



Exploring the use of school absenteeism data for the early detection of outbreaks in the community

Jason R. Garay
Manager, Infectious Diseases Surveillance Unit
York Region Community and Health Services

Ontario Agency for Health Protection and Promotion
"Syndromic Surveillance in Ontario – Current Initiatives and Future Directions"

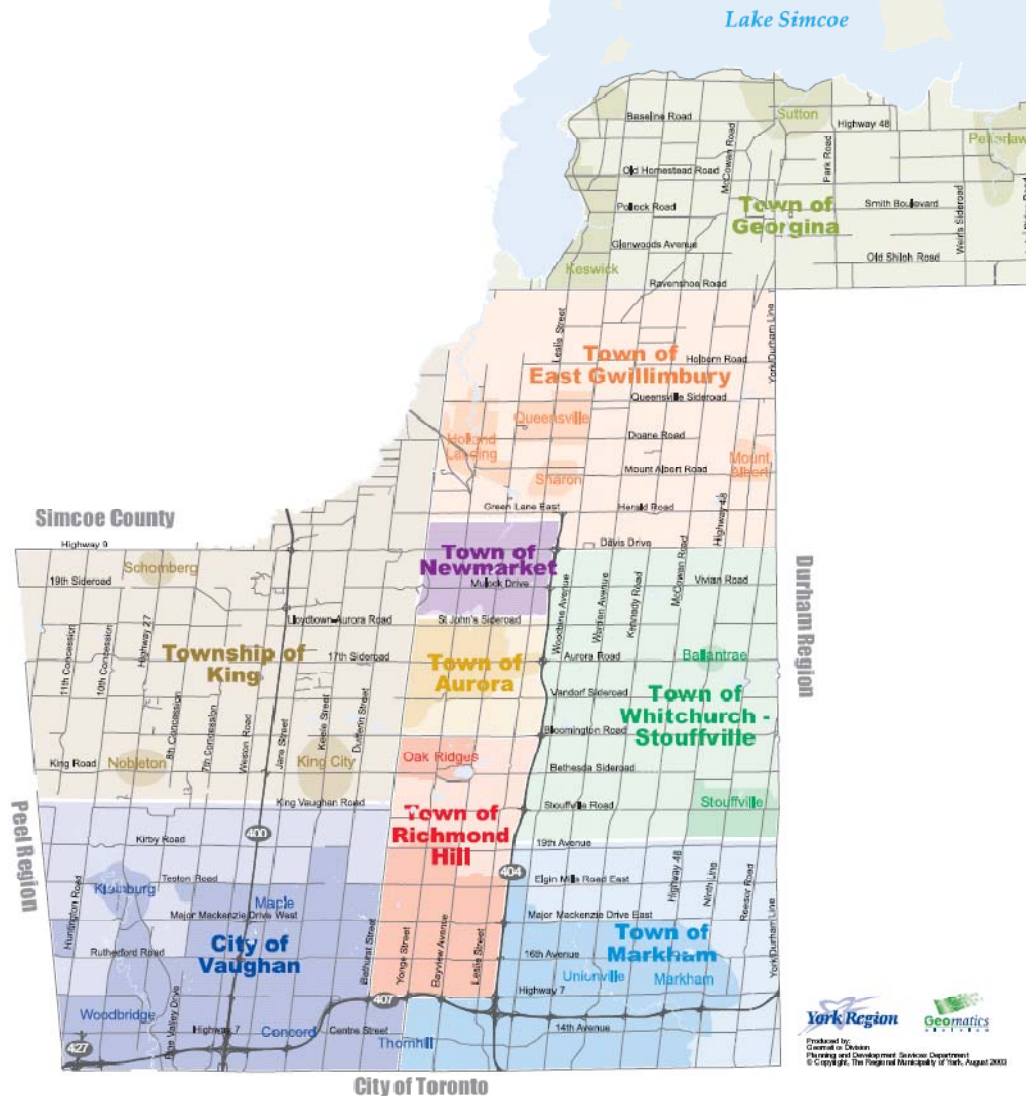
March 30, 2009





Welcome to York Region!

- Nine municipalities
- Population = 892,712 (2006 Census); current projection - ~1,000,000 residents
- Rapid population growth
 - Especially in immigrant population
- Densely populated southern municipalities





Many different examples of syndromic surveillance

- Sentinel physician
- Emergency department
- Over-the-counter pharmaceutical products
- Workplace absenteeism
- Sentinel School
 - To monitor and collect data on student absenteeism rates due to illness in order to identify trends or clusters of illness within that school community



Rationale

- During an outbreak, this information is helpful in targeting control and/or prevention strategies
- Syndromic surveillance information may provide early detection of outbreaks before they reach their peak level
- Existing data sources in York Region do not provide any real potential for advanced warning
- Outbreaks in the school community often precede larger community-based outbreaks
- What do we want out of syndromic surveillance?
 - **An early warning system for developing community outbreaks**



Objectives

- **Monitoring and collecting data on student absenteeism due to illness to identify trends within York Region schools;**
- Detecting outbreaks of respiratory and/or enteric illness in York Region schools;
- Evaluating the potential of using school absenteeism rates for the early identification of novel illnesses in York Region, such as pandemic flu;
- Providing summary feedback on illness trends within York Region schools to YRDSB and YRCSB; and
- Continuing to strengthen and facilitate the working relationship that exists between YRDSB, YCDSB and YRCHS.



History

- Project began with discussions in 2003 with school boards in York Region
 - Initial buy-in from public school board to initiate a pilot program
- Phase I initiated in 2005 involving 8 schools
 - 2 main purposes: (1) test process for collection of data; (2) determine school's support for continuation and maintenance of the program
- Phase II expanded to 12 schools in 2006 (8 high schools and 4 elementary)



History cont'd

- In both Phase I and II, buy-in achieved through regular feedback to both school staff (i.e. attendance secretaries) and school administrators
 - Example of school reports
- Phase II saw introduction of regular monthly reporting back to pilot schools
 - Included York Region disease statistics, school-specific absenteeism data and anonymized benchmarking information



History cont'd

- Between Phase II and Phase III, worked closely with public school board to implement new automated electronic data collection for student absenteeism reporting
 - Introduction of Trillium system in York Region
 - Allowed for automated daily downloads to YRCHS of all absenteeism information
 - YRDSB IT professionals built syndrome-specific capacity into electronic system

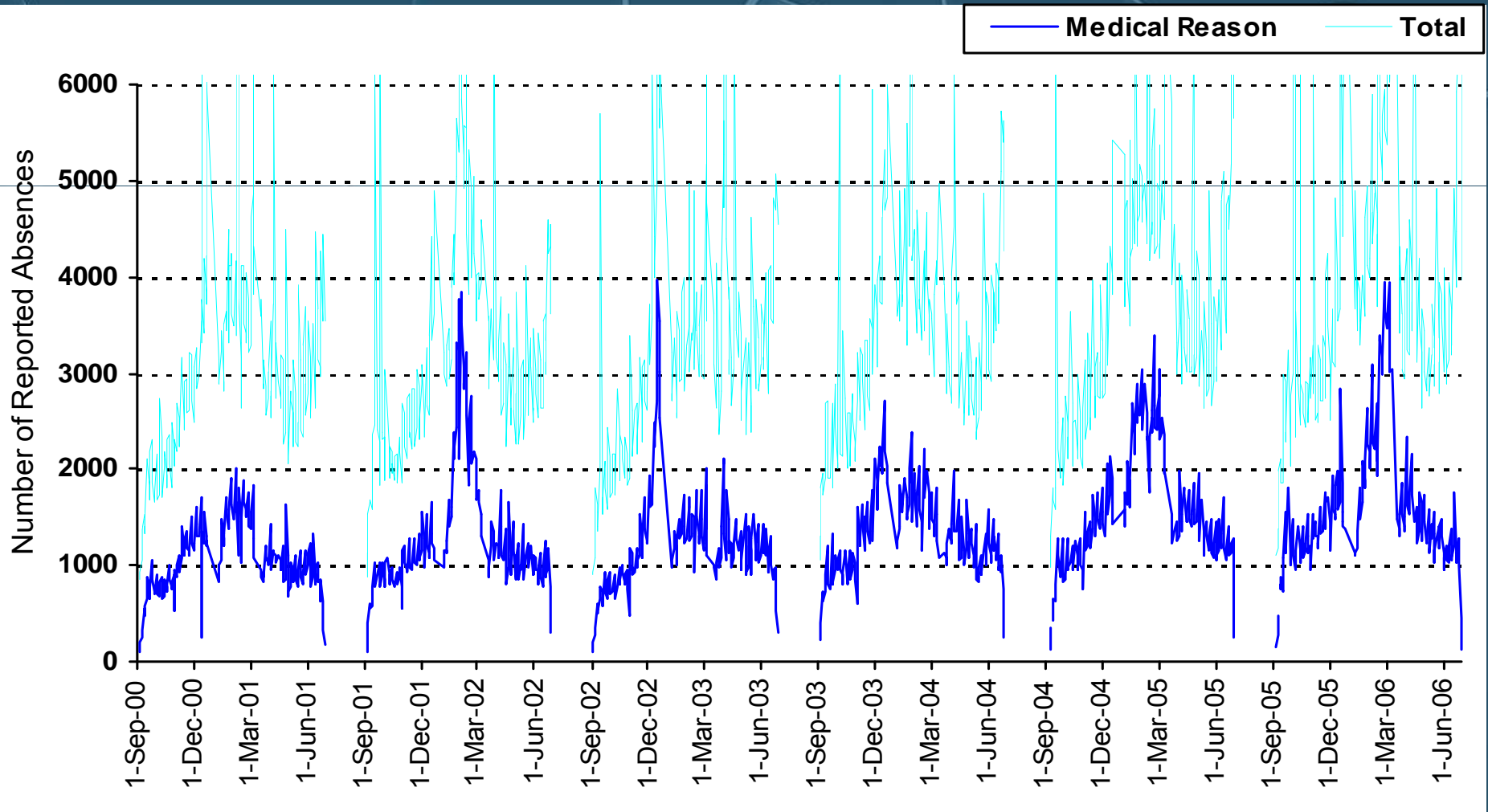


History cont'd

- Worked closely with YRDSB to obtain 6 years of historical student absenteeism data for all public board students in York Region
 - Over 2 million lines of data received
 - Allowed YRCHS to establish baseline absenteeism rates for all public schools in the Region
 - Will significantly assist in early aberration detection



Historical Analysis – YRDSB 2000-2006 schools





History cont'd

- In Phase III, began receiving daily automated electronic downloads from Trillium system for all public high school students
 - Maintained parallel manual data collection for pilot elementary schools



History cont'd

- In Phase IV, expanded program to include:
 1. **All Public high schools**
 2. **All Public elementary schools**
 3. **All Catholic schools**
- Buy-in with Catholic board achieved through success and benchmarking with Public board
- System now collects data on every student in York Region on each and every school day



Daily data statistics

Receive daily information as follows:

York Region District School Board

- All cause absences and all illness absences for 161 public elementary schools and 31 public secondary schools
 - **~115,000 students daily**

York Region Catholic School Board

- All cause absences and all illness absences for 84 catholic elementary schools
 - **~55,000 students daily**



Process

- Each school enters absenteeism information into Trillium system daily
- Selection of pilot schools also enter “syndrome-specific” information into Trillium
 - Includes classification of illness due to “breathing-related” or “stomach-related”
 - Syndrome classification based on messaging to parents of children attending school and instruction on absentee voice messaging system
- Automated data extracts from Trillium to YRCHS every day



Definitions

- Breathing-related illness

- Persistent cough, either dry or productive;
- Either a runny nose or nasal congestion; and/or
- Sore throat or hoarseness.



- Stomach-related illness

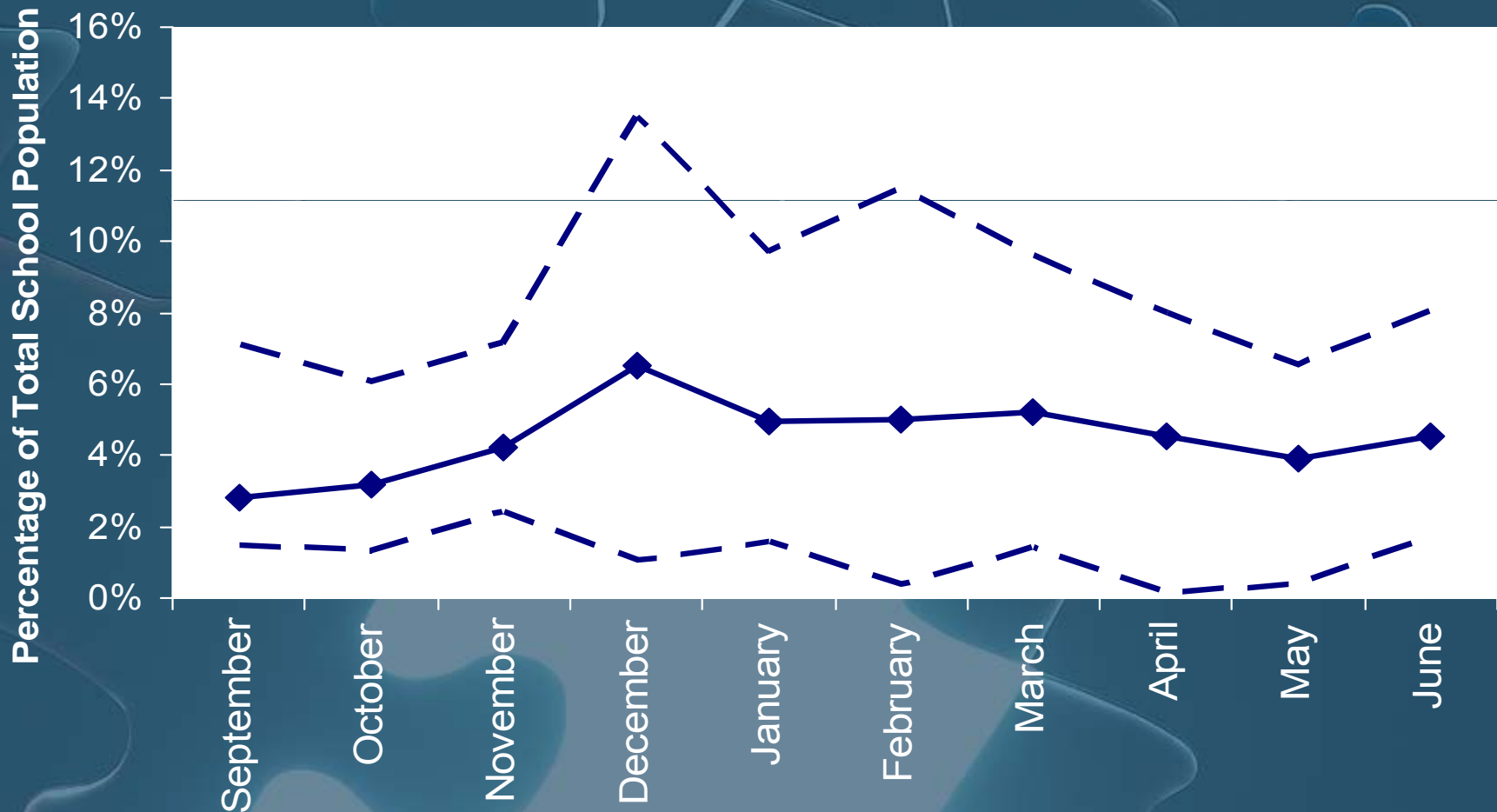
- Diarrhea;
- Vomiting; and/or
- Stomach cramps.

- 'Other'

- Fever;
- Malaise;
- Lethargy; and/or
- Anything that does not fit into above categories.

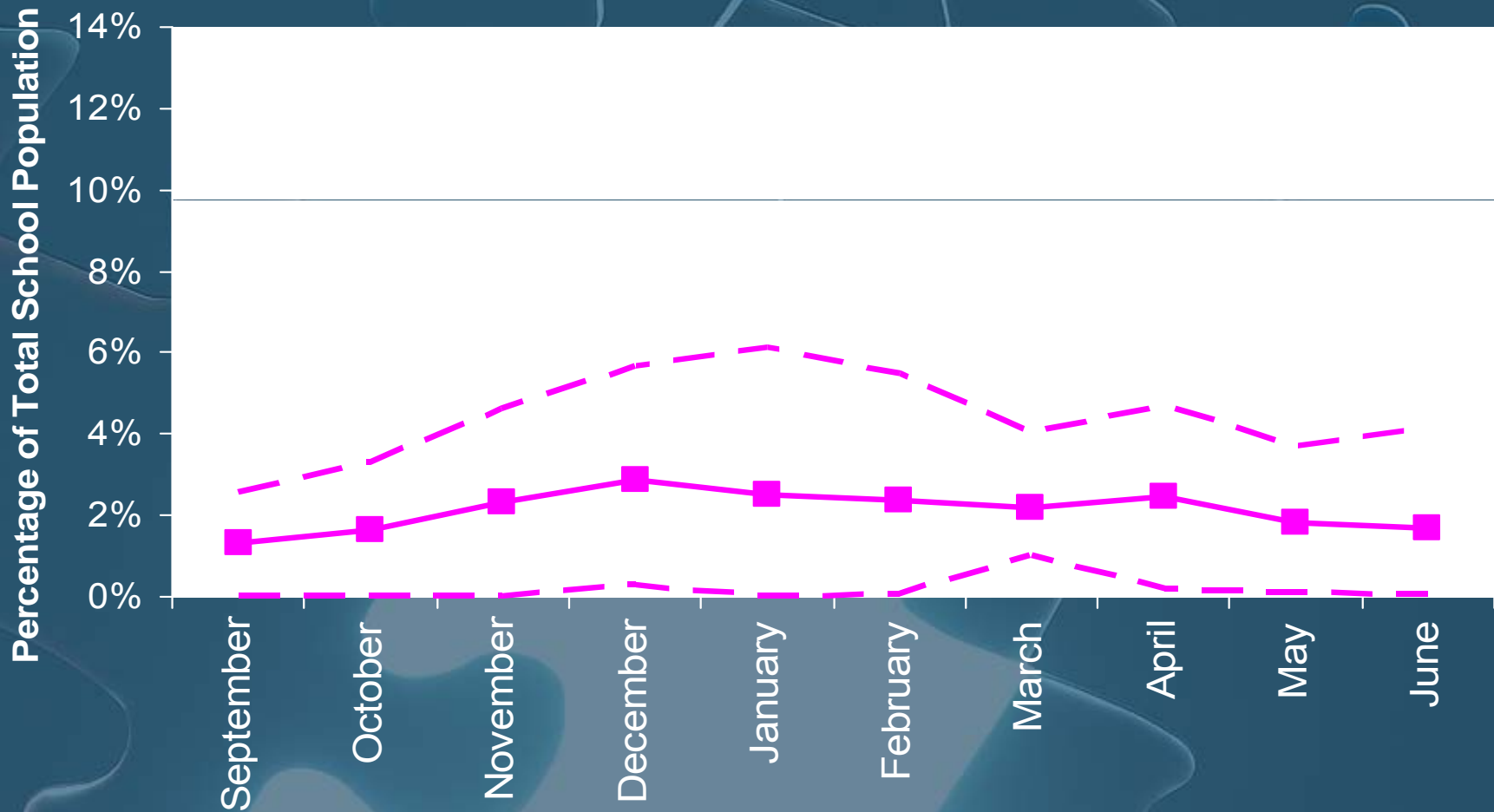


Average Percentage of Student Absences due to All Cause by month – Elementary schools (N=155) (Sep 2007 – Jun 2008)



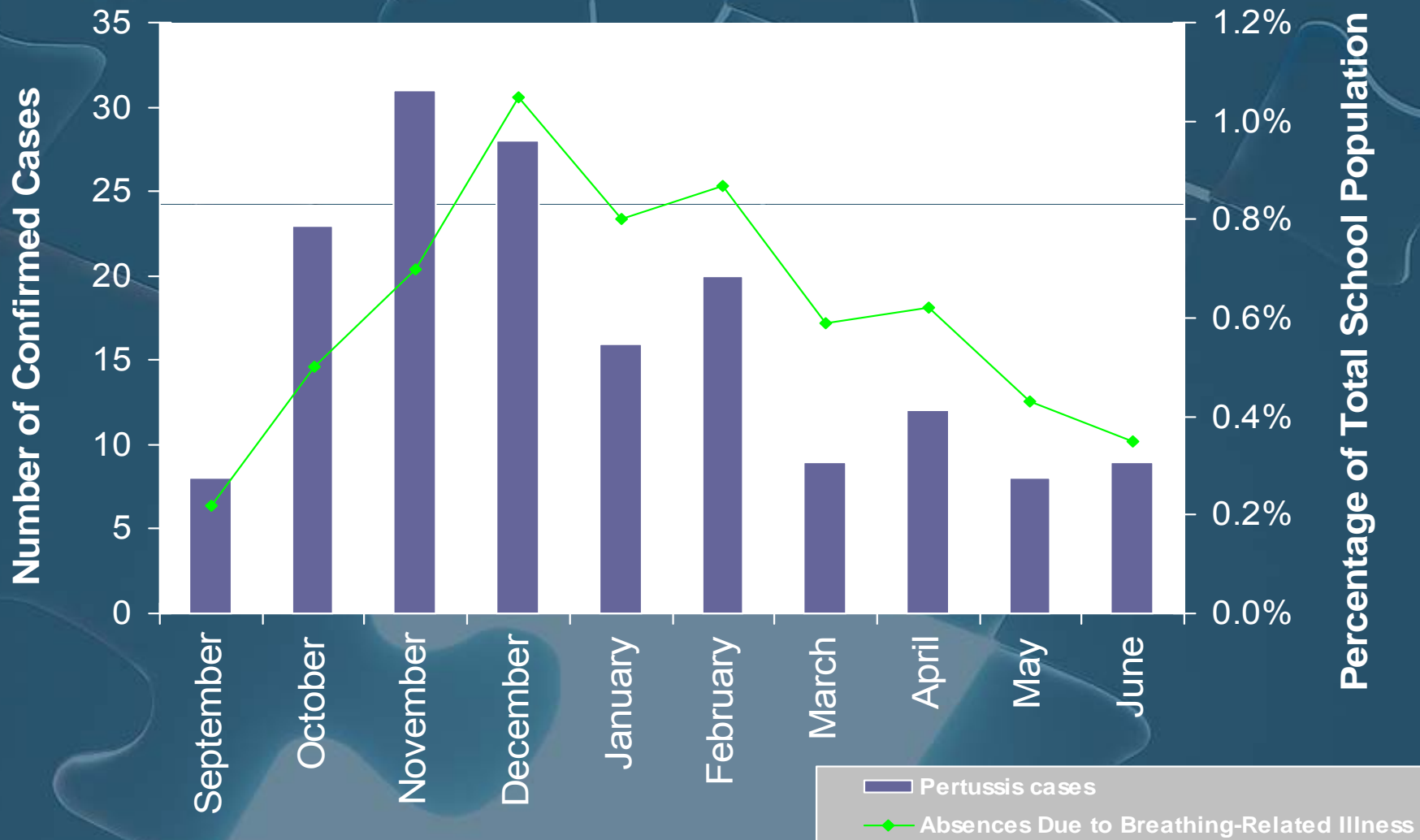


Average Percentage of Student Absences due to All Illness by month – Elementary schools (N=155) (Sep 2007 – Jun 2008)



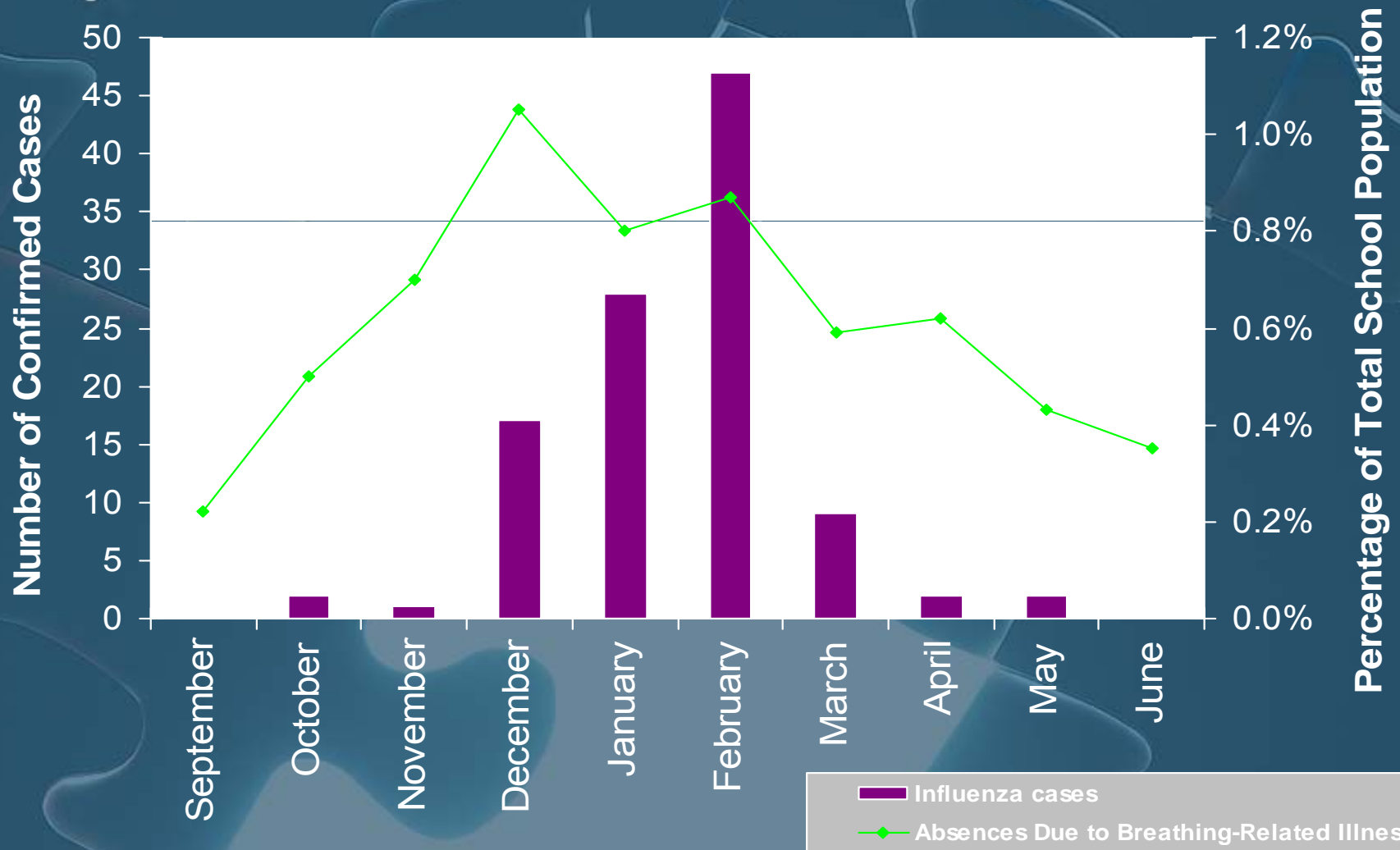


Average Monthly Percentage of Student Absences Due to Breathing-Related Illness and Pertussis Cases (2006-2007)



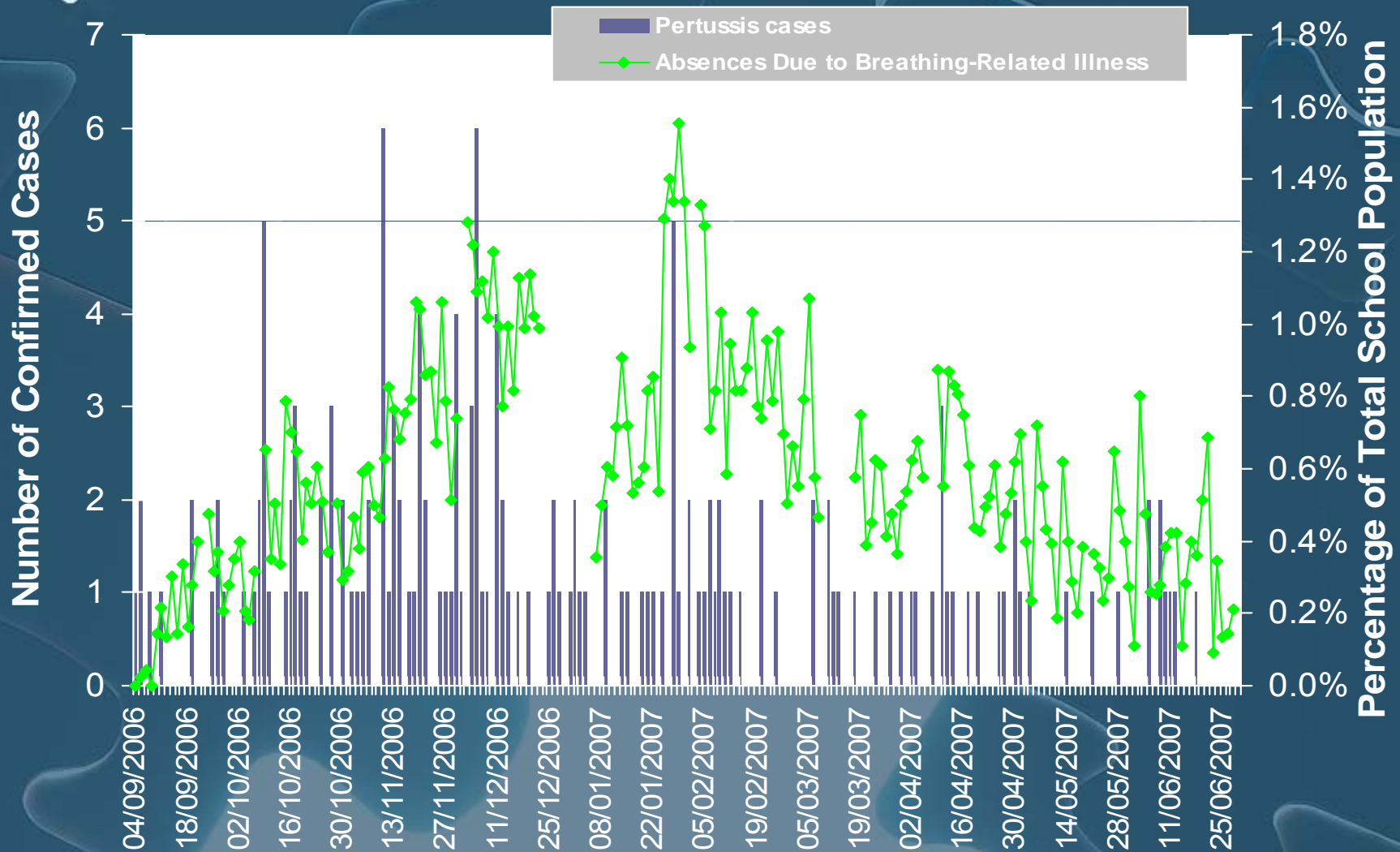


Average Monthly Percentage of Student Absences Due to Breathing-Related Illness and Influenza Cases (2006-2007)



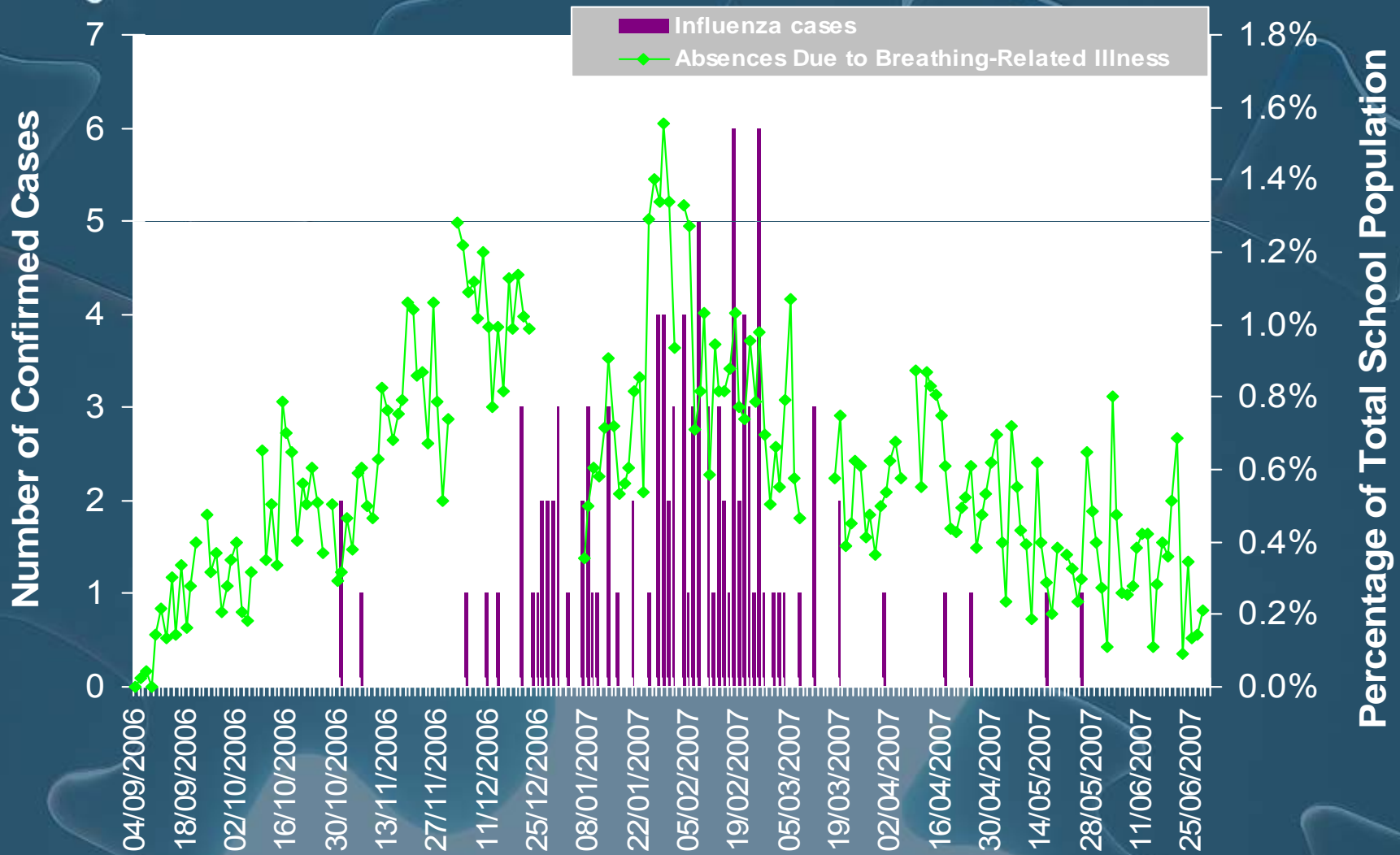


Average Daily Percentage of Student Absences Due to Breathing-Related Illness and Pertussis Cases (2006-2007)





Average Daily Percentage of Student Absences Due to Breathing-Related Illness and Influenza Cases (2006-2007)





Utility of Syndromic Surveillance Data

- Sentinel school surveillance data → one piece of a larger puzzle
- Findings from one data stream may provide additional evidence as to whether a syndromic signal requires a public health response or whether a change is part of the normal baseline observed from year to year
 - Combination of routinely collected surveillance information with sentinel absenteeism and PHAC pharmacy surveillance pilot allowed for comprehensive evaluation of signals



Challenges

- Achieving buy-in from school boards
- Communicating messaging to parents
- Handling extensive data on a daily basis
- Dealing with “noise” related to collection of absenteeism data
- Integrating information from system into existing surveillance information
- Public health response to “unusual” increases in absenteeism



Summary

- These data have the potential of providing insight into patterns of less severe illness occurring among children who do not seek medical attention in close to a real-time setting
- Similar to the previous years, YRCHS detected moderate increases in school absenteeism during the 2007-2008 school year that coincided with peak influenza and pertussis activity
- Now that data systems are operational, system runs at NO COST to school boards and only minimal human resource costs at health unit (i.e. 30 minutes health analyst time/day)



Conclusion

- Four years of data collection suggest that student absenteeism, as reported by this program, generally coincides with disease trends for York Region as a whole
- Introduction of automatic data extractions for all YRDSB and YCDSB elementary schools has greatly enhanced the scope of this program
- Demonstrated utility in collecting and monitoring student absenteeism by specific syndrome groups



Acknowledgements

- York Region District and Catholic School Boards
 - Principals and Attendance secretaries of participating schools
- York Region Community and Health Services
 - Administrative support staff
- YRDSB and YCDSB IT professionals and communications liaisons