surveillance strategies need significant improvements if we are to mitigate such a potentially devastating worldwide pandemic, and provide the healthcare system with as much early warning as possible to enhance preparedness. Telehealth Ontario is a provincial telephone helpline for health information staffed by nurses that, if monitored on a real-time basis, has the potential to identify increases in seasonal respiratory infection rates. A recent study suggested that Telehealth Ontario respiratory calls reflect the seasonality of diagnosed respiratory illnesses in emergency departments (van Dijk *et al.*, unpublished data), but an estimation of how respiratory pathogens contribute to Telehealth Ontario's respiratory complaint calls has not been studied.

Methods

We retrospectively compared the volume of calls to Telehealth Ontario for respiratory illnesses to provincial respiratory viral laboratory data. Time-series analyses were performed on respiratory calls and compared to Ontario's weekly respiratory virus isolation counts from September 2004 – July 2006. Models using backward stepwise regression were fitted to estimate the contribution of respiratory pathogens to the volume of respiratory calls, similar to previous work by Cooper *et al* (3).

Results

During the study period the Telehealth Ontario helpline received 202,367 calls that were related to an upper or lower respiratory illness. Of these calls, 48% were for children aged 0-4, 14% for adolescents aged 5-17, 35% for adults aged 18-64 and 3% of the calls

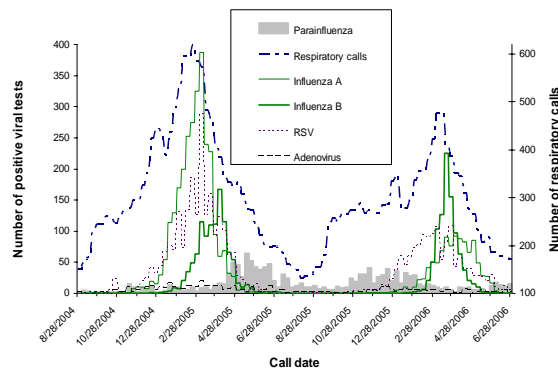


Figure 1. Comparison of the number of Telehealth Ontario calls for respiratory illness and the number of positive tests for respiratory pathogens across Ontario (September 2004 - July 2006).

were for the elderly (age 65+). The time-series analysis comparing total influenza lab reports and respiratory calls calculated the Spearman correlation coefficient at 0.84 ($p < 0.0001$). Statistically significant cross correlations of residuals were also found, indicating increases in respiratory call volume precede rises in positive laboratory cultures. The regression analysis revealed that the respiratory call data for all ages was best explained by the model which included influenza A and B, RSV and adenovirus with a calculated R^2 of 0.79. Figure 1 shows Telehealth Ontario calls in relation to circulating respiratory pathogens.

Conclusions

Early warning combined with effective communication and collaboration among stakeholders may help to minimize the impact that respiratory outbreaks may have on a local, provincial and even nation-wide level. Respiratory data from the Telehealth Ontario helpline can be a worthwhile, non-traditional data source for real-time syndromic surveillance which would be a valuable asset to a public health influenza surveillance strategy for Ontario.

References

- (1) Fact sheet on influenza. World Health Organization 2003; Available from: URL: <http://www.who.int/mediacentre/factsheets/fs211/en/>
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- (3) Cooper DL, Smith GE, Edmunds WJ, Joseph C, Gerard E, George RC. The contribution of respiratory pathogens to the seasonality of NHS Direct calls. *Journal of Infection*. In press 2007.

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