

Effect of human papillomavirus vaccination on cervical cancer screening in Alberta

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Disclosure Statement

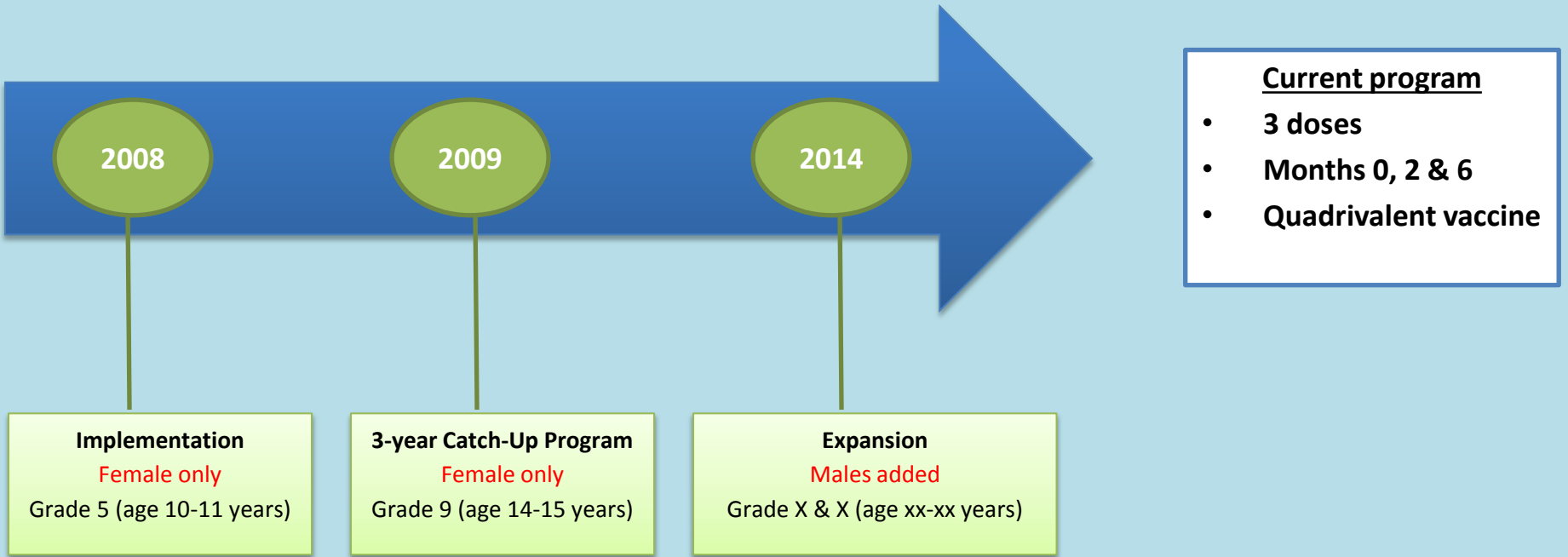
I have no affiliation (financial or otherwise) with a pharmaceutical, medical device or communications organization.

Background: Cervical Cancer Screening

- **The Alberta Cervical Cancer Screening Program (ACCSP)**
 - Papanicolaou (**Pap**) test
 - **Population-based**
 - Recommends routine **screening beginning at age 21**
 - Some women **elect** to begin **screening at a younger age**

Background: HPV Immunization

Alberta's School-Based HPV Vaccination Program



Background: Study Objective

- To assess the impact of the Alberta school-based HPV vaccination program on Pap test cytology results using databases of province-wide vaccination and cervical cancer screening

Study Design: Nested Case-Control

Population

Women born between **1994 and 1997**,
who had **at least one Pap** test
between **2012 and 2015**,
and who had permanent
residency in **Alberta**

Exclusion Criteria

- Women identified as First Nations or Inuit;
- Women who moved to Alberta after 2008 and who had no vaccination record;
- Women who had only unsatisfactory Pap test results

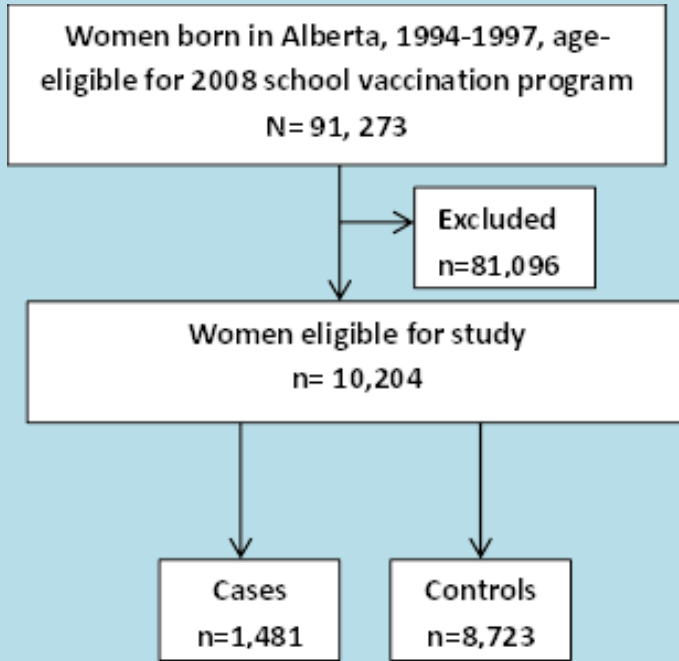
Study Design: continued

Intervention: Vaccination record		Outcome: Case–control status		Covariates
Vaccinated	at least 1 dose of HPV vaccination before Pap test	Assigned according most severe cytology results captured in the ACCSP database		Neighbourhood income
Fully vaccinated	3 or more doses of HPV vaccination before Pap test	Control	negative cytology results	Urban vs. rural residency
Partially vaccinated	fewer than 3 doses before Pap test	Case (Low Grade)	atypical squamous cells of undetermined significance (ASC-US) or low-grade squamous intraepithelial lesion (LSIL)	Laboratory service that processed cytologic specimens
Unvaccinated	no record of vaccination before the Pap test	Case (High Grade)	atypical squamous cells, cannot rule out a high-grade lesion (ASC-H) or high-grade squamous intraepithelial lesion (HSIL)	Age in years (as of Just 31, 2015)

Main Data Sources

Cytology		Immunization	
ACCSP Database	Receives all of the cytological laboratory test data for women aged 18 to 60 who are residents of Alberta	Imm/ARI Repository	Captures all vaccinations administered through public health programs <ul style="list-style-type: none">○ Women vaccinated in the school-based program
		Pharmaceutical Information Network (PIN)	Captures privately dispensed vaccinations <ul style="list-style-type: none">○ Women age-eligible for the school-based program but vaccinated outside of the program

Results



- Adjusting for age, **vaccinated women had a higher screening rate than unvaccinated women** (13.0% v. 11.4%, $p < 0.001$)
- Among women who received **full vaccination (≥ 3 doses)**, the **adjusted OR for cervical abnormalities** was **0.72** (95% CI 0.63–0.82)
- For **high-grade lesions**, the **adjusted OR for cervical abnormalities** was **0.50** (95% CI 0.30–0.85)

Implications

Vaccine Effectiveness

- **Early benefits of 3-dose HPV vaccination**
 - **High-grade** cervical abnormalities more likely to progress to cervical cancer

Cervical Cancer Prevention

- **Balance of harms and benefits** of cervical cancer screening
- **Risk-stratified** population
 - **Low**
 - **Medium**
 - **High**

Conclusion

- Our study provides **early evidence for the effectiveness of HPV vaccination**
- To optimize cervical cancer prevention, **population-based vaccination and screening programs should work collaboratively**

Limitation

- **Not using pathology outcomes**
 - Did not have sufficient biopsy outcomes for the study purpose
 - Accuracy of cytology compared with pathology varies

Questions