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An assessment of routine rotavirus vaccination coverage among children aged less than 3 years following the implementation of a publicly-funded rotavirus vaccine program in Québec

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Disclosure Statement



- I have no affiliation (financial or otherwise) with a pharmaceutical, medical device or communications organization.

Co-author Disclosures

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Québec Rotavirus (RV) Vaccination Program

- In November 2011, Québec implemented routine childhood RV vaccination program using Rotarix[®] vaccine
 - 2 dose series, administered at ages 2 and 4 months
- Current provincial coverage surveys do not examine RV coverage among eligible vaccinees
- Québec does not have an Immunization Information System (IIS) where the uptake of RV vaccine may be readily assessed



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Image: Rotavirus vaccination, CDC Public Health Image Library.

Study Objective

To examine routine ≥ 1 & ≥ 2 -dose RV vaccination coverage among eligible vaccinees following the implementation of the Québec RV vaccination program

Methods – Data Source & Collection

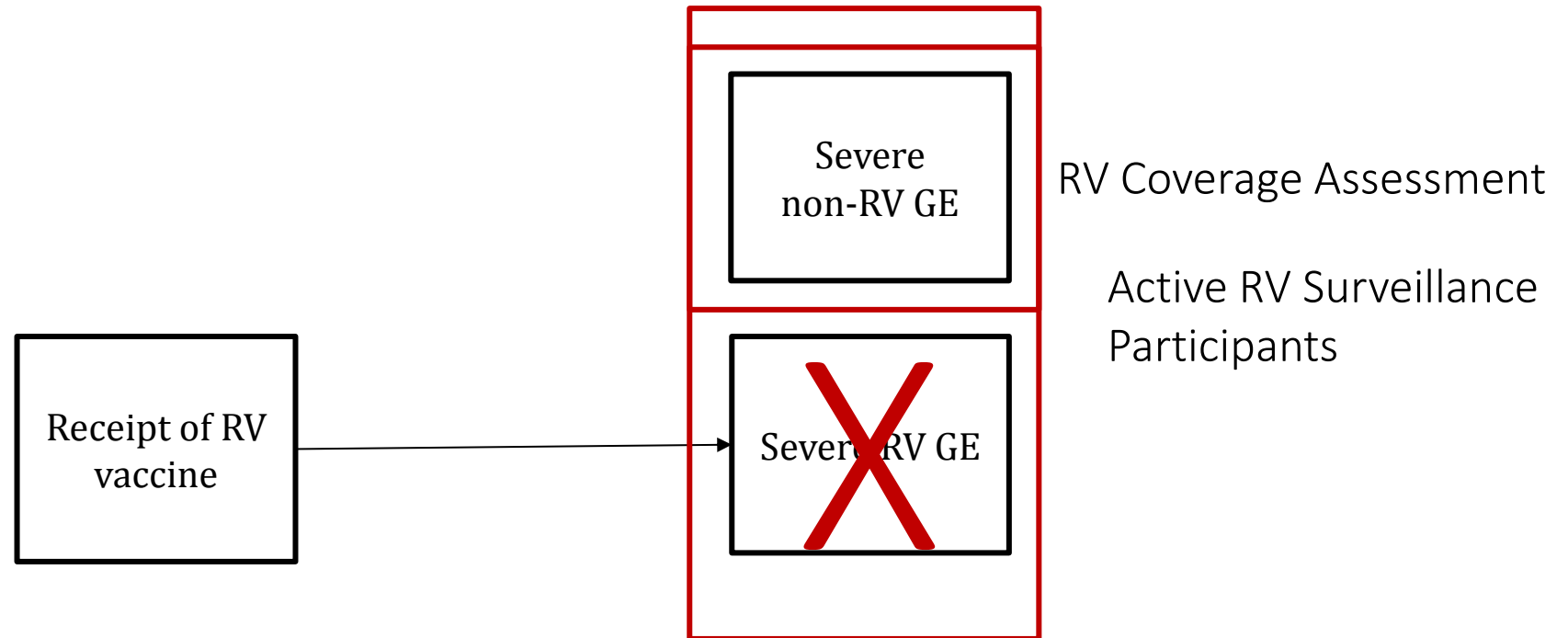
Data Source: Active surveillance for severe RV gastroenteritis (GE) at 3 Québec hospitals

- Study Locations:
 - University Hospital of Sherbrooke (SHE)
 - Montréal Children’s University Hospital (MCH)
 - Sainte-Justine University Hospital (STJ)
- Study Participation:
 - Admitted or seeking ED care for GE
 - Children aged 8 weeks to < 3 years
 - Not contraindicated for RV vaccine
 - Parental consent to be contacted for research
- Sampling frame:
 - February 2012 – October 2014 (SHE, MCH)
 - February 2012 – June 2014 (STJ)
- Design:
 - Prospective recruitment of GE patients
 - Stool sample obtained for RV testing
- Measurement:
 - Vaccination history ascertained via parent/guardian interview in consultation with immunization booklet
 - Contact medical provider if booklet unavailable
 - Stool tested for RV (ELISA)

Methods – Eligibility & Definitions

Participant inclusion criteria for coverage assessments:

- Stool must test negative for RV



Methods – Eligibility & Definitions

Participant inclusion criteria for coverage assessments:

- Stool must test negative for RV, assumes:
 - Lab test has high accuracy when identifying true negatives (high specificity)
 - RV vaccination has no effect on non-RV aetiologies causing severe GE
 - Coverage among active surveillance participants is representative of the general population

Examine coverage among children eligible to receive RV vaccine via a routine schedule, defined as:

- Aged <8 weeks at program implementation (November 1, 2011), AND
- Eligible for 1-dose; Aged ≥8 weeks at the time of GE onset OR
- Eligible for 2-doses; Aged ≥16 weeks at the time of GE onset

Severe
non-RV GE

Receipt of
RV vaccine

Severe
RV GE

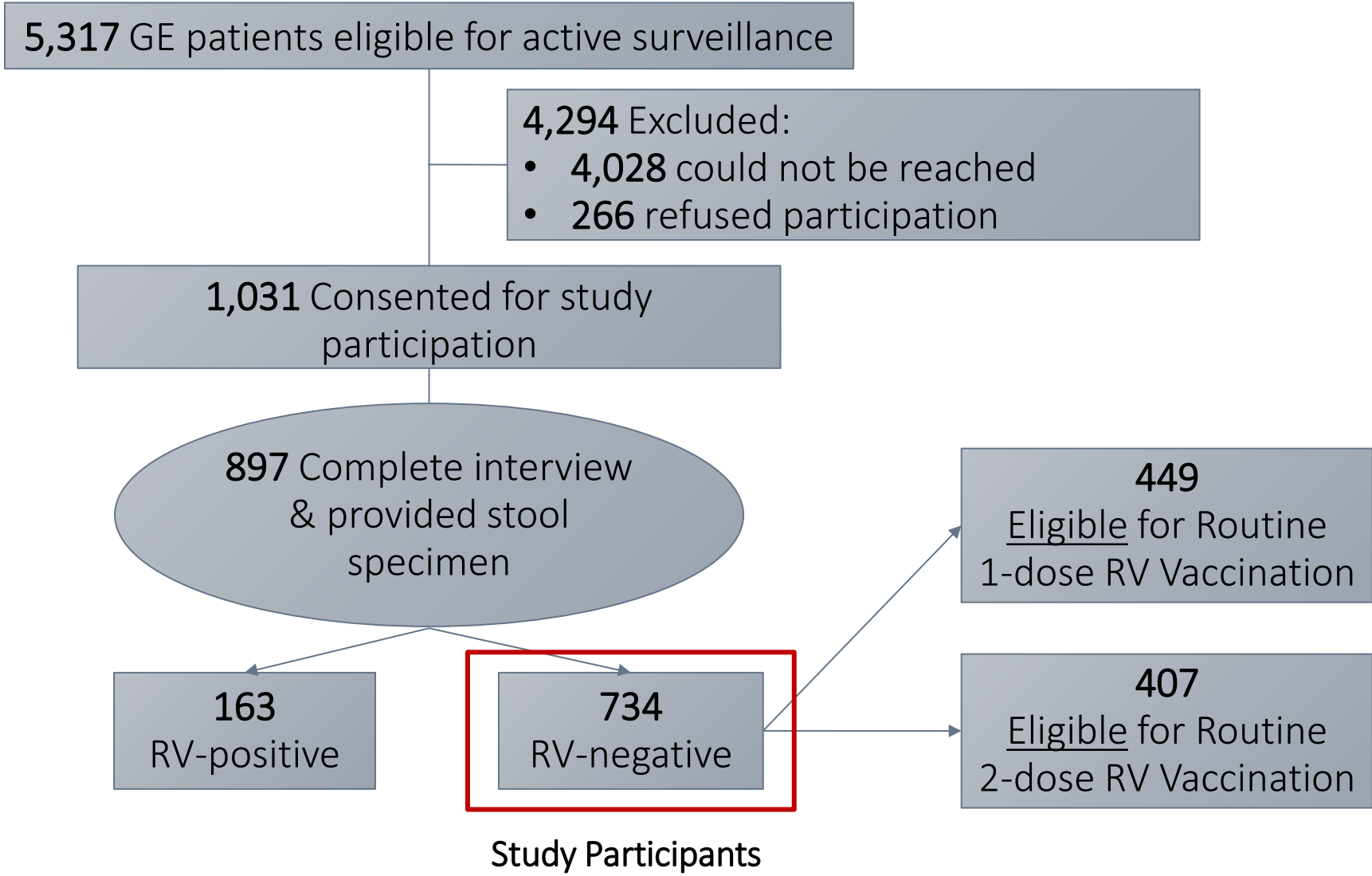
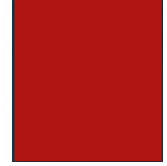
Methods – Design & Analysis

Study design: Descriptive study

Analyses:

1. RV ≥ 1 - and ≥ 2 -dose coverage & 95% Wilson binomial confidence intervals (CI)
 - Overall & by eligibility to receive vaccine
 - Among RV eligible, coverage stratified by geographic location, race/ethnicity, & birth cohort
2. Diphtheria-Tetanus-acellular Pertussis (DTaP)/Polio/Haemophilus influenza b (Hib) & Pneumococcal conjugate vaccine (PCV) ≥ 1 - and ≥ 2 -dose coverage & 95% CI
 - Among RV eligible, for comparison with ≥ 1 - and ≥ 2 -dose RV coverage
 - Among children aged 1 year, for comparison with 2012 provincial estimates

Results – Study Enrollment



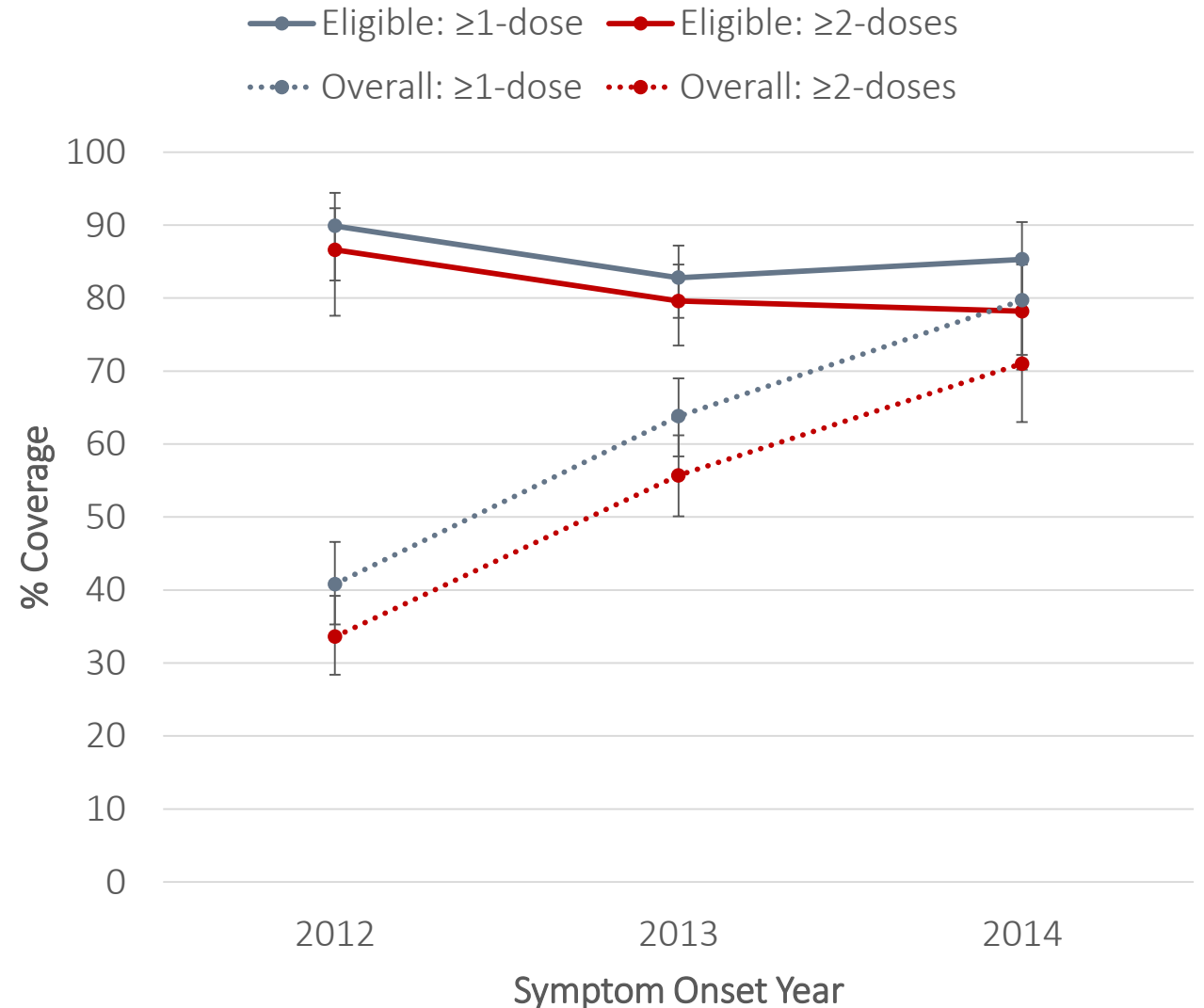
Results – RV Coverage

Coverage among all participants:

- ≥ 1 -dose: 57.8% (95% CI: 54.1, 61.3%)
- ≥ 2 -dose: 49.9% (95% CI: 46.3, 53.5%)

Coverage among RV eligible participants:

- ≥ 1 -dose: 85.1% (95% CI: 81.5, 88.1%)
- ≥ 2 -dose: 80.6% (95% CI: 76.5, 84.1%)

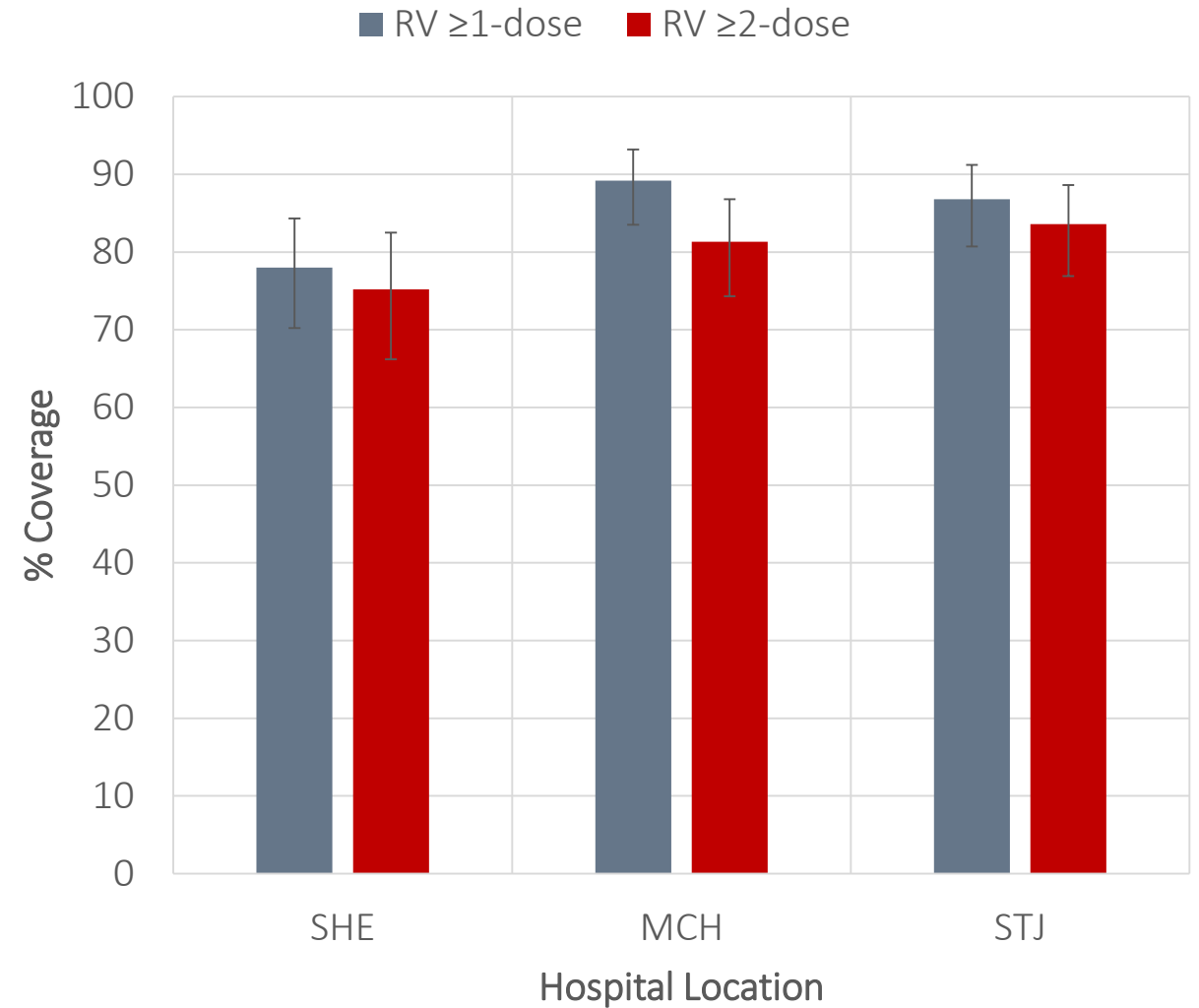


Results – Geographic Location

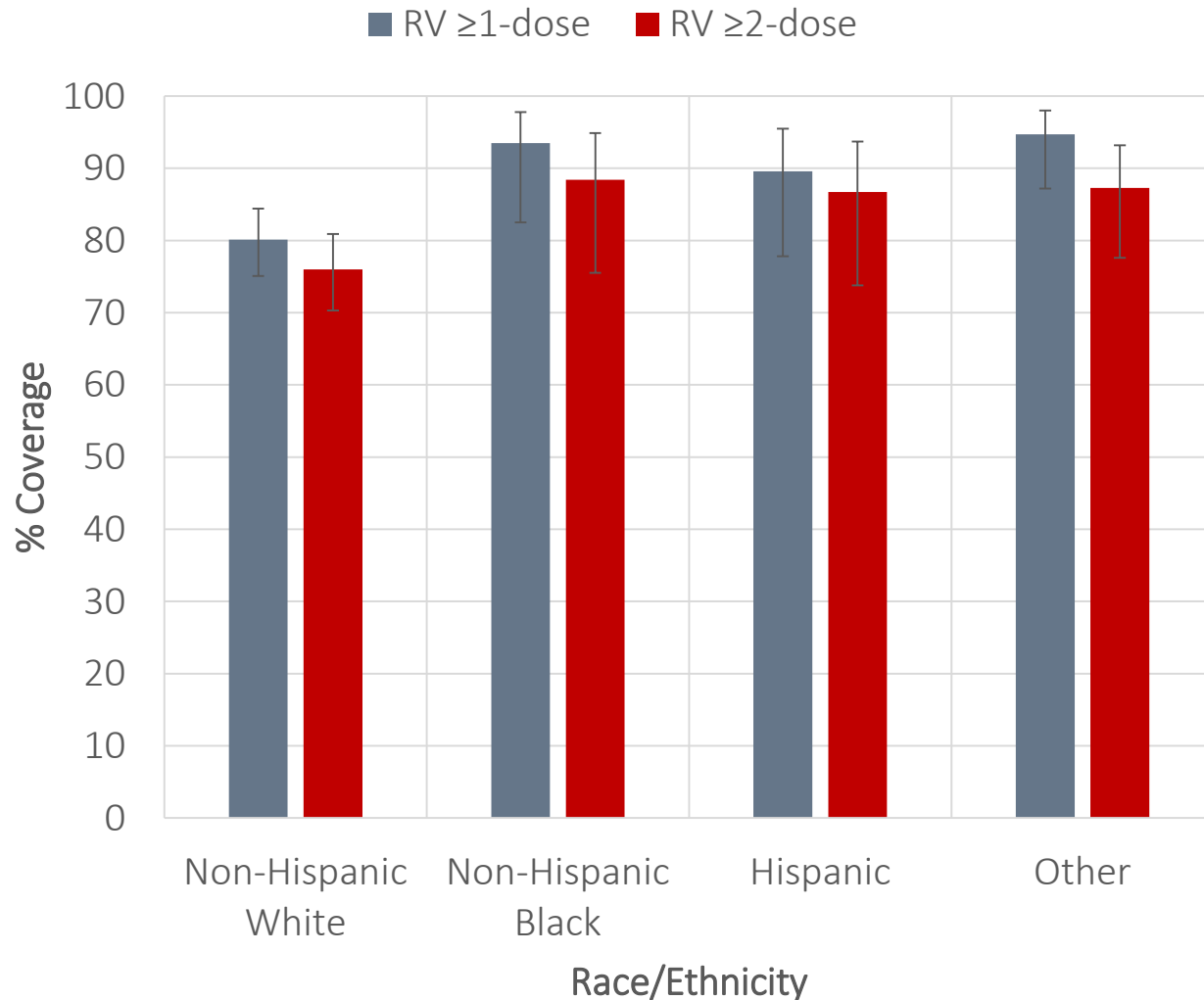
In comparison with SHE location:

- **≥1-dose coverage**

- MCH: 11.2% (95% CI: 2.7, 19.8%) higher coverage
- STJ: 8.8% (95% CI: 0.0, 17.6%) higher coverage



Results – Race/Ethnicity



In comparison with Non-Hispanic Whites:

- **≥1-dose coverage**
 - Non-Hispanic Blacks: 13.3% (95% CI: 4.8, 21.9%) higher coverage
 - Other: 14.6% (95% CI: 7.7, 21.5%) higher coverage
- **≥2-dose coverage**
 - Non-Hispanic Blacks: 12.4% (95% CI: 1.4, 23.3%) higher coverage
 - Other: 11.3% (95% CI: 1.9, 20.7%) higher coverage

Results – Birth Cohort

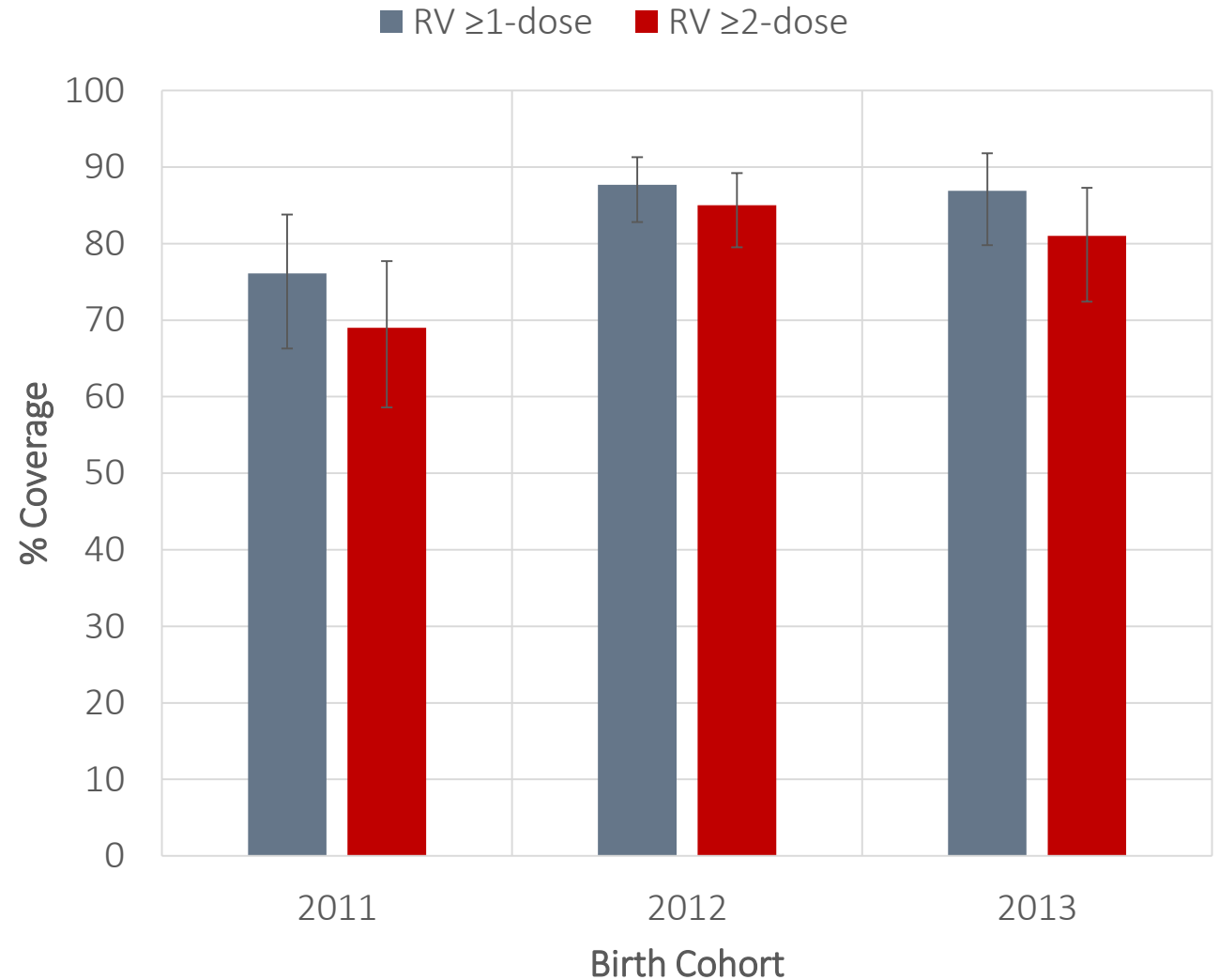
In comparison with the 2011 cohort:

- **≥1-dose coverage**

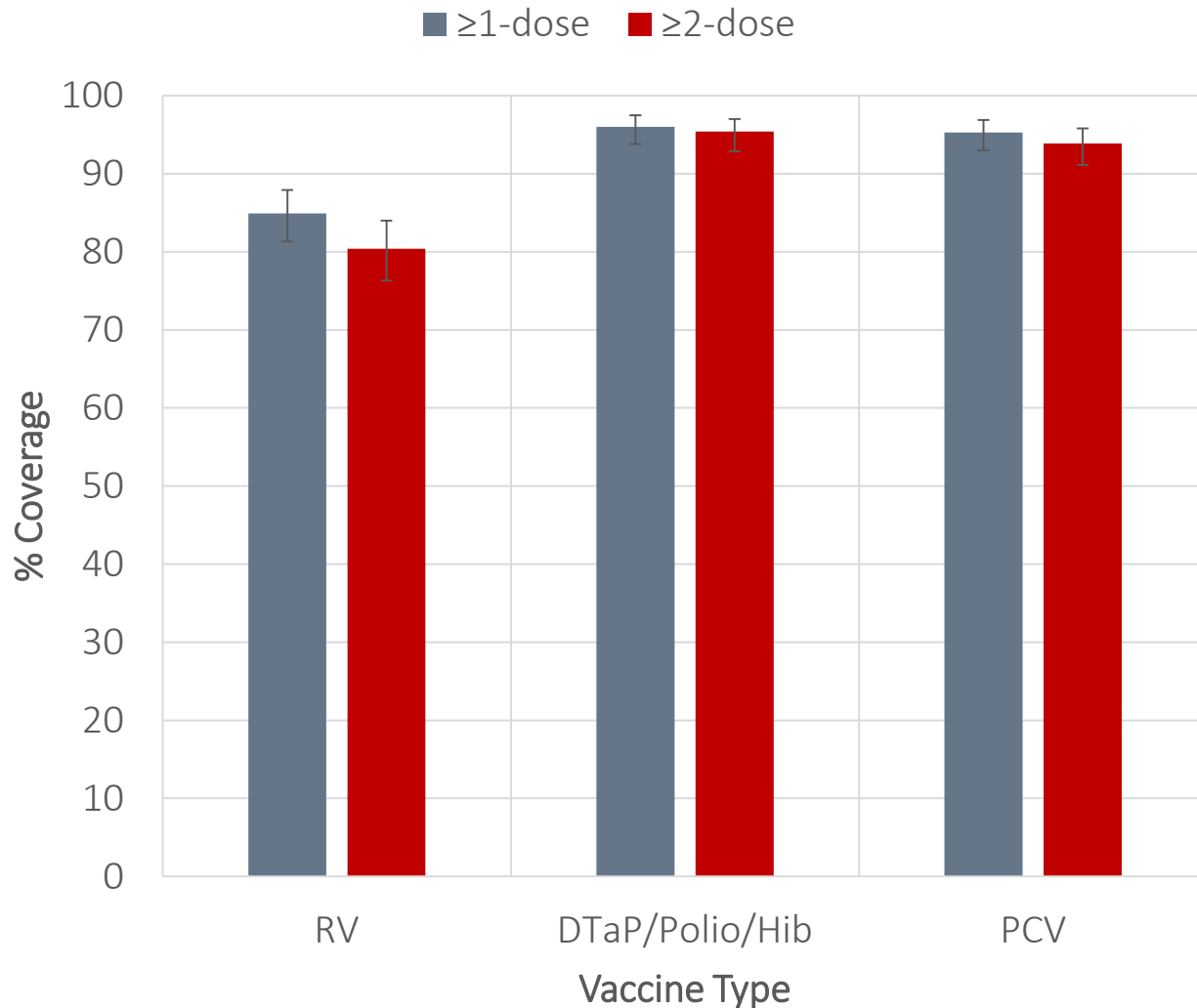
- 2012: 11.5% (95% CI: 1.7, 21.4%) higher coverage
- 2013: 10.8% (95% CI: 0.0, 21.5%) higher coverage

- **≥2-dose coverage**

- 2012: 16.0% (95% CI: 5.1, 26.9%) higher coverage



Results – Vaccine Comparison



≥1-dose coverage among RV eligible:

- RV: 85.1% (95% CI: 81.5, 88.1%)
- DTaP/Polio/Hib: 96.2% (95% CI: 94.0, 97.6%)
- PCV: 95.6% (95% CI: 93.2, 97.1%)

≥2-dose coverage among RV eligible:

- RV: 80.6% (95% CI: 76.5, 84.1%)
- DTaP/Polio/Hib: 95.6% (95% CI: 93.1%, 97.2%)
- PCV: 94.1% (95% CI: 91.4, 96.0%)

Results – Comparison to Provincial Estimates

Among participants aged 1 year:

Vaccine Type & Coverage	2012 INSPQ* %	Sample % (95% CI)
DTaP/Polio/Hib:		
≥1-dose	97.8%	97.8% (95% CI: 93.9, 99.3%)
≥2-dose	96.9%	97.8% (95% CI: 93.9, 99.3%)
PCV:		
≥1-dose	97.3%	97.1% (95% CI: 92.8, 98.9%)
≥2-dose	96.2%	96.4% (95% CI: 91.9, 98.5%)

Discussion

- Overall, demonstrates early success & uptake of the RV vaccination program
 - >80% coverage with ≥ 1 - and ≥ 2 -doses of RV vaccine
 - Vaccination coverage increased over time among birth cohorts
 - In comparison, U.S. ≥ 1 -dose RV coverage among eligible was 49.1% (range: 40.1, 60.5%)¹
- Yet, RV coverage still lower than other routine vaccinations
 - >90% ≥ 1 - & ≥ 2 -dose coverage of DTaP/Polio/Hib & PCV vaccines
- Suggestion that RV coverage may vary by subgroup
 - Geographic location & race/ethnicity

Limitations

1. Coverage assessment relied on documented vaccinations
 - Assessed via immunization booklet or provider records
 2. Assessment limited to those enrolled in active surveillance
 - Healthcare seekers, not contraindicated for RV vaccination, that may be more/less likely to have underlying conditions than the general population
- ❖ However, DTaP/Polio/Hib & PCV coverage similar to provincial estimates which use different sampling methods

Acknowledgements

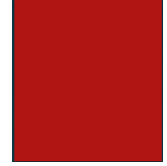
- Funding for the active RV GE surveillance provided by GlaxoSmithKline
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Extra Slides

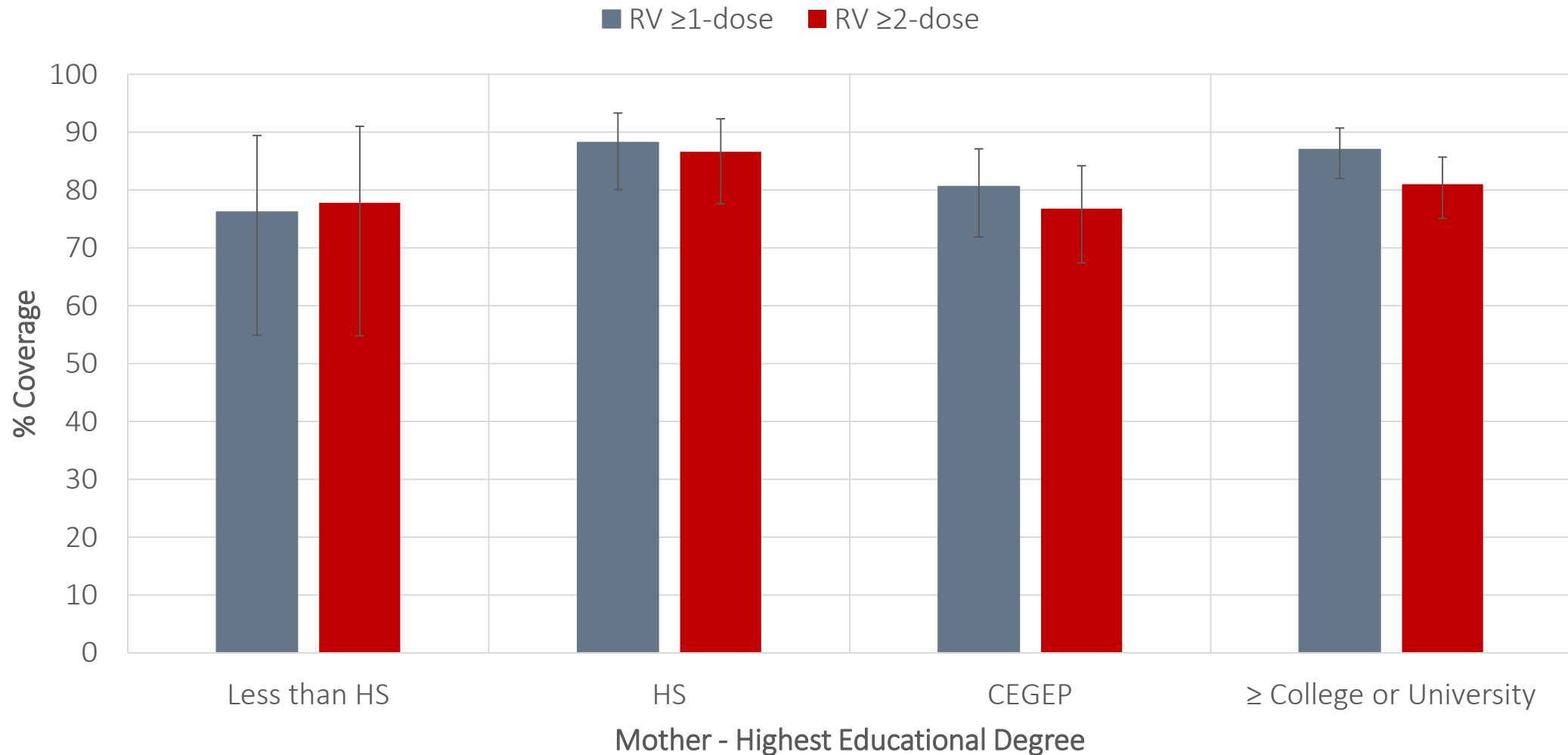
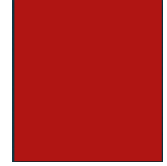


Results - Reasons for Not Vaccinating

- Among participants where a reason was provided (n=58)

Reason for not vaccinating with RV vaccine	N (%)
Did not know RV vaccine existed	12 (21)
Fear of side effects	11 (19)
Lack of information on the vaccine	9 (16)
Benign disease	7 (12)
Does not believe in vaccines	6 (10)
Sick child at home	5 (9)
Not in calendar	3 (5)
No vaccine at vaccination clinic	3 (5)
No time	2 (3)

Results – Maternal Education



Results – Parental Education

