

# Contraceptive Use Among Canadian Women of Reproductive Age: Results of a National Survey

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## Abstract

**Objective:** Past studies indicate that despite a wide range of contraceptive options, Canadian women tend to use a narrow selection of contraceptive methods. New contraceptive methods have recently been introduced in Canada. The objective of this research is to characterize Canadian women's current contraceptive choices and adherence to contraceptive regimens.

**Methods:** A national cross-sectional survey was conducted in November 2006. A standardized, confidential, Internet questionnaire was administered to female members of a previously recruited national market research panel. Percentages of current contraceptive use and consistency of use were calculated by age group, marital status, and province and were weighted according to age and region. Chi-square test was used to detect within-group differences for consistency of contraceptive use, oral contraceptive (OC) use, and condom use. Multivariate logistic regression analyses predicting consistent contraception use, OC use, and condom use were performed.

**Results:** Of 5597 survey respondents, 3253 were eligible for data analysis. Of these women, 2751 had had vaginal intercourse in the previous six months, were not trying to conceive, and reported whether they or their partner had used contraception. Of these 2751 women, 410 (14.9%) never used contraception. Among contraception users, the most frequently used methods of contraception were condoms (54.3%), OCs (43.7%), and withdrawal (11.6%). Newer contraceptive methods were used by less than 4%. Choice of contraceptive method varied by age. Only 65.2% of respondents who were sexually active and not trying to conceive "always used" contraception. Multivariate logistic regression analyses found significantly higher odds of no contraception use in women over 40 years of age, without higher education, living in PEI or Newfoundland, married or living common-law, or having annual household incomes under \$100 000.

**Conclusion:** Despite many contraceptive options, Canadian women continue to use a narrow range of contraceptive methods and to use contraception inconsistently. Consistent contraceptive use is influenced by a number of independent social variables. Future public health initiatives should focus on raising awareness of contraception options, increased access to a variety of contraceptive methods, and assisting with contraceptive adherence.

## Résumé

**Objectif :** Les études menées par le passé indiquent que, malgré une vaste gamme d'options en matière de contraception, seul un faible nombre de modes de contraception sont utilisés par les Canadiennes. De nouveaux modes de contraception ont récemment été lancés au Canada. La présente recherche a pour objectif de décrire les choix actuels des Canadiennes en matière de contraception et la façon dont elles respectent les schémas posologiques contraceptifs.

**Méthodes :** Un sondage transversal national a été mené en novembre 2006. Un questionnaire standardisé et confidentiel a été administré par Internet aux membres féminins d'un groupe national d'étude de marché déjà constitué. Les pourcentages d'utilisation actuelle d'un contraceptif et la régularité de son utilisation ont été calculés par groupe d'âge, par état matrimonial et par province, et ont été pondérés en fonction de l'âge et de la région. Le test du chi carré a été utilisé pour déceler les différences intragroupes en matière de régularité du recours à la contraception, d'utilisation d'un contraceptif oral (CO) et d'utilisation du condom. Des analyses de régression logistique multivariées prédisant la régularité du recours à la contraception, l'utilisation d'un contraceptif oral (CO) et l'utilisation du condom ont été menées.

**Résultats :** Chez les 5 597 répondantes, 3 253 étaient admissibles en vue de l'analyse des données. Parmi ces femmes, 2 751 avaient connu une relation vaginale au cours des six mois précédents, ne cherchaient pas à devenir enceintes et nous ont fait part de l'utilisation d'un contraceptif (par la participante elle-même ou son partenaire). Chez ces 2 751 femmes, 410 (14,9 %) n'ont jamais eu recours à la contraception. Parmi les utilisatrices d'un contraceptif, les modes de contraception les plus fréquemment utilisés étaient les condoms (54,3 %), les CO (43,7 %) et le coït interrompu (11,6 %). Les nouveaux modes de contraception n'étaient utilisés que par moins de 4 % de ces

**Key Words:** Contraception, survey, Canadian women, adherence, condom use, oral contraceptive

Competing Interests: None declared.

Received on January 20, 2009

Accepted on February 10, 2009

femmes. Le choix d'un mode de contraception variait en fonction de l'âge. Seulement 65,2 % des répondantes qui étaient sexuellement actives et qui ne cherchaient pas à devenir enceintes « utilisaient toujours » un contraceptif. Les analyses de régression logistique multivariées ont constaté une probabilité considérablement plus élevée de non-utilisation d'un mode de contraception chez les femmes de plus de 40 ans, n'ayant pas un niveau de scolarité élevé, demeurant à l'Î.-P.-É. ou à T.-N.-L., étant mariées ou vivant avec un conjoint de fait, ou dont le revenu annuel du ménage se situait en deçà de 100 000 \$.

**Conclusion :** Malgré l'abondance d'options en matière de contraception, les Canadiennes continuent de n'avoir recours qu'à une faible gamme de modes de contraception et de faire appel à la contraception de façon irrégulière. La régularité de l'utilisation d'un contraceptif est influencée par un certain nombre de variables sociales indépendantes. Les futures initiatives de santé publique devraient se centrer sur la sensibilisation aux options en matière de contraception, un meilleur accès à une vaste gamme de modes de contraception et l'offre d'une aide en matière d'observance de la contraception.

J Obstet Gynaecol Can 2009;31(7):627-640

## INTRODUCTION

Contraception is an important aspect of reproductive health care for women, their partners, and their health care providers. Contraceptive choices are important in that they not only provide birth control but may also affect the risk of STIs,<sup>1,2</sup> affect sexual desire and function,<sup>1</sup> have different side-effect profiles, and provide non-contraceptive benefits.<sup>2</sup> Although many effective contraceptive options are available in Canada, unintended pregnancies still occur.<sup>3-7</sup> In fact, 27% of respondents in a national survey reported having had an unplanned pregnancy.<sup>4</sup> (Similarly, Fisher W., unpublished data, 2008).

An American study estimated that six million women in the United States are exposed to unintended pregnancy risk because of lack of contraceptive protection for at least some period each year.<sup>8</sup> Abortion statistics in Canada<sup>9</sup> and the US<sup>10,11</sup> partly reflect the consequences of inconsistent contraceptive adherence, in addition to reflecting method failure and a number of other factors.

Successive Canadian contraceptive studies conducted in 1993, 1995, 1998, and 2002 with nationally representative samples of women have provided information about contraceptive use in Canada.<sup>3-7</sup> The 2002 study found that oral contraception, condoms, and sterilization were the most

commonly used methods of contraception, with oral contraception and condoms being the predominant methods among those aged 15 to 17 years, and sterilization being the predominant method among married couples aged 35 to 44. In this age group, male sterilization was more than twice as common as female sterilization. Six percent of respondents reported using withdrawal as their method of contraception, while only 3% used two of the most effective methods of contraception, the intrauterine device and injectable progestins.<sup>4</sup> On the basis of these successive studies it would appear that oral contraceptive use increased somewhat from 27% in 1993 to 32% in 2002,<sup>4,7</sup> while condom use declined steadily, from a peak of 32% in 1998<sup>5</sup> to 21% in 2002.<sup>4</sup> There was also an increase in Chlamydia, gonorrhoea, and syphilis<sup>12</sup> and in HIV infection among women during this period.<sup>13</sup>

It is evident that in spite of the wide selection of contraceptive options available in Canada, Canadians tend to use a narrow range of contraceptive methods. Since the last Canadian contraception study,<sup>4</sup> newer contraceptive methods have become available in Canada, including the contraceptive patch, the contraceptive ring, and the LNG-IUS. There are currently no data on how often these newer methods are being used by Canadian women.

Evidence concerning contraceptive use or non-use, choice of method, and adherence to regimen may help to guide clinical and public health education programs and policies to provide optimal contraceptive choice and to optimize adherence, thereby reducing unintended pregnancies. This national survey was conducted in order to characterize the contraceptive choices made by Canadian women, to understand their attitudes towards different contraceptive methods and their reasons for choosing a contraceptive method, and to profile what type of safer sex behaviours are being practised by sexually active Canadian women. The purpose of this analysis of study data is to characterize Canadian women's current contraceptive choices and their adherence to contraceptive regimens.

## METHODS

A cross-sectional survey, approved by an independent ethics review board (Institutional Review Board Services of Aurora, Ontario), was conducted in November 2006. A standardized, confidential, Internet questionnaire was offered to randomly selected reproductive age female members of a previously recruited national market research panel who had consented to receive marketing research surveys. Before the survey was administered, it was pilot tested by 15 women for comprehensibility, sensitivity, and response burden. The survey was distributed throughout the regions of Canada on the basis of the population

## ABBREVIATIONS

DMPA	depot medroxyprogesterone acetate
IUD	intrauterine device
LNG	IUS levonorgestrel intrauterine system
OC	oral contraceptive/oral contraception
STI	sexually transmitted infection

distribution reported in the 2001 Canadian Census Profile.<sup>14</sup> The survey was administered in French or English according to the preference of the respondent. The final responses were weighted according to the age and regional distributions of the Canadian population in the 2001 Census. This paper is based on an independent secondary analysis of the data by the authors.

Women aged 15 to 50 years who had been sexually active with a male partner and were not pregnant at the time of the survey were eligible for inclusion. Women were asked to provide detailed information on a number of topics, including socioeconomic characteristics, personal characteristics, partner characteristics, contraceptive use patterns, sexual activity, attitudes towards contraception, and reasons for use or non-use of contraception.

Respondents were excluded from the analysis if they had never had intercourse, if they were male, if they had only female partners, if they were currently pregnant, or if they lived outside Canada. Of 5597 individuals who responded to the survey, 3253 were eligible for inclusion in the data analysis (Figure 1). Of these women, 2751 had had vaginal intercourse in the previous six months, were not trying to conceive, and responded to the question of whether they and/or their partner had used contraception in the last six months. "Never use" contraception was reported by 410 women (14.9%). Analyses were carried out on the subset of 2751 sexually active women who were not attempting to conceive for consistency of contraceptive use, and on the subset of 2341 women for contraceptive method use, OC use, and condom use.

Descriptive data are presented to profile contraception usage in this sample of Canadian women of reproductive age. Percentages of current contraceptive use and consistency of use were calculated by age group, marital status, province, urban versus rural residence, education, employment status, and income level and were weighted to correspond to regional and age distributions of Canadian women. The chi-square test was used to detect within-group differences for consistency of contraceptive use, OC use, and condom use. Multivariate logistic regression analyses for consistency of contraception use (adherence), oral contraceptive use, and condom use were performed using age, marital status, educational level, province, residence, employment status, and household income as independent variables. Statistical significance was set at an alpha level of 0.05. All analyses were performed using SAS-PC statistical software version 9.1 (SAS Inc., Cary NC).

## RESULTS

The demographic characteristics of the 3253 respondents in the survey are shown in Table 1. Of these respondents, 43%

were under 20 years old, 38% were aged 20 to 29, and 19% were aged 30 or over. Three quarters lived in urban areas and over two thirds had either some college or university education or had completed a degree. Only 21% of the respondents were unemployed, and 61% had annual household incomes between \$20 000 and \$100 000. Nearly 75% of the respondents were married in a common-law relationship, or steadily dating. Seventy-seven percent of respondents were English-speaking, and 23% were French-speaking. Twenty-one percent of qualified respondents had experienced an unintended pregnancy (data not shown).

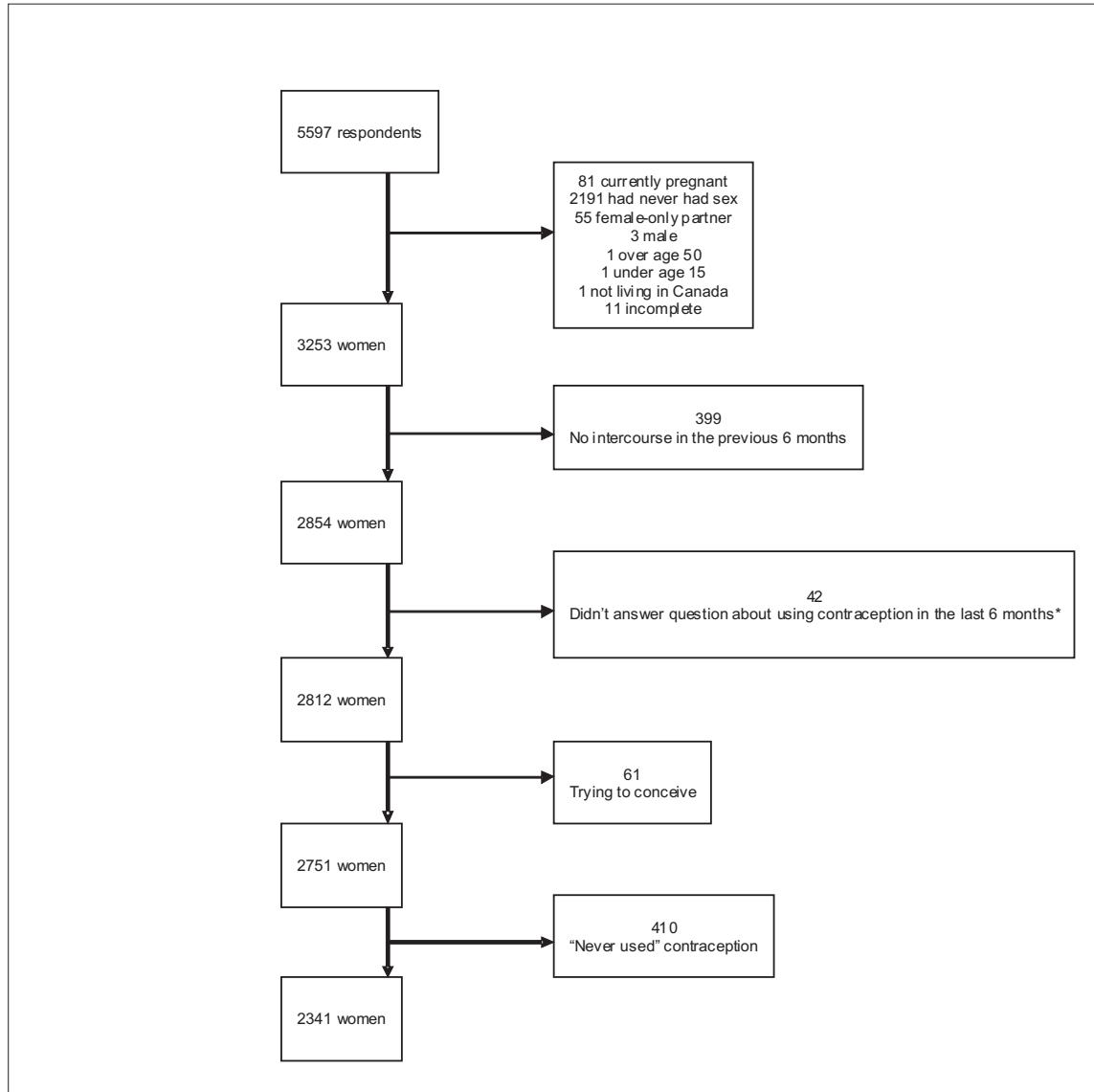
### Choice of Contraceptive Method

Of 3253 respondents, 2751 had had vaginal intercourse in the previous six months and were not attempting to conceive (84.6% of the total, Figure 1). Of these women, 410 (15%) never used contraception. Women were able to select more than one current method of contraception and were not required to indicate which was the primary method. Among the 2341 women who used contraception, the most frequently used current methods were condoms (54.3%), oral contraceptives (43.7%), withdrawal (11.6%), and sterilization (male/female, 13.4%) (Table 2). More than 30% of women were using *both* condoms and oral contraceptives, with the rate of combined OC and condom use highest in the group aged 15 to 19 years (47%). Newer methods of contraception were used by a very small percentage of women. The LNG IUS, transdermal patch, and vaginal contraceptive ring were used by 2.0%, 1.2%, and 0.6% of the respondents respectively. Condoms were the most frequently used method of contraception among women who "sometimes" (69.4%) or "usually" used contraception (80.1%). Oral contraceptives were the method most commonly used by women who "always" used contraception (65.6%).

Choice of contraceptive method varied by age, marital status, and province. The predominant methods in the 15 to 19 age group were condoms (74.3%), oral contraceptives (66.6%), and withdrawal (17.3%). In the over 40 age group, the predominant contraceptive methods were condoms (42.5%), female and male sterilization (16.4% and 19.6%), and oral contraceptives (17.1%). A significantly greater percentage of the 15 to 19 age group used both condoms and OC (45.3%) than women aged 20 to 29 (25.9%), 30 to 40 years (10.7%), or 40 years and over (3.3%) ( $P < 0.01$ ).

Women who were married or living in common-law relationships had lower rates of OC use (33.2%) and condom use (40.2%) than women who were in other types of relationships (53.1%, 66.8%) ( $P < 0.01$ ), but had higher rates of use of sterilization as their contraceptive method (Figure 2). By province, the highest rates of condom use were in Newfoundland and Labrador (70%) and Nova Scotia (60%),

**Figure 1. Subjects for data analysis**



\*"In the last six months, when you had vaginal sexual intercourse, did you/your partner(s) use any method of contraception?"

while the lowest rates were in Prince Edward Island (28%); however, there was no statistically significant difference in condom use among the provinces ( $P > 0.05$ ). There was a significant difference in OC use among provinces ( $P < 0.01$ ), with the highest rates of OC use in Nova Scotia (69.5%) and Newfoundland and Labrador (61%), and the lowest rates in New Brunswick (29.3%) (Figure 3).

**Adherence to Contraceptive Methods**

Of the respondents, 2854 had had vaginal intercourse in the previous six months. Women who wished to conceive (61 women) and women who did not answer the question on whether they had used contraception (42 women) were excluded, leaving a total of 2751 for the analysis of contraceptive adherence. Women who had had a hysterectomy or

who were using male or female sterilization as a contraceptive method were considered to “always” use contraception. Of the eligible respondents, only 65.3% reported that they “always” used a method of contraception. Fifteen percent of women “never” used a method of contraception, while 9.3% of women “sometimes” and 10.6% “usually” used contraception (Table 3). Within all demographic categories, there were statistically significant variations in the consistency of contraceptive use (Table 4). The percentages of women who “always” used a contraceptive method decrease with increasing age.

Although 74% of women aged 15 to 19 “always” used a method of contraception, only 33% of women aged 40 and over “always” used contraception. Prince Edward Island and Newfoundland and Labrador had the highest rates of

“never” using contraception (71% and 59%). Urban women and women who had at least some college or university education were more likely to “always” use contraception than their rural counterparts or women with high school education or less. Women who were in common-law relationships or who were married were less likely to use contraception consistently (42.1% always used contraception) than unmarried women (60.3%), and unemployed women were less likely to use contraception (43.6% “always” used contraception) than employed women (52%).

A multivariate logistic regression analysis was performed to identify the demographic factors that were significantly associated with “always” using a contraceptive method (Table 5). Women aged 15 to 19 were 7.5 times more likely to always use contraception than women aged 40 and over (OR 7.5; 95% CI 5.42–10.56), while women aged 20 to 29 years were 4 times more likely (OR 4.28; 95% CI 3.43–5.37) to always use contraception. There were also higher odds of consistent contraceptive use in women who had completed college or university compared with those who had completed only high school or less (OR 2.01; 95% CI 1.61–2.51). The odds of consistent contraceptive use were significantly lower in women who were married or in common-law relationships (OR 0.77; 95% CI 0.63–0.94). The odds of always using a contraceptive method were lower in Alberta (OR 0.72; 95% CI 0.54–0.95) and Newfoundland and Labrador (OR 0.40; 95% CI 0.17–0.89), and higher in Manitoba (OR 1.57; 95% CI 1.04–2.37) than they were in Ontario. Women with annual household incomes over \$100 000 were more likely to always use contraception.

A multivariate logistic regression analysis was also performed to identify demographic factors that were significantly associated with “never” using a contraceptive method (Table 6). Women aged 15 to 19 had lower odds than women aged 40 and over of being contraceptive non-users (OR 0.30; 95% CI 0.02–0.5), as did women aged 20 to 29 (OR 0.09; 95% CI 0.07–0.12), and women aged 30 to 39 (OR 0.40; 95% CI 0.32–0.49). Lower odds of being non-users of contraception were also seen in urban women (OR 0.76; 95% CI 0.61–0.94) and in women who had completed some type of higher education (OR 0.47; 95% CI 0.37–0.60). There were significantly higher odds of never using contraception in PEI (OR 6.60; 95% CI 1.67–31.27) and Newfoundland and Labrador (OR 3.91; 95% CI 1.54–10.14), in women in common-law relationships or who are married (OR 1.98; 95% CI 1.57–2.51), and in women with household incomes under \$100 000.

**Use of Oral Contraceptives**

Women aged 15 to 19 had the highest rate of current OC use (66.6%). Rate of OC use decreased with increasing age to 17.1% in women aged 40 and over (Table 2). Women

**Table 1. Demographic characteristics of respondents (n = 3253)**

Characteristics	n	%
Age, years		
< 20	1408	43.3
20–29	1239	38.1
≥ 30	606	18.6
Residence		
Urban	2434	74.8
Rural	819	25.2
Education		
Secondary school or lower	1102	33.9
Some or completed college/university	1974	60.7
Some or completed postgraduate	177	5.4
Living situation		
Living with family	2573	79.1
Living alone or with roommates	553	17.0
Other living situation	127	3.9
Employment		
Full-time	1346	41.4
Part-time	1229	37.8
Unemployed	678	20.8
Annual household income		
< \$20 000	1027	31.6
\$20 000–\$59 999	1277	39.3
\$60 000–\$99 999	693	21.3
≥ \$100 000	256	7.9
Current relationship status		
Not dating	529	16.3
Casual dating	382	11.7
Steady dating	1355	41.7
Common-law or married	987	30.3
Region		
British Columbia/Alberta	661	20.3
Saskatchewan/Manitoba	249	7.6
Ontario	1284	39.5
Quebec	772	23.7
Atlantic Canada	287	8.8
Language		
English	2515	77.3
French	738	22.7

**Table 2. Methods of contraception currently used by women who had vaginal sexual intercourse in the previous six months, by age (%) (n = 2341)**

Contraceptive method	Age, years				All women
	15–19	20–29	30–39	≥ 40	
Condom	74.3	55.5	48.8	42.5	54.3
Oral contraceptives	66.6	58.3	31.5	17.1	43.7
Withdrawal	17.3	12.0	10.3	8.1	11.6
Male sterilization	0.2	1.4	9.6	19.6	7.4
Female sterilization	0.0	0.7	8.1	16.4	6.0
Rhythm	1.5	2.8	3.0	6.6	3.5
Contraceptive film	1.5	2.1	0.7	6.5	2.7
Natural family planning	1.5	1.3	5.2	2.4	2.5
Injection: DMPA	1.8	3.4	2.6	1.0	2.4
IUD	0.5	1.8	5.8	0.8	2.3
Levonorgestrel IUS	0.5	1.5	2.2	3.8	2.0
Morning after pill	4.4	1.7	1.5	0.0	1.7
Contraceptive patch	1.6	2.3	0.7	0.0	1.2
Hysterectomy	0.0	0.0	2.3	1.7	1.0
Contraceptive sponge	0.2	1.0	0.7	1.0	0.8
Contraceptive ring	0.9	1.2	0.0	0.0	0.6
Female condom	0.4	0.2	0.0	0.8	0.3
Diaphragm	0.3	0.5	0.0	0.0	0.2
Implant	0.0	0.2	0.0	0.0	0.1
Cervical cap	0.2	0.0	0.0	0.0	0.0

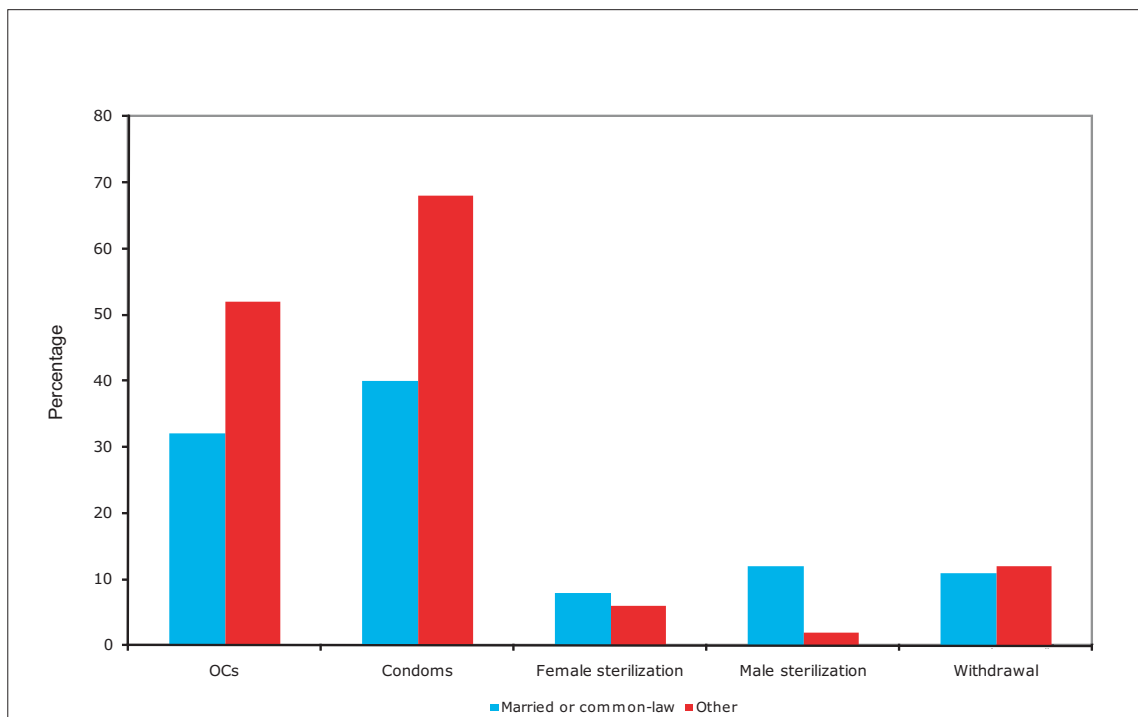
Column totals may exceed 100% as women were allowed to choose more than one method.

Responses were weighted by age and region.

who were married or in common-law relationships had lower rates of current OC use than those who were not (33.2% vs. 53.1%) ( $P < 0.01$ ) (Figure 2). Women with higher education had higher current OC use rate (50.1%) than those with high school education or less (43.2%) ( $P < 0.01$ ). The province of Nova Scotia had the highest rate of current OC use (69.5%), while the province of New Brunswick had the lowest rate (29.3%) ( $P < 0.01$ ) (Figure 3). OC use rates were very similar between urban and rural women ( $P > 0.05$ ). Rates of OC use were higher in women who agreed with positive statements about oral contraceptives and lower among women who agreed with negative statements about OCs. Seventy-two percent of women who “strongly agreed” and 66.1% of those who “agreed” with positive statements about OC were using it as their method of contraception. Women who agreed with positive statements about OC were 4.7 times more likely to use OC than women who disagreed with the positive statements (OR 4.67; 95% CI 3.13–7.22). The rates of OC use were lower in women who “agreed” or “strongly agreed” with negative

statements about the oral contraceptives, with 53.1% and 23.9% respectively using it as their method of contraception (Table 7). The odds of OC use were significantly lower in women who agreed with negative statements about the OC (OR 0.33; 95% CI 0.25–0.44).

A multivariate regression analysis was performed to identify demographic factors that were significantly associated with oral contraceptive use (Table 7). Compared with women aged 40 and older, women aged 15 to 19, 20 to 29, and 30 to 39 years old were 9.7, 5.9, and 2.3 times more likely to use OC, respectively. Women who lived in Nova Scotia were more likely to use OC than those in Ontario (OR 2.68; 95% CI 1.36–5.53). Women with some college education or who had completed college or university had significantly higher odds of OC use than those with high school education or less (OR 1.63 and 1.65). Unemployed women were significantly less likely than women employed full-time to use the OC (OR 0.74; 95% CI 0.56–0.97). There was no significant difference in odds of OC use among categories of annual household income.

**Figure 2. Current contraceptive use among women who had vaginal intercourse in the last six months, by marital status (n = 2341)**

### Use of Condoms

Women aged 15 to 19 years had the highest rate of current condom use (74.3%), while women aged 40 years and older had the lowest rate of condom use (42.5%) ( $P < 0.01$ ) (Table 2). Women who were married or in common-in-law relationships had lower rates of condom use than those who were not (40.2% vs. 66.8%) ( $P < 0.01$ ) (Figure 2). There was no difference in rates of current condom use by employment status, urban or rural residence, or income level. Interestingly, women with high school education or less had higher rates of condom use (60.6%) than those who had some college and/or university education (52.9%) or had completed college and/or university (51.2%) ( $P < 0.01$ ). Rates of condom use were higher in women who “agreed” or “strongly agreed” with positive statements about condoms (Table 8). Seventy-two percent of women who “strongly agreed” with positive statements about condoms were using condoms as their method of contraception, while 61.9% of those who “agreed” with positive statements about condoms were using them. Women who agreed with positive statements about condoms were 1.6 times more likely to use condoms than women who disagreed with the positive statements (OR 1.63; 95% CI 1.15–2.33). The rates of condom use were lower in women who “agreed” or “strongly agreed” with negative statements about condoms, with 52.6% and 43.1% respectively using it as their method of contraception. The odds of condom use were significantly lower in women who agreed

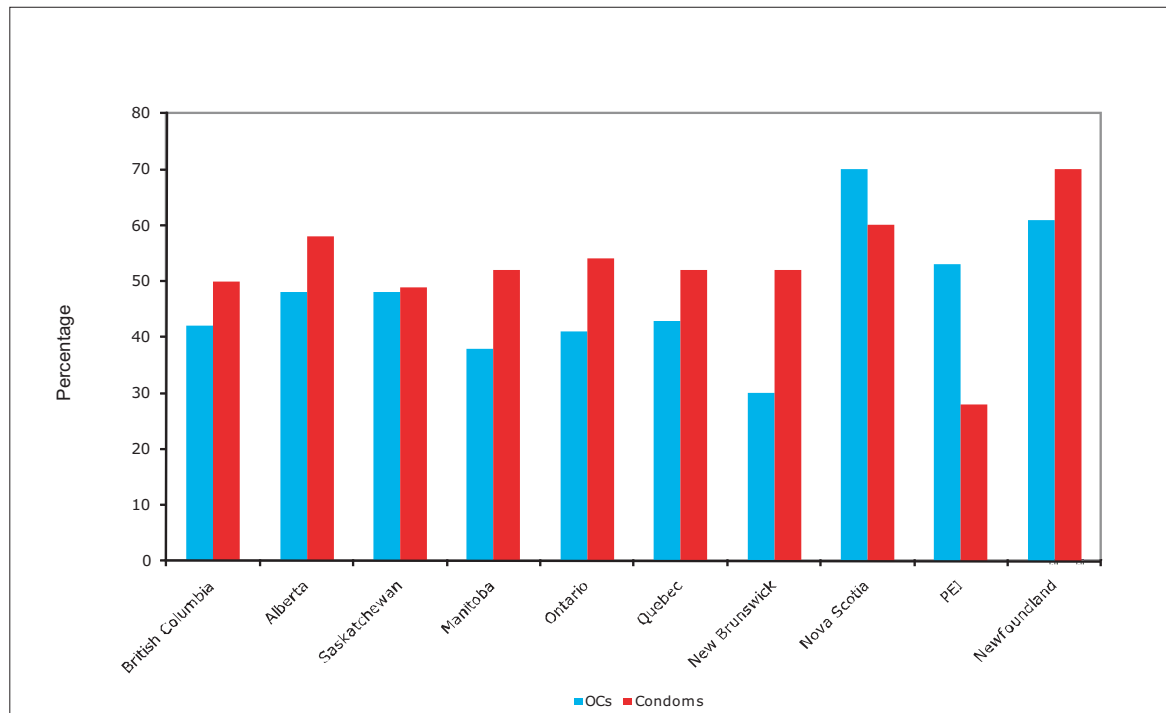
with negative statements about condoms (OR 0.55; 95% CI 0.44–0.68).

A multivariate logistic regression analysis was performed to determine the demographic factors that were significantly associated with condom use (Table 7). Women aged 15 to 19 had higher odds of condom use than women aged 40 and over (OR 2.39; 95% CI 1.64–3.52). There were no statistical differences in odds of condom use among other provinces compared with Ontario. It is noteworthy, but not statistically significant, that the probability of using a condom was 68% less in Prince Edward Island (OR 0.32; 95% CI 0.01–3.09) and 29% more in Newfoundland and Labrador (OR 1.29; 95% CI 0.41–4.93) than in Ontario. Married women or those in common-law relationships were less likely to use condoms than women who were not (OR 0.40; 95% CI 0.31–0.50).

### Use of Intrauterine Devices or Levonorgestrel Intrauterine Systems

Only 4.3% of Canadian women used the IUD or LNG-IUS as their contraceptive method (Table 2). IUD and IUS use was highest in Quebec, where 7.0% of women used this contraceptive method, followed by British Columbia and Alberta (5.8%). IUD/IUS use was lowest in Saskatchewan (1.0%). By age, IUD/IUS use was highest in women aged 30 to 39 (8.0%). Married women had higher rates of IUD/IUS use than single women (6.7% vs. 2.3%), and

**Figure 3. Oral contraceptive and condom use among women who had vaginal intercourse in the last six months, by province (n = 2341)**



**Table 3. Use of contraception among women who had intercourse in the previous six months (n = 2751)**

Use of Contraception	%
Never used	14.9
Sometimes used	9.3
Usually used	10.6
Always used*	65.2

\*Women who had a hysterectomy or were using female or male sterilization were included in the "always used" group.

French-speaking respondents had higher rates of IUD/IUS use (7.2%) than English-speaking respondents (3.5%).

**DISCUSSION**

As found in previous Canadian contraception studies,<sup>3-6</sup> oral contraceptives and condoms continue to be the predominant methods of contraception used by Canadian women. Different methods of contraception may be better suited for women at different stages in their lives. Although in our survey the percentage of women using these contraceptive methods did vary by age, condoms and the OC remained the most commonly used method of contraception among women aged 15 to 39. Only in women over the age of 40 did we find that female or male sterilization was more commonly used than OC. Oral contraceptives and

condoms are both excellent methods of non-permanent contraception with low failure rates with perfect use. Unfortunately, typical-use failure rates are considerably higher than perfect-use failure rates<sup>15-18</sup> because the contraceptive effect of these methods is user-dependent and requires consistent and correct use. Although failure rates with perfect OC use are cited at 0.3%, typical-use failure rates range from 2.4% to 8.7%.<sup>16-18</sup> Condoms, which have perfect-use failure rates of 2%, have typical-use failure rates between 3.3% and 17.4%.<sup>16-18</sup> For this reason, it seems plausible that methods of contraception that demand less stringent adherence might be preferable for many women. However, the results of this survey found very low rates of use of the less compliance-demanding methods of contraception, including DMPA (2.4%), the IUD (2.3%), the contraceptive patch (1.2%), the vaginal contraceptive ring (0.6%), and the LNG-IUS (2.0%).

One of the reasons that the IUD, the contraceptive patch, the vaginal contraceptive ring, and the LNG-IUS are rarely used by Canadian women may be a lack of easy accessibility to these methods. Copper IUDs and the LNG-IUS must be inserted by trained health care providers, who may not be available in some parts of Canada, particularly in remote areas. Moreover, the Common Drug Review, a federal board that advises the provinces on which pharmaceuticals to list on their formulary, has recommended against the inclusion of the contraceptive patch and the vaginal contraceptive ring on provincial drug formularies.<sup>19,20</sup> Therefore,



most Canadian women must pay the total cost of these methods themselves unless they have coverage under a private insurance plan. Furthermore, women may not even have access to these methods in their region because high cost reduces demand, and low demand reduces availability. Likewise the Aboriginal population, which has the highest abortion rates in Canada<sup>21,22</sup> and may derive the greatest benefit from less adherence-demanding methods, does not have universal access to these methods. Although the Non-Insured Health Benefits Program covers OCs, DMPA, and the LNG-IUS,<sup>23</sup> the vaginal contraceptive ring is a limited-use medication,<sup>24</sup> and the contraceptive patch is an exception drug, which may either delay or prevent access to these methods, thus putting Aboriginal women at further risk of unintended pregnancy. Quebec is the only province where the cost of all hormonal contraceptive methods, (including the LNG-IUS, but not copper IUDs), is reimbursed by the provincial drug insurance plan,<sup>25</sup> which may partly explain the higher prevalence of LNG-IUS use in this province than in other Canadian provinces.

In previous studies of contraceptive use in Canada, withdrawal was the third most common active method of contraception and was employed by up to 6% of women.<sup>4</sup> The current survey found that withdrawal was again the third most common method of contraception in Canada, used by 11.6% of women. This is in contrast to rates of withdrawal use in the United States of between 0.3% and 2.7%.<sup>26</sup> Withdrawal is often thought of as an “adolescent” method of contraception. In fact, a study of contraceptive use by US high school students found that the proportion of adolescents using withdrawal decreased from 19% in 1991 to 11% in 2003.<sup>27</sup> In our survey, although the rates of withdrawal use were highest in adolescents (17.3%) and gradually decreased with age, withdrawal was the third most commonly used method of contraception in all age groups up to age 40. Even among women aged 40 and older, it was still used by 8.1% of respondents.

Rates of female and male sterilization continue to decline. In 1984, female sterilization was used by 24% of all women, but its use decreased to 7% in 2002.<sup>3,4</sup> In the current survey, the rate of female sterilization was 6%. The highest rates of female sterilization were seen in women aged 40 and older, 16.4% of whom used this as their method of contraception. In the past, rates of male sterilization had stayed relatively constant at 13%, but in this survey they were much lower at 7.4%. Male sterilization was more common among partners of women over the age of 40 (19.6%). Overall, 20% of women used sterilization as their method of contraception in 2002 versus 13.4% of women in our survey. The trend of declining rates of female sterilization may be attributable to a number of factors, including an increasing mean age at

first childbirth,<sup>28</sup> the recommendation that healthy non-smoking women can continue to take oral contraceptives until menopause,<sup>2</sup> and the recognition that many non-permanent contraceptive methods have a number of non-contraceptive benefits for women as they move through their reproductive years.<sup>2,15,29,30</sup> The opinion of international experts in a recent review of IUDs and the IUS may help to sustain this trend: “Intrauterine contraception provides contraception which is just as effective as, and arguably safer than, female sterilization.”<sup>30</sup>

Unlike previous contraception studies in Canada that had shown a decline in condom use from a high of 25% in 1995 to 18% in 2002,<sup>4</sup> our survey found high rates of condom use by Canadian women and their partners. Of note, in this survey subjects were able to select more than one contraceptive method and thus may have been using condoms along with another method of contraception, not necessarily as their primary contraceptive method. Fifty-four percent of sexually active women who used contraception used condoms, with the highest proportion in the group aged 15 to 19 years, 74.3% of whom used condoms. The group aged 15 to 19 years also had the highest rates of using both condoms and OC (47%). For the prevention of STIs as well as efficacious contraception, this seems reassuring. Latex condoms have been advocated as part of numerous safer sex campaigns to help decrease the risk of acquiring STIs and HIV, and past studies have suggested that the onset of OC use may be associated with the offset of condom use.<sup>31</sup> The highest odds of condom use were in women aged 15 to 19, while the lowest odds of condom use were in older women and in women who were married or in common-law relationships. Lower odds of condom use among older women have also been reported in other studies.<sup>32–35</sup> The lower odds of condom use among women who are married or in common-law relationships may reflect the fact that they are in stable, monogamous relationships where STI prevention is not of great concern and other methods of contraception may be used. Although low rates of condom use among women in Quebec have been reported in a survey of Quebec adolescents,<sup>36</sup> our analysis did not find odds of condom use in Quebec to be lower than in Ontario. Fewer women who had completed part or all of a college education used condoms than did women who had completed high school or less. This may echo the findings of MacDonald et al., that the onset of another contraceptive method resulted in cessation of condom use.<sup>31</sup> However, on multivariate regression analysis, the odds of condoms use did not differ significantly by women’s educational level.

As mentioned, the group aged 15 to 19 years had the highest rates of both condom and OC use (47%). The survey did not specifically address the question of dual protection;

**Table 4. Consistency of contraception use among Canadian women who had vaginal sexual intercourse in the previous six months, 2006 (n = 2341)**

Demographic factors	Contraceptive use (%)				P
	Never	Sometimes	Usually	Always	
Age, years					< 0.01
15–19	4.0	9.4	12.4	74.2	
20–29	11.0	8.6	12.1	68.3	
30–39	35.7	13.2	6.2	44.9	
≥ 40	59.7	4.6	2.7	33.0	
Province					< 0.05
British Columbia	28.8	10.5	5.9	54.9	
Alberta	38.0	10.3	7.5	44.3	
Saskatchewan	30.6	15.4	7.4	46.7	
Manitoba	32.8	5.1	6.0	56.1	
Ontario	33.5	8.3	7.0	51.2	
Quebec	35.0	6.8	8.4	49.8	
New Brunswick	40.6	7.6	8.5	43.3	
Nova Scotia	41.0	7.3	3.0	48.8	
PEI	71.2	0.0	5.3	23.5	
Newfoundland and Labrador	58.5	4.1	6.4	31.1	
Residence					< 0.01
Urban	32.1	8.4	7.6	51.9	
Rural	41.7	8.0	5.9	44.4	
Marital status					< 0.01
Common-law or married	46.0	7.4	4.5	42.1	
Others	19.5	9.6	10.6	60.3	
Education					< 0.01
High school education or less	41.0	9.0	5.9	44.1	
Some college/university	33.1	9.1	8.6	49.3	
Completed college/university	30.9	7.2	6.9	55.0	
Employment					< 0.01
Full-time	34.4	7.6	6.0	52.0	
Part-time	27.9	9.2	10.3	52.6	
Unemployed	41.7	8.7	6.0	43.6	
Annual household income, \$					< 0.01
< 20 000	27.5	9.9	9.3	53.3	
20 000–59 999	36.2	6.9	8.1	48.8	
60 000–99 999	38.8	9.4	5.3	46.5	
≥ 100 000	31.2	8.4	3.3	57.2	

however, subjects who stated they were using *both* OC and condoms likely practised dual protection at some point. Although self-selected, this adolescent population in our survey shows that dual protection may be achieved in certain subgroups. Using six youth risk behaviour surveys conducted between 1991 and 2001 among nationally representative samples of students in grades 9 to 12, Anderson et al.

observed a trend of increasing dual protection use among American adolescents, from 3.2% in 1991 to 7.2% in 2001.<sup>37</sup> In Australia, the 2005 Wave 5 of the nationwide Household Income and Labour Dynamics survey found that 11% of women aged 18 to 44 years and 20.9% of women aged 18 to 24 years used dual protection (oral contraceptive and condom).<sup>38</sup> Studies have shown that

**Table 5. Determinants of “always use” of a contraceptive method, 2006 (n = 2751)**

Demographic Factors	Number of subjects	aOR	95% CI
<b>Age, years</b>			
15–19	1175	7.53	5.42–10.56
20–29	1075	4.28	3.43–5.37
30–39	206	1.54	1.25–1.90
≥ 40	295	reference	reference
<b>Province</b>			
British Columbia	280	1.23	0.93–1.62
Alberta	285	0.72	0.54–0.95
Saskatchewan	93	0.82	0.49–1.37
Manitoba	112	1.57	1.04–2.37
Ontario	1067	reference	reference
Quebec	669	1.00	0.80–1.23
New Brunswick	69	0.89	0.53–1.49
Nova Scotia	120	0.93	0.56–1.54
PEI	11	0.30	0.06–1.12
Newfoundland and Labrador	45	0.40	0.17–0.89
<b>Residence</b>			
Urban	2051	1.20	0.99–1.46
Rural	700	reference	reference
<b>Marital status</b>			
Common-law or married	898	0.77	0.63–0.94
Others	1853	reference	reference
<b>Education</b>			
High school or less	915	reference	reference
Some college/university	1145	1.18	0.94–1.48
completed college or more	691	2.01	1.61–2.51
<b>Employment</b>			
Full-time	1171	reference	reference
Part-time	1015	0.81	0.66–1.00
Unemployed	565	0.85	0.69–1.04
<b>Annual household income, \$</b>			
< 20 000	846	0.52	0.36–0.73
20 000–59 999	1086	0.58	0.43–0.78
60 000–99 999	598	0.57	0.42–0.77
≥ 100 000	221	reference	reference

consistency of condom use was lower among oral contraceptive users<sup>31,39</sup> and that adoption of methods such as tubal sterilization, injected contraceptives, and contraceptive implants reduced subsequent condom use.<sup>40</sup> A recent study of patterns of oral contraceptive and condom use found that among adolescents who were stable OC users, only 45% of coital events were protected by both OC and condoms,<sup>41</sup> leading the researchers to the conclusion that dual protection in this population remained an elusive goal.

Preventing unintended pregnancies and STIs are key public health priorities. However, meeting this dual objective poses major challenges for women and couples. As previously noted,<sup>40</sup> further research is necessary to understand which strategy will best prevent both unintended pregnancy and STI. Meanwhile, the use of condoms in combination with another contraceptive method at each act of sexual intercourse (dual protection) may help to reduce the rates of

**Table 6. Determinants of “never use” of a contraceptive method, 2006 (n = 2751)**

Demographic factors	Adjusted OR	95% CI
<b>Age, years</b>		
15–19	0.30	0.02–0.05
20–29	0.09	0.07–0.12
30–39	0.40	0.32–0.49
≥ 40	reference	reference
<b>Province</b>		
British Columbia	0.80	0.58–1.09
Alberta	1.30	0.95–1.78
Saskatchewan	0.92	0.50–1.67
Manitoba	0.77	0.48–1.21
Ontario	reference	reference
Quebec	1.07	0.84–1.36
New Brunswick	1.11	0.63–1.95
Nova Scotia	1.48	0.83–2.65
PEI	6.60	1.67–31.27
Newfoundland and Labrador	3.91	1.54–10.14
<b>Residence</b>		
Urban	0.76	0.61–0.94
Rural	reference	reference
<b>Marital status</b>		
Common-law or married	1.98	1.57–2.51
Others	reference	reference
<b>Education</b>		
High school or less	reference	reference
Some college/university	0.79	0.62–1.02
Completed college or more	0.47	0.37–0.60
<b>Employment</b>		
Full-time	reference	reference
Part-time	0.96	0.75–1.22
Unemployed	1.11	0.88–1.40
<b>Annual household income, \$</b>		
< 20 000	2.19	1.44–3.33
20 000–59 999	1.88	1.35–2.63
60 000–99 999	1.78	1.28–2.50
≥ 100 000	reference	reference

unplanned pregnancies and of STIs in both women and men.

Previous studies have found that non-users of contraception in the United States tend to be more than 40 years of age, less educated, uninsured, and have intercourse infrequently.<sup>42,43</sup> These studies also found that approximately 80% of women were consistent contraception users, while 11% to 15% were inconsistent users and 8% to 10% were non-users.<sup>42,43</sup> Although women included in our analysis were not trying to conceive, only 65.2% “always” used a method of contraception. In our study, Canadian rates of inconsistent use or non-use of contraception were higher than those found in US studies. Twenty percent of our respondents were inconsistent users (“sometimes” or “usually”), while 15% “never” used contraception. As in other studies,<sup>42,43</sup> we found significantly higher odds of no use of contraception in women who were over age 40 and who had less than a college education. In contrast, adolescents in our survey had the highest rates of always using contraception and the lowest rates of never using contraception. The fact that women over the age of 40 have been identified as more likely to be non-users of contraception may be related to a lower self-perceived risk of pregnancy. Although the contraceptive practices of adolescents have been of interest to researchers, it is also important to understand the beliefs and attitudes of older women, who may have a relatively lower risk of pregnancy but who are still at risk for an unintended pregnancy. We also found significantly lower odds of “always” using contraception among women in married or common-law relationships and those with household incomes under \$100 000. Interventions focused on “never” and inconsistent users could have a significant impact on public health concerns such as rates of unintended pregnancies and abortion.

Because of differences in methodology (sampling, recruitment, item wording) and respondent demographics, direct comparisons of our study with the results of previous Canadian contraception studies may not accurately reflect changes and trends in the contraceptive behaviour of Canadian women. Our survey was delivered over the Internet, while previous Canadian contraception studies were mailed through Canada Post. Women who respond to Internet surveys may be inherently different to women who participate in face-to-face or postal mail surveys. Moreover, even though our study was weighted for age, the fact that a significant percentage (43.3%) of our respondents was under the age of 20 may make comparisons with previous Canadian contraception studies difficult. In addition, the denominator used to determine rates of contraceptive use in the current survey was not comparable to that used in previous Canadian contraception studies, which included

women who had ever had intercourse, women who were trying to conceive or who were pregnant at the time of the survey, and women who didn't use contraception, all of whom were excluded from this study. Also, in this survey women were able to select more than one method of contraception, thus making it difficult to determine their primary method of contraception when more than one was chosen.

Another limitation of our study was selection bias. Women were self-selected both by their willingness to participate in general market research and by their comfort in responding to this particular survey. This bias was partly reduced by weighting the sample according to age and regional distributions of the Canadian population.<sup>14</sup> Although normative data will always be skewed by self-selection, relationships among demographics, attitudes, and contraceptive use are less likely to be so affected. Other biases may be related to recall, reporting, or social desirability. Women may have difficulties recalling which method they used or how, or they may want to make themselves appear to have been better contraceptive users than they really were. Data comparing self-reported contraceptive pill-taking with an electronic device measuring compliance has shown that the electronic data recorded substantially more episodes of missed pills than women reported.<sup>44</sup> Although pilot tested, the validation of this questionnaire was minimal, which may have led to response errors by participants who may not have correctly interpreted the questions. Finally, as quantitative research, this study may be lacking several subtleties that could have been identified with a qualitative approach.

**CONCLUSION**

Despite the fact that a number of contraceptive options are available in Canada, Canadian women continue to use a narrow range of contraceptive methods and to use contraception inconsistently. Consistent contraceptive use is influenced by a number of independent social variables. Future public health initiatives in Canada should focus on raising awareness of all options for contraception, promoting dual protection, increasing access to a variety of contraceptive methods, and assisting Canadians in maximizing their contraceptive adherence.

**ACKNOWLEDGEMENTS**

The Society of Obstetricians and Gynaecologists of Canada's Contraception Awareness Program provided financial support for this research.

The authors would like to acknowledge the contributions of Heather Mains of Duegood and Carolyn Peters and Laurie Mah of Youthography Inc., who assisted with survey

**Table 7. Oral contraceptive use in women who agreed with positive or negative statements about oral contraceptives**

	Percentage who used OCs
Positive statements about OCs	
Strongly agreed	72.0
Agreed	66.1
Negative statements about OCs	
Strongly agreed	23.9
Agreed	53.1

**Table 8. Condom use in women who agreed with positive or negative statements about condoms**

	Percentage who used condoms
Positive statements about condoms	
Strongly agreed	71.5
Agreed	61.9
Negative statements about condoms	
Strongly agreed	43.1
Agreed	52.6

design, fielded the survey, and were responsible for compiling and cleaning the data.

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