

Use of Cross-sectional Surveys and Laboratory Diagnostics in Respiratory Virus Surveillance

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Outline

- Laboratory Surveillance
- Laboratory Surveillance Compared with Syndromic Surveillance
- McMaster University Student's Study
- Harris/Decima Cross-sectional Survey

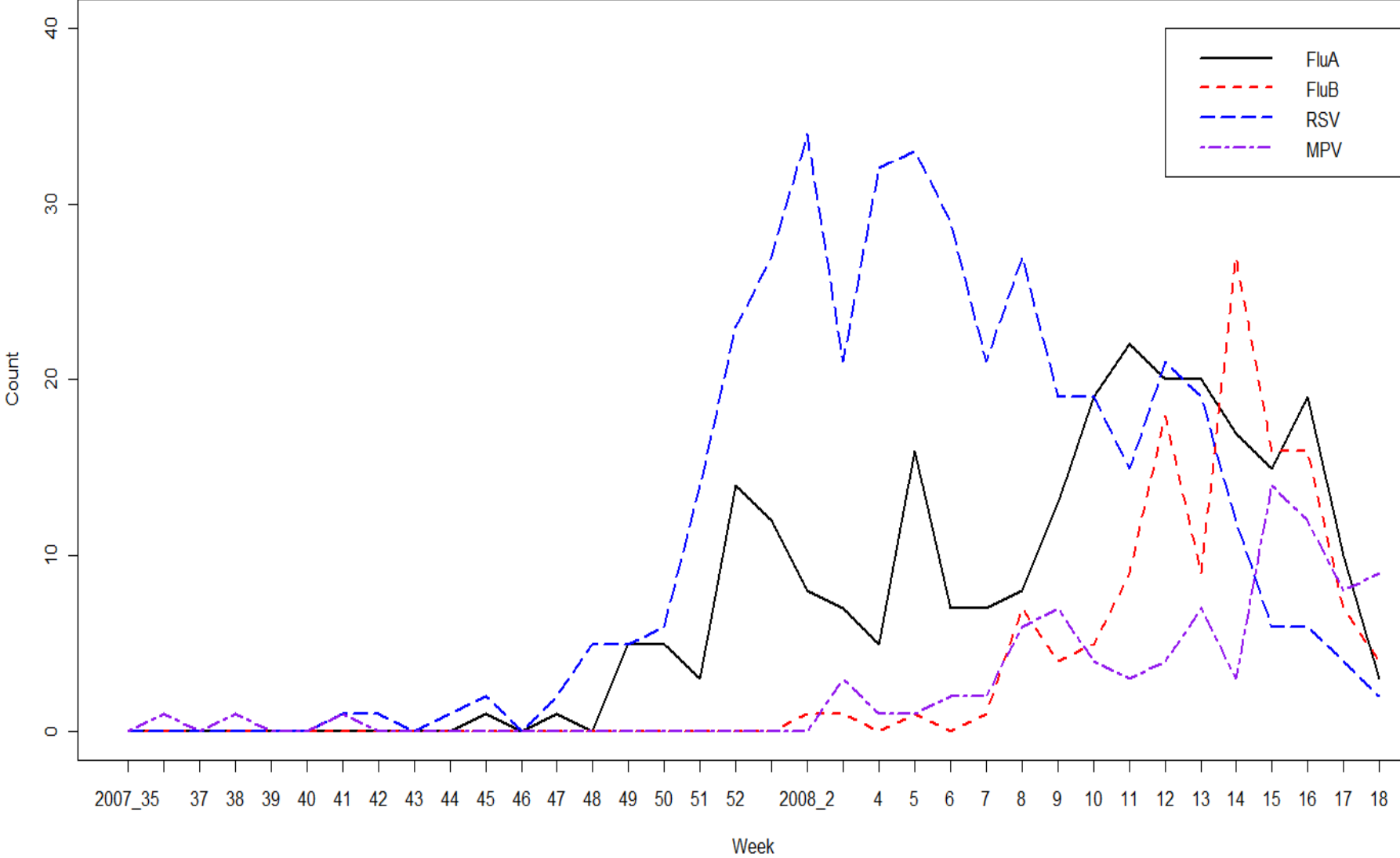
Goal of Surveillance Research

- To get a better estimate of the level of illness present in the community
- To ensure laboratory-based surveillance is timely and effective
- Estimate the true burden of ILI and URI

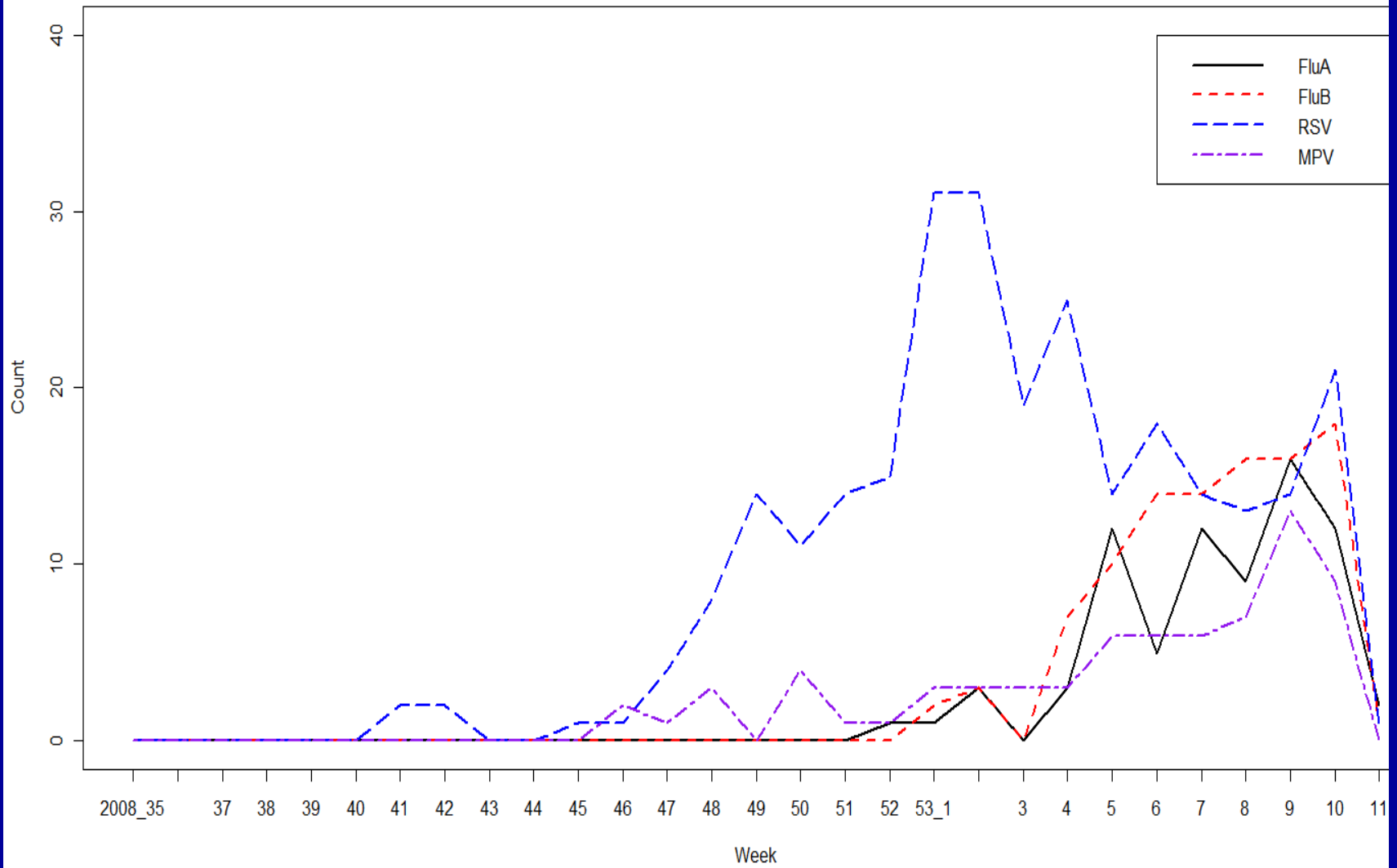
Laboratory Surveillance

- Clinical Laboratory
 - DFA/Culture
 - Weekly reports on positive samples
 - All data shared with our local Public Health Office
- Ongoing Surveillance Study
 - Molecular diagnostics using the Luminex Respiratory Virus Panel (ID-Tag™ RVP)
 - Epidemiologic surveillance study of individuals having a NPS for suspected respiratory illness that uses age and time-stratified random sampling

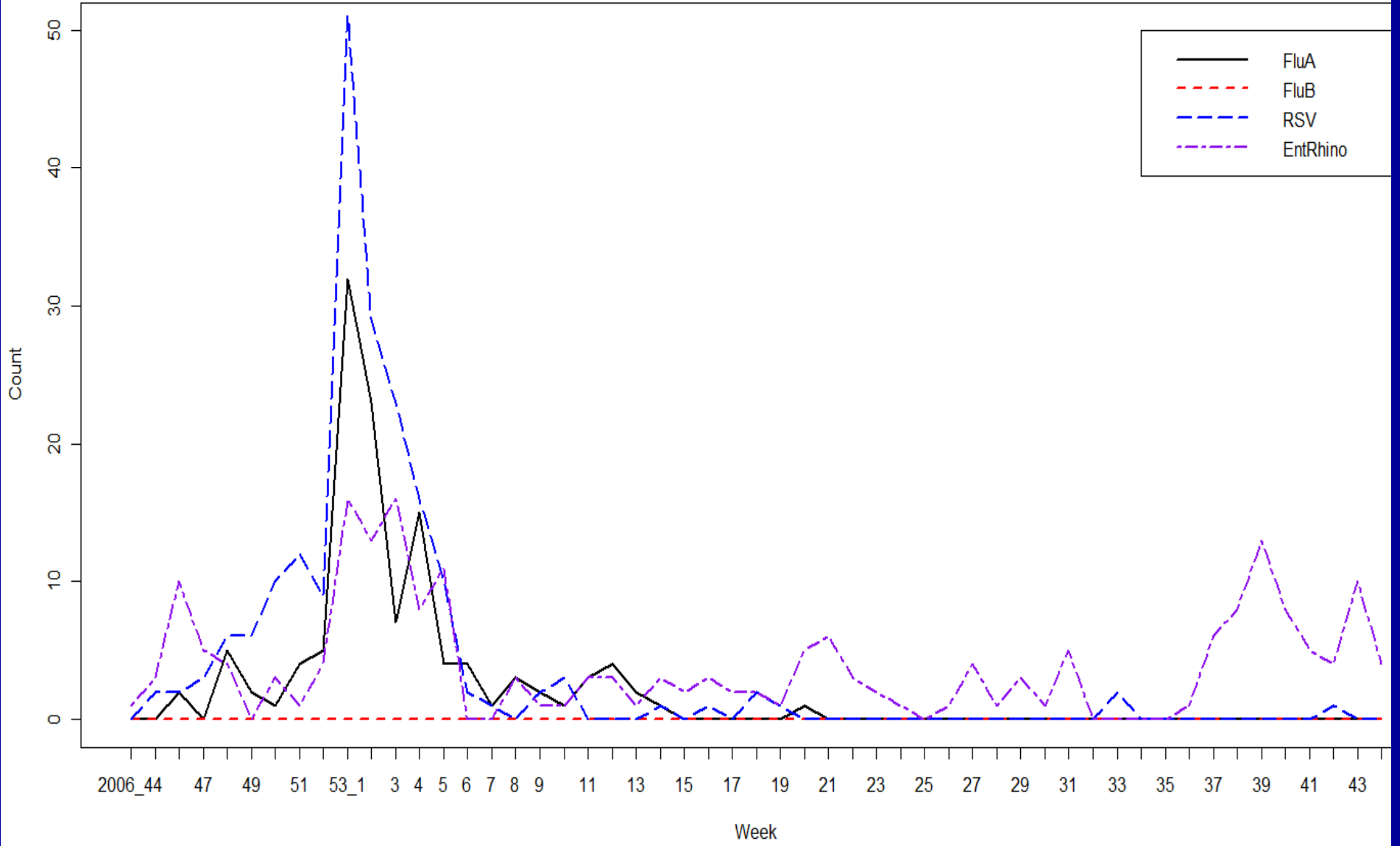
2007-2008 Season Weekly Lab ILI Count by Virus Type



2008-2009 Season Weekly Lab ILI Count by Virus Type



2006-2007 Weekly RVP ILI Count by Virus Type

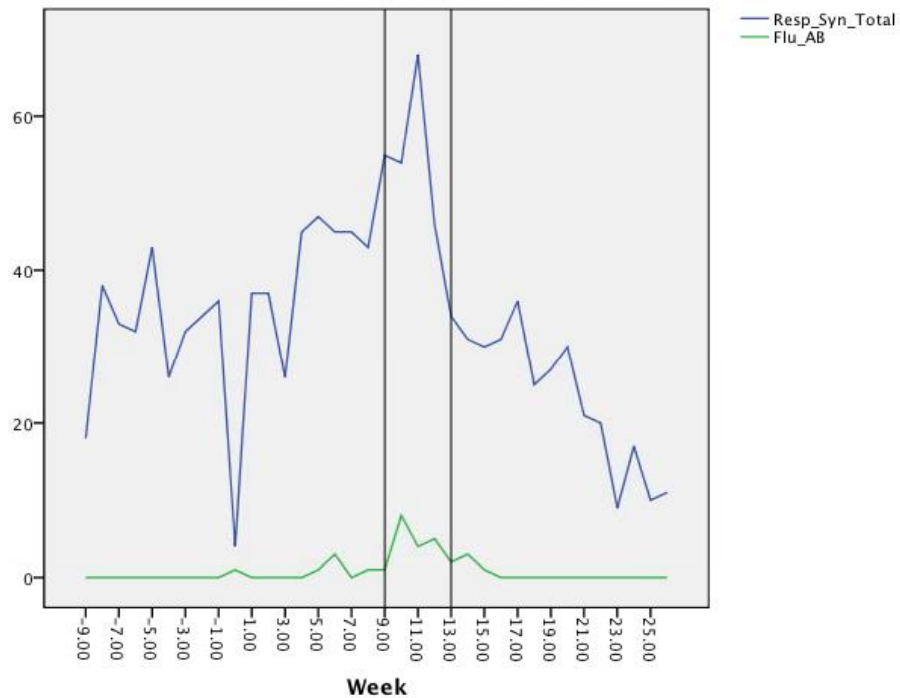


Comparing Syndromic to Laboratory Surveillance in Pediatric Populations

- Objective was to determine whether passive laboratory surveillance using molecular diagnostics was timely and sensitive for detecting community respiratory outbreaks in children by comparing it to rises in calls of parents seeking telephone advice from, Telehealth Ontario, a nurse-led medical hotline.
- Using an ecological study design, the rise in calls of acute respiratory syndromes in children was compared with laboratory-based surveillance in Hamilton, Ontario, Canada between November 2005 and June 2006.

Time Series Graphs

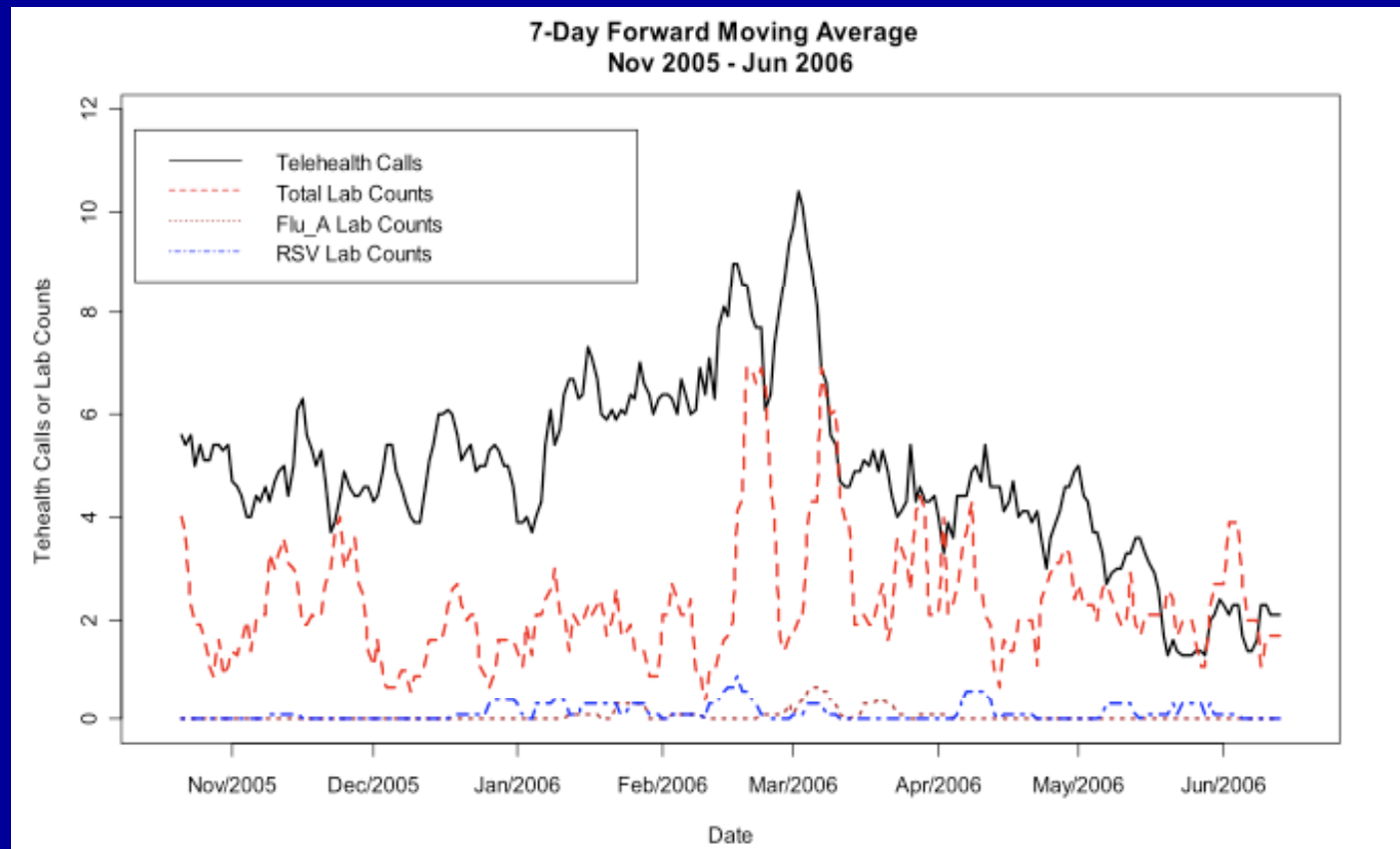
Telehealth Reported Respiratory Syndromes and Laboratory Confirmed Isolates of Influenza A and B



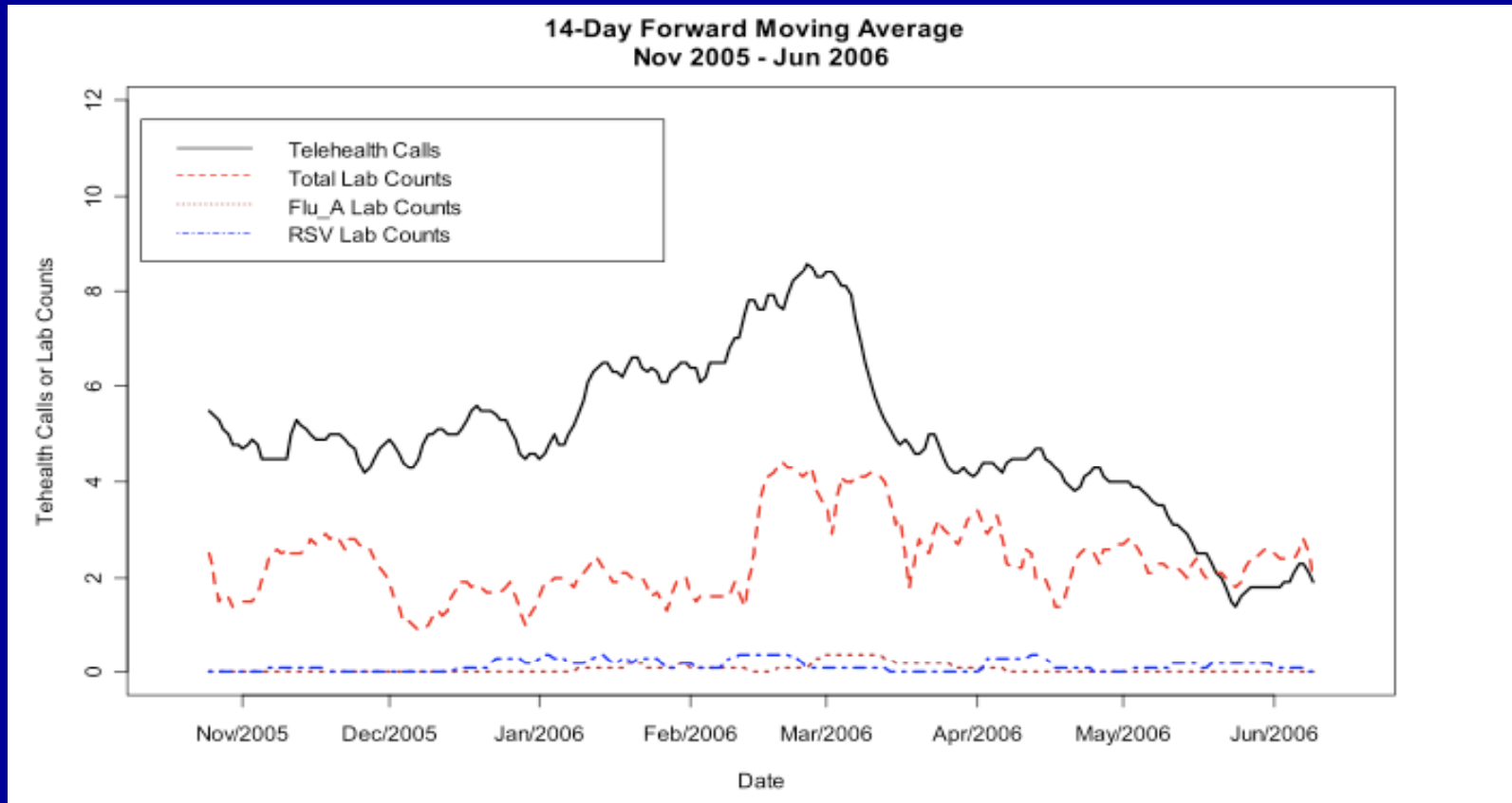
Telehealth Reported Respiratory Syndromes and Lab Confirmed Isolates of RSV and Influenza A



7-Day Forward Moving Average



14-Day Forward Moving Average



Results/Conclusions

Molecular diagnostics coupled with passive laboratory surveillance were sensitive and timely for the detection of pediatric outbreaks of influenza A, B and RSV in the community

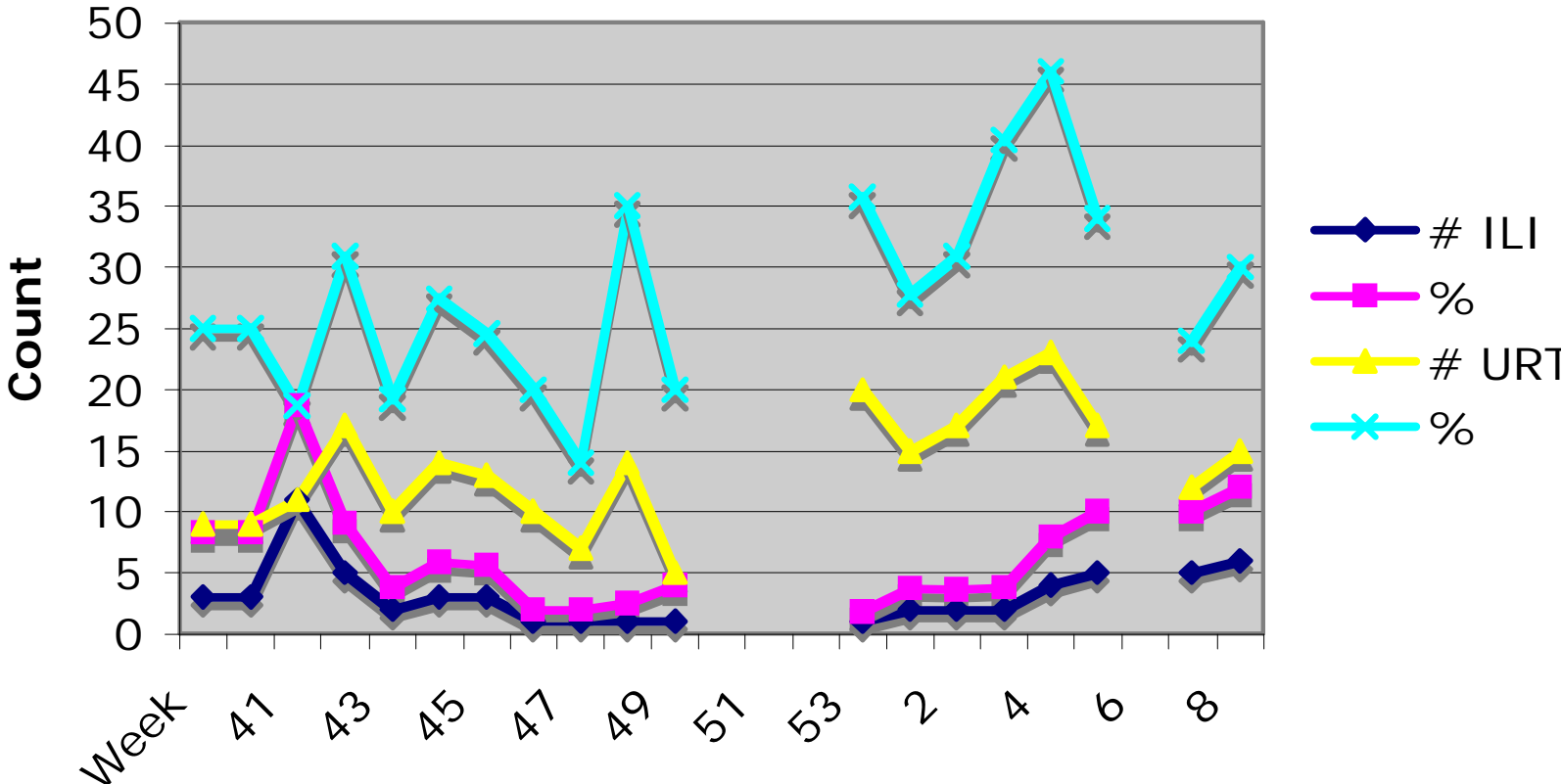
Molecular diagnostics coincide with or may even predict outbreaks earlier than telephone-based surveillance.

McMaster Student's Survey

- Cross-sectional Survey Design
- Each week a sampling of approx. 50 students completed a one-page respiratory virus survey
- Concurrently doing laboratory sampling on a small number of students per week.
- Aim was to survey and monitor patterns of ILI and URI in the residences, as well as to assess lifestyle factors (smoking, living arrangements, sleeping habits etc.) and their relationship with respiratory symptoms

Presence of ILI and URI in University Students

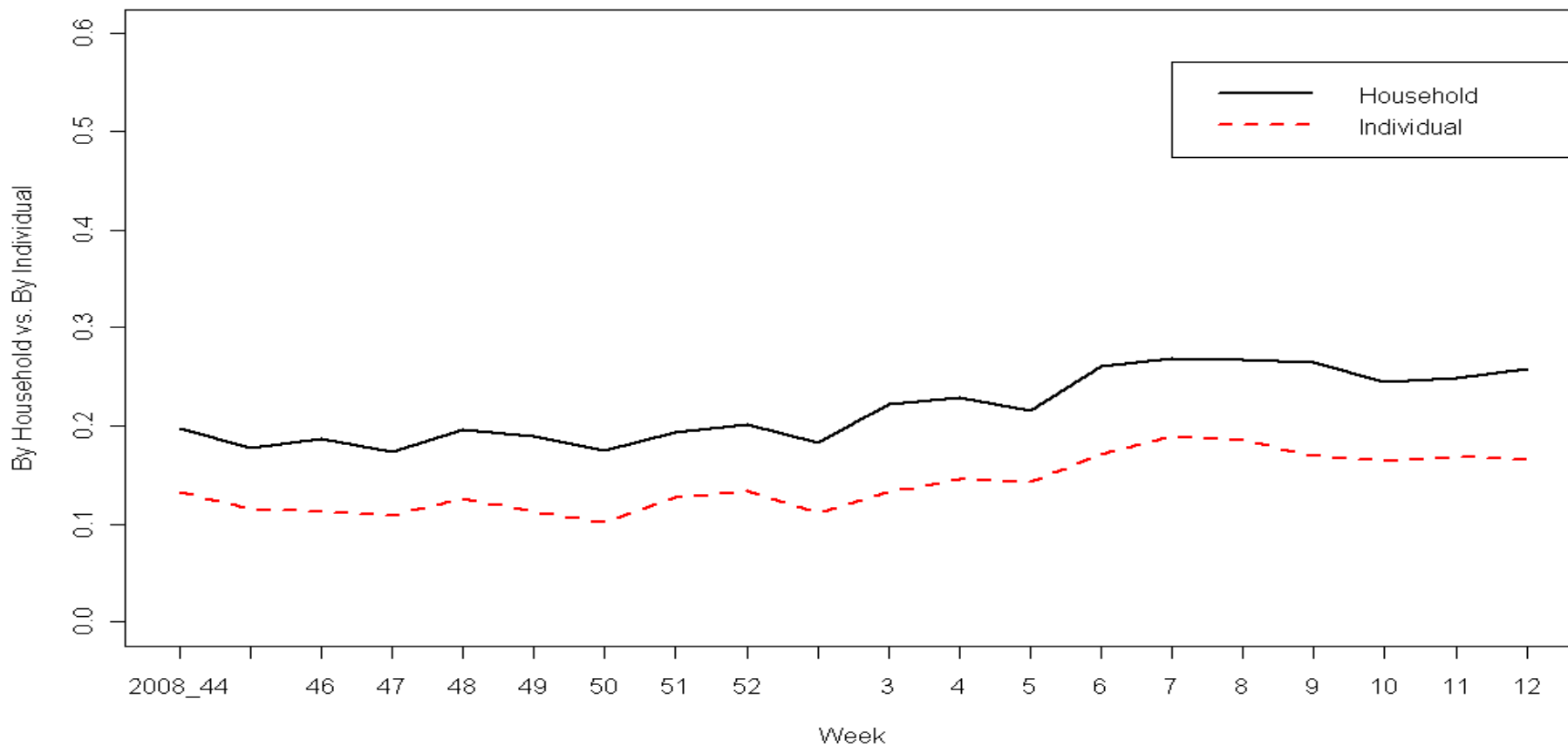
McMaster University ILI/URI Survey



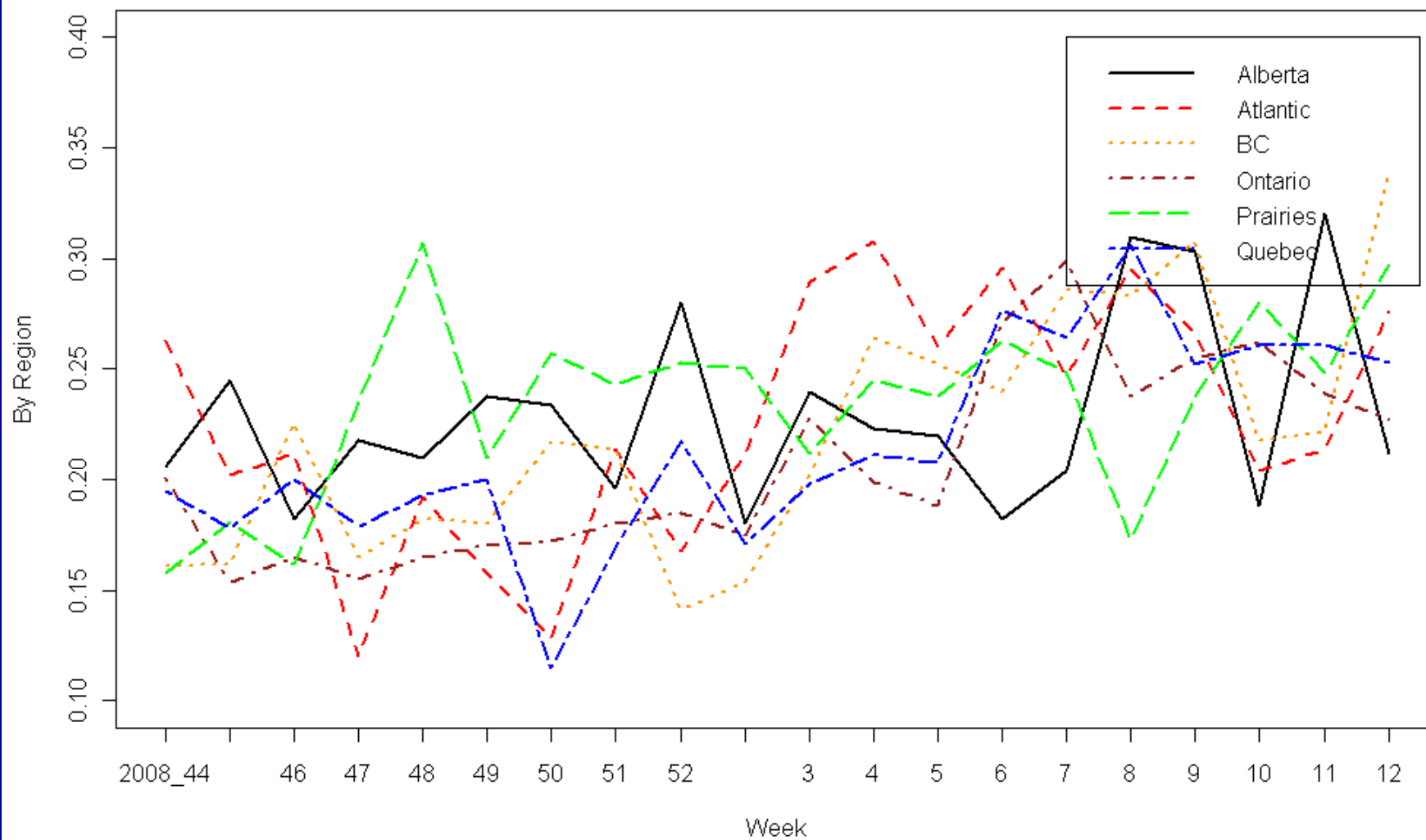
Weekly National ILI Survey (N=1000)

- Harris/Decima is a National Polling Agency
 - Nationally representative samples
- Contracted to include 1 question about ILI each week from November through April
- As you may know, the flu is a common illness that causes fever with cough, headache, sore muscles, runny nose, or sore throat. Including yourself, how many members of your household have experienced a fever together with one or more of these symptoms over the past two weeks?

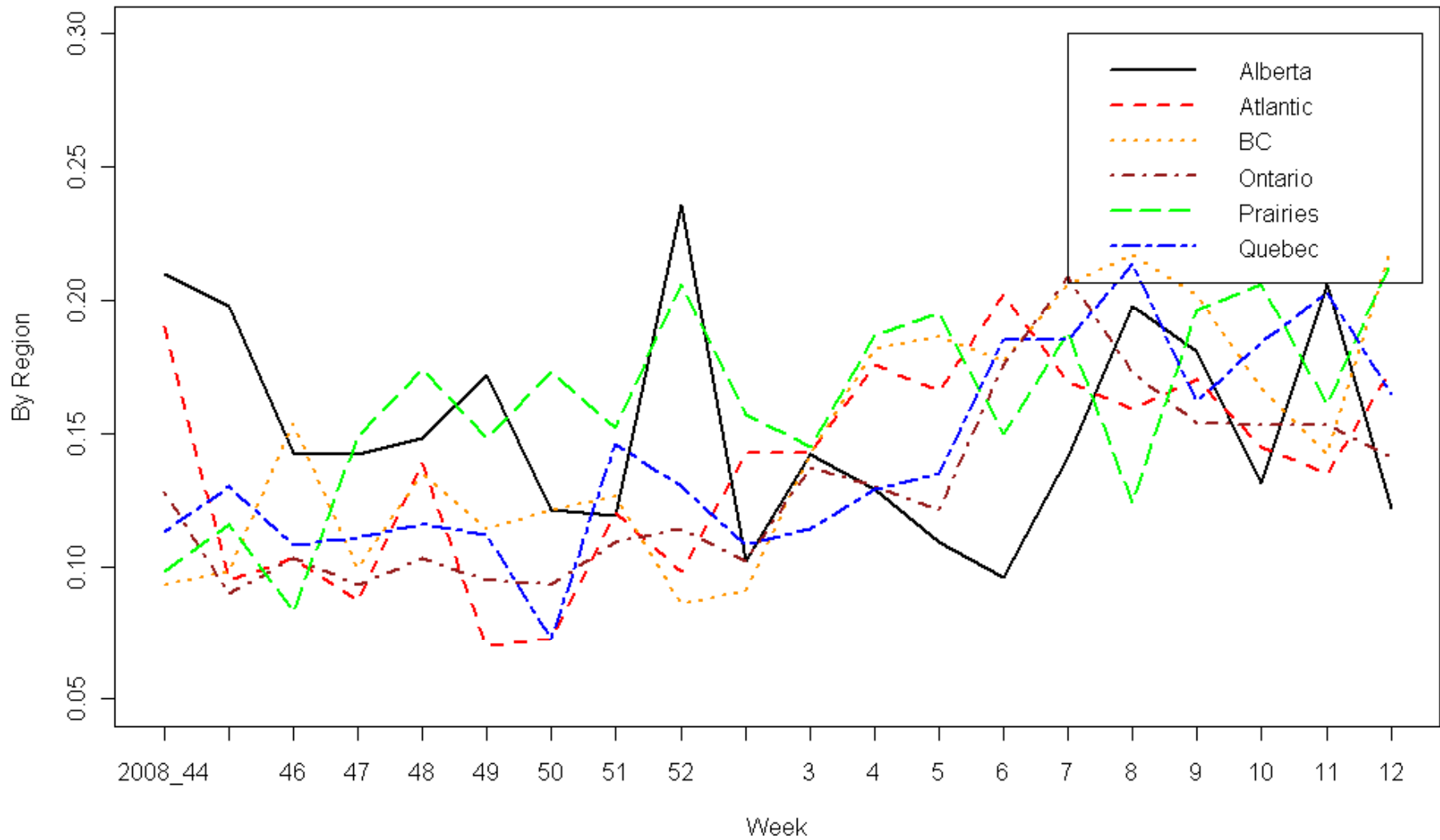
2008-2009 Canadian Weekly ILI 2-Week Proportion



2008-2009 Canadian Weekly ILI 2-Week Proportion by Household



2008-2009 Canadian Weekly ILI 2-Week Proportion by Individual



Most Recent Harris/Decima Survey

- 256 of 991 (25.8%) Canadian households reported at least one household member with ILI in the past 2 weeks.
- The rate for Ontario was 73 of 321 (22.7%)

Harris/Decima End of Season Questionnaire

- 8 item questionnaire including questions about ILI experience in the individual and household, vaccination status, smoking, physician visits & treatment.
- 27% of individuals and 42% of households experienced ILI between January and April 2008.
- Median loss of 2 (Q1-Q3: 1-5) days of work or school
- 0.7 doctor visits & 0.15 antibiotic prescriptions per household

Future Directions in Respiratory Virus Surveillance

- Continue to combine clinical and laboratory surveillance methods
 - Using more Telehealth Ontario data
 - Or using a proportion of those people identified in clinical or syndromic surveillance
- Improve lab testing for clinical syndromes that are not diagnosed
- Continue to monitor ILI/URTI in University Students

Take Home Messages

- We have very useful laboratory data that if combined in real time across the province could be very powerful.
- Need a way to quantify the large amount of people with ILI that do not seek medical attention.

Thank-you