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Surveillance for Rotavirus Hospitalisations In Canadian Pediatric Hospitals - IMPACT 2010-2013

N. Le Saux, S. Halperin, D. Scheifele,
W. Vaudry, JA Bettinger
On behalf of Immunization Monitoring Program ACTive (IMPACT) investigators.

Disclosure Statement

- I have no affiliation (financial or otherwise) with a pharmaceutical, medical device or communications organization.
- Rotavirus Surveillance Study is funded by GlaxoSmithKline
- Grant to Canadian Pediatric Society who administers the funds to IMPACT hospitals

Disclosure Statement

Disclosure of Relationship	Company/Organization
I am a member of an Advisory Board or equivalent with a commercial organization.	No
I am a member of a Speaker Bureau.	No
I have received payment from a commercial organization (including gifts or other consideration or 'in kind' compensation).	No
I hold a patent for a product referred to in the CME/CPD program or that is marketing by a commercial organization	No
I hold a patent for a product referred to in the CME/CPD program or that is marketing by a commercial organization	No
I hold investments in a pharmaceutical organization, medical devices company or communications firms.	No
I am currently participating in or have participated in a clinical trial within the past two years.).	No

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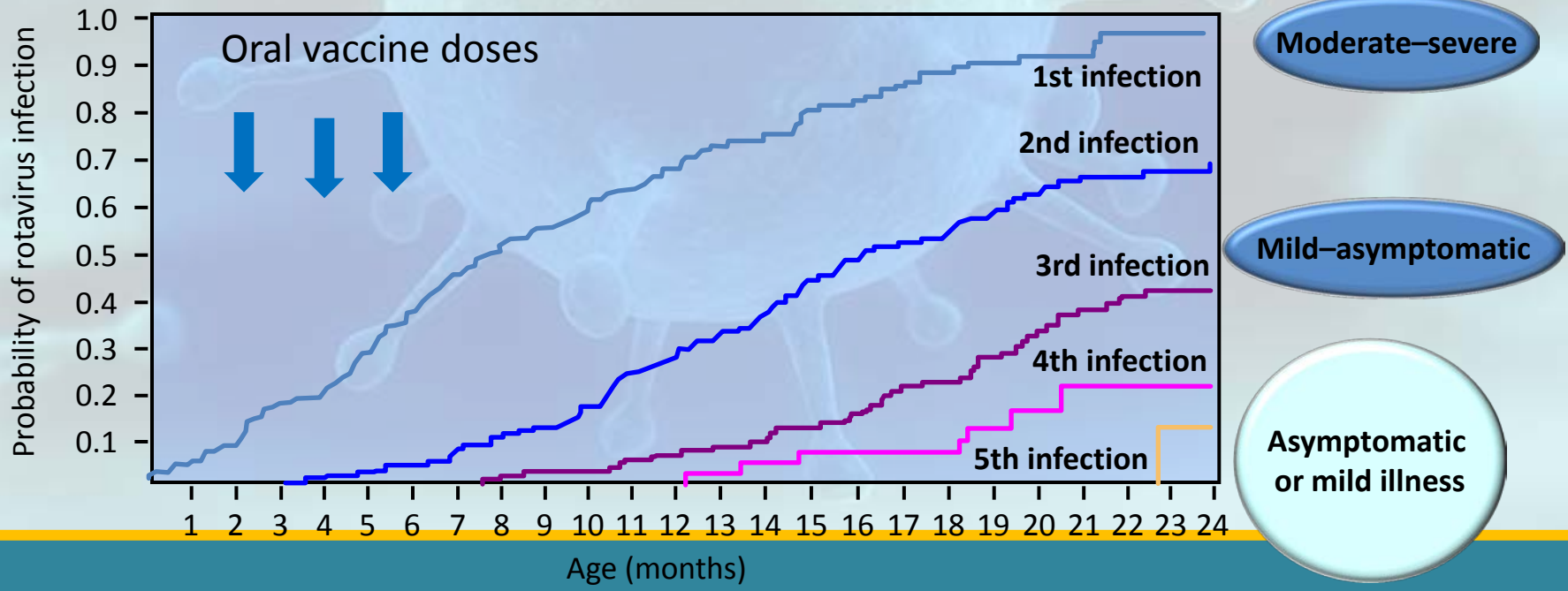
Basics of Rotavirus Infections

- Every child, in the absence of vaccine, will have at least one episode of rotavirus disease before the age of 5 years
- There is year to year variation in epidemiology, yearly peaks in the winter months
- Usually the first episode is the most severe, especially in infants
  - Diarrhea, fever, vomiting
  - Dehydration, sepsis in infants (50%)
- 1in 30 children will require a visit to ED for illness
  - Of those admitted, 40% have at 2 visits to MD or ED
- Mean parental cost (lost work, caregiver) is about $261.40 per episode

PIDJ 2012;31(2):159-163
PIDJ 2010; 29(9); 879-882

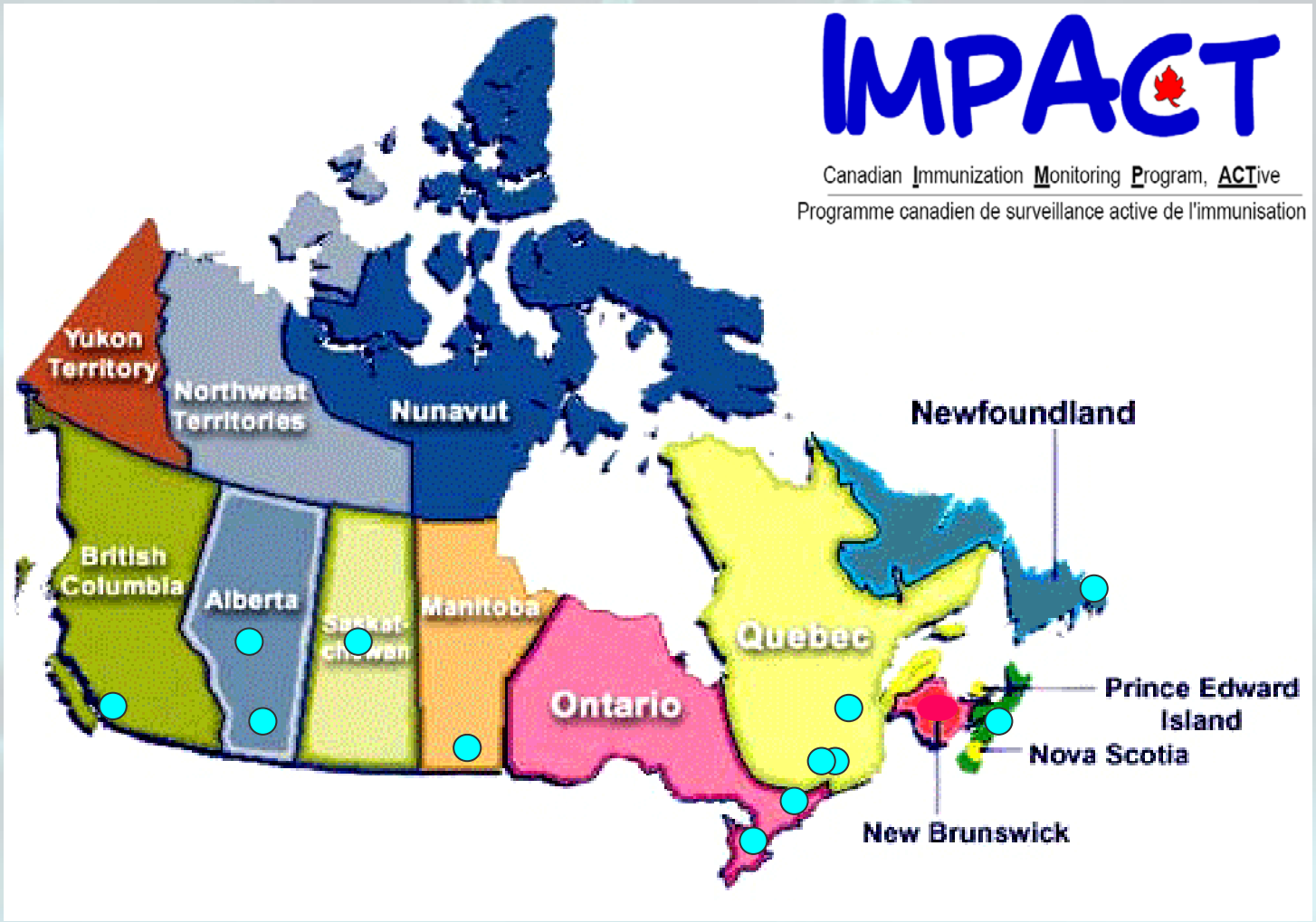
Objective of Vaccine:
Decreases Moderate to Severe Disease

- To mimic protection conferred by natural rotavirus infections
  - The live attenuated vaccines provide ~90% protection against moderate-to-severe disease – resulting in **hospital admission or Emergency Department visit**



Velázquez *et al. N Engl J Med* 1996; **335**: 1022–8. Figure adapted with permission from the Massachusetts Medical Society./ adapted from GSK Sept 2011

National Surveillance:
Children Hospitalized with Rotavirus Illness



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Objectives of Rotavirus Surveillance

1. To determine changes in rotavirus admissions and rates in 12 pediatric hospitals in Canada before and after implementation of rotavirus vaccine programs.
2. To determine the number of hospital acquired infections in children at 12 sites before and after implementation of rotavirus vaccine programs.

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Ongoing Surveillance Since 2005
Focus on 2010 to 2013

	2010	2011	2012	2013	Total
Community acquired (CA)	272	499	262	228	1261 (79%)
Hospital Acquired * (HA)	91	118	63	59	331 (21%)
Totals	363	617	325	287	**1592 (100%)**

* Hospital acquired - ≥72 h after admission or ≤ 48 hours after discharge

Gender, Health Status and Outcome

- Overall, 882 (55.4%) were male
- **Health status**
  - 1261 CA cases – 915 (72.6%) no underlying health conditions
  - 331 HA - 234 (70.7%) had underlying health conditions
- **Outcome**
  - 10 patients died (2 CA, 8 HA)

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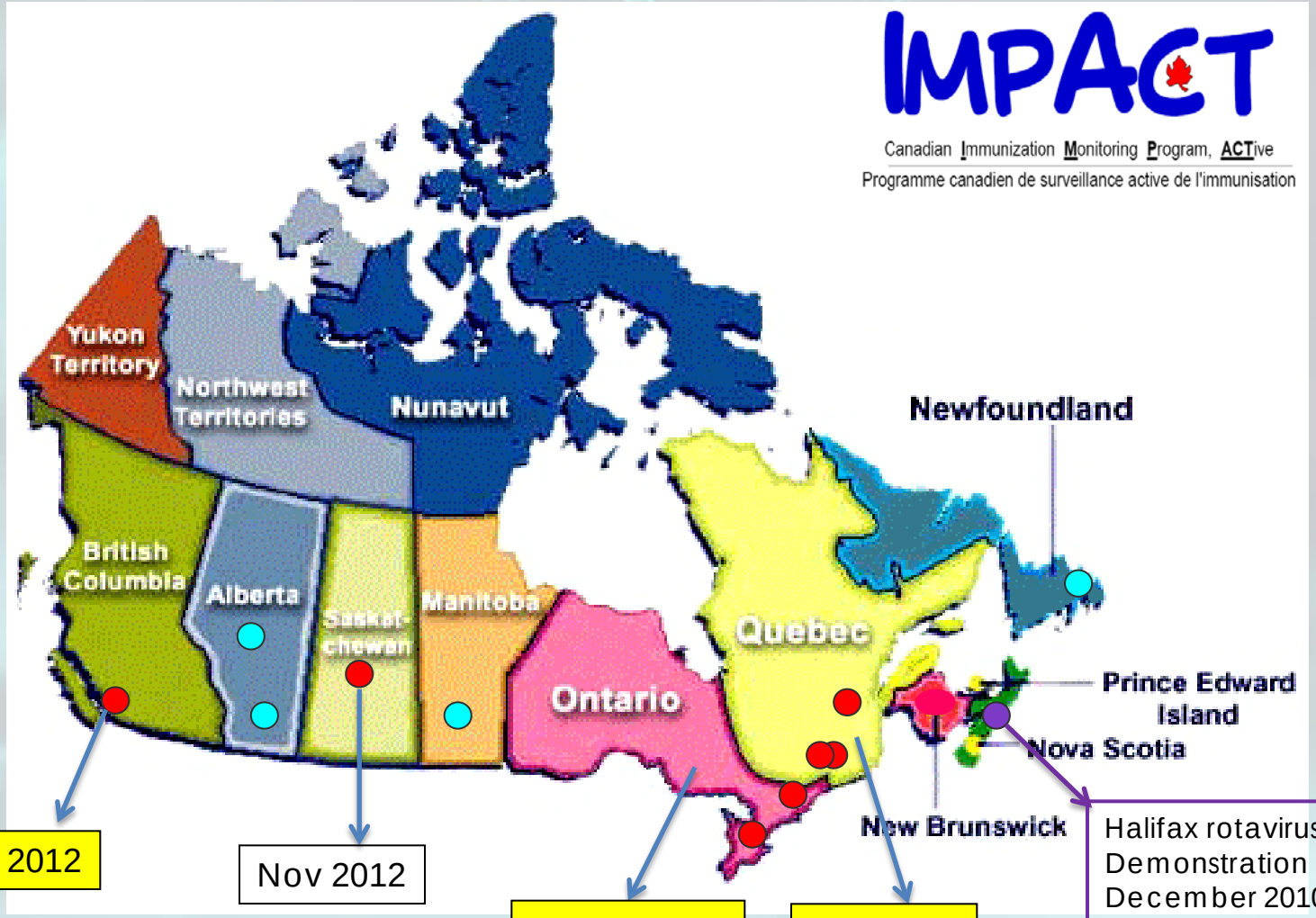
Characteristics of Patients 2010-2013

- 14/1592 (0.9%)patients had received at least one dose of rotavirus immunization

- Length of stay for patients with CA Rotavirus
  - Median Length of stay is 2 days
    - Mean length of stay across sites ranges from 3.3 to 3.8 days

IMPACT Sites with Programs 2010 -2013



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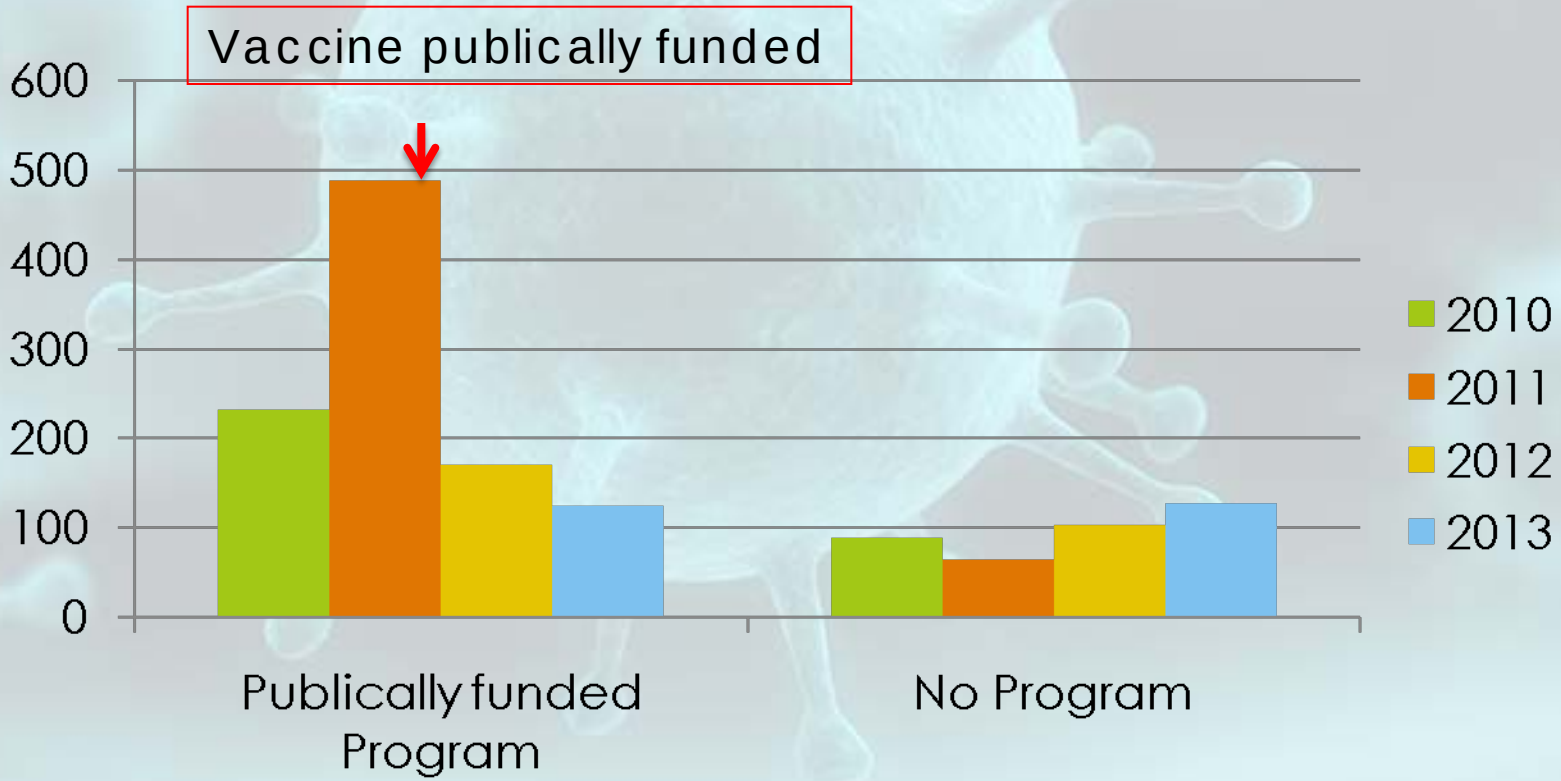
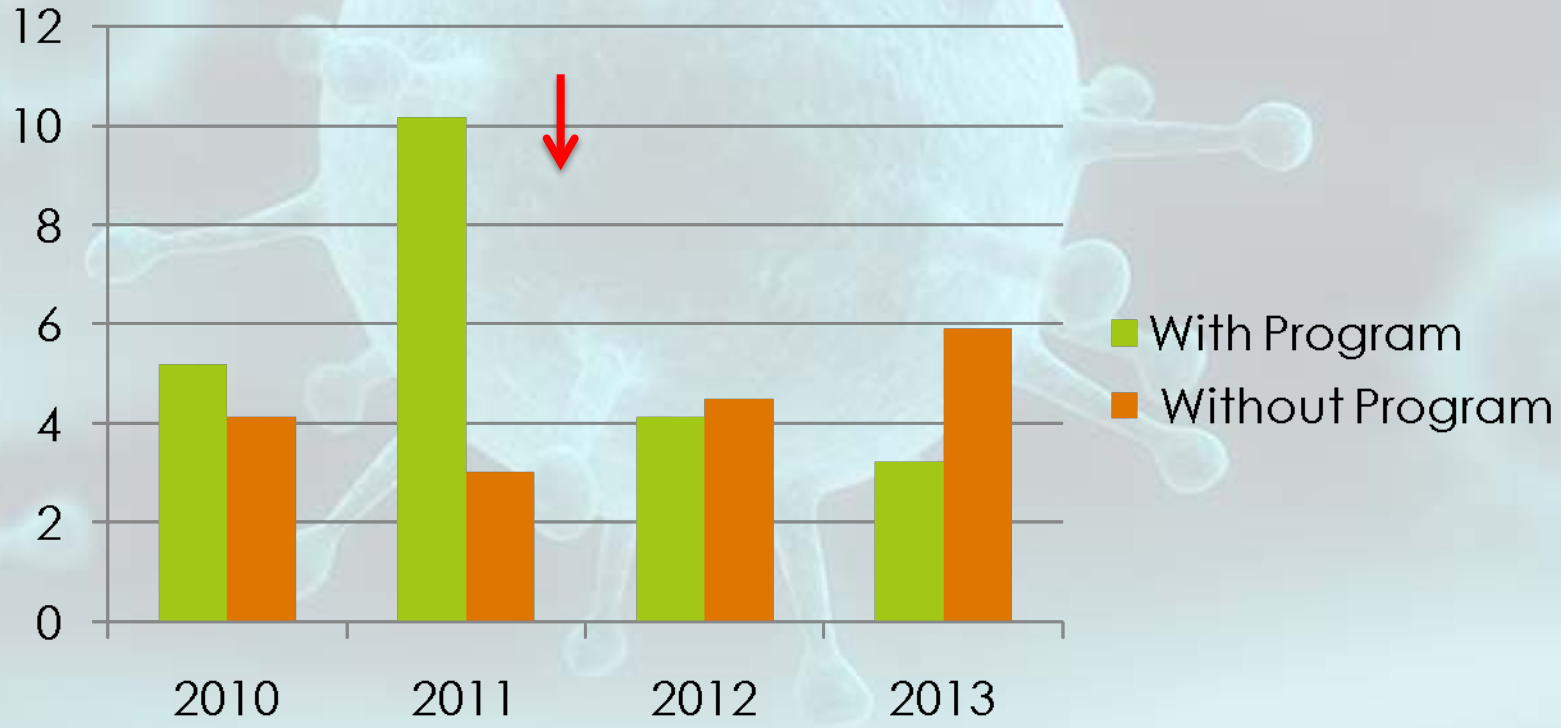
Trends in Number Rotavirus infections by Year: Sites **With** (BC, Ont, Québec) versus **Without** Publically Funded Rotavirus Vaccine Programs (Alberta, Manitoba, NFLD) 2011-2012



* Excludes Saskatchewan and Halifax

Decrease in Rotavirus Infections (per 1000 admissions) by Year At Sites **With** Vaccine Programs 2012-2013 versus **No** Programs



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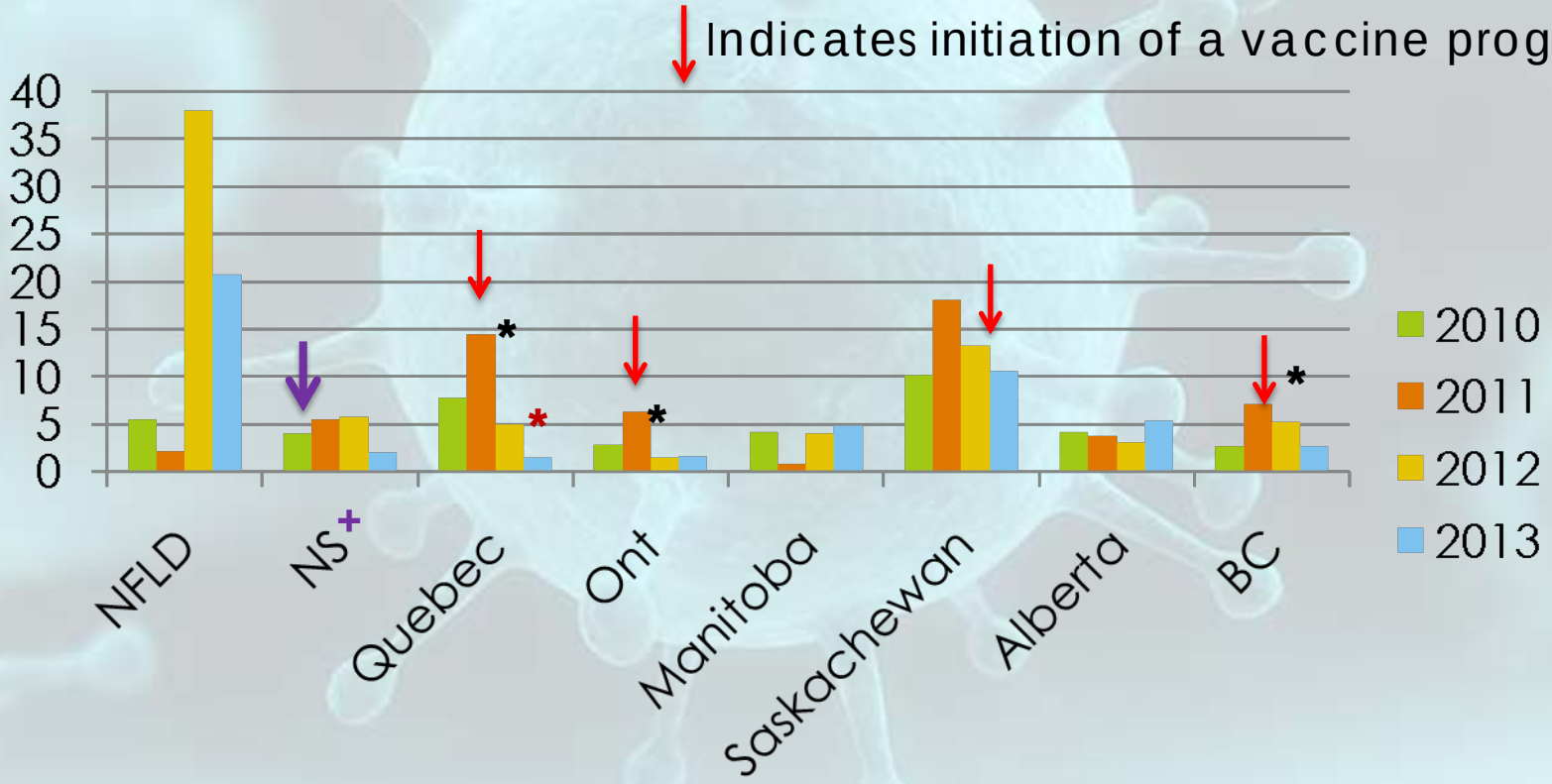
Rotavirus cases per 1000 hospital Admissions by Province



* Denotes significant difference between 2011-2012

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+ Halifax had Demonstration Project

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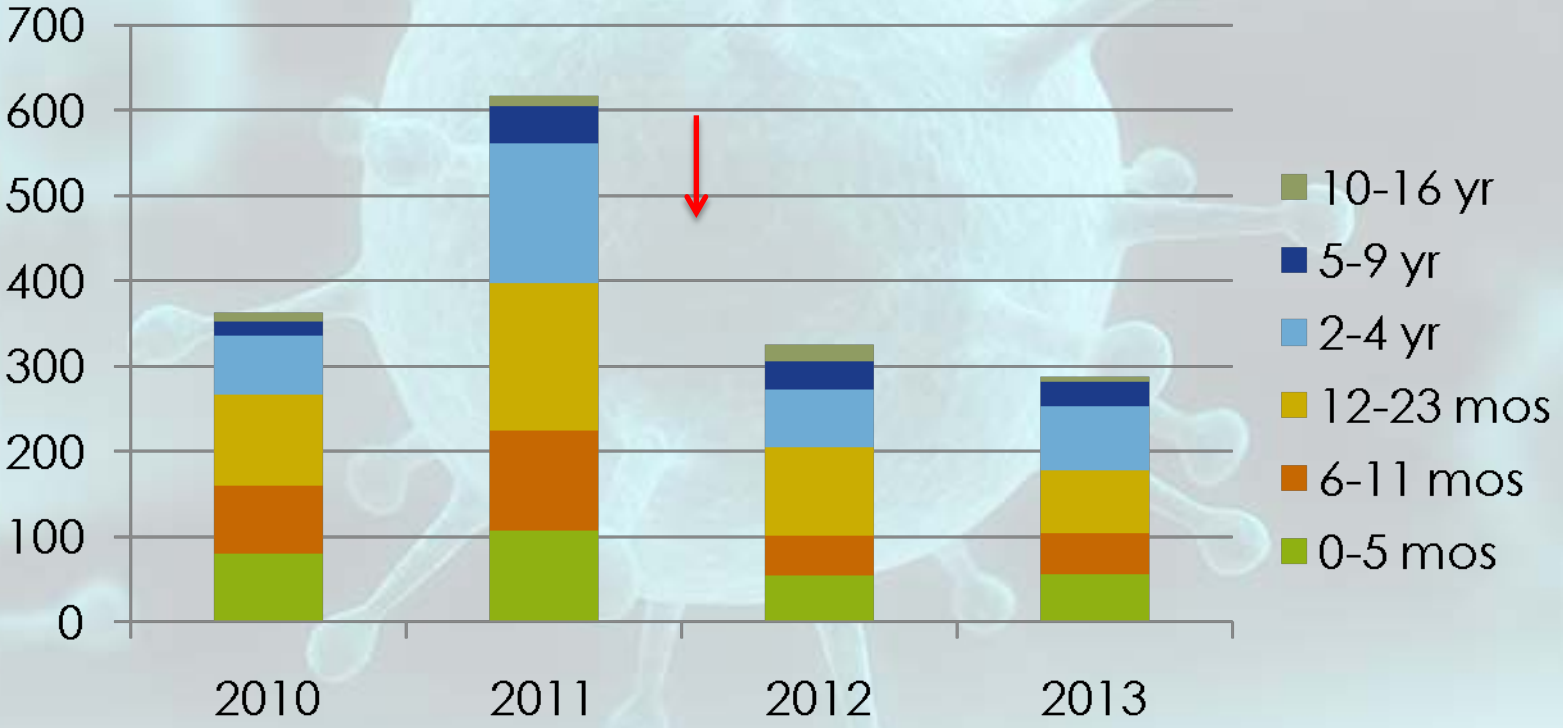
Overall (all sites) Decrease in Infections in Infants 0 to 23 months of age



↓ Indicates Timing of Publically funded programs in 3 provinces

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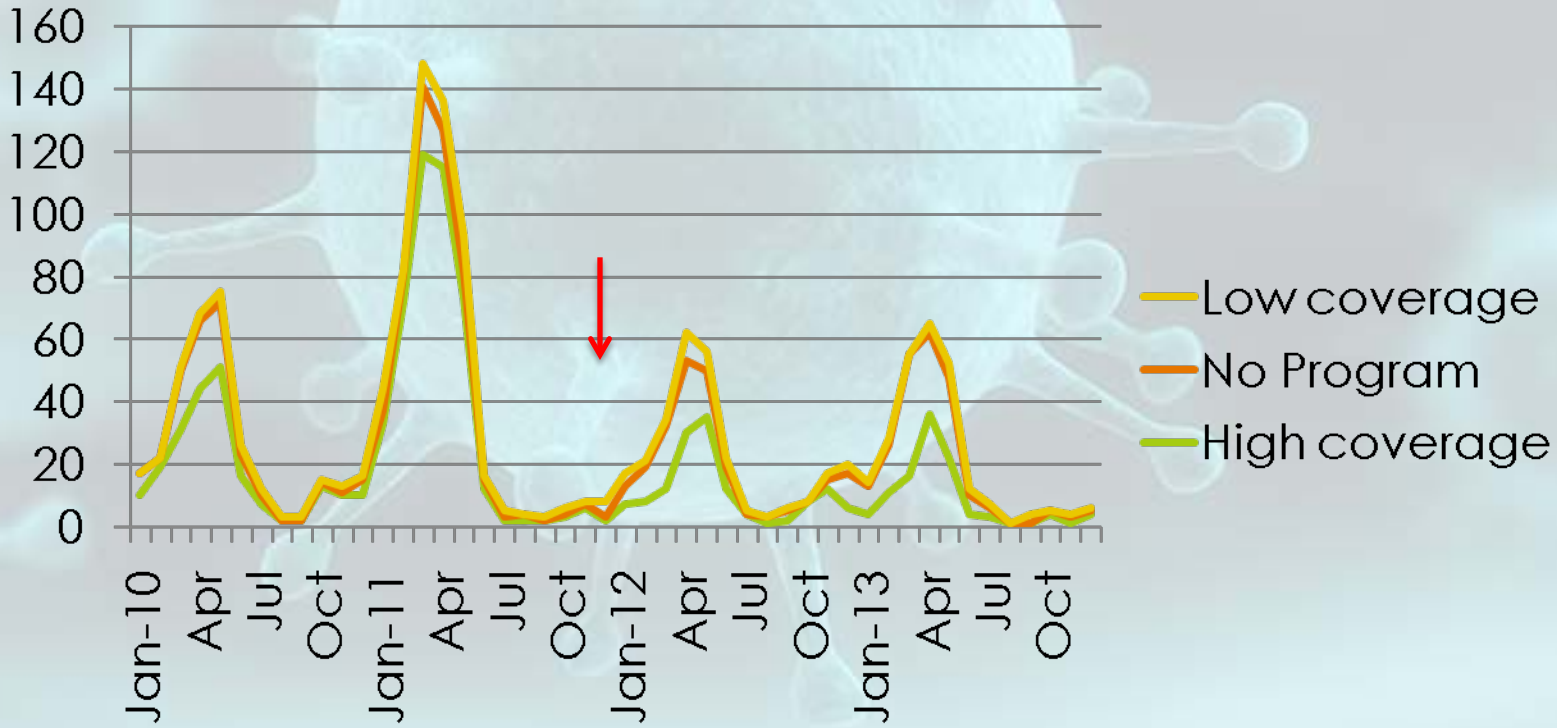
Comparison of Seasonality and Number of Rotavirus infections at all sites 2010-2013 According to Estimated Vaccine Coverage



High ≥85% coverage

Number of HA Rotavirus infections in Sites **With** Versus sites **Without** Rotavirus Immunization Programs

Conclusions

- There continues to be significant morbidity and some mortality associated with rotavirus disease in Canadian pediatric hospitals.
- Children 0–23 months had the greatest decrease in hospital admissions since 2012.
- The rates of rotavirus infections at sites with publically funded programs has significantly decreased between 2011 and 2012 while the rates in sites and provinces without programs has not decreased.
- The number of HA infections has decreased only in sites with publically funded programs.
- Further surveillance will provide ongoing information with respect to the impact of programs on hospital admissions.

IMPACT Members

- **Vaccine Evaluation Center, Vancouver**:
  K. Marty and D. Heayn,
- **St. John's**: N. Bridger, S. Penney
- **Halifax**: S. Halperin, K. Top, H. Samson, A. Hudgin, K Branscombe
- **Quebec City**: P. Déry, R. Thibeault, L. Poirier
- **Montreal**: D. Moore, L. Piche, A. Audet
- **Montreal**: M. Lebel, S. Bouchard
- **Toronto**: D. Tran, S. Lee
- **Ottawa**: N. Le Saux, C. Bergeron
- **Winnipeg**: J. Embree, D. Coté
- **Saskatoon**: B. Tan, B. Andreychuk
- **Edmonton**: W. Vaudry, G. Tyrrell, A. Roth
- **Calgary**: T. Jadavji, O. Vanderkooi, S. Pyra
- **Vancouver**: L. Sauvé, D. Scheifele, J. Bettinger, K. Kroeker

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