



# Cost Analyses of Point of Care Influenza Immunization during Pregnancy in a Canadian Province

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- My group practice has received an unrestricted educational grant from Sanofi (makers of Enoxaparin)



# Scope

- Pregnancy = window of opportunity
- <30% of pregnant women in Canada/US are ever offered the flu shot
- Pregnancy influenza immunization uptake  
2-20%: **16.24%** (Alberta, Canada 2013/14 season)
- Do access/convenience matter?



# Access/Convenience

## ALBERTA IMMUNIZATION STRATEGY 2007-2017

immunize...do it for life



Alberta

### IMMUNIZATION BARRIERS: WHY ARE IMMUNIZATION RATES LOWER THAN TARGET RATES?

Evidence gathered during the development of the Alberta Immunization Strategy reveals:

- Low socio-economic status is the strongest predictor for under-immunization, and factors related to access are the strongest barriers to immunization;
- In more affluent communities, parental attitudes, beliefs and perceptions are a stronger predictor of immunization behaviour.

Barriers to immunization involve a variety of factors related to three major areas:

- **Accessibility** - Inconvenient immunization clinic hours and transportation availability affect immunization rates;
- **Clients** - Individuals' resistance to immunization is sporadic but concerning. Some clients have inadequate information about immunization and vaccine-preventable diseases and perceive the risk of immunization/vaccines to be greater than the risk of acquiring a communicable disease, others possess poor literacy skills, some may experience socio-economic barriers, ethnic-specific barriers and time constraints, while others may oppose immunization for religious or cultural reasons. Open and candid information sharing by health professionals is critical to addressing this issue, while recognizing that an individual's decision whether to immunize must be respected;
- **Health care providers** - Providers require time and resources for role modelling and knowledge transfer to new health professionals, and for counselling clients about immunization.



# Point of Care Immunization Pregnancy: Rational

- Reduce Health Care Utilization
- Increase Efficiency
- Increase Cost Effectiveness

Myers ER, Misurski DA and Swamy GK. Influence of timing of seasonal influenza vaccination on effectiveness and cost-effectiveness in pregnancy. *Am J Obstet Gynecol.* 2011; 204: S128-40.

Jit M, Cromer D, Baguelin M, Stowe J, Andrews N and Miller E. The cost-effectiveness of vaccinating pregnant women against seasonal influenza in England and Wales. *Vaccine.* 2010; 29: 115-22.

Beigi RH, Wiringa AE, Bailey RR, Assi TM and Lee BY. Economic value of seasonal and pandemic influenza vaccination during pregnancy. *Clin Infect Dis.* 2009; 49: 1784-92.

Skedgel C, Langley JM, MacDonald NE, Scott J and McNeil S. An incremental economic evaluation of targeted and universal influenza vaccination in pregnant women. *Can J Public Health.* 2011; 102: 445-50.

Roberts S, Hollier LM, Sheffield J, Laibl V and Wendel GD, Jr. Cost-effectiveness of universal influenza vaccination in a pregnant population. *Obstet Gynecol.* 2006; 107: 1323-9.



# Point of Care Immunization Pregnancy: Rational

- Adults: cheaper to deliver flu shots @ non-medical settings like pharmacies (adults)
- Pregnancy: cost-effective if part of routine prenatal care\*; nursing personnel cost-effective (Vs MD)\*\*

\* Prosser LA, O'Brien MA, Molinari NA, et al. Non-traditional settings for influenza vaccination of adults: costs and cost effectiveness. *Pharmacoeconomics*. 2008; 26: 163-78.

\*\* Skedgel C, Langley JM, MacDonald NE, Scott J and McNeil S. An incremental economic evaluation of targeted and universal influenza vaccination in pregnant women. *Can J Public Health*. 2011; 102: 445-50.

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# Point of Care Immunization Pregnancy



Internet panel  
N= 1457 pregnant women  
October 2010-January 2011



# Point of Care Immunization Pregnancy

- Hospital attached downtown Toronto (multi-ethnic, varied socioeconomic status)
- N= 631 pregnant women November
- Point of care doubled influenza immunization uptake to 42% from 19% historical controls

Yudin, M. H. Salaripour, M. Sgro, M. Acceptability and feasibility of seasonal influenza vaccine administration in an antenatal clinic setting. *Journal of Obstetrics & Gynaecology Canada: JOGC.* 32(8): p. 745-8. 2010





# Setting: Alberta

NEWS

## Alberta leads nation with mini baby boom

Wednesday, May 30, 2012, 12:46 AM



**SUN+** article

Alberta is fast becoming a land of sippy cups and baby slings in the biggest infant explosion Canada has experienced in 50 years, according to census data released Tuesday.

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## Calgary leads Canada in terms of population growth; some question whether we can afford it

Ian Campbell and Kenny Mason Feb 26, 2014



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# Alberta 2013-2014

- Does access/convenience matter?
- Most pregnant must engage on at least one extra contact with the health care system outside of standard prenatal care to obtain influenza immunization
- **Would point of care influenza immunization save health care dollars in Alberta?**



# Methods

- Literature review to determine parameters included in cost-effectiveness studies
- Cost Analyses: provincial cost data applied to reported provincial or national maternal and infant influenza-related events
- Scenario analyses



# Annual Flu Disease Burden: Alberta

Maternal flu-related Hospitalizations	36-53	Decrease by 35%
Infant <6m Hospitalization	241	Decrease by 45-90%
Preterm birth <32w	750	Decrease by 27%
Preterm birth <37w	4715	Decrease by 72%
SGA	4662	Decrease by 25-57%



# Assumptions

- Point of care influenza immunization will increase uptake from 16.2% (n=8,681 women) to 30% (n=16,076) or 50% (n=26,793)
- Influenza vaccine efficacy 59% (95% CI, 51-67) to 60% (95% CI, 45-71)

Osterholm, M.T., et al., Efficacy and effectiveness of influenza vaccines: a systematic review and meta-analysis. *The Lancet Infectious Diseases*, 2012. 12(1): p. 36-44. Janjua, N.Z., et al., Estimates of influenza vaccine effectiveness for 2007-2008 from Canada's sentinel surveillance system: cross-protection against major and minor variants. *Journal of Infectious Diseases*, 2012. 205(12): p. 1858-68.



# Alberta 2013/14 Costs

- AB\$17,000 average hospitalization for adult influenza (non-pregnant)\*
- US\$7,030 to US\$39,792 influenza-related infant hospitalization\*\*
- AB\$20 million annual cost preterm birth
- CAN\$1,084 SGA 2000-2499gr, \$12, 693 SGA1500-1999gr, \$117,000 SGA<750gr\*\*\*

\*Government of Alberta [http://alberta.ca/release.cfm?xID=360595D82588C\\_BB3B-3026-52F4A1AE065ECBBA](http://alberta.ca/release.cfm?xID=360595D82588C_BB3B-3026-52F4A1AE065ECBBA)\*\* Keren, R., et al., Direct medical cost of influenza-related hospitalizations in children. Pediatrics, 2006. 118(5): p. e1321-7.

\*\*\* Information, C.I.f.H., Giving Birth in Canada : the Costs. 2006: Ottawa, Ontario, Canada



# Alberta 2013/14 Costs

- AB\$16.87 per influenza vaccine (vaccine + physician administration cost)

\$12/dose: average administration cost; pharmacists receive \$20/dose; physicians receive \$9.58/dose



# Other Infant Costs

- Parental lost work-hours
  - \$1,456: 73h if child hospitalized
  - \$383: 19h if child goes to ER
  - \$222: 7h if child seen as outpatient

Ortega-Sanchez IR, Molinari NA, Fairbrother G, et al. Indirect, out-of-pocket and medical costs from influenza-related illness in young children. *Vaccine*. 2012; 30: 4175-81





# Annual Flu Disease Burden Cost: Alberta

	Uptake 15%	Uptake 30%	Uptake 50%
Maternal Hospitalizations	\$587,000-865,000	\$550,000-\$810,000	\$505,000-747,000
Infant <6m Hospitalization	\$1.5M-\$8.1M	\$1.4M-\$7M	\$1.3M-\$5.2M
Preterm birth <37w	\$19M	Decrease by 72%	\$17.2M
SGA	\$5M	\$4M	\$3.5M



# Annual Flu Disease Cost Savings: Alberta

	Uptake 15%	Uptake 30%	Uptake 50%
Maternal Hospitalizations	\$30,000-45,000	\$68,000-100,000	\$110,000-164,000
Infant <6m Hospitalization	\$135,000-\$1.4M	\$230,000-\$2.5M	\$389,000-\$4.3M
Preterm birth <37w	\$1M	\$1.8M	\$2.8M
SGA	\$200,000-\$500,000	\$400,000-\$900,000	\$656,000-\$1.4M



# Point of Care Costs

- Excess cost for the vaccine would be \$124,753.65 or \$305,549.44 annually



# Limitations

- Cost analysis alone, not a full economic evaluation



# Conclusion

- POC Influenza Immunization during pregnancy can results on cost savings in this Canadian province

