

June
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TARRANT VIRAL WATCH

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The influenza season is coming to a close in Alberta as most indicators of influenza activity have been decreasing, with a late season influx of influenza B. It was a busy season with over 1044 samples collected for the vaccine effectiveness study and over 180,000 patients screened for ILI and LRTI. The TARRANT Team also attended five provincial conferences/CME events to share TARRANT data and recruit new sentinels. This year, eleven new sentinels have enrolled in the program, many of whom practice in rural communities and help us capture these populations. Our data contributed to two publications in peer reviewed journals, a presentation at an International meeting and contributed to the WHO decision on next season's vaccine. Without your support, these accomplishments and developments in cutting edge research would not be possible. Thank you for your contributions and we hope to see your participation continue throughout the summer and next season!



Preparing for the 2018-19 Season

- AHS mandates we maintain a 90% active sentinel rate. We will be contacting you over the next few months to confirm your continued involvement with the program for the upcoming year. Should you be unable to continue with the program, or wish to opt out, please contact us by phone at 403-220-2750 or by email at tarrant@ucalgary.ca.
- The influenza vaccine for the coming season will contain the A/Michigan/45/2015 (H1N1) pdm09-like virus, an A/Singapore/INFIMH-16-0019/2016 (H3N2)-like virus; a B/Colorado/06/2017-like virus (B/Victoria/2/87 lineage); and a B/Phuket/3073/2013-like virus (B/Yamagata/16/88 lineage)
- You will receive new VE requisition forms for the 2018-19 season in late August/early September. Until then, please continue to use the **BLUE** 2017-18 season forms for the VE study.
- After a year as a TARRANT RA, Manish Ranpara will be leaving the team this June as he begins a residency in Ontario. Yvonne Efegoma is our new RA and will continue to work with us as she begins her Master's degree in September.

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2017-2018 Flu Season Update

Alberta Influenza

From the beginning of the season, there have been 9,081 laboratory-confirmed cases of influenza in the province. The majority (5,621, 62%) of cases were influenza A, with A (H3N2) predominating. Influenza peaked in week 50, with 900 laboratory confirmed cases. During the peak, over 600 cases were influenza A. Unique to this season was the early appearance of influenza B, which typically peaks at the end of the season. The rate for influenza B peaked in January. There have been 3,027 hospitalization cases to date with the rate of hospitalizations, ICU admissions and fatalities highest in those age 80+. For the 2017/2018 Seasonal Influenza Immunization Program (Aug 27, 2017– May 19, 2018), over 1.2 million Alberta residents received an annual dose, an overall coverage rate of 29% for the province. The coverage rate for the previous 2016/2017 seasonal influenza immunization program was 30%.

Other Infection Respiratory Diseases:

Rhinovirus/enterovirus predominated at the start of the season, reaching a positive rate of just under 40% before dropping to under 10% by week 4. As Rhinovirus/enterovirus decreased, RSV began to increase, peaking in week 8. Parainfluenza, adeno-virus, coronavirus and mixed infections had low levels of detection throughout the season.

Data Source: AHS Public Surveillance

Canada

Influenza activity was high throughout Canada over the season, with over 64,154 laboratory-confirmed cases identified. Almost 36,000 (56%) of the confirmed cases tested positive for influenza A, and over 28,000 (44%) have tested positive for influenza B. Of the influenza A positive specimens, 90% were A (H3N2) and 10% were A(H1N1). 295 influenza-associated deaths and 513 ICU admissions have been reported nationally: Adults aged 65 years of age or older accounted the majority of deaths (85%). Each year the National Microbiology Laboratory (NML) characterizes a proportion of positive influenza lab specimens to compare circulating strains to the seasonal vaccine. This season, 3,723 isolates were tested. Among influenza viruses characterized by hemagglutination inhibition (HI) assay during the 2017-18 season, most viruses were antigenically similar to the cell-culture propagated reference strains recommended by WHO. The NML also undertakes antiviral testing of a select number of specimens. Out of 558 tested A(H3N2) specimens, one was resistant to oseltamivir. Those viruses with oseltamivir resistance showed a H275Y mutation. All influenza A were sensitive to zanamivir, while two influenza B specimens were resistant.

Data Source: FluWatch

International

Internationally, influenza activity has returned to inter-seasonal levels in the temperate northern hemisphere. The temperate southern Hemisphere, influenza activity has started to increase, but remains below seasonal thresholds in most countries. Over the past season, influenza A (H3N2) dominated with a unique co-circulation of influenza A and influenza B during most of the season in North America.

Data Source: WHO

Consecutive Influenza Vaccinations

Influenza is a significant contributor to morbidity and mortality, responsible for upwards of 500,000 deaths a year. Vaccination against influenza has been recommended on an annual basis, with populations at high risk of complications being prioritized followed by general recommendations for the rest of the community. Recent studies however, have since suggested that consecutive vaccinations may blunt or reduce vaccine effectiveness (VE) in the current year, with a number of immunological explanations being posited. This meta analysis then assessed whether consecutive influenza vaccinations reduce VE compared to current season influenza vaccinations by examining the entirety of existing data.

Methods	
Data Sources	MEDLINE, EMBASE and the Cochrane Central Register of Controlled Trials (CENTRAL)
Study selection:	Randomized, controlled trials (RCTs) and observational studies of children, adults and/or the elderly that reported laboratory confirmed influenza over 2 or more consecutive influenza seasons
Data Extraction	Data related to study characteristics, participant demographics, cases of influenza infection by vaccination group and risk of bias assessment was extracted in duplicate

Results:

5 RCTs (11,987 participants) across 9 influenza seasons were pooled and showed a VE of 71% for two consecutive seasonal vaccinations compared to a VE of 58% for vaccination in the current season alone. 28 observational studies (28,627 participants) across 9 influenza seasons were pooled and showed a VE of 41% for two consecutive seasonal vaccinations versus 47% for the current season alone.

Conclusions:

The evidence from the RCTs and observational studies did not support a reduction in VE due to repeat vaccinations. However, after assessing the degree of risk of bias, inconsistency, indirectness, imprecision and publication bias, the overall quality of evidence was very low and although the findings suggest there is no VE reduction with repeat vaccinations, this does not rule out the possibility of reduced effectiveness.

While the current study has shown conflicting results with other studies in regards to consecutive vaccinations, it shows that better research is required to assess the effects of repeat vaccinations, and perhaps uncover immunological or biological interference of consecutive vaccinations.

Bartoszko, J. J., McNamara, I. F., Aras, O. A., Hylton, D. A., Zhang, Y. B., Malhotra, D., ... & Loeb, M. (2018). Does consecutive influenza vaccination reduce protection against influenza: A systematic review and meta-analysis. Vaccine.

Pharmacist Administration of Influenza Vaccines

Despite widespread public funding for both high-risk groups and the entire population, uptake of the influenza vaccine in Canada remains low, and possibly is declining over time. An individual's decision to get vaccinated depends on factors such as health beliefs or risk-benefit perceptions, but the final decision often depends on ease of access.

In Canada, influenza vaccines are primarily administered by physicians and public health nurses. Allowing pharmacists to administer the vaccine may help overcome issues with accessibility given their ubiquitous distribution, extended working hours, walk-in policies and availability to people without a primary care provider. Recently several provinces have implemented policies permitting administration by pharmacists.

The Canada Community Health Survey from 2009 to 2014 was used to assess the effect of changed rules for pharmacy on uptake of vaccine. Influenza vaccination was associated with age >50yrs, females, urban residence, higher income and education, being married, higher body mass index, having chronic conditions, having a child less than 5 years in the household and having a regular doctor. After adjusting for these factors, in provinces with a pharmacist policy the immunization rate was 2% higher than those without. (30.4% vs 28.2%) Thus there is a small impact of these policies, and there may be benefits such as increased advertising and public awareness, not only of immunization but also other health promoting behaviours such as hand washing and respiratory etiquette.

Buchan, S. A., Rosella, L. C., Finkelstein, M., Juurlink, D., Isenor, J., Marra, F., ... & Kwong, J. C. (2017). Impact of pharmacist administration of influenza vaccines on uptake in Canada. Canadian Medical Association Journal, 189(4), E146-E152.

Burden of influenza

Seasonal influenza is responsible for a large disease burden worldwide. A study was done in the United States to provide an updated estimate of the annual economic burden of seasonal influenza in the presence of vaccinations efforts.

Method: Influenza attributable outcomes (Ill but not medically attended, office-based out-patient visit, emergency department visits, hospitalizations and death) were evaluated as well as associated productivity loss. Direct and indirect health care costs were also evaluated. These were characterized in age groups.

Result: There were an estimated 26.2 million cases annually with 82.2% of cases ill but not medically attended and 0.1% deaths. The estimated annual economic burden of influenza was \$ 3.2 billion. This figure rose to \$11.2billion with the addition of costs from lost productivity. Those over 65 years had the largest share of direct costs resulting mainly from hospitalizations, while lost income due to influenza-related mortality accounted for majority of indirect costs especially in working aged adults. These estimates suggest that substantial cost from influenza persists despite mass vaccination efforts.

The burden of influenza in Canada may also be rising as the last influenza season (2017/2018) had 5,111 influenza-associated hospitalizations, 513 ICU admissions and 295 deaths compared to the previous season (2016/2017) which had 143 ICU admissions and 86 deaths. Given the population of Canada, the total annual economic burden would be about \$1.2 billion.

Further strategies are still required to reduce the burden of Influenza.

Putri, WCWS et al. Economic burden of seasonal influenza in united states. Vaccine (2018), <https://doi.org/10.1016/j.vaccine.2018.05.057>

FluWatch