

Potential Factors That May Affect Acceptance of Routine Prenatal HIV Testing

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ABSTRACT

Background: Despite increasing advocacy for an “opt-out” strategy in routine prenatal HIV screening programs in Canada, no published studies have examined factors that may affect acceptance of prenatal HIV testing.

Methods: We included all pregnant women in Alberta who received prenatal care (N=38,712) and their caregivers (N=2,007) between January 1 and November 30, 2000. Factors associated with non-acceptance of HIV testing in both pregnant women and their caregivers were assessed using multivariate logistic regression.

Results: Overall, 1.5% of women declined HIV testing. First Nations women were about twice as likely to decline the test (adjusted odds ratio [OR_{adj}] 1.91, 95% CI [1.42-2.58]) compared to non-First Nations women (p<0.001). The proportion also increased with age (χ^2 trend p<0.001) in the general population. In First Nations women, however, most (3.2%) declined in the 20-24 year age group. No significant effect was seen for a socio-economic status marker or for the place of residence. The caregivers of women who declined HIV testing were more likely to be female (OR_{adj} 1.56 [1.28-1.89]), midwives (OR_{adj} 140.65 [58.61-337.49]), other non-obstetrical medical specialties (OR_{adj} 4.92 [1.94-12.47]), and general practitioners (OR_{adj} 3.44 [1.87-6.33]).

Conclusion: In an “opt-out” routine prenatal HIV screening program, the characteristics of both the pregnant women and their caregivers may contribute to the non-acceptance of HIV testing. A higher likelihood of declining HIV testing among First Nations pregnant women and other pregnant women under the care of midwives and female physicians warrants further study.

MeSH terms: HIV; prenatal; screening; prevention and control; policy

La traduction du résumé se trouve à la fin de l'article.

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The provision of routine and universal prenatal HIV screening programs, especially with an “opt-out” testing policy, is becoming an important public health policy issue in Canada¹⁻⁸ and other countries.⁹⁻¹¹ The higher rates of acceptance under the opt-out policy,^{2,3,10,11} particularly experiences from routine prenatal HIV screening programs of Newfoundland and Labrador^{3,10} and Alberta,^{2,4,10} have drawn attention in Canada.^{1,4,5} In addition to higher rates of acceptance, other attributes of the opt-out routine HIV testing include no fear of being “singled out” for testing,^{9,11} less anxiety for women who are tested,¹¹ less time required on pre-test counselling,^{9,11} and no requirement for formalized counselling or written informed consent.⁹ A resolution after the 2002 Annual General Meeting of the Canadian Medical Association recommended the adoption of an opt-out universal HIV screening policy for pregnant women in Canada.⁵ Despite increasing advocacy for an opt-out policy in routine prenatal HIV screening programs in Canada,^{1,4,5} no data are available on potential barriers to acceptance of routine HIV testing under this policy.

Previous studies have identified some of the key factors related to the acceptance or non-acceptance of HIV testing.¹²⁻¹⁹ They include the pregnant woman’s age,¹²⁻¹⁵ race or ethnicity,¹³⁻¹⁵ education,^{14,15} marital status,^{12,14,15} income,¹⁴ employment,¹⁴ residence,¹⁴ inadequate counselling,¹³ lack of dedicated technical staff,¹³ lack of insurance to receive care,¹⁴ the patient-provider ratio,¹³ caregiver’s gender and age,¹⁶⁻¹⁸ medical specialty,¹⁶⁻¹⁹ years of practice or years since graduation,^{11,16} and screening policy or guidelines.^{9,18} However, these studies are limited to the assessment of either the pregnant women¹³⁻¹⁵ or prenatal caregivers,¹⁶⁻¹⁹ without good representation of the pregnant population.^{13,15} Some studies had little control over confounding effects.^{13,15,16,18,19} Furthermore, most of these studies were conducted within the context of an “opt-in” policy framework.

This study examines the effects of the characteristics of the pregnant women and their caregivers on acceptance of HIV testing in an opt-out routine population-based prenatal HIV screening program in Alberta, Canada.

MATERIALS AND METHODS

Background of the Alberta Routine Prenatal HIV Screening Program

Alberta was among the first provinces in Canada that adopted an opt-out policy in routine prenatal HIV screening.⁶ This policy recommendation was based on extensive input from key stakeholders and the success of routine prenatal testing for hepatitis B introduced in Alberta in 1985.²⁰ Under this policy, all pregnant women seeking prenatal care are routinely tested for HIV unless they specifically choose not to be tested.^{2,7} A Perinatal Order Form, which has a 'declined testing' option along with a pregnant woman's demographics and a caregiver's contact information, has to be properly completed.⁷ The program requires that all pregnant women seeking prenatal care be offered HIV testing. For pregnant women not seeking prenatal care, thus not screened in early pregnancy, the program offers intrapartum and rapid HIV testing.⁷ The details of this program have been discussed elsewhere.^{2,7,8}

Study population and data sources

We included all Alberta women seeking prenatal care (N=38,712) between January 1 and November 30, 2000, as well as their caregivers (N=2,007). The prenatal testing data from Canadian Blood Services were combined with the Alberta Health Care Insurance Plan (AHCIP) and the AHCIP Provider Registry by deterministic linkage,²¹ as done in our previous work.^{7,8} The linkage rate was 96.3% for the women and 91.4% for the caregivers. Data on the Perinatal Order Form for women who declined HIV testing were manually entered into the system by Health Surveillance staff. We extracted data from the AHCIP files on a pregnant woman's age, socio-economic status marker, First Nations status, the health region of residence, and on a prenatal caregiver's gender, age, medical specialty, and years of practice. All data were extracted as part of the HIV program evaluation and surveillance project,⁷ with non-disclosure of any individualized data. Definitions of the study variables are listed in Appendix A. Pregnant women who were previously known to be HIV-positive (n=23) were excluded.

TABLE I

Characteristics of Pregnant Women and the Likelihood of Declining HIV Testing, Alberta Routine Prenatal HIV Screening Program, January-November 2000

Characteristics of Women	Declined (%)*	Crude OR	Adjusted OR (95% CI)†	p value‡
Age (years)				
15-19	1.0	1.00	1.00 (-)	
20-24	1.3	1.26	1.37 (0.88-2.12)	0.163
25-29	1.4	1.39	1.45 (0.94-2.21)	0.090
30-34	1.7	1.67	1.67 (1.09-2.56)	0.020
35+	2.2	2.17	2.21 (1.43-3.42)	<0.001
First Nations Status				
No	1.5	1.00	1.00 (-)	
Yes	2.2	1.46	1.91 (1.42-2.58)	<0.001
Lower SES Marker				
No	1.5	1.00	1.00 (-)	
Yes	1.1	0.69	0.94 (0.51-1.71)	0.879
Geographic Area of Residence				
Calgary	2.1	1.00	1.00 (-)	
Edmonton	1.1	0.53	0.68 (0.43-1.08)	0.101
Southern	1.5	0.74	0.87 (0.67-1.14)	0.325
Central	1.5	0.75	0.93 (0.59-1.48)	0.765
Northern	1.2	0.57	0.77 (0.48-1.26)	0.300

* The proportion of pregnant women who declined HIV testing among total women who received prenatal care blood tests, January-November 2000.

† Adjusted for a woman's age, First Nations status, socio-economic status marker, week of pregnancy and residence, and a caregiver's gender, age, specialty, and years of practice, and testing centre.

‡ The p value for the statistical significance of a parameter estimate in a multivariate logistic regression model.

Statistical analysis

The proportion of women declining an HIV test was calculated for each comparison group. The odds ratio (OR) of non-acceptance and its 95% confidence interval (CI) were calculated using logistic regression. Multivariate logistic regression was used to refine estimates by simultaneously adjusting for potential confounding effects from the characteristics of both pregnant women and their caregivers. Stratified analysis by First Nations status and caregiver's gender was also performed to examine whether the effect of a pregnant woman's age depends on her First Nations status and her caregiver's gender. The Chi-square (χ^2) tests were used as appropriate. In multivariate logistic regression, missing values were analyzed separately and recoded as the average or the reference, as appropriate to minimize the loss of the statistical power.²²

RESULTS

Characteristics of pregnant women

Of the 38,712 pregnant women studied, 36,163 (93.4%) were non-First Nations and 2,549 (6.6%) were First Nations. The proportion of First Nations women varied by the area of residence ($p<0.001$), the highest being in Northern Alberta (16.9%), followed by Central Alberta (9.4%), Southern Alberta (8.5%), the Edmonton

area (4.0%), and the Calgary area (1.8%). The proportion of those younger than 25 years among First Nations women (53.4%) was double that among non-First Nations women (25.6%, $p<0.001$).

A total of 593 (1.5%) pregnant women declined HIV testing: 538 (1.5%) of all non-First Nations women and 55 (2.2%) of all First Nations women. Overall, the proportion of those declining increased with a woman's age ($\chi^2_{\text{trend}} p<0.001$). However, when the analysis was limited to First Nations women, the largest proportion of those declining (3.2%) were between 20 and 24 years. Table I shows that the adjusted likelihood of non-acceptance is significantly higher for pregnant women 30-34 years ($OR_{\text{adj}} 1.67$ [95% CI 1.09-2.56]) and for those 35 years or over ($OR_{\text{adj}} 2.21$ [1.43-3.42]). The pregnant women of First Nations were on average about twice as likely to decline HIV testing ($OR_{\text{adj}} 1.91$ [1.42-2.58]) compared to non-First Nations women ($p<0.001$), particularly when they were under the care of male practitioners ($OR_{\text{adj}} 2.21$ [1.46-3.33], data not shown).

The proportion of women not accepting HIV testing appeared to vary by the area of residence before adjustment, but no differences were noted after adjustment (Table I). There was no significant effect of the lower socio-economic status marker either before or after adjustment ($p>0.05$).

TABLE II

Characteristics of Prenatal Caregivers and the Likelihood of Declining HIV Testing, Alberta, January-November 2000

Characteristics of Caregivers	Declined (%)*	Crude OR	Adjusted OR (95% CI)†	p value‡
Gender				
Male	1.2	1.00	1.00 (-)	
Female	1.9	1.65	1.56 (1.28-1.89)	<0.001
Unknown	1.6	1.32	2.28 (1.33-3.92)	0.003
Medical Specialty				
Obstetrician	0.4	1.00	1.00 (-)	
GP	1.5	3.64	3.44 (1.87-6.33)	<0.001
Midwife	33.7	118.66	140.65 (58.61-337.49)	<0.001
Other	2.1	4.99	4.92 (1.94-12.47)	<0.001
Unknown	1.5	3.55	3.66 (1.82-7.36)	<0.001
Years of Practice				
1-5	1.4	1.00	1.00 (-)	
6-10	1.8	1.11	0.95 (0.69-1.29)	0.728
11-15	1.4	0.85	0.58 (0.41-0.82)	0.002
16-20	1.3	0.78	0.48 (0.33-0.71)	<0.001
>20	1.2	0.75	0.46 (0.31-0.68)	<0.001

* The proportion of pregnant women who declined HIV testing among total women who received prenatal care blood tests, January-November 2000.

† Adjusted for a woman's age, First Nations status, socio-economic status marker, week of pregnancy and residence, and a caregiver's gender, age, specialty, and years of practice, and testing centre.

‡ The p value for the statistical significance of a parameter estimate in a multivariate logistic regression model.

Characteristics of prenatal caregivers

A total of 2,007 practitioners provided prenatal care for pregnant women under study, including 1,558 (77.6%) general practitioners (GPs), 49 (2.4%) obstetricians, 9 (0.4%) midwives (all female), 32 (1.6%) other non-obstetrical medical specialties (e.g., internal medicine, general surgery), and 359 (17.9%) unknown specialties (due to non-linkage or missing data). About 27,880 (72.0%) pregnant women were under the care of GPs. A small group (n=68, 3.4%) of caregivers accounted for a disproportionately large number (n=215, 36.3%) of the pregnant women who declined HIV testing. The majority of the small group were midwives and GPs.

When the characteristics of both pregnant women and their caregivers were examined simultaneously, it was apparent that the caregivers of pregnant women who declined HIV testing were more likely to be female (OR_{adj} 1.56 [1.28-1.89]), midwives (OR_{adj} 140.65 [58.61-337.49]), other non-obstetrical medical specialties (OR_{adj} 4.92 [1.94-12.47]), and GPs (OR_{adj} 3.44 [1.87-6.33], Table II). Pregnant women under the care of practitioners with more than 15 years of practice were about half as likely to decline HIV testing compared to those with 1-5 years of practice (OR_{adj} 0.48 for caregivers with 16-20 years of practice and 0.46 for those with more than 20 years of practice, Table II).

DISCUSSION

This study is the first to examine the barriers to acceptance of HIV testing in a routine population-based prenatal HIV screening program under the opt-out policy. Our finding of the likelihood of non-acceptance increasing with age in the overall pregnant population is in accordance with previous observations under the "opt-in" policy.¹³⁻¹⁵ Perceived lower risk of HIV infection among older pregnant women, and perhaps by their caregivers, may be contributing to this situation. Non-acceptance of HIV testing depended not only on a woman's age, but also on her First Nations status and her caregiver's gender. Among those of First Nations status, the likelihood of non-acceptance did not increase with the age of a pregnant woman, but rather with her caregiver being male.

The greater likelihood of declining prenatal HIV testing among First Nations women, especially young women (20-24 years), is of note. We support suggestions by others²³ that a culturally specific component should be considered for prenatal HIV screening among minority groups. In Alberta, First Nations people, in collaboration with Health Canada and Alberta Health and Wellness, have already developed a more culturally sensitive HIV/AIDS strategy for Aboriginal people.²⁴

Our finding of a lower likelihood of non-acceptance among pregnant women under the care of obstetricians is in accordance with previous observations that obstetricians are more likely to offer HIV testing.^{18,19} However, there is a difference between "acceptance of" and "offer to provide" HIV testing. Under the opt-out policy of the Alberta routine prenatal HIV screening program, the HIV test is offered to all women seeking prenatal care. Acceptance depends not only on having the test offered, but also on personal HIV risk perception,^{9,25} acknowledging risky behaviours,^{9,25} concerns regarding confidentiality,^{9,25} presenting counselling and testing as "routine" rather than optional,^{9,25} and how the test is offered.^{12,13,15} In the current study, over 77% of caregivers were GPs. A greater likelihood of non-acceptance among pregnant women under the care of GPs suggests the need to address educational requirements and practice patterns of busy physicians. A higher likelihood of non-acceptance among pregnant women under the care of midwives, who were described as being less likely to encourage pregnant women to have HIV testing in Ontario,¹⁹ was also observed in our study. The College of Physicians and Surgeons of Alberta has cautioned its members about their probable legal liabilities related to offering prenatal HIV screening.²⁶

Our finding of a greater likelihood of non-acceptance of prenatal HIV testing among women under the care of female physicians or caregivers with fewer years of practice differs from previous observations.^{13,16-18} Surveys of Canadian physicians conducted in 1996¹⁶ and 1997/98^{17,18} found that female family physicians spent a longer time providing pre-test counselling¹⁶ and were more likely to offer HIV testing.^{17,18} It has been reported that physicians practising more than 20 years after graduation were less likely to offer HIV testing.¹⁷ However, these results were found in the context of an opt-in policy rather than the opt-out approach adopted in Alberta. Provincial policies regarding prenatal HIV screening may significantly influence a physician's decision whether to offer such screening.¹⁸ It is possible that the female caregivers in our study provided more HIV-related pre-test counselling than their male counterparts, which led to enhanced decision-making skills and more

women declining HIV testing after a careful assessment of personal risks. In the context of an opt-out routine population-based prenatal HIV screening program, how to optimize the efficiency of pre-test counselling may need further study.

There is an increasing trend to the belief that HIV testing should be part of routine, optimal prenatal care. The test should be offered not only to pregnant women perceived as being at "high risk," as was practised by some physicians in the past,^{17,18} but to all pregnant women. Under an opt-out policy, HIV testing is offered as part of the standard battery of prenatal tests and no detailed pre-test counselling may be required.⁹ The Institute of Medicine of the US National Academy of Sciences⁹ recommends "that pre-test counseling consist primarily of notification that HIV testing is a regular part of prenatal care for everyone, and that women have a right to refuse it." The refusal should be documented in the patient's medical record to protect the provider from liability.⁹ Women found to be HIV-positive should receive extensive "post-test" counselling and be referred for treatment for themselves and to prevent perinatal transmission.⁹ Caregivers in Canada need to be aware of prenatal HIV screening policies established within their jurisdictions and their legal liabilities in adhering to those policies.

In our study, inclusion of the records of pregnant women and their caregivers with unknown or missing values (caregiver's age, gender, specialty, and years of practice) in a multivariate analysis may have led to slight distortion of the true effect – likely the underestimation – of some variables. However, this potential bias did not lead to a spurious association between a prenatal caregiver's characteristics and non-acceptance of HIV testing observed in this study. A separate analysis of complete data presented a similar pattern of association for all factors, but at a lower statistical power. Since our study included only pregnant women seeking prenatal care, a small proportion of pregnant women would have been missed in our analysis.

REFERENCES

1. Walmsley S. Opt in or opt out: What is optimal for prenatal screening for HIV infection? *CMAJ* 2003;168:707-8.

Appendix A

Alberta resident: An individual lives in Alberta and is registered with the Alberta Health Care Insurance Plan (AHCIP) at the time of receiving prenatal care.

First Nations: An individual is recorded with an Indian treaty status in the AHCIP stakeholder registry any time in 2000.

Lower socio-economic status (SES) marker: An individual is recorded as receiving support from governmental social services programs and receiving full subsidy for the AHCIP any time in 2000.

Geographic area of residence: Five areas were defined by a woman's residence within a regional health authority (RHA) in 2000, including Southern (RHA 1-3, 5), Central (RHA 6-9), Northern (RHA 11-17), Calgary (RHA 4), and Edmonton (RHA 10).

Week of pregnancy at screening: The expected full-term delivery (40 weeks) minus the difference between the expected date of delivery and the date of screening divided by seven. This measure tends to estimate the time of accessing prenatal care more conservatively.

Age of caregiver: The difference between the date of providing prenatal HIV screening and the date of a caregiver's birth divided by 365.25.

Years of practice: The difference between the date of eligibility for a specialty practice and the date of providing prenatal HIV screening divided by 365.25.

2. Jayaraman GC, Preiksaitis JK, Larke B. Mandatory reporting of HIV infection and opt-out prenatal screening for HIV infection: Effect on testing rates. *CMAJ* 2003;168:679-82.
3. Mossman CL, Ratnam S. Opt-out prenatal HIV testing in Newfoundland and Labrador. *CMAJ* 2002;167:630-31.
4. O'Connor KS, MacDonald SE. Aiming for zero: Preventing mother-to-child transmission of HIV. *CMAJ* 2002;166:909-10.
5. Canadian Medical Association. Resolution Passed at the 135th Annual Meeting, Aug. 18-21, 2002; Saint John, New Brunswick. Ottawa: Canadian Medical Association, 2002.
6. Government of Alberta News Release. Routine prenatal HIV screening program launched. Edmonton: Alberta Health and Wellness, August 25, 1998.
7. Alberta Routine Prenatal HIV Screening Program: Final evaluation report prepared for Alberta Medical Association and Alberta Health and Wellness. Edmonton: Howard Research and Instrumental Systems, June 2001. Available on-line at: www.albertadoctors.org/resources/womens/hiv.html (Accessed Dec. 15, 2002).
8. Alberta Health and Wellness. *Alberta Blood-Borne Pathogens Surveillance Report 2003*. Edmonton, Alberta: Alberta Health and Wellness, June 2003.
9. Institute of Medicine, Committee on Perinatal Transmission of HIV and Commission on Behavioral and Social Sciences and Education. *Reducing the Odds: Preventing Perinatal Transmission of HIV in the United States*. Washington: National Academy Press, 1999.
10. Centers for Disease Control and Prevention. HIV testing among pregnant women – United States and Canada, 1998-2001. *MMWR* 2002;51(45):1013-16.
11. Simpson WM, Johnstone FD, Goldberg DJ, Gormley SM, Hart GJ. Antenatal HIV testing: Assessment of a routine voluntary approach. *BMJ* 1999;318:1660-61.
12. Simpson WM, Johnstone FD, Boyd FM, Goldberg DJ, Hart GJ, Prescott RJ. Uptake and acceptability of antenatal HIV testing: Randomized controlled trial of different methods of offering the test. *BMJ* 1998;316:262-67.
13. Ethier KA, Fox-Tierney R, Nicholas WC, Salisbury KM, Ickovics JR. Organizational predictors of prenatal HIV counseling and testing. *Am J Public Health* 2000;90:1448-51.

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RÉSUMÉ

Contexte : Malgré les pressions croissantes en faveur d'une stratégie de participation facultative aux programmes de dépistage anténatal systématique du VIH au Canada, aucune étude publiée n'examine les facteurs pouvant influencer l'acceptation du test du VIH chez les femmes enceintes.

Méthode : Nous avons inclus toutes les femmes enceintes de l'Alberta qui avaient reçu des soins prénatals (n = 38 712) entre le 1^{er} janvier et le 30 novembre 2000, ainsi que leurs pourvoyeurs de soins (n = 2 007). Nous avons ensuite analysé par régression logistique multivariée les facteurs associés au refus du test de sérodiagnostic du VIH par les femmes enceintes ou par leurs pourvoyeurs de soins.

Résultats : Dans l'ensemble, 1,5 % des femmes ont refusé de subir le test du VIH. Les femmes des Premières nations étaient environ deux fois plus nombreuses à refuser le test (rapport de cotes ajusté [RCA] = 1,91, IC de 95 % = 1,42-2,58) que les femmes qui n'étaient pas membres des Premières nations (p < 0,001). La proportion de refus augmentait aussi avec l'âge (tendance χ^2 : p < 0,001) dans la population générale. Les femmes des Premières nations étaient toutefois proportionnellement plus nombreuses (3,2 %) à refuser le test lorsqu'elles se situaient dans le groupe d'âge des 20 à 24 ans. Aucun effet significatif n'a été constaté selon le statut socio-économique ou le lieu de résidence. Les pourvoyeurs de soins des femmes ayant refusé le test du VIH étaient plus susceptibles d'être des femmes (RCA = 1,56 [1,28-1,89]), des sages-femmes (RCA = 140,65 [58,61-337,49]), d'avoir une spécialité médicale autre que l'obstétrique (RCA = 4,92 [1,94-12,47]) et d'être des omnipraticiens (RCA = 3,44 [1,87-6,33]).

Conclusion : Dans le cadre d'un programme de participation facultative au dépistage anténatal systématique du VIH, les caractéristiques des femmes enceintes et celles de leurs pourvoyeurs de soins peuvent contribuer au refus du test de sérodiagnostic du VIH. Les refus proportionnellement plus nombreux chez les femmes enceintes des Premières nations et chez les autres femmes enceintes soignées par des sages-femmes et par des femmes médecins mériteraient une étude plus poussée.

