UBC **CSHS**
Canadian Sexual Health Survey

British Columbia
2015 Sexual Health Indicators

Rates and determinants among 14 to 49 year old females

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Prepared by the Contraception Access Research Team

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Executive Summary

The Canadian Sexual Health Survey (CSHS) was designed to determine a series of indicators not currently collected in Canada. Developed nations throughout the world monitor indicators of reproductive (pregnancy) intention, unmet need for contraception, contraception method use prevalence and the intention among pregnancies that have occurred. Women able to time and space their pregnancies provide better care for the health of their family, are more likely to complete their own education; and their children are more likely to experience food security, have adequate shelter and to graduate from high school. Families able to achieve their reproductive plan provide a strong foundation for healthy child development and contribute to positive change in society through a spectrum of social, educational, workforce and family health benefits. Canada needs to collect similar reproductive health indicators to inform policies such as public subsidy of contraception, and to determine cost-effectiveness and the effect on health equity and outcomes.

We conducted the CSHS to determine sexual health behaviours, pregnancy intention, the prevalence of use of contraceptives and correlation with pregnancy outcomes, sexual behaviours and socio demographic and geographic determinants of health and health equity, among a representative sample of British Columbian females age 14-49 years.

This personal interview household survey collected data from December 2014 to October 2015 in all geographic health regions in BC. Among eligible females approached 75.3% participated. Education, income levels and self-identified cultural heritage among respondents are reflective of the general BC female population.

Mean age at first intercourse among those who had ever had vaginal intercourse was 18.2 years (SD 4.2), with 2.2% of females reporting first intercourse prior to first menstrual period, and 81% reporting vaginal intercourse within the past year. Nearly 20% of females approaching menopause reported ever having a sexually transmitted infection (STI), and overall 1.6% of females reported an STI within the past year.

Nearly **90% of respondents currently wished to avoid pregnancy.** We found 63% of respondents are "At Risk for Unintended Pregnancy" (ARUP) using a standard definition that combines fertility, intention and sexual activity responses. Among females who had a **pregnancy within the past five years, 40% of pregnancies were unintended** at the time of conception, with 57% of unintended pregnancies resulting in birth, and **a third of births overall reported as unintended.**

Among those ARUP, **only 14% indicated use of highly effective** intrauterine contraceptives, while 21% used other hormonal methods, and **over half (56%) of females not using permanent methods reported using a method with higher than 10% pregnancy rates per year, or no method.** For example, 26% used condoms as their most effective method, and 9% used withdrawal. Generally, 8% of females ARUP used no method at last intercourse, with a range of 5-8% among those younger than 30 years. Use of the most effective methods at last intercourse correlated with higher income, education beyond high school, older age, with **higher income as the most significant determinant of effective contraception use** in multivariate analyses.

Figure 1. Pregnancy intention and pregnancy outcome, among British Columbian females age 14-45 for the most recent pregnancy within the last five years, 2015
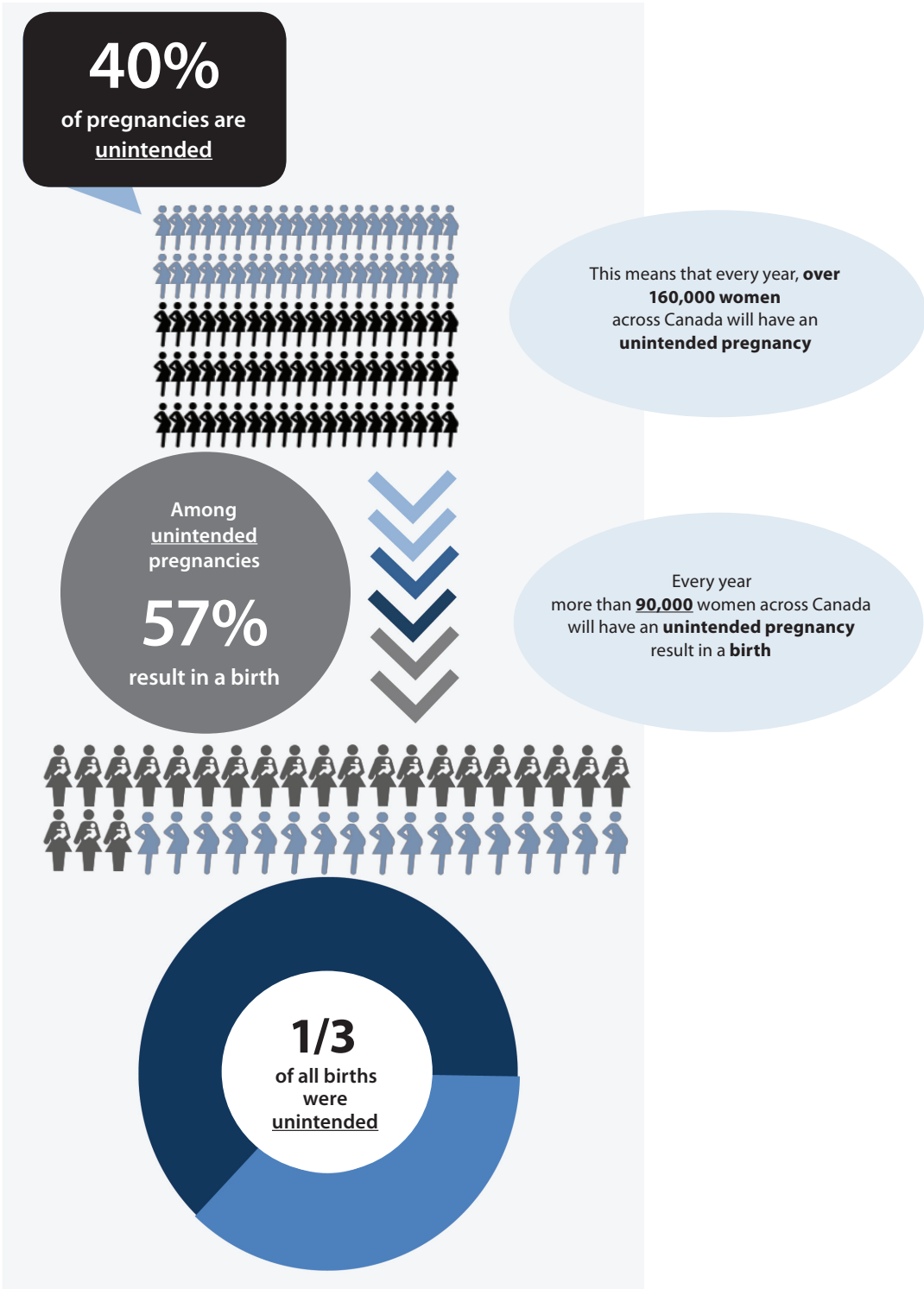
40%
of pregnancies are <u>unintended</u>

This means that every year, **over 160,000 women** across Canada will have an **unintended pregnancy**

Among <u>unintended</u> pregnancies

57%
result in a birth

Every year more than **90,000** women across Canada will have an **unintended pregnancy** result in a **birth**

1/3
of all births were <u>unintended</u>

The Canadian Sexual Health Survey 2015

Aim

Health Policy and health system decision makers require reliable evidence and key population health indicators to support development of strategies to improve health and health equity for the population.

Extensive evidence supports the consideration of universal subsidy for contraception as a policy that can improve health and health equity.[1-3] Universal contraception subsidy (i.e., subsidy of all or part of the cost of contraception, or of certain contraceptives, for all females of reproductive age) is a policy currently in place in the UK, Australia, New Zealand, the USA, and in more than 11 EU countries.[1,4,5] In these and other countries around the world, governments are regularly provided with information about population-level trends on indicators of pregnancy intention, unmet need for contraception and contraception method prevalence among reproductive age populations.[6-10] Neither BC, nor Canada has monitored these indicators among females throughout the reproductive age range.

The Canadian Sexual Health Survey (CSHS) systematically assessed these important indicators among a representative sample of British Columbian females age 14-49 years in 2015. These indicators will assist policy makers to assess the performance of existing policies and programs and their impact on health equity, while also enabling decision makers to more accurately forecast possible savings accrued through the prevention of unintended pregnancies.

Partners and Collaborators

Methods

The Canadian Sexual Health Survey (CSHS) was developed using questions from similar validated surveys in use in the USA, UK, France, Ireland and Australia.[6-10] Questions on demographics and social determinants of health were included from the Canadian Community Health Survey 2012. The questions were adapted for Canadian relevance when needed, with iterative focus group and individual interview testing among populations in Vancouver, Richmond, Surrey, and Kelowna. Final questionnaires were reviewed for face validity, relevance and readability by an interdisciplinary panel of experts, then pilot tested among over 400 respondents through two iterations. Reliability testing using test-retest samples was conducted among over 100 respondents.

Surveys were translated (and back translated) into Punjabi and traditional Chinese characters, with focus group testing and revisions until cultural relevance and competence was acceptable to native speakers in the respective languages. Language specific surveys were conducted by trained surveyors who were also native speakers of the relevant language.

Final surveys were conducted as door-to-door "computer assisted personal interviews" (CAPI), including a set of confidential "audio-assisted computer self-entry interview" (ACASI) questions, among a random sample of 5 Local Health Areas (LHA) among each geographic Health Authority in BC. All interviews were conducted by trained female health care professionals (nurses, midwives, doctors, or social workers). An initial pilot launch was conducted in Aug 2014. The full-scale survey was conducted from Dec 2014 to Oct 2015.

Surveyors recorded the addresses for all residences within a selected postal code and delivered introduction letters to each residence 7 to 10 days prior to attempting the interview. Contact to determine if an eligible participant lived at that address and to conduct the interview if they consented to participate was attempted as often necessary or limited at seven attempts for each residence location.

Sample, Weighting

The survey sample was constrained to sample equal numbers of participants from all sampled LHAs, thus oversampling for rural areas but ensuring representation of all BC regions.

Similarly, the knowledge users on the team advised oversampling among females under age 30 years. Thus, for females in each five-year age group in each LHA between age 14 and 29 twice the proportion of females in that group in the

LHA was sampled, and half of the proportion of females in five-year age groups from 30-49 from each LHA was sampled. Recognizing the correspondence of pregnancy to sex rather than gender, we will use the term female throughout this report, rather than women or girls.

This analysis has been weighted to reflect proportional responses from the number of women in each five-year age group in each health authority in the population of BC in 2015. To compensate for the "healthy volunteer" effect that may hinder capture of those with lower incomes and potentially facing more challenging social determinants of health we oversampled among lower income areas. Our sampling was conducted by postal codes (or in rural areas by dissemination), oversampling in a two to one ratio among postal codes below the mean annual income in that LHA, compared to postal codes with a mean income above that for the LHA.

Eligibility Criteria

Eligibility criteria included:

- Resident of British Columbia
- Age 14 to 49 years old and biologically female at birth
- Able to consent (and for minors to have a parent consent and for the minor to assent)
- Able to understand English, Punjabi or written traditional Chinese characters or spoken Mandarin or Cantonese.

Exclusion criteria:

- Only one eligible person per household would be offered participation

Response Rate

We calculated a rate of completed surveys among all eligible participants encountered at home by our surveyors, within each LHA and throughout the province. Overall among eligible females offered an opportunity to participate, 75.3% completed a survey. This completion rate for urban LHAs was lower (69.5%), than for rural LHAs (80.1%).

Research Team

The conduct of this research would not have been possible without the expertise, guidance and active involvement of an engaged and dedicated group of public health, policy and health system leaders, academic researchers in a wide range of disciplines, staff, trainees and students. [Appendix 2]

Demographics of Respondents

Region of Residence

Overall 1671 completed surveys were collected. Roughly equal numbers of surveys were collected from each regional health authority, with the distribution of responses in five-year age ranges reflective of the age distribution of females in that health authority. Table 1 represents the number of completed surveys by five-year age group among each regional health authority weighted to reflect the 2015 proportion of the BC population of females of that five-year age range in that regional health authority (RHA).

Education

The survey respondents reported just over a quarter overall were still in school, including all age 14 and nearly four out of five, 79%, of those age 15-19, as expected. Interestingly about one in ten females aged 30-49 years reported being currently enrolled in school, college or university.

Overall 31% had a university degree or higher, with about one in ten or fewer among females age 20 through 49 reporting less than high school graduation as their highest level of education. This correlates well with latest reports that 89% of females in BC graduate high school, 97% of these prior to age 25 years.[11]

Table 1. Region of Residence

Number of responses by 5-year age group and regional health authority									
Weighted responses									
	AGE (YEARS)								
RHA	**14**	**15-19**	**20-24**	**25-29**	**30-34**	**35-39**	**40-44**	**45-49**	**Total**
VCH	7.7	46.0	63.0	74.9	71.2	61.2	62.6	67.5	**454.2**
FHA	14.1	82.8	90.4	87.2	94.0	91.2	93.2	96.2	**649.2**
VIHA	5.0	30.4	35.4	33.2	35.6	33.6	34.1	36.7	**244.0**
IHA	5.3	30.5	30.5	28.6	32.0	31.1	32.7	35.7	**226.3**
NHA	2.5	13.3	13.6	13.5	14.2	13.2	13.2	13.8	**97.3**
BC	**34.7**	**202.9**	**232.8**	**237.4**	**247.0**	**230.5**	**235.8**	**250.0**	**1671**

Income

Mean annual household income before taxes was reported by 90% of respondents. Non-respondents appear to be more likely to represent lower income categories, as most non-respondents to income questions were under 20, or over 20 and still in education or not reporting current employment.

Our estimated mean household income at $75,000 (SD 50,000), without compensation for our non-responders potentially biased toward among lower income participants, appears to be well aligned with the overall estimates for BC. We were unable to find 2015 income data for comparison. Data from Statistics Canada for 2013 annual household income for BC indicates a median of $60,000 with a median for "economic families" of $83,700 and for those "not in an economic family" of $31,500.[12]

Self-identification as First Nations or Aboriginal

Our survey respondents reported 4.4% overall self-identify as a North American First Nations, Aboriginal, Metis or Inuit person as their sole cultural identity, with 8.0% indicating this identity along with one or more other cultural identities. This is well aligned with the proportion of those with First Nations and Aboriginal Status as estimated among females age 15-49 in BC at 5.7%.[13,14]

Table 2: Education, Income and Aboriginal self-report

Demographic indicators of Education, Income and
self-identified Aboriginal status among females
age 14-49 years in BC, 2015

VARIABLE		TOTAL	AGE (YEARS)							
			14	15-19	20-24	25-29	30-34	35-39	40-44	45-49
(Weighted) N		1671	34.7	202.9	232.8	237.4	247.0	230.5	235.8	250.0
Highest Level of Completed Education (%)	Still in High school	8.5	100.0	50.4	1.8	–	–	–	–	–
	Completed High School or less	26.3	–	44.0	55.0	23.4	20.1	19.1	13.5	16.5
	More than High School	65.3	–	5.6	43.3	76.6	79.9	80.9	86.5	83.5
Currently in school (%)	Yes	26.6	100.0	79.0	43.5	20.5	8.3	10.3	11.1	11.0
Neighbourhood income (%) See note ##	High Income	32.7	20.4	36.6	24.2	29.4	29.0	30.7	33.7	47.0
	Low Income	67.3	79.6	63.4	75.8	70.7	71.0	69.3	66.3	53.0
Household Income, Mean (SD) In $ "000"s	See note **	75 (50)	81 (53)	67 (37)	52 (35)	61 (32)	79 (61)	81 (69)	89 (61)	93 (71)
Household Income in relation to "Poverty Line" of $30,000 (%)	Above	79.7	96.0	74.4	61.0	75.0	84.6	78.9	86.6	90.5
	Below	20.3	4.0	25.6	39.0	25.0	15.4	21.1	13.4	9.5
Self-identify as an Aboriginal Person (%)	Exclusive cultural identity	4.4	11.4	5.7	7.9	3.8	2.6	4.0	3.0	2.8
	As one among 2 or more cultural identities	8.0	25.4	9.8	13.1	7.5	3.6	7.9	5.2	6.7

NOTES:

Note that purposive oversampling was undertaken in each LHA to sample households in twice as many postal code areas with a mean household income for the postal code that was under the mean for the LHA, as those over the mean for the LHA. This analysis of the weighted results accounting for the proportion of urban vs rural and LHA specific females in five-year age ranges, has not adjusted for this designed oversampling.

** Note that missing income was most common under 24 or still in school, so values likely overestimate actual mean income.

Sexual Orientation and Sex of Partner Experiences

Context for Options on Sexual Orientation Questions

During 2008-2010 question development, piloting and testing we assembled sexual orientation questions from a number of international instruments, and pilot tested category name options in a wide range of BC urban populations. All categories suggested by pilot program participants were offered including: Heterosexual or straight, Homosexual, gay, or lesbian, Bisexual, Two-spirit, Queer, Asexual, Not yet sure, Don't know, and Refused. For this analysis we have combined options to report the categories currently used in the Canadian Community Health Survey: Heterosexual (sexual relations with people of the opposite sex), Homosexual, that is lesbian or gay (sexual relations with people of your own sex), Bisexual (sexual relations with people of both sexes). We have created categories, "Other/Asexual" and "Non-Respondent/ Don't Know", to capture responses that do not fit into those found in the CCHS, see Table 3.

Table 3: Categories for reporting sexual orientation

CSHS SEXUAL ORIENTATION CATEGORY	CCHS 2015 SEXUAL ORIENTATION CATEGORY	FINAL CATEGORY
Heterosexual or straight	Heterosexual (sexual relations with people of the opposite sex)	Hetero sexual or Straight
Homosexual, gay, or lesbian	Homosexual, that is lesbian or gay (sexual relations with people of your own sex)	Homosexual, Gay, Lesbian, Queer, or Two-spirit
Two-spirit	-	Homosexual, Gay, Lesbian, Queer, or Two-spirit
Queer	-	Homosexual, Gay, Lesbian, Queer, or Two-spirit
Bisexual	Bisexual (sexual relations with people of both sexes)	Bisexual
Asexual	-	Other/Asexual
Not listed	-	Other/Asexual
Not yet sure	-	Other/Asexual
Don't know	Don't know	Non-Respondent/Don't Know
Refused	Refused	Non-Respondent/Don't Know

Sexual Orientation

The majority of all respondents self-identified as heterosexual (91.5%) with a consistent portion, 6.7%, self-identifying as bisexual or lesbian across all age groups. Our finding that 1.7% overall among females self-identified as lesbian is very analogous to the findings of the 2015 Canadian Community Health Survey percentage of Canadians aged 18 to 59 who reported in 2014 that they consider themselves to be homosexual (gay or lesbian). [1]

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1   (http://www.statcan.gc.ca/eng/dai/smr08/2015/smr08_203_2015#a3)

Table 4: Sexual Orientation

Self-reported sexual orientation among BC females age 14-49 years, by five-year age group, 2015

		AGE (YEARS)							
	Total	14	15-19	20-24	25-29	30-34	35-39	40-44	45-49
(Weighted) n	1671	34.7	202.9	232.8	237.4	247.0	230.4	235.8	250.0
Heterosexual or Straight (%)	91.5	65.3	87.0	84.0	90.2	92.7	96.3	96.0	97.3
Homosexual, Gay, Lesbian, Queer, or Two-spirit (%)	1.7	-	1.4	3.2	1.0	0.6	1.2	-	0.2
Bisexual (%)	5.0	28.0	6.5	7.2	7.2	4.6	2.5	1.9	2.5
Other/Asexual (%)	1.4	-	1.2	3.3	0.9	1.4	-	-	-
Non-RespondentDon't Know (%)	0.3	6.7	3.8	2.3	0.6	0.8	-	2.0	-

Figure 2: Sexual Orientation

Self-reported sexual orientation among BC females age 14-49 years by reported orientation, 2015
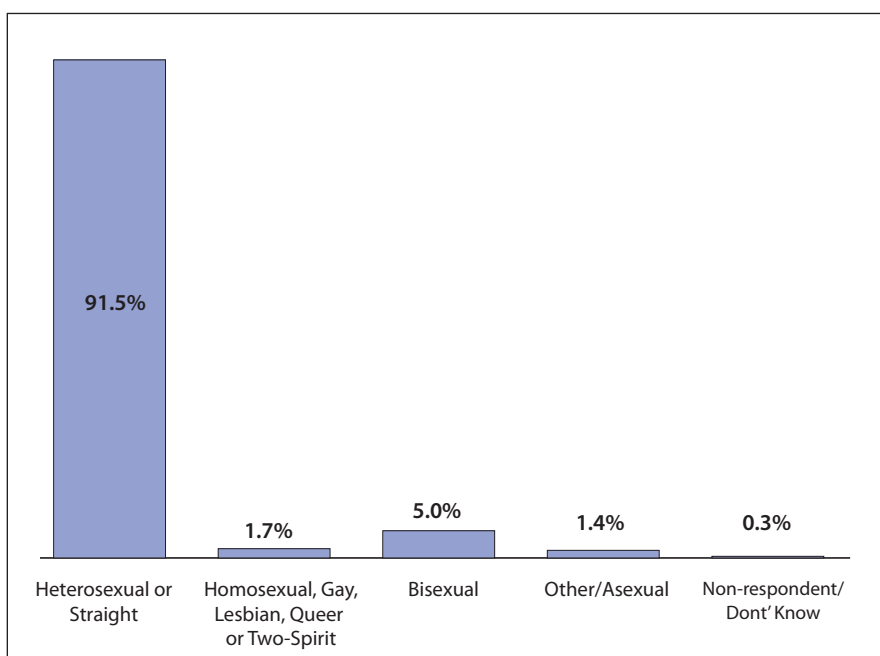
Table 5: Sexual Partners

Self-reported sex of partners among BC females age 14-49 years, by percent among five-year age group, 2015

		AGE (YEARS)							
	Total	**14**	**15-19**	**20-24**	**25-29**	**30-34**	**35-39**	**40-44**	**45-49**
(Weighted) n	**1671**	34.7	202.9	232.8	237.4	247.0	230.4	235.8	250.0
Only with males, never with females (%)	**73.4**	23.4	68.9	60.7	62.6	73.4	80.2	77.0	84.8
More often with males, and at least once with a female (%)	**24.2**	76.6	27.9	31.3	34.4	25.8	17.3	21.8	15.0
About equally often with males and females (%)	**1.3**	–	1.3	4.0	1.7	0.2	1.3	1.2	–
More often with females and at least once with a male (%)	**0.9**	–	1.7	3.9	0.8	0.6	–	–	0.2
Only with females, never with males (%)	**0.3**	–	0.2	–	0.4	–	1.2	–	–
Don't Know (%)	**0.0**	–	–	–	0.1	–	–	–	–

Figure 3: Sexual Partners

Self-reported sex of partners among BC females age 14-49 years, by partner sex, 2015

Reported Sex of Partners

Among British Columbian responding females who had ever had sexual intercourse (including vaginal, oral and anal sex) 73.4% of respondents reported only having sexual intercourse with males and never with females.
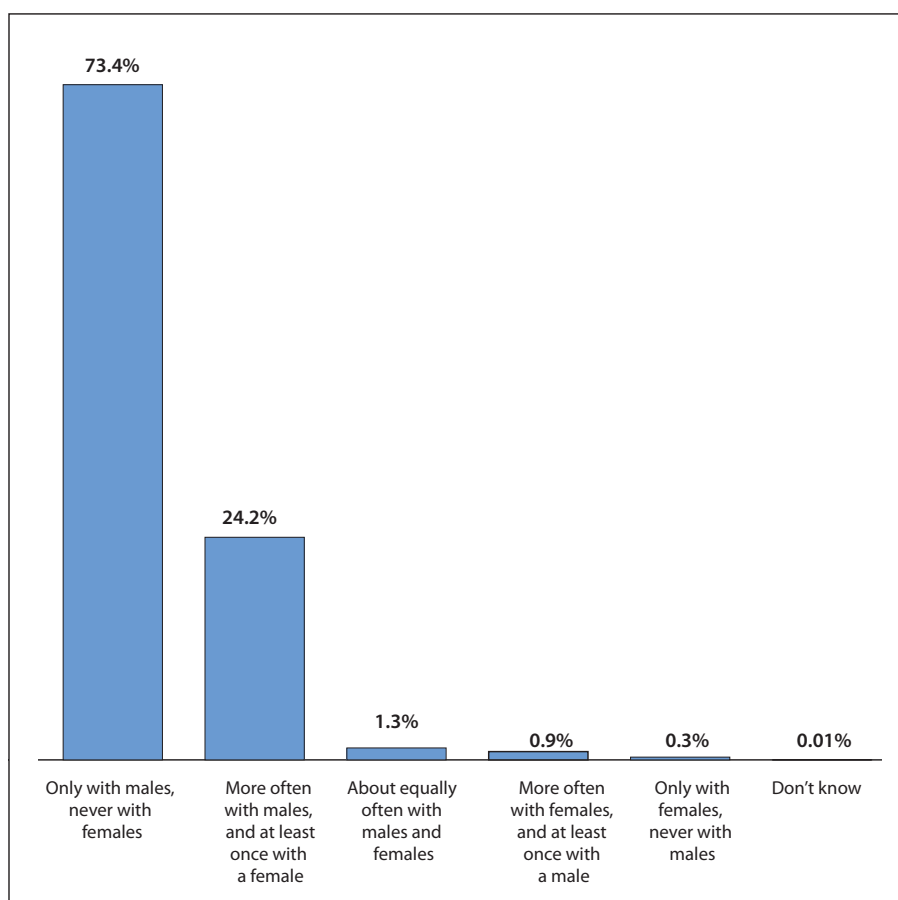
Sexual Activity

Vaginal Intercourse and Other Sexual Activity

The vast majority (88%) of respondents reported ever experiencing sexual intercourse (including vaginal, oral and anal sex); 81% reported vaginal intercourse within the past year (See Table 6). Nearly all (94%) of respondents reported having had some sexual experience during their lifetime (i.e., "any kind of contact with another person that you felt was sexual, such as kissing, touching, intercourse or any other form of sex").

Age at First Vaginal Intercourse

Mean age at first intercourse among those who had ever had vaginal intercourse was 18.2(SD 4.2) years, with 2.2% of females reporting first vaginal intercourse prior to first menstrual period.

Number of Sexual Partners

Among British Columbian responding females who had ever had sexual intercourse (including vaginal, oral and anal sex)

respondents reported a mean of 10.5 (SD 23.3) partners with whom they had sexual intercourse over their lifetime. This number was relatively stable in all respondents age 20 or more years. Roughly half of those aged 15 to 19 years and fewer than 2 percent of those age 14 years reported any prior experience of sexual intercourse. However, respondents with this experience reported 6 (for 14 year olds) and 5 (for 15-19 year olds) lifetime partners.

History of Sexually Transmitted Infection

Overall 15.6% of females reported ever being told by a health care provider that they had a sexually transmitted infection (STI), including 14% of those 20-24, with a lifetime cumulative incidence among those age over 30 approaching 20%. Occurrence of an STI within the past year was reported by 1.6% of females, with little variation between five-year age groups.

Table 6: Sexual Activity and Experiences

Indicators of Sexual Activity and Experiences among BC females age 14-49, 2015

			AGE (YEARS)							
		Total	14	15-19	20-24	25-29	30-34	35-39	40-44	45-49
(Weighted) n		**1671**	34.7	202.9	232.8	237.4	247.0	230.0	235.8	250.0
Ever Sexually Active (%)	Yes	**93.8**	44.2	72.5	90.9	98.4	100.0	100.0	98.6	100.0
Ever Sexual Intercourse (%)	Yes	**87.8**	1.9	47.6	79.9	96.6	98.6	100.0	98.6	99.5
Past Year Vaginal Intercourse (%)	Yes	**81.1**	1.5	41.4	72.0	89.6	94.5	92.3	94.6	88.8
Ever STI (%)	Yes	**15.6**	-	2.8	13.7	16.6	20.2	17.9	19.9	18.4
Within past year STI (%)	Yes	**1.6**	-	1.3	3.7	2.1	1.3	0.6	-	1.9
Age at first intercourse among those who ever had intercourse Mean (SD)		**18.2 (4.2)**	13.7 (0.3)	15.8 (1.2)	16.6 (2.0)	18.2 (2.7)	18.3 (5.0)	19.1 (5.6)	18.3 (5.5)	19.1 (7.7)
First intercourse before first period (%)		**2.2**	-	2.3	2.3	0.9	4.2	0.6	2.4	2.7
Number of lifetime sexual partners Mean (SD)		**10.5 (23.3)**	6.3 (3.5)	4.9 (6.0)	10.0 (12.5)	11.8 (21.1)	9.6 (17.7)	12.9 (47.7)	11.4 (33.1)	9.9 (18.9)
Fertile (%)	Yes	**85.9**	100.0	99.5	99.7	98.3	94.7	81.1	69.4	59.6

Current intention to become pregnant

All participants who were not currently pregnant were asked about their current intention to become pregnant. Overall 88.9% of non-pregnant females age 14-49 years were not currently intending to become pregnant.

This is consistent with the current BC total fertility rate of no more than 1.41.[16] Thus, if BC females intend to have two or fewer pregnancies, then over their roughly 30-year reproductive lifespan we would expect they would spend fewer than three or at most four years attempting to become pregnant which is less than 13% of their reproductive lifespan. This corresponds with our cross-sectional survey response that 89% of females are not currently intending to become pregnant.

Among women and girls age 14 years, 15-19 years, and 20-24 years 99%, 98% and 94% were not currently intending to become pregnant.

This is consistent with the current age at first birth among British Columbians of over thirty years.[17]

At Risk for Unintended Pregnancy

Using standard definitions, we combined responses from a number of questions to create an indicator of the proportion of females that are currently "At Risk for Unintended Pregnancy"(ARUP); females who are sexually active, fertile and not intending to become pregnant. These conditions are required:

- not currently pregnant,
- have not passed menopause,
- have had vaginal sexual intercourse with a male within the past year,
- have not had an operation or surgery causing them personally to become infertile or had proven infertility, (excepting sterilization specifically for contraception) and
- do not currently intend to become pregnant.

Figure 4: Current intention to become pregnant among BC females age 14-49, 2015, Percent
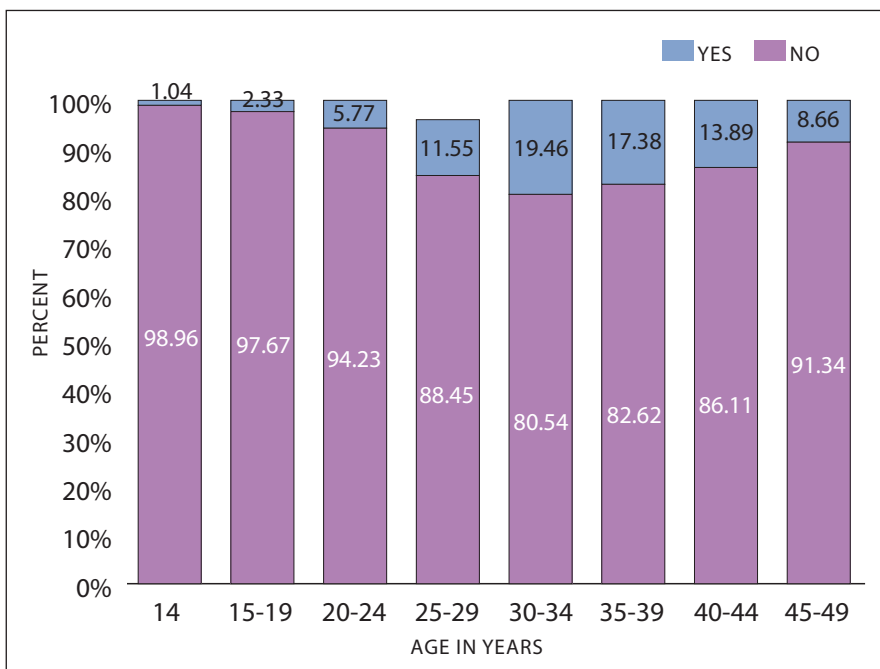
Figure 5: At risk of Unintended Pregnancy (fertile, hetero-sexually active, not intending to become pregnant) among BC females, Percent
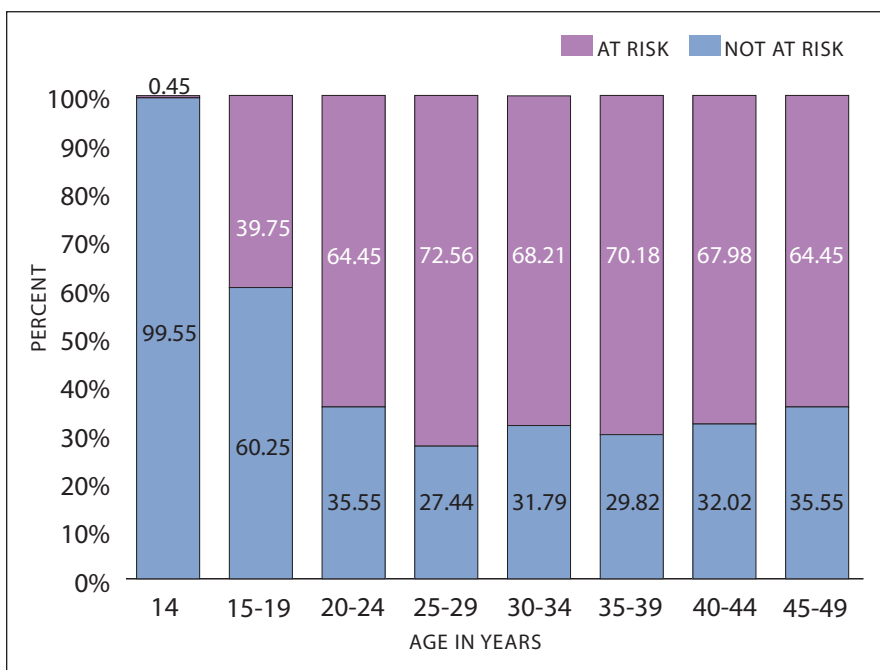
Pregnancy Intention

Intention of the Most Recent Pregnancy Within the Past Five Years

Among females who reported a pregnancy outcome within five years prior to the interview date we administered the London Measure of Unintended Pregnancy (LMUP).15 This validated six question scale reports a 13-point range for pregnancy intendedness of the most recent pregnancy.

The CSHS use of the LMUP measure provides the first Canadian representative population-based indicator of unmet need for contraception. This indicator highlights the prevalence of unintended (potentially avoidable) pregnancy, including those where the pregnancy outcome is birth.

British Columbian females indicate 40.4% of pregnancies within the past five years were unintended, including 33.4% of all births, including nearly all (86%) births among teenagers and three fourths of births (75%) among females age 20-24 years.

Table 7: Pregnancy intention indicators

Pregnancy intention indicators among BC females age 14-49, 2015

Question		Total	AGE (YEARS)							
			14	15-19	20-24	25-29	30-34	35-39	40-44	45-49
(Weighted) n		1671	34.8	202.9	232.9	237.4	247.0	230.5	235.8	250.0
Current intention to become pregnant (%)	No	88.9	99.0	97.7	94.2	88.4	80.5	82.6	86.1	91.3
At Risk for Unintended Pregnancy (%)	Yes	63.1	0.5	39.8	64.5	72.6	68.2	70.2	68.0	64.5
(Weighted) n who answered LMUP		408.5	0.0	10.2	45.7	88.9	124.1	84.9	42.8	12.0
Intention for most recent pregnancy within 5 years (%)	IP	59.6	-	14.3	24.5	57.0	68.6	71.7	54.6	90.4
	UIP	40.4	-	85.7	75.5	43.0	31.4	28.3	45.4	9.6

NOTE: *Intended Pregnancy* (IP), *Unintended Pregnancy* (UIP) both as determined by the *London Measure of Unintended Pregnancy* (LMUP) where intention scores of 10, 11 or 12 represent IP and 0 through 9 represent UIP. LMUP answers relate to the most recent pregnancy if it occurred within the past five years. *At Risk for Unintended Pregnancy* includes all of the following factors: not currently pregnant; have not passed menopause; have had vaginal sexual intercourse with a male within the past year; are not infertile for medical reasons (e.g., hysterectomy or prior cancer treatment); and not currently intending to become pregnant.

Most recent pregnancy outcome and relation to pregnancy intention

Figure 6: Intention of most recent pregnancy within 5 years, by outcome, among BC females age 15-49 years, %
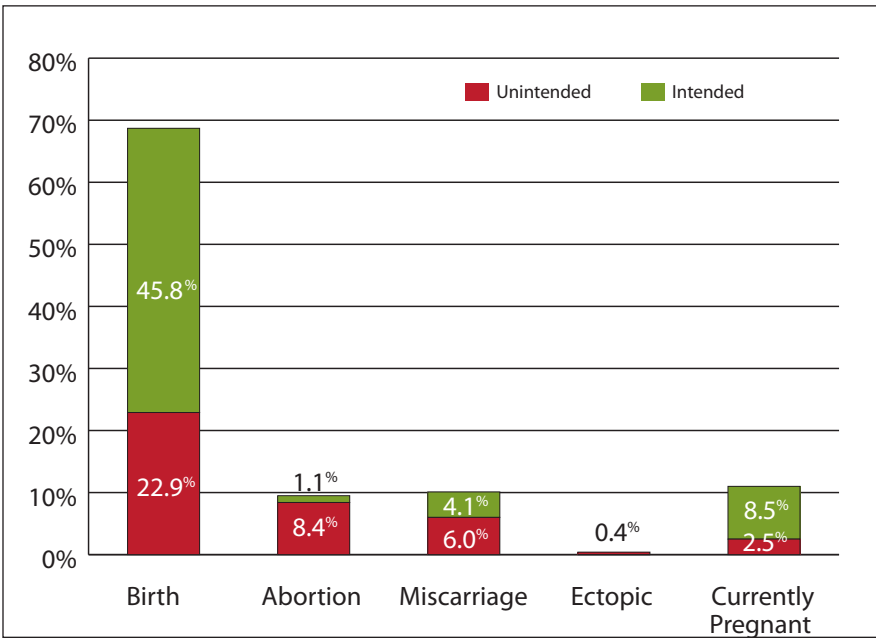
Notably, as illustrated in both Figure 6 and Figure 7, a third of births in BC are reported as unintended at the time of conception.

Overall respondents reported their most recent pregnancy within the past five years as being unintended 40.4% of the time, with unintended pregnancies most frequently (56.8%) resulting in birth.

Figure 7: Outcome of most recent pregnancy, by intention

Outcome of most recent pregnancy within five years, by intention, among BC females age 15-49 years, %
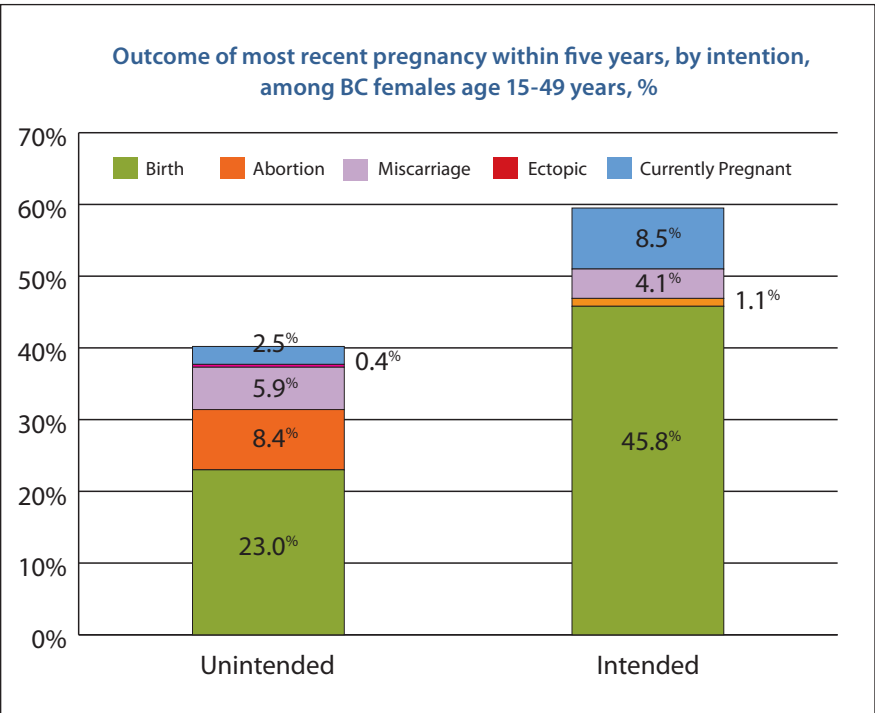
Social Determinants of Health

Table 8: Pregnancy intention status for the most recent pregnancy within the last five years among BC females age 14-49 and correlated social determinants of health, 2015

CHARACTERISTIC	VALUE	UNINTENDED PREGNANCY (%)	INTENDED PREGNANCY(%)	SIGNIFICANCE
Age group (years)	15-19	85.7	14.3	<0.0001
	20-24	75.5	24.5	
	25-29	43.0	57.0	
	30-34	31.4	68.6	
	35-39	28.3	71.7	
	40-44	45.4	54.6	
	45-49	9.6	90.4	
Highest Education	High school or less	58.4	41.6	<0.0001
	Trade or university less than a Bachelor's	32.3	67.7	
	University degree or more	33.3	66.7	
Household income	< $50,000	65.6	34.4	<0.0001
	$50,000 or more	27.3	72.7	
Self-identified as Aboriginal	Yes	38.9	61.1	0.0103
	No	66.1	33.9	
Relationship Status	Married/Common-law/ Living together	34.1	65.9	<0.0001
	No current relationship	78.2	21.8	

Current intention to become pregnant

All participants who were not currently pregnant were asked about their current intention to become pregnant. Overall 88.9% of non-pregnant females age 14-49 years were not currently intending to become pregnant.

This is consistent with the current BC total fertility rate of no more than 1.41.[16] Thus, if BC females intend to have two or fewer pregnancies, then over their roughly 30-year reproductive lifespan we would expect they would spend fewer than three or at most four years attempting to become pregnant which is less than 13% of their reproductive lifespan. This corresponds with our cross-sectional survey response that 89% of females are not currently intending to become pregnant.

Among women and girls age 14 years, 15-19 years, and 20-24 years 99%, 98% and 94% were not currently intending to become pregnant.

This is consistent with the current age at first birth among British Columbians of over thirty years.[17]

At Risk for Unintended Pregnancy

Using standard definitions, we combined responses from a number of questions to create an indicator of the proportion of females that are currently "At Risk for Unintended Pregnancy"(ARUP); females who are sexually active, fertile and not intending to become pregnant. These conditions are required:

- not currently pregnant,
- have not passed menopause,
- have had vaginal sexual intercourse with a male within the past year,
- have not had an operation or surgery causing them personally to become infertile or had proven infertility, (excepting sterilization specifically for contraception) and
- indicate they are not currently intending to become pregnant.

Contraception Use

Definitions: Effectiveness, Tiers

Although a wide range of contraceptive methods are available, factors such as cost, accurate knowledge, access to trained health care professionals and pharmacies all may affect the contraceptive method a person will choose to use. As well the ability to follow daily or per use instructions perfectly and to ensure the contraceptive is available affect the ability in typical use to ensure an effective contraceptive is used at each episode of intercourse, as can intimate partner violence, substance use, mental health disorders and very young age.

Efficacy of contraceptive methods reflect the pregnancy rate per 100 women per year as determined under ideal conditions of contraceptive availability and perfect use.

Effectiveness of contraceptive methods reflect the pregnancy rate per 100 women per year in typical use, and account for the variety of factors that may intercede to prevent a short acting or barrier method from being effective at the time of sexual intercourse. Typical use effectiveness of methods may be presented in a framework of "Tiers of Effectiveness". For this analysis, we will group contraceptives as follows: [18,19]

Tier 1:

Permanent methods:
- Male and female sterilization

Reversible methods:
- Subdermal implants and
- Intrauterine contraceptives (copper or levonorgestrel-releasing)

Tier 2:

All other hormonal methods:
- Depo medroxyprogesterone acetate (DMPA-"the shot")
- Hormonal contraceptive pill, patch or ring

Tier 3:
- Barrier methods
- Fertility Awareness methods
- Withdrawal

No Method

Table 9: Typical Use Pregnancy Rate and Continuation at one year Rate, for common contraceptive methods, by Tier of Effectiveness[19]

TIER OF EFFECTIVENESS	REVERSIBLE CONTRACEPTIVE METHOD	PREGNANCIES/ HUNDRED WOMEN IN THE FIRST YEAR WITH TYPICAL USE	PROPORTION OF WOMEN STILL USING THE METHOD AT THE END OF ONE YEAR
I	IUC Progesterone-releasing (aka IUS)	0.2	80
I	IUC Copper-releasing (aka IUD)	1	78
II	Progesterone injection (Depo-Provera®)	4	56
II	Combined hormonal contraceptive (Pill, Patch or Ring	7	67
III	Condoms	13	43
III	Coitus Inerruptus (aka "withdrawal")	20	46
	No method	85	

Tiers of effectiveness organize contraception into Tier 1 methods with <= 1 pregnancy per hundred women per year (usually long acting reversible methods and permanent methods); Tier II are other hormonal methods (4%-10%) and Tier III are barrier and other methods (>10% of women become pregnant each year).

Most Effective Method at Last Vaginal Intercourse

We present the rates of contraceptive method used at the most recent episode of vaginal intercourse both among all females age 15-49 years, and the rates among 15-49 year-old females meeting the definition above for being "At Risk for Unintended Pregnancy" (ARUP).

Table 10: Contraception method prevalence among all females age 15-49

Most effective contraceptive method used at last intercourse by percent among all BC females age 15-49 years (Percent)								
METHOD		**AGE (YEARS)**						
	Total	**15-19**	**20-24**	**25-29**	**30-34**	**35-39**	**40-44**	**45-49**
Tier 1	**27.8**	2.6	10.6	18.9	32.4	34.7	45.3	45.5
Vasectomy	**11.6**	0.1	0.3	2.4	9.6	18.5	22.0	26.4
Contraceptive implant	**0.1**	-	0.2	0.3	-	-	-	-
Hormonal intrauterine system (IUS)	**4.6**	0.8	5.2	7.8	7.2	5.4	2.4	2.5
Female sterilization	**6.3**	-	-	0.7	4.3	7.7	16.9	13.7
Copper intrauterine device (IUD)	**5.2**	1.7	4.9	7.7	11.3	3.1	4.0	2.9
Tier 2	**15.7**	25.5	26.8	23.2	12.2	12.0	5.5	6.0
DMPA	**1.0**	2.4	1.4	1.3	0.2	0.6	0.2	0.8
Hormonal Pill, Patch or Ring	**14.7**	23.1	25.4	21.9	12.0	11.4	5.3	5.2
Tier 3	**29.6**	12.0	29.5	39.2	31.7	35.9	26.8	30.0
Condom	**20.9**	9.2	23.2	27.7	19.6	22.0	18.1	25.6
Fertility Awareness	**1.0**	-	0.6	0.4	0.8	1.6	2.5	0.8
Spermicide alone	**0.1**	-	-	-	0.6	-	-	-
Emergency contraception	**0.3**	0.3	0.7	0.5	0.6	-	-	-
Withdrawal	**7.3**	2.5	5.0	10.6	10.1	12.3	6.2	3.6
No method **	**27.1**	59.9	33.1	18.8	23.6	17.4	22.5	18.3

NOTE: **Respondents who reported never having had sexual intercourse were not asked contraception questions, and have been included in this table in the group of those using "No Method".

Figure 8: Contraception method prevalence among females "ARUP"

Most effective contraceptive method used at last intercourse by Tier of Effectiveness, among BC females age 15-49 years who are sexually active, fertile and not intending to become pregnant (Percent), 2015
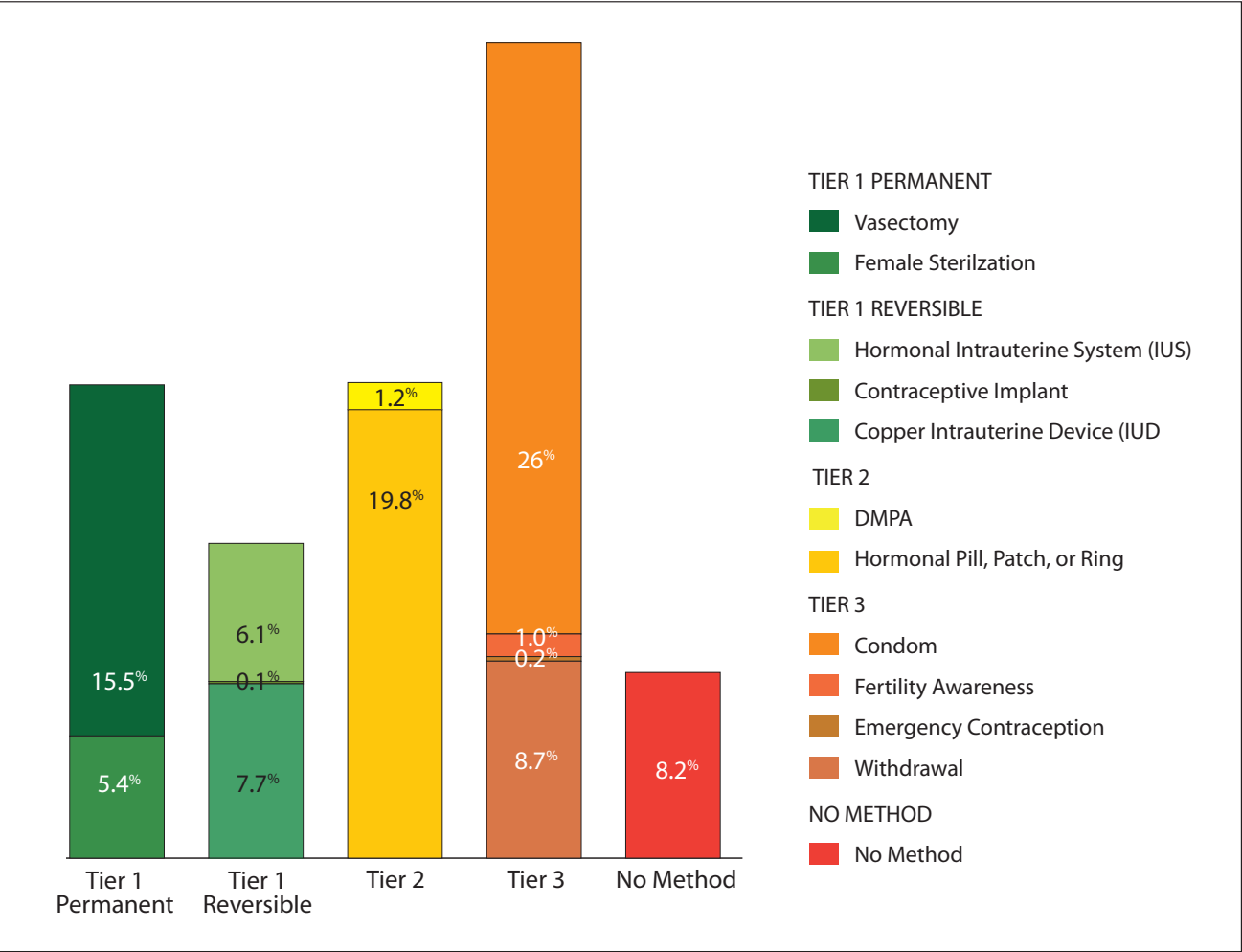
The use of highly effective intrauterine contraception (both copper and levonorgestrel-releasing) at 14% is higher than the 4% prevalence previously reported for BC women at risk of unintended pregnancy, among a volunteer internet-based market panel in 2006.[20]

A significant opportunity to assist British Columbians to achieve their reproductive goals is highlighted in this data

by the **predominant use of less effective contraceptive methods.** Nearly half (44.2%) of females in BC having sexual intercourse and not desiring a pregnancy reported that their most effective method at last intercourse in the Tier 3 group, or that no method was used. When excluding females using permanent methods, this becomes more than half (56%). Thus, as shown in Figure 8

Figure 9: The most effective contraceptive method used at last intercourse as a proportion of all methods used, by five year age group, among BC females age 15-49 years who are sexually active, fertile and not intending to become pregnant, 2015
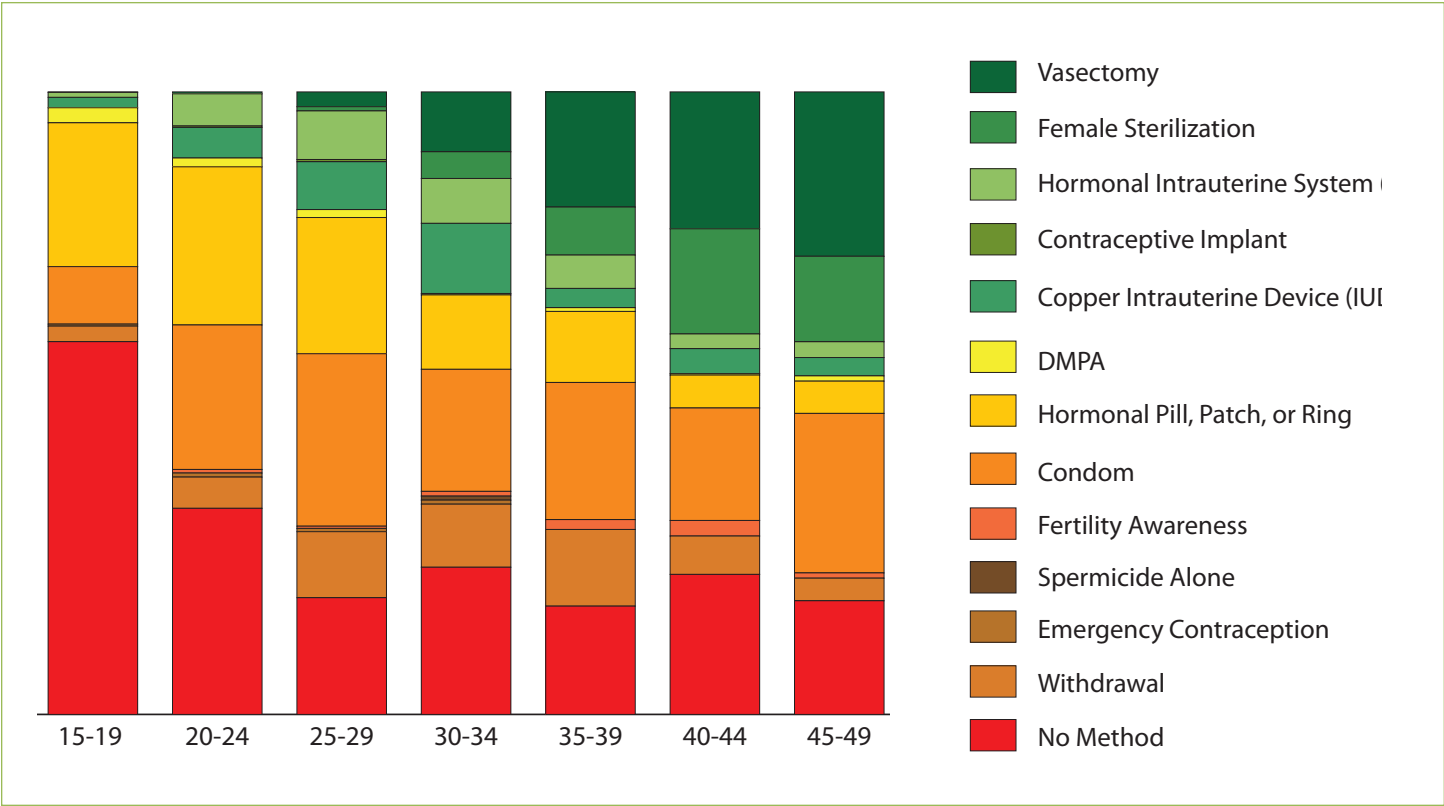

Legend:
- Vasectomy
- Female Sterilization
- Hormonal Intrauterine System (
- Contraceptive Implant
- Copper Intrauterine Device (IUD
- DMPA
- Hormonal Pill, Patch, or Ring
- Condom
- Fertility Awareness
- Spermicide Alone
- Emergency Contraception
- Withdrawal
- No Method

Age groups: 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49

Figure 10: Contraception method prevalence among females "ARUP" including permanent methods

Most effective contraceptive method used at last intercourse by Tier of Effectiveness, among BC females age 15-49 years who are sexually active, fertile and not intending to become pregnant (Percent), 2015
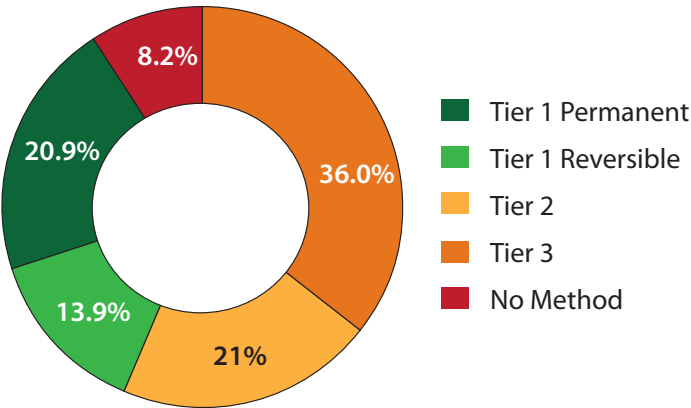

- Tier 1 Permanent — 20.9%
- Tier 1 Reversible — 13.9%
- Tier 2 — 21%
- Tier 3 — 36.0%
- No Method — 8.2%

Figure 11: Contraception method prevalence among females "ARUP" excluding permanent method users

Most effective contraceptive method used at last intercourse by Tier of Effectiveness, among BC females age 15-49 years who are sexually active, fertile and not intending to become pregnant, excluding those using permanent sterilization (Percent), 2015

- Tier 1 Reversible — 17.6%
- Tier 2 — 26.5%
- Tier 3 — 45.50%
- No Method — 10.4%
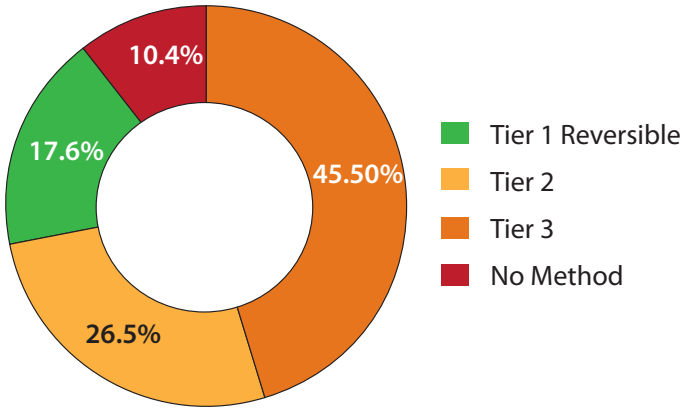
Table 11: Correlates of use of Tier 1 methods

Percent of BC females age 14-49 years at risk of unintended pregnancy using Tier 1 contraceptive methods compared to using any other method of contraception or no method, by social determinants of health, 2015

CHARACTERISTIC	VALUE	TIER 1 (%)	TIER 2, TIER 3 AND NO METHOD (%)	SIGNIFICANCE
Age group (years)	14	-	100.0	<0.0001
	15-19	6.4	93.6	
	20-24	15.0	85.0	
	25-29	23.4	76.6	
	30-34	38.7	61.3	
	35-39	41.2	58.8	
	40-44	52.0	48.1	
	45-49	53.0	47.0	
Highest Education	High school or less	27.3	72.7	<0.0001
	Trade or university less than a Bachelor's	44.9	55.0	
	University degree or more	33.4	66.6	
Household income	< $50,000	25.5	74.5	<0.0001
	$50,000 or more	41.0	59.0	
Poverty Line	Under 30K poverty line	24.9	75.1	0.00025
	Above 30K poverty line	39.2	60.8	
Self-identified as Aboriginal	Yes	27.2	72.8	0.2951
	No	35.2	64.8	
Relationship Status	Married/Common-law/ Living together	41.8	58.2	<0.0001
	No current relationship	19.3	80.7	

NOTE: Tier 1 methods include male and female sterilization, subdermal implants and intrauterine contraceptive methods. At risk for unintended pregnancy includes all of the following factors: not currently pregnant; have not passed menopause; have had vaginal sexual intercourse with a male within the past year; are not infertile for reasons other than contracpetion; and not currently intending to become pregnant.

Summary

The conduct and response rate of the BC 2015 Sexual Health Survey yielded survey results highly representative of the population of reproductive age females in BC.

New indicators are now available for the first time in Canada on contraceptive method prevalence, current intention to become pregnant, pregnancy intention at the time of conception, and related pregnancy outcomes and social determinants of health.

The contraception use reported includes frequent use of the least effective methods or no method, particularly among women under 30. This behaviour aligns with the reported high rates of unintended pregnancy (40%) overall and among females under age 30 (43-86%).

In British Columbia this would translate to 24,000 unintended pregnancies of which 14,000 result in birth every year. On a national level, approximately 160,000 Canadian women would have an unintended pregnancy, while 90,000 of these would result in birth every year.

Data from this study will be useful to inform policy, system and program decisions to support Canadian females and their families to achieve their reproductive goals. Canadian families who are supported to effectively time and space their pregnancies will experience a wide range of education, economic, and family health benefits.
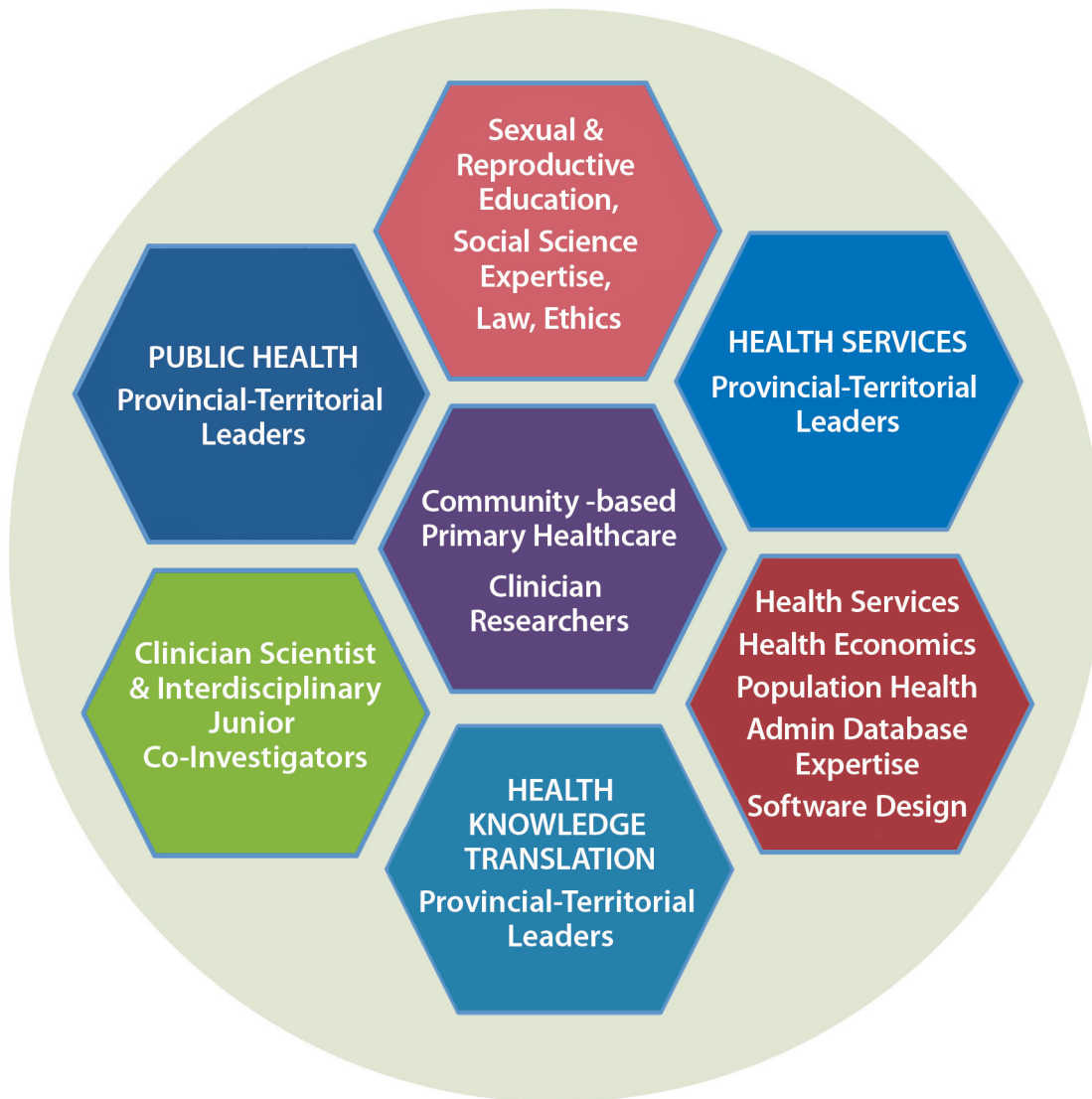
Appendices

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Appendix 2: Research Team and Collaborators

NAME	POSITION	INSTITUTION	ROLE IN PROJECT
Jan Christilaw	Vice President / Site Executive	Provincial Women's and Newborn Health, Provincial Health Services Authority, BC / BC Women's Hospital & Health Centre	Knowledge User
Perry Kendall	Provincial Health Officer	Government of BC	Knowledge User
Wendy Norman	Associate Professor	UBC, Faculty of Medicine, Department of Family Practice	Principal Investigator
Stirling Bryan	Professor / Director	UBC, School of Population and Public Health / Centre for Clinical Epidemiology & Evaluation	Co-Principal Investigator
Rollin Brant	Professor	UBC, Department of Statistics & BC Children's Hospital Research	Co-Investigator
Sheila Dunn	Associate Professor	University of Toronto, Department of Family and Community Medicine	Co-Investigator
Janusz Kaczorowski	Professor and Research Director	University of Montreal, Department of Family and Emergency Medicine	Co-Investigator
Gina Ogilvie	Professor	UBC, School of Population and Public Health	Co-Investigator
Saied Samiedaluie	Assistant Professor	University of Alberta, School of Business	Co-Investigator
Steven Shechter	Associate Professor	UBC, Sauder School of Business	Co-Investigator
Jean Shoveller	Professor	UBC, School of Population and Public Health	Co-Investigator
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Jessica Danforth	Executive Director	The Native Youth Sexual Health Network of Canada	Collaborator
Cheryl Davies	Chief Operating Officer	BC Women's Hospital and Health Centre,	Collaborator
Edith Guilbert	Senior Medical Advisor	National Institute of Public Health of Quebec	Collaborator
Shireen Mansouri	Family Physician	Yellowknife Health and Social Services	Collaborator
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Sandra Peterson	Staff	UBC, Centre for Health Services and Policy Research	Data Analyst
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Melissa Brooks	Trainee - Medical Resident	Dalhousie University, Department of Obstetrics and Gynecology	Survey Development
Boris Henriquez	Trainee - Master's Student	UBC, School of Population and Public Health, Master of Public Health Program	Survey Development & Piloting
Lingsa Jia	Trainee - Medical Student	UBC, Faculty of Medicine	Survey Piloting
Adriana Mejia-French	Trainee - Medical Student	UBC, Faculty of Medicine	Survey Piloting
Emma Rossnagel	Trainee - Master's Student	UBC, School of Population and Public Health, Master of Public Health Program	Data Analysis and Knowledge Translation

CART-GRAC: The Core Team

Sexual & Reproductive Education, Social Science Expertise, Law, Ethics

PUBLIC HEALTH Provincial-Territorial Leaders

HEALTH SERVICES Provincial-Territorial Leaders

Community -based Primary Healthcare Clinician Researchers

Clinician Scientist & Interdisciplinary Junior Co-Investigators

Health Services Health Economics Population Health Admin Database Expertise Software Design

HEALTH KNOWLEDGE TRANSLATION Provincial-Territorial Leaders

Appendix 3: Acknowledgements and Funding

CSHS — Canadian Sexual Health Survey