Women and HIV Prevention: A Scoping Review

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Introduction

HIV prevention interventions have been in place for decades now. However, HIV infection rates continue to rise at an alarming rate. A significant body of evidence suggests that many existing interventions are not working effectively for women. In Canada, and in Ontario, a growing rate of HIV/AIDS infections among heterosexual women is being recorded. If left unchecked, it is predicted that this increase in incidence and prevalence will continue to rise. Gaps in knowledge, barriers to health care services, women's physiological vulnerability to the virus and social marginalization, all contribute to increasing infection rates among women.

The female Canadian population is diverse with a wide range of differing HIV prevention needs. To best meet these needs, we require community-based, tailored approaches to HIV prevention that can be evaluated for their effectiveness. Evaluating a previous approach's strengths and weaknesses, enables us to find gaps and create solutions.

A literature review of existing HIV prevention interventions revealed common characteristics and planning considerations for HIV prevention interventions directed at women. They include: the use of theoretical models; skills training; need for tailored approaches (ie- gender/age/community/culturally appropriate strategies); use of peer educators and community leaders; and appropriate delivery channels and intervention duration. Unfortunately, little to no HIV information exists in the Ontario-based literature on many populations of Canadian women, specifically women from East Asia, Southeast Asia, South America, Arab and Middle Eastern women. The following literature review is therefore limited to the available documentation on HIV prevention but makes recommendations for gaps to be addressed in this body of knowledge.

Overview of Prevention Interventions

To exemplify the diversity of Canadian women's HIV prevention needs, this paper will describe the unique needs of the following groups of women: young women, women who inject drugs, women involved in the sex trade, street-involved women, Aboriginal women, African and Caribbean women, Asian and South Asian women, women in prison, transgendered individuals, lesbian women and bisexual women. HIV prevention theory, models and policy are discussed. Additionally, special attention is given to describing the potential role of stigma, discrimination and the social determinants of health in influencing Canadian women's HIV risk.

General Recommendations Found in the Literature

- Both macro (general) and micro (tailored/community-specific) level interventions should be used
- Interventions should be based on a theoretical model with an evaluation component
- Gender, race and sexual orientation, must be seen as crucial factors influencing women's HIV risk and HIV-prevention needs
- The determinants of health should be considered in any analysis of HIV risk
- Policy, research and programming should compliment one another
- Women, including marginalized women, should be included in all stages of intervention development and delivery
- Condom use and sexual negotiation/communication should be encouraged
- The design of interventions should take into consideration behavioural, social and structural factors
- Peer-led skills training and community leader programs have been found to be beneficial
- Men, particularly heterosexual men, have been too often overlooked and should be targeted for HIV prevention education interventions
- Social norms and practices linked to risk around sexuality, stigma/discrimination, violence/coercion and addiction should be challenged
- Resources must be put into the creation of women-controlled HIV prevention technologies, such as microbicides and vaccines
- Prevention resources must be made accessible to all women

General Gaps

- Lack of theoretical underpinning
- Lack of consistent evaluation
- Lack of consideration given to intersecting gender, race and sexual orientation issues
- Lack of continuity between policy and practice
- Under-funding, lack of resources/capacity
- Underutilization of potential partnerships and research dissemination
- Ethnicity reporting and cultural competency of programming must improve
- Relatively little or no information on the prevention issues of certain groups of women to inform programs, services and policies
  (ie- African and Caribbean women, transgendered women, lesbian women, Asian women, South American women, Middle Eastern and Arab women, immigrant women, non-status women, refugee women)

Recommendations

- Develop timely, socially responsible policy, research/surveillance and programming HIV prevention interventions for women
- Develop accessible, community-tailored HIV prevention programming that reflect intersecting dimensions of difference based on gender, race, sexual orientation, culture, age, literacy, etc.
- Ensure that adequate, detailed information about HIV is available to all women
- Provide harm reduction interventions such as condom distribution, methadone maintenance programs and needle exchange programs
- Consider the determinants of health when designing interventions for improving the overall health and wellness of all Canadian women
- Use gender-based analysis on existing and future interventions and find meaningful ways to engage women and men in HIV prevention initiatives
- Create open forums for the discussion of women's HIV prevention needs, with opportunities for meaningful involvement
- Continue to advocate for equity and social justice to eliminate the negative impacts of gender-based violence, racism, homophobia and HIV-related stigma and discrimination
- Improve resources focused on the advancement of women-controlled HIV prevention technologies, such as microbicides and vaccines
- Advocate for sustainable funding and resources for women's programming

From Ideas to Action

In light of the ideas and evidence presented in this paper, it is obvious that gender plays a central role in shaping an individual's HIV prevention needs and must be taken into consideration when developing, planning, and implementing HIV/AIDS initiatives. However, the study of gender alone, is not sufficient, and must be enriched by looking at how gender interacts with race and other determinants of health. To promote capacity-building for those providing HIV education and prevention interventions, this paper suggests the need for effective strategies for translating knowledge into action. Specifically: (1) the publication and extensive dissemination of best practice materials; (2) the creation of a series of fact sheets aimed at policy makers, practitioners, and women for the purpose of generating discussion and making meaningful recommendations to key stakeholders; (3) the general promotion of innovative and collaborative capacity-building around HIV/AIDS education, prevention, and outreach for women.

This report highlights several ideas for enhancing programming and policies aimed at increasing knowledge and prevention of HIV/AIDS for women. Building capacity to meet women's behavioural, social and structural HIV prevention needs will improve HIV/AIDS education, prevention and services for all Canadians. A coordinated effort is needed to stem the HIV/AIDS epidemic in Canada.

SECTION 1: INTRODUCTION

This paper will review the literature describing the development and implementation of effective HIV prevention interventions for women and explore how this knowledge can be applied to women living in Ontario. Although both genders are susceptible to HIV, women are especially vulnerable to the virus for a variety of physiological, social and cultural reasons. In order to frame women's HIV risk, this paper will start by describing international, national and provincial epidemiology. This will be followed by a discussion of women's identified HIV prevention needs as found in the literature. Understanding and addressing women's HIV risk is problematic in that women are a highly heterogeneous group that is at risk of being inappropriately treated as uniform in character and circumstance. Women's behaviours, as influenced by personal and social motivations, may vary greatly over time, placing an individual woman at various degrees of HIV risk over her lifespan. This paper will look at behavioural, social and structural influences on women's HIV risk and attempt to determine how HIV prevention interventions can be responsive to these considerations. Lastly, evaluation research from reviews of HIV intervention research with women will be summarized. Based on the interventions reviewed, common characteristics and planning considerations of HIV prevention interventions are identified. They include: the use of theoretical models; skills training; need for tailored, culturally competent approaches; use of peer educators and community leaders; and appropriate delivery channels and intervention duration. Best practices for HIV prevention interventions for women in Ontario will be provided in relation to provincial resources.

Background

An estimated 42 million people worldwide are now living with HIV, with approximately 5 million new infections occurring in 2005 [1]. HIV/AIDS has reached pandemic status with AIDS having already claimed the lives of over 24 million people worldwide. However, in terms of the burdens and responsibilities associated with the disease (ie – caregiving) women are disproportionately affected. Once inappropriately described as 'the gay plague', HIV is now known to be an infection that indiscriminately crosses gender, sexuality, race, class and geographical boundaries [2].

A quarter century into the HIV/AIDS epidemic, new challenges continue to test research, program and policy responses to the disease. HIV transmission and the natural history of the disease are now well documented, as well as a myriad of social and individual factors associated with the spread of this illness. In the early days of the epidemic, HIV/AIDS prevention efforts were tailored to specific populations, firstly gay men, followed by hemophiliacs, heroin users and Haitians (referred to as the '4 Hs') [2]. Early HIV prevention strategies focused on increasing public awareness of HIV transmission and teaching individuals to change their sexual and drug use behaviours as a means of avoiding infection. These approaches showed some success, however, HIV infection rates have continued to rise within the earliest targeted populations and have started to rise among other groups [1, 3]. Heterosexual women have become recognized as an 'at risk' group in Canada, and worldwide [4]. In Sub-Saharan Africa, the number of women infected with HIV has quickly surpassed the number of men infected, this difference is most obvious among young men and women. Currently, there are approximately 36 women for every 10 men living with HIV among 15 to 24 year olds

[5]. The dramatic increase in HIV infection among women has led researchers to prioritize the needs of women and look at the role of gender in influencing the spread of HIV among both men and women [6,7,8,9].

SECTION 2: HIV/AIDS SURVEILLANCE

AIDS Among Women in Canada

In Canada, of the total 19,468 cumulative AIDS cases among adults reported to the Centre for Infectious Disease Prevention and Control (CIDPC) to the end of June 30, 2004, 1,741 (9%) were among women [10]. In the context of significantly declining Canadian rates of AIDS incidence, Canadian women represent an increasing proportion of the total number of annual reported AIDS cases among adults (for which age and gender are known). In recent years the most notable trend in AIDS diagnoses across age groups has been an increase found among young women. Women make up the largest proportion of adult AIDS cases in the 15-29 years of age group. Prior to 1994, females represented 10% of all AIDS diagnoses in the age group 15-29; in 2004 this proportion was 45% [10].

Table 1.
Cumulative number of reported AIDS cases occurring in adults and children by gender between 1979 and December 31, 2004. [10]

Age and gender	Number of cases reported Nombre de cas signalés	%[1]	Âge et sexe
Children (< 15 years)	**226**	**1.2**	**Enfants (< 15 ans)**
Males	120	53.1	Sexe masculin
Females	106	46.9	Sexe féminin
Gender not reported/transgender	0		Sexe non indiqué/transgenre
Adults (≥ 15 years)	**19,238**	**98.8**	**Adultes (≥ 15 ans)**
Males	17,585	91.5	Hommes
Females	1,635	8.5	Femmes
Gender not reported/transgender	18		Sexe non indiqué/transgenre
Age group not reported	**4**		**Groupe d'âge non indiqué**
Males	4		Hommes
Females	0		Femmes
Gender not reported/transgender	0		Sexe non indiqué/transgenre
Total	**19,468**	**100.0**	**Total**
Males	17,709	91.0	Sexe masculin
Females	1,741	9.0	Sexe féminin
Gender not reported/transgender	18		Sexe non indiqué/transgenre

Exposure categories associated with AIDS cases among women have also shifted over time. The greatest proportion of AIDS cases diagnosed among adolescent and adult women prior to 1997 was attributed to sexual contact with a male partner at risk of HIV[1]. For the next four years, from 1997 to 2000, injection drug use was the exposure category reported by the greatest proportion of women diagnosed with AIDS in each of the four years: 35%, 46%, 35% and 37% respectively. In 2001, the majority of AIDS cases (51%) among women were attributed to having lived in a pattern II country, that is, a country in which HIV is endemic[2]. In 2004, 73% of new AIDS cases were attributed to heterosexual contact (37% persons from endemic countries, 24% high risk heterosexual, 12% low risk heterosexual), 24.4% to injection drug use (IDU) and 2.4% to recipients of blood or blood products [11].

Overall, of the cumulative 1,696 AIDS cases among Canadian women reported to the CIDPC by 2004, as shown in Table 6, the greatest proportion (29.1%) was attributed to sexual contact with a male partner at risk of HIV, the next highest proportion (28.8%) to origin in a pattern II country, 24% to injection drug use and 18% to other factors [11].

[1] In Canadian federal HIV/AIDS reporting documents, 'heterosexual risk' is the risk of HIV transmission between a woman and man who are having unprotected sex with a partner whose HIV status is unknown.
[2] The term HIV-endemic country refers to a country in which the prevalence of HIV infection in the general population is greater than 1% (may be 20% or higher), or the male to female ratio is 2:1 or less, or HIV prevalence is greater than 20% of women receiving prenatal care.

Table 2

AIDS Cases among Canadian Women ≥ 15 years by Exposure Category and Year of Diagnosis 1979 – 2004

	YEAR OF DIAGNOSIS												TOTAL	
	1979 - 1998		1999		2000		2001		2002		2003		2004			
EXPOSURE CATEGORY	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%[a]**
IDU	283	22.4	29	38.2	21	39.6	8	13.3	16	31.4	15	23.4	10	24.4	382	23.8
Blood/blood products																
a) recipient of blood	109	8.6	2	2.6	0	0.0	3	5.0	0	0.0	1	1.6	1	2.4	116	7.2
b) recipient of clotting factor	22	1.7	0	0.0	0	0.0	1	1.7	0	0.0	0	0.0	0	0.0	23	1.4
Heterosexual contact/endemic																
a) origin in a pattern II country	341	27.0	23	30.3	15	28.3	28	46.7	21	41.2	20	31.3	15	36.6	463	28.8
b) sexual contact with a person at risk	402	31.9	11	14.5	11	20.8	11	18.3	10	19.6	12	18.8	10	24.4	467	29.1
Occupational exposure	2	0.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	0.1
No identified risk – Heterosexual	103	8.2	11	14.5	6	11.3	9	15.0	4	7.8	16	25.0	5	12.2	154	9.6
Other	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
No identified risk	54		8		3		5		5		7		7		89	
TOTAL	1,316	100	84	100	56	100	65	100	56	100	71	100	48	100	**1,696**	100

[a] Percentages based on total number minus those reports for which there was no identified risk.

HIV Infection Among Women in Canada

Because AIDS diagnoses often occur some years after the initial transmission of HIV, HIV surveillance data is often used to reflect more recent trends in the epidemic. Women represent an increasing proportion of those with positive HIV test reports in Canada. Surveillance data from provincial and territorial HIV testing sites indicate that 8,689 positive test results have been reported in adult Canadian women up to the end of 2004 [11]. It should be noted, however, that these numbers represent only women diagnosed and actual numbers of women living with undetected HIV may be much higher, due to under-utilization of testing sites and under-reporting of diagnoses. HIV reporting legislation is now in place across the country, however, this is a recent occurrence.

Before 1994, adult and adolescent women represented just 10% of all reports of positive HIV test results among Canadians. This proportion increased sharply in 1996 to 21% and increased again to 24% in 2000. In 2002, this proportion increased slightly to 25% of all positive HIV test reports with age and gender classification, and again to 27% in 2004.

The proportion of women among all adult positive HIV test reports varies with age and is highest among young women. In 2004, women between the ages of 15-29 accounted for 42% of positive HIV test reports within this age group. This represents an increase from 38% in 2002.

Table 4 depicts the relative contribution of HIV related behaviours, situations and structural factors to this level of HIV infection among adolescent and adult women,

demonstrating that, in contrast to AIDS case report data, the HIV-related risk exposure profile has been largely consistent since 1998.

Table 3.
Number of positive HIV test reports among females by age group and year of test [10].

Age group	Year of test — Année du test							Total		Groupe d'âge
	1985-1998	1999	2000	2001	2002	2003	June/juin 2004	n	%[2]	
Female children										**Enfants de sexe féminin**
< 15 years	225	15	4	8	8	4	9	273	3.3	< 15 ans
Adult females	**4,809**	**515**	**484**	**522**	**619**	**629**	**354**	**7,932**	**96.7**	**Femmes**
15 to 19 years	183	20	18	24	25	14	15	299	3.6	15 à 19 ans
20 to 29 years	1,688	168	163	173	171	203	105	2,671	32.6	20 à 29 ans
30 to 39 years	1,740	193	187	201	248	253	121	2,943	35.9	30 à 39 ans
40 to 49 years	574	98	84	86	124	122	77	1,165	14.2	40 à 49 ans
≥ 50 years	297	36	32	38	51	37	36	527	6.4	≥ 50 ans
Adult, age not reported[3]	327	0	0	0	0	0	0	327	4.0	Adulte, âge inconnu[3]
Age group not reported	152	13	3	5	1	4	0	178		**Groupe d'âge non indiqué**
Total – females	**5,186**	**543**	**491**	**535**	**628**	**637**	**363**	**8,383**	**100.0**	**Total – sexe féminin**

Prior to 2004, injection drug use accounted for the greatest proportion (38%) of cumulative HIV test reports among adolescent and adult women in Canada. Starting in 1996, this has been the HIV risk-related exposure category reported annually by the greatest proportion of women receiving positive HIV test reports. Recently, this trend has been declining and heterosexual contact has increased to become the primary mode of exposure. Although sexual contact with a person at risk accounted for only 8% of cumulative HIV test reports due to earlier combining of this category with that of origin in a pattern II country, since 1998, this exposure category has been broken down into three distinct subgroups: heterosexual/high risk, heterosexual/low risk and heterosexual/women from pattern II countries. Although origin in a pattern II country

accounted for only 7% of cumulative HIV test reports, this is an exposure category that has been steadily increasing since 1998. The proportion of cumulative HIV test reports among adolescent and adult women for all combined heterosexual risk groups now represents 64.8% of cases [11].

AIDS Among Women in Ontario

In Ontario, reporting of AIDS cases was informally initiated in 1982 and expanded into the official surveillance system, the Ontario AIDS Surveillance Programme (OASP), when AIDS became a reportable disease in 1983. AIDS cases are reported to local public health units and forwarded to the Public Health Branch of the Ontario Ministry of Health and Long Term Care (OMHLTC).

Of the 1,803 cumulative AIDS cases among all Canadian women (children, adolescent and adult women combined) reported to the CIDPC by the end of December 2004, Ontario reported the second highest number, 583 cases, in comparison to all other Canadian provinces and territories. Quebec held the highest number (725) and British Columbia (274) reported the third highest number of cases, these numbers support an overall population size effect for the three most populated provinces [11].

As shown in Table 5, the average gender ratio of reported AIDS cases in Canada is ten reported AIDS cases among males of all ages to one reported AIDS cases among females of all ages. Ontario reported a slightly higher proportion of diagnosed male HIV cases, showing a provincial gender ratio of 12:1 for persons who have tested HIV positive.

Table 4

Positive HIV Test Reports among Canadian Women ≥ 15 years by Exposure Category and Year of Test 1985 – 2004

	YEAR OF TEST													TOTAL	
	1985-98		1999		2000		2001		2002		2003		2004		
EXPOSURE CATEGORY	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%**	**n**	**%** [a]
IDU	910	39.6	125	47.3	95	39.6	85	31.7	104	37.4	76	26.7	96	31.9	1,491	37.9
Blood/blood products [b]																
a) recipient of blood/blood products	112	4.9	1	0.4	0	0.0	2	0.7	0	0.0	1	0.4	2	0.7	118	3.0
b) recipient of blood	56	2.4	2	0.8	4	1.7	2	0.7	4	1.4	7	2.5	4	1.3	79	2.0
c) recipient of clotting factor	7	0.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	7	0.2
Heterosexual contact/endemic [b]	310	13.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	310	7.9
a) origin in a pattern II country	36	1.6	20	7.6	26	10.8	32	11.9	39	14.0	47	16.5	59	19.6	259	6.6
b) sexual contact with a person at risk	388	16.9	67	25.4	70	29.2	84	31.3	70	25.2	75	26.3	79	26.2	833	21.2
No identified risk– HET	355	15.5	38	14.4	34	14.2	54	20.1	52	18.7	62	21.8	52	17.3	647	16.5
Other	122	5.3	11	4.2	11	4.6	9	3.4	9	3.2	17	6.0	9	3.0	188	4.8
No identified risk	329		4		11		8		9		19		33		413	
Not reported [c, f]	2,181		248		232		246		331		324		323		3,885	
TOTAL [d, e]	4,806	100	516	100	483	100	522	100	618	100	628	100	657	100	**8,230**	100

[a] Percentages based on total number minus reports for which exposure category was not reported or for which there was no identified risk.

[b] Prior to 1998, blood/blood products and heterosexual contact/endemic were combined exposure categories, but have since been separated where possible.

Table 5

Number of reported AIDS cases among Canadians of All Ages by Province/Territory and Gender to June 30, 2005

	Number of tests Nombre de tests		Ratio Ratio		
Province/territory	**Males** **Hommes**	**Females** **Femmes**	**Males: Females** **Hommes: Femmes**	**Total**	**Province/territoire**
British Columbia	3,628	293	12:1	3,921	Colombie-Britannique
Yukon	4	4	1:1	8	Yukon
Alberta	1,121	93	12:1	1,214	Alberta
Northwest Territories	14	5	3:1	19	Territoires du Nord-Ouest
Nunavut	0	0	-	0	Nunavut
Saskatchewan	185	37	5:1	222	Saskatchewan
Manitoba	208	28	7:1	236	Manitoba
Ontario	7,242	608	12:1	7,850	Ontario
Quebec	5,373	725	7:1	6,098	Québec
New Brunswick	147	16	9:1	163	Nouveau-Brunswick
Prince Edward Island and Nova Scotia	296	24	12:1	320	Île-du-Prince Édouard et Nouvelle-Écosse
Newfoundland and Labrador	71	19	4:1	90	Terre-Neuve-et-Labrador
Total	18,289	1,852	10:1	20,141	**Total**

Public Health Agency of Canada. (2005). Surveillance Report to June 30, 2005. Ottawa, ON: Centre for Infectious Disease Prevention and Control.

At the provincial level, between 1981 and 2004, 7,514 cases had been reported, of which 551 were among female children and adolescent and adult women. However, reflecting the national trend of an increasing annual proportion of AIDS case reports among women of all ages relative to all AIDS case reports for which gender is known, the proportion of AIDS cases among Ontario women at the provincial level has increased from less than 11% for the period 1981 to 1996, to 19% of all AIDS cases reported in

1998 [12]. In 2000, 12% of all AIDS cases reported were among women, a proportion that increased dramatically to 23.5% in 2003.

The majority (54%) of AIDS cases among women reported to the Ontario Ministry of Health and Long-Term Care (OMHLTC) between 1981 and 2003 occurred among women from two health regions comprising the major urban centres of Toronto and Ottawa. As shown in Table 6, 42% of all reported AIDS cases occurred among women residing in the Metro Toronto health unit, 12% were among women residing in the City of Ottawa health unit, and 46% of reported AIDS cases were among women from other areas of the province [12].

Table 6

Location, by Public Health Unit, of AIDS Cases among Females in Ontario 1981 – 2003 [12]

LOCATION	NUMBER	PERCENTAGE
Northern	28	5.1
Ottawa	68	12.3
Eastern Other (Kingston)	24	4.4
Metro Toronto	231	41.9
Central East Other	92	16.7
Central West (Hamilton)	60	10.9
Southwest	48	8.7
TOTAL	**551**	**100**

Overall, the greatest proportion (37%) of cumulative reported AIDS cases between 1981 and 2003 among women in Ontario was attributed to sexual contact with a

male partner. However, cases attributed to this risk exposure category are the most unstable of any category as depicted in Table 7. For example, in 1998, 28% of women reported their exposure category as sexual contact with a male partner, 19% in 1999, and 47% in 2000. Overall, proportions of cumulative reported AIDS cases for this period ranged from 17-50%.

The next highest proportion of cumulative AIDS cases, 28%, were among women born in HIV-endemic regions with the proportion associated with this risk exposure category ranging between 24-48% from 1996 to 2000. However, 57% of cases were among women born in HIV-endemic regions in 2001 ($p<0.001$). 14% of cumulative AIDS cases were attributed to injection drug use, a proportion which has fluctuated between 0% and 28% over the last six years. The decrease in the last two years of 2000 and 2001 was marginally significant.

Table 7

AIDS Cases among Females in Ontario by Exposure Category 1981 – 2003 [12]

EXPOSURE CATEGORY	NUMBER	PERCENTAGE
Injection drug use	78	14.2
HIV-endemic	156	28.3
Heterosexual	204	37.0
Clotting factor	10	1.8
Transfusion	49	8.9
Perinatal	29	5.3
Occupational	1	0.2
No Identified Risk (NIR)	24	4.4
TOTAL	**551**	**100.1**

HIV Infection Among Women in Ontario

The trend of increasing reported cases of HIV infection among women seen in national HIV data is reflected at the provincial level. In Ontario, legislation has been in place since 1985 requiring laboratories and physicians to report HIV infection to public health officials. Data from the HIV Laboratory, Central Public Health Laboratory, and OMHLTC, indicate that the number of first-time HIV-positive diagnoses among women in Ontario has increased both in number and proportion. Specifically, in 1985 there were 220 first-time HIV positive diagnoses in 1995, this number declined slightly to just below 190 cases each year between 1996 and 1999 and increased again to 202 in 2000. In 2003, 346 women living in Ontario received first-time HIV-positive diagnoses, the highest number ever recorded [12]. Of the 8,689 cumulative HIV cases among women of all ages in Canada, Ontario reported the highest number, 3,392, in comparison to all other Canadian provinces and territories as shown in Table 8. Quebec reported the second highest number of positive HIV test reports (2,335) followed by British Columbia (1,634). The trend toward infections occurring at a younger age is also reflected in Ontario.

Consistent with this increase in actual numbers of first-time HIV-positive diagnoses, the proportion of all first-time HIV-positive diagnoses comprised by women also increased. In 1985, approximately 2% of first-time HIV-positive diagnoses in Ontario was among women. This proportion increased to 12% in 1993; 17% in 1994; and plateaued at approximately 20% in the three-year period from 1997 to 1999. From 2000 to 2002, the proportion of all first-time HIV-positive diagnoses in Ontario comprised by

women increased from 23%, to 26%, to 27% respectively. In 2003, the latest year for which data are available, this proportion increased to 29% ($p<0.0001$).

Table 8

Positive HIV Test Reports among Canadians of All Ages by Province/Territory and Gender 1985 – 2004 [11]

PROVINCE/TERRITORY	N,UMBER OF CASES		RATIO [a] MEN:WOMEN
	MEN	WOMEN	
British Columbia [b]	9,928	1,634	6:1
Yukon	31	13	2:1
Alberta	3,443	709	5:1
Northwest Territories	30	6	5:1
Nunavut [c]	2	0	-
Saskatchewan	353	143	2:1
Manitoba	930	274	3:1
Ontario [b]	21,087	3,392	6:1
Québec [d]	9,426	2,335	4:1
New Brunswick	299	41	7:1
Prince Edward Island and Nova Scotia	564	92	6:1
Newfoundland and Labrador	177	50	4:1
TOTAL [e]	**46,270**	**8,689**	**5:1**

Again, reflecting the regional variations documented in AIDS case reports among Ontario women, the majority (66%) of positive HIV test reports reported to the OMHLTC between 1985 and 2003 were among women from the two health units comprising the major urban centres of Toronto and Ottawa. As shown in Table 13, 49% of all first-time HIV-positive diagnoses occurred among women residing in the Metro Toronto health unit, 16% among women residing in the City of Ottawa health unit, and 35% among women from other areas of the province.

Table 9

Location, by Public Health Unit, of First-time HIV-positive Diagnoses among Females in Ontario [a]
1985 – 2003 [11]

LOCATION	NUMBER	PERCENTAGE
Northern	102	3.4
Ottawa	535	17.6
Eastern Other (Kingston)	88	2.9
Metro Toronto	1,599	52.7
Central East Other	229	7.5
Central West (Hamilton)	246	8.1
Southwest	236	7.8
TOTAL	**3,035**	**100**

The HIV-related risk exposures reported to be associated with these positive HIV test reports reflect a markedly different profile from that associated with HIV prevalence among all Canadian women and a slightly different profile in relation to the exposures associated with AIDS case reports among females in Ontario. As shown in Table 14, the greatest proportion (33%) of the 3,409 positive HIV test reports among females in Ontario recorded between 1985 and 2003 was attributed to women born in HIV-endemic regions [12].

Table 10

First-time HIV-positive Diagnoses among Females in Ontario by Exposure Category [a] 1985 – 2003 [12]

EXPOSURE CATEGORY	NUMBER	PERCENTAGE
Injection drug use	600	17.6
Clotting factor	37	1.1
Transfusion	182	5.3
HIV-endemic	1,120	32.9
High Risk : Heterosexual	683	20.0
Low Risk : Heterosexual	559	16.4
Perinatal[b]	164	4.8
Other[c]	64	1.9
TOTAL	**3,409**	**100.0**

Overall, cases attributed to injection drug use accounted for 18% of Ontario's cumulative first-time HIV diagnoses among women during this period. Women from HIV-endemic regions accounted for approximately a third (33%) of Ontario's cumulative first-time HIV diagnoses. In contrast to injection drug use however, positive HIV diagnoses among these women have been increasing gradually to a plateau of 22 to 28% from 1990 to 1999. However, from 2000-2003, they accounted for about 41 to 48% of cases ($p<0.00001$). Sixteen percent of first-time HIV-positive diagnoses among women are attributed to low-risk heterosexual contact, that is, sexual contact with a male partner not known to be HIV-positive or at increased risk of HIV infection. Low risk heterosexual women accounted for less than 10% until 1995, but increased to 19% in 1998, 25% in 2001 and 32% in 2003. Clearly this is a newly emerging HIV risk exposure category and HIV risk-related practice among women in Ontario not yet reflected in AIDS case report data.

In contrast to injection drug use however, positive HIV diagnoses among women from pattern II countries have been gradually increasingly. Some of this increase may be a reflection of the new immigration rules. Since January 2002, Citizenship and Immigration Canada require immigrants to be screened for HIV including those who had already arrived in Canada, thus creating higher testing patterns [11].

An additional consideration of HIV infection in women is that HIV can be transferred from a mother to her unborn child during pregnancy and delivery (vertical transmission). 496 HIV-infected women who delivered in Canada have been identified since 1984, to whom 118 HIV-infected infants were born. The vast majority of infants who are HIV infected were born to mothers from HIV-endemic countries. Since 1994, 52 HIV-infected infants have been born in Ontario, suggesting that prenatal HIV testing and the use of anti-retrovirals was not widely practiced following publication of results illustrating their effectiveness at preventing vertical transmission. In 1999, 21 HIV-infected infants were born in Ontario; 5 have been born since 2002 [13].

Federal HIV/AIDS Surveillance Categories

In federal HIV/AIDS surveillance, reports of positive HIV test results and reports of diagnosed AIDS cases are assigned to a single exposure category according to a hierarchy of HIV-related risk factors, with the higher risk activities appearing at the top of the hierarchy. If more than one HIV-related risk factor is reported by the person receiving the diagnosis, an AIDS case report or the report of an HIV positive test result is assigned to the exposure category listed highest in the hierarchy. The underlying principle is that for people with multiple exposures, the most likely source of HIV

transmission is assumed to be that associated with the highest HIV prevalence and incidence. However, this potentially oversimplifies the relevance of overlapping risk factors and may confound HIV prevention design efforts.

The primary HIV risk factors associated with women are heterosexual contact and injection drug use, together they accounted for 95% of new HIV infections in 2001 [11]. In the last few years, data have reflected a slight rise in heterosexual transmission and a slight decrease in the proportion of positive HIV tests attributed to injection drug use. Most recently, heterosexual contact has come to be seen as the main risk factor for HIV infection in women internationally, nationally, and provincially. In Canadian HIV/AIDS surveillance data, the heterosexual classification is reported if an individual identifies having had unprotected sexual intercourse with an HIV-positive person or someone who is at high risk of HIV infection (ie - an IDU, bisexual male or partner from an endemic country) [14]. Young women, women who inject drugs, Aboriginal women, women from HIV-endemic countries make up the subgroups within the Canadian population of women that are most at risk for acquiring HIV. An individual woman can fall into one or several of these subgroups concurrently.

Limitations in AIDS and HIV Surveillance Data

The prevalence of HIV/AIDS among Canadian and Ontario women are likely to be higher than those provided in epidemiological reports due to under-utilization of testing sites and previous delayed or under-reporting of testing results [11]. Data describing the number of new HIV infections in each year are subject to further limitations. Only a proportion of HIV-positive women will have become infected in the

year in which they are tested. Using enhanced sources of data including AIDS case reports, provincial HIV testing databases, population-based surveys, targeted epidemiologic studies, and census data, the Centre for Infectious Disease Prevention and Control (CIDPC) has estimated that in 1996 and 1999, women accounted for more than one in every five infections in Canada, a proportion much higher than that documented in surveillance data [15]. To reflect these challenges, new epidemiological reports in Canada are placing an emphasis on providing ranges rather than point estimates, and are adjusting data for potential missed cases.

AIDS case report data, although providing information on HIV infections that occurred some ten years in the past, are nevertheless far more complete than HIV positive test report data in terms of the reported ethnic status of the person receiving the diagnosis. Ethnicity data for positive test results first became available in Canada in 1998. Of the total 18,336 AIDS cases reported to the CIDPC by the end of June 2002, 86% included ethnicity data. Data on the ethnic status of persons who received a positive HIV test result are less complete: in fact, at the end of June 2002 it was estimated that 71% of all positive HIV test results did not include data on ethnic status [14]. A number of factors combine to construct the incompleteness of ethnicity reporting in HIV data: not all provinces and territories routinely collect data on ethnicity; not all provinces and territories routinely report data on ethnicity to the CIDPC; and newly diagnosed HIV-positive people may choose not to identify their ethnic background for fear of collective stigmatization directed at their community.

SECTION 3: WOMEN AND HIV/AIDS

Physiological Aspects

Physiologically speaking, during heterosexual sex, it is easier for the virus to be transmitted from male-to-female versus female-to-male. This biological disadvantage for women is based on the relative efficiency of male-to-female transmission of the virus in one single act of unprotected heterosexual intercourse. A higher concentration of HIV is found in semen compared to vaginal secretions; a greater volume of seminal fluid is transmitted compared with vaginal fluid; and a much larger area of mucous membrane in the vagina through which seminal fluid can be absorbed; together construct a greater likelihood of women being infected in one single act of penile-vaginal unprotected intercourse [15]. Additionally, women with a history of sexually transmitted infections (STIs) are particularly physically vulnerable to HIV, as they may be engaging in unprotected sex, may have open sores as a result of an STI (ulcerative STIs carry a higher risk than non-ulcerative STIs), may have weakened physical barriers due to use of oral birth control, and their STI may be undetected as women generally have less pronounced symptoms [16]. For a more complete discussion of women's physiological vulnerability to HIV, please see Appendix 1.

Early diagnosis of HIV in women is paramount for their continued health and access to necessary health care services. Once infected, women differ from men in their unique physical vulnerabilities to specific opportunistic infections, such as pelvic inflammatory disease, cervical cancer, breast cancer, vaginal fungal infections and candidal esophagitis [17]. Women's initial symptoms are less pronounced and often mislabeled as common gynaecological conditions. Opportunistic infections will require

pharmacological treatment, ongoing surveillance, and possible hospitalization. For this reason, HIV education and access to confidential or anonymous testing sites[3] for sexually transmitted infections must be made available to all women.

Another unique way in which the virus differentially impacts women is its effect on pregnancy. Should an HIV-positive woman become pregnant, she will be able to take precautions to effectively decrease the chance of perinatal transmission of the virus to her child if she is aware of her HIV-status. Perinatal transmission of HIV is the transmission of the virus between a mother and her newborn during or following pregnancy. Evidence now exists to show unequivocally that the transmission of HIV from an infected mother to her unborn child can be significantly interrupted through existing treatments and interventions. Perinatal, or mother-to-child transmission of HIV can occur in the uterus, during birth or following birth through breastfeeding [18,19]. That being said, since the development of effective preventive perinatal treatment, risk of perinatal transmission can be reduced to as low as 5% in women who are diagnosed with HIV and follow all necessary treatment and intervention precautions during and post-pregnancy [20].

HIV testing during pregnancy is an option available to all Canadian women; however recommendations and guidelines for how physicians discuss HIV testing with pregnant patients vary between provinces/territories and may not always be applied consistently [21, 22,23]. Prenatal HIV screening programs follow either opt out, opt in, or voluntary (unlinked anonymous) studies. The prevalence of diagnosed HIV infection among pregnant women in Canada is approximately 3-4/10,000. The highest rates are found in large cities, however there are exceptions: New Brunswick reported 4.1/10,000

[3] Anonymous testing is testing in which the results can be linked to the person being tested by a code known only to the patient. Neither the physician ordering the test nor anyone else knows the identity of the patient [AIDS Law, anonymous HIV testing, 2000].

between 1994-1996 and a study of pregnant Aboriginal women in BC found a rate of 31.3/10,000 between 2000-2002 [11].

The Ontario Prenatal HIV Testing Evaluation Working Group have recommended that more dissemination on the importance and rationale for universal HIV counseling and voluntary testing among pregnant women must be urgently communicated to health care professionals and women [21]. Comprehensive communication plans are needed to improve the public's general awareness about perinatally transmitted HIV, and the availability of counseling, testing and treatment options for women.

Specific information on HIV prevention and testing, disease manifestations (ie-women's symptoms) and how available HIV medications affect women, as well as general information on sexuality, reproduction and all STIs are needed so women can make informed choices about their HIV prevention, care, treatment and support needs.

Sociological Aspects

In order to understand women's HIV prevention needs, further attention is being paid to the social, cultural, economic and political factors that put women at risk. The primary ways in which women acquire HIV are through heterosexual contact with an HIV-infected partner and through drug use. Globally speaking, the spread of HIV through these means is occurring more readily among women who fall into specific demographic categories, namely young women, visible minority women, street-involved women, women involved in the sex trade, women who use drugs and women in prison [15]. A great deal of research has focused on looking at the impact of gender and other social constructs on women's health:

> *Social structures such as denial of education, exclusion from paid work and lack of property rights prevent or inhibit women's participation in society. Women can neither voice their concerns about issues affecting them, nor gain the skills and esteem which are a part of social and political participation. Cultural and religious ideologies reinforce social and political structures by providing them with deeply felt rationales. Specific cultural and religious practices, especially those concerning marriage, childbearing and sexuality, negatively affect the health of women* [2, p. 95].

The contextual factors that shape women's health behaviours, access to health care services and information, and health outcomes must be continuously studied. Health services and interventions initially designed around male norms are not the most effective for women. For example, in a society where women can be socially or economically dependent on men, individualistic approaches to HIV prevention could have repercussions for women, including stigma, violence or abandonment. HIV/AIDS-related stigma and discrimination continue to confound HIV prevention interventions and illustrate dangerous gender assumptions. Beliefs such as only promiscuous women or women involved in the sex trade are at risk of HIV continue to exist despite contrary epidemiological evidence [24]. Other social issues such as poverty, unemployment, drug addiction, lack of childcare or transportation for women wishing to use health care services, lack of female-controlled prevention methods, and women's exploitation in the commercial sex trade, provide examples of ways in which gender can make women vulnerable to HIV [2].

Identification as a member of a 'at risk' or 'vulnerable' group does not however, predict HIV infection and it is important to ensure that identified 'at risk' groups are not collectively stigmatized. Slowing the rate of HIV infection among all women will require designing, implementing and evaluating HIV prevention programs that look at the individual as part of a complex social dynamic of individuals, systems and structures that

influence individual risk behaviours. Women may engage in behaviours that put them at greater risk of acquiring HIV of their own volition or due to circumstance or coercion. Classification of women into 'high risk' and 'low risk' categories may deemphasize the fact that all women should be informed about, and assisted in, decreasing their personal risk. Risk group identification may be useful at the policy and programming level for priority setting and fund allocation. For this reason, it is important to explore why certain groups of women are increasingly becoming infected with HIV, while simultaneously providing HIV education and prevention interventions to all. Research into the social contexts that shape women's HIV risk may help uncover information gaps, risk behaviours, testing patterns and lend insight for surveillance data interpretation. As women and men interact in ways that may increase or decrease one another's personal risk it is important to look at the impact of gender on HIV.

Gender

Gender has been defined as shared expectations and norms held by society about appropriate male and female behaviour, characteristics, and roles. Such norms are said to influence social interactions [25]. Gender differs from the concept of sex in that it refers to socially prescribed gender roles and sex refers to biological sex differentiation. Gender inequality refers to differential social opportunity and power based on gender [26]. Those with less social power are more likely to have their needs marginalized. According to feminist theory, women who are marginalized (firstly by gender and also potentially by race, culture, class and sexual orientation) will have less access to social and health care systems and be at higher risk of contracting communicable diseases,

including HIV [27].

The study of gender has contributed much to the study of HIV as a communicable disease increasingly affecting women. By studying gender in relation to other social determinants of health, specific risk factors that make women vulnerable to HIV have emerged. Social stereotypes around women's sexuality and early misconceptions of women's HIV risk put women at an increased risk for contracting HIV [2, 28]. Social norms, which sexualize women, yet vilify them for being sexual, condone male sexual promiscuity, place birth control responsibilities on females, and dissuade public discourse on sex and sexuality, perpetuate uneven sexual dynamics that are harmful for women. Additionally, barriers to health care use that are often specific to women, such as lack of childcare, respite care or transportation, will impact a woman's ability to engage in health resource seeking behaviours [29]. For these reasons, gender-based analysis that explores the experiences of both genders should be included in the design of all HIV prevention efforts.

One theory that looks at the gender dynamics involved in relationships and HIV risk, is the Theory of Gender and Power [30]. The Theory of Gender and Power focuses on women's needs by looking at the distribution of power and authority, gender norms and interpersonal influences on behaviour. Specifically, this theory looks at the differences in labour, power dynamics and relationship investment issues between men and women as a way of illustrating how social dynamics can produce inequalities for women and increase women's vulnerability to HIV. This theory provides evidence for the importance of gender-based analysis as a means of further understanding women's HIV prevention needs.

In terms of HIV prevention strategies for women in Canada, Health Canada created a gender-based analysis framework in 1995 and have pledged commitment to use it as a way to help foster gender equality in health care. This would involve ensuring that government policies and programs consider the needs of both men and women using gender-based analysis tools. Gender-based analysis is based on four key principles:

1) Gender equality can be achieved only by recognizing the different impact of norms or measures on women and men according to their diverse life situations.
2) Gender-based analysis is an integral part of the substantive analytical process and must be applied at each stage of this process.
3) Gender-based analysis focuses not only on results but also on concepts, arguments and language used in the work process.
4) Gender-based analysis must lead to remedies to inequality.

[31].

Health Canada hopes to use gender-based analysis to break down existing stereotypes and acknowledge disparities created by the social determinants of health within Canadian communities. To do this, they have created workbooks, given seminars and established gender-based analysis professional networks. However, critics stress that much research and front-line work is still needed to ensure gender analysis remains an HIV prevention priority. Examples of gender-appropriate interventions are: female-centered programs; services offered in existing health/women's centers; both female and male involvement in initiatives; relationship-based negotiation skills training; empowerment-based programs; and female controlled technologies (such as microbicides and female condoms) [32,33].

Groups such as the Status of Women, the Women's Health Bureau and the Secretary of State have all had to continuously fight for the integration of gender analysis into government policies and legislation. Although they have succeeded at ensuring its inclusion in working documents, it rarely has been found to filter down into program

planning and policies at the various sectoral levels [34]. Unfortunately, a disconnect exists between the ability of government to enforce such a framework and the ability of community-based organizations to always apply it as laid out in policy [35]. Lack of funding and resources to implement this level of analysis is often an issue in community-based projects. Ideally, the government would have to create legislation that mandated gender analysis into its funding guidelines and then support and enforce it rigorously in order for it to filter down to the majority of HIV prevention efforts. This may be a challenge since many organizations at the community level may be overburdened and uncomfortable with complicated evaluation plans and new guidelines for their pre-existing programs and strategies. The health care system is still largely organized around the biomedical model[4] of health care, which assumes erroneously that both genders' needs are being addressed by a system originally designed for males [2,36]. Once a distinction is created between the HIV prevention needs of women and men, the following challenge becomes one of recognizing that women are a highly heterogeneous group with vastly different experiences that will shape their individual HIV risk.

Culture and Race: Exclusion, Discrimination, Mono-cultural Approaches

Women of colour, specifically Latina, African, Caribbean, Asian and Aboriginal women living in Canada, have unique cultural issues that influence their HIV-risk. Women of colour make up a disproportionate percentage of women living with HIV in Canada. Approximately 50% of all HIV-positive test results among Aboriginal and Black

[4] The biomedical model is based on the premise that health issues are biologically determined and health solutions should be attained through accepted medical interventions – get ref*

persons are among women, whereas only 16% of the Caucasian HIV-positive population is female [15,37,38]. Women of colour are disproportionately vulnerable to HIV due to multiple, intersecting frameworks of oppression that create unique HIV risk situations and impact on an individual's ability to navigate around HIV risk. Racism, homophobia, gender discrimination, poverty, lack of culturally-appropriate and language-appropriate HIV prevention interventions limit access to services and impact the ability of women of colour to prevent HIV transmission [39, 40, 41].

Ensuring that all Canadian women have access to HIV prevention resources requires developing culturally competent health services and service providers [42]. The concept of 'cultural competence' refers to programming that incorporates the active involvement of individuals from differing cultural contexts in the design, implementation, and evaluation of HIV prevention interventions so as to ensure that community-based values, traditions and norms are not overlooked or assumed in the planning phases of HIV prevention activities [43].

The nuanced socio-cultural realities of women require that interventions go beyond an analysis of gender. Racism experienced by women of colour has been found to contribute to feelings of hopelessness, powerlessness and lower self-esteem [44]. Additionally, theorists interested in the impact of ethnicity on health are also exploring the potential of 'weathering' frameworks which suggest that women of colour may suffer deteriorating health over time due to repeated experience with social, economic, or political exclusion [45]. Issues such as social isolation, lack of culturally appropriate services and knowledgeable service providers, limited language (verbal and non-verbal) proficiency and cultural invisibility can all contribute to the marginalization of women's

general health needs. Women of colour are also more likely than Caucasian women to live in poverty, which in turn is likely to place additional focus on basic survival needs over concern for HIV prevention [37,38,46].

In a review paper on culturally competent HIV prevention interventions for women, Scott et al. [43] developed the following recommendations for organizations and agencies providing HIV prevention programming:

1. Recognize the intersection of race, gender, and class and the resulting self-perceptions of powerlessness.
2. Focus attention on the harsh economic realities faced by many women of colour.
3. Incorporate self-esteem building as part of intervention efforts
4. Acknowledge and incorporate cultural norms.
5. Include social skills training for clients.
6. Combine behavioural skills modification and motivation efforts.
7. Recognize the barriers to HIV prevention efforts that are rooted in the cultures and histories of communities of colour.
8. Advocate for societal and structural changes that will positively influence the lives of women of colour at risk for living with HIV.

[43].

The existing literature on HIV in Ontario provides little information on the unique needs of women of colour and the challenges faced by AIDS service organizations working with women from various ethno-cultural communities. One study conducted by the National Project on Healthy Sexuality for Canadian Asian Women illustrates that different populations of Canadian women have different levels of HIV knowledge and prevention issues. This study found that in general, Asian immigrant women had a lower level of sexual health knowledge and 'unrealistic' perceptions of personal risks regarding

HIV and STIs [47, p. 2]. This study illustrates the importance of culturally-specific research projects.

Special attention must be given to the unique HIV prevention needs of various groups of women, so that programming reflects and responds appropriately to the cultural realities of all Canadian women.

SECTION 4: WOMEN AND HIV RISK FACTORS

Sexuality and HIV

Heterosexual contact remains the primary method of HIV transmission for women in Canada. Part of the problem in addressing women's sexual HIV risk is the complexity of women's sexual lives. For example, Canadian women may see their sexual orientation as fluid or static, may have one partner or many, may choose to engage in certain sexual behaviours and not others, and may begin their sexual lives early or late in their lifespan. While society reinforces certain sexual behaviours and discourages others, women may find it difficult to negotiate their sexual rights and needs and access sexual education resources. Certain sexual activities present higher HIV risk than others. Unprotected heterosexual intercourse carries the risk of acquiring HIV if a partner is HIV-positive or of unknown status. Heterosexual women who are engaging in unprotected sexual intercourse with a bisexual male or male injection drug user are particularly vulnerable to HIV infection. Additionally, anal intercourse between a man and a woman carries with it a higher risk of HIV transmission than vaginal or oral intercourse [48].

Heterosexual, bisexual and lesbian women are all at risk of acquiring HIV if they are engaging in unsafe sex or risky drug practices with an HIV-infected partner. A myth exists that lesbian women are unlikely to come into contact with this disease. Research has found that although, HIV transmission rates are spreading most rapidly among women who have sex with men, lesbian women have important HIV prevention needs as well [49,50]. Studying sexual orientation along with HIV risk, has allowed researchers to uncover the complexity of sexual behaviours that put women at risk of HIV and other

STIs. In a study in the US, researchers interviewed 1,304 women from various primary care settings asking them questions about their sexual orientation and perceived STI risk [49]. The women involved in the study self-identified as 49% heterosexual, 11% bisexual and 40% lesbian. The researchers found that of the three groups, heterosexual women were at the highest risk of acquiring HIV as a result of inconsistent condom use. Bisexual women reported a higher number of sexual partners and a higher level of substance use than the other two groups, which increased their risk. Lesbian women reported having had more bisexual male and female partners, but also reported a higher rate of condom use. Overall, this study provides some examples of the contexts within which women's sexual-related and drug-related HIV risks are taking place.

In another US study, researchers have explored discrepancies between self-reported sexual orientation and sexual behaviour [51]. The authors found that self-identified sexual orientation was much less accurate for determining the gender of an individual's sexual partners than were specific questions about sexual behaviours. This phenomenon also varied by race/ethnicity. For example, Hispanic men engaging in active anal or oral intercourse with other men were less likely than their receptive partners to identify as either homosexual or bisexual, but instead often identified as heterosexual. This reinforces the notion that sexual orientation is for some a fluid concept and can be influenced by such factors as economic necessity, fear of stigmatization based on identified homosexuality/bisexuality, or differences in cultural understanding of sexual behaviours. Unknown HIV risk may exist for women who are engaging in sexual intercourse with men who sleep with other men, while not self-identifying as bisexual. For this reason, specific questions about sexual behaviours rather

than classification into a sexual preference label will likely yield more useful findings for HIV prevention interventions.

An additional important consideration is that of general access to health care resources for women who identify as either lesbian or bisexual. Comprehensive gynecological care for women who identify as lesbian may be more difficult to access, as many physicians are less familiar or comfortable with lesbian sexual health issues [52]. For example, the ease of categorizing lesbians as 'low risk' for many STIs may lead to overlooked symptoms or discussions of sexual risk behaviours. Making assumptions about any woman's sexuality, sexual behaviours or sexual risk is dangerous and risks perpetuating societal silencing of sexual issues which should be discussed as health issues. For example, in Koh's interviews with women who self-identified as lesbian, he found that many had slept with men and bisexual women [49]. Rates of chlamydial and gonorroceal infection found among lesbian women are in some studies similar to those found among women who have sex with men, possibly due to sex with men or sex with bisexual women [50]. Furthermore, existing HIV prevention efforts, although hugely supported by the efforts of lesbian women from the beginning of the epidemic, exclude this population as a risk group and do not prioritize funds to conduct further research into lesbian women's HIV prevention needs [2]. Lastly, little to no information exists on lesbian women of colour and HIV prevention in Ontario.

Drug Use and HIV

As discussed earlier in this paper, drug use among women has been found to elevate HIV risk. This is true of many different forms of drug use, including not only

injected drugs, but also non-injected drugs and alcohol.

The 'highest risk' drug behaviour associated with HIV is injecting heroin or cocaine. People who inject drugs are at risk of HIV infection when they use injection equipment contaminated by the HIV-infected blood of another user. Previously used needles and syringes found, borrowed or bought from another user or dealer, pose significant risk for infection as efficient storers of the previous user's blood [53]. Women may be exposed from their own drug use through the direct sharing of needles and indirect sharing of other injecting equipment, such as syringes, cookers, spoons, water, and cotton filters [54,55].

Additional studies have found that women's injection drug use and sexual safety are intricately connected to life issues such as sexual, emotional and physical abuse [56]. Previous abuse and involvement in the sex trade have been associated with an increased tendency toward injection drug use. Additionally, the trading of sex directly for drugs or survival needs (ie - shelter, food, protection) creates situations that increase the risk of HIV transmission [57].

In a study of HIV prevalence and risk behaviours among Ontario injection drug users, Millson et al. found that HIV positivity was associated with specific injecting practices and issues, namely: using drugs for more than five years, use of cocaine, use of crack, binge injecting, being a long-term needle exchange program (NEP) user, sharing drug equipment and having less access to methadone treatment. Cross-sectional surveys administered over the course of a decade were found to be a cost-efficient, useful approach for monitoring trends relating to injection drug use and condom use. Using previously used needles and/or other injection equipment decreased while condom use

has remained relatively the same over the course of the study. Significantly more resources have to be dedicated to providing additional, accessible harm reduction, and HIV prevention programs to drug users in Ontario [58].

There is a growing interest in creating HIV and Hepatitis C (HCV) prevention interventions tailored for crack smokers. Evidence suggests that communicable diseases, such as HIV and HCV, may be transmitted through the sharing of drug equipment [59, 60]. In Ontario, safer crack smoking kits are now available for distribution in Toronto, Guelph, Windsor, and more recently Ottawa, through pre-existing harm reduction programs [61]. In Vancouver, interest in establishing safer smoking facilities (SSFs) has been growing in the harm reduction community [62]. SSFs are being described as not only a potential route for the distribution of crack kits, but also a way to link safer smoking environments with health care resources, HIV education and counseling for people smoking crack, cocaine, heroin or methamphetamine. A recent study looking at uptake and participant willingness to use SSFs found that those who expressed the most interest in SSFs were individuals involved in the sex trade and/or those currently sharing crack pipes [63].

In a study in Nova Scotia, youth were asked to describe the significance of drug and alcohol use in relation to their sexual encounters [64]. Alcohol consumption was identified as playing a key role in impairing their safer sex behaviours. Many youth admitted to having had unprotected intercourse while under the influence of alcohol. Alcohol was also associated with frequency and tendency of engaging in casual sexual encounters. In comparison, the youth described their drug use, specifically the use of marijuana and ecstasy, as more likely to impair their ability to perform sexually, thus

resulting in fewer incidences of unsafe sex. Other studies have found both alcohol and drugs (specifically marijuana) to be associated with unprotected sexual intercourse and earlier initiation into sexual activity [65,66]. Greater attention must be paid to teaching youth how to engage in safer sex negotiations and protective behaviours in the context of alcohol and drug experimentation.

SECTION 5: HIV PREVENTION INTERVENTIONS AND WOMEN

A myriad of HIV prevention interventions have now been designed for women, however, gender, race and class continue to interact to make women vulnerable to HIV infection. Using epidemiology to identify transmission patterns, characteristics and needs of a community, both targeted and general HIV prevention interventions, can be created to reach both accessible and harder to access groups of women. Considerations in the design of HIV prevention interventions for women, such as theory, policy, and program development resources will be outlined. This will be followed by a discussion of specific groups of women in Canada that share a disproportionately greater risk of acquiring HIV and how HIV prevention efforts have been tailored to meet their specific needs.

Theory

HIV prevention interventions are generally designed based on either a formal or informal theoretical framework. Theories are a set of ideas, principles or methods that are used to frame an issue and help with the design of interventions or research [67]. Theory can be particularly useful in designing steps or goals for interventions, framing discussions on particular topics, or as a teaching tool.

The earliest theoretical approaches used in HIV prevention came from the fields of education, marketing and psychology and attempted to increase the public's understanding of HIV risk through awareness-raising campaigns [68]. These strategies focused on providing disease prevention education or access to screening services to the general public. The underlying hypothesis in this approach was that if people were provided with information telling them how to lower their HIV risk, they would modify

their behaviours to correspond [69]. Individual behavioural approaches can be broken down into three main categories: those that predict behaviour, those that promote behaviour change, and those that encourage safer behaviours. These theories tend to focus on change as a process that can be accomplished in steps or stages. The most widely used models have been: the Theory of Reasoned Action, Stages of Change (also named Transtheoretical Model), Health Belief Model, and the AIDS risk Reduction Model [68]. At this level of analysis, social and structural influences are not seen as being crucial to the understanding of how people make health decisions. These theoretical approaches have been effective in identifying behavioural HIV risk factors and for increasing general awareness about HIV [70,71].

The most commonly used theories in HIV prevention interventions for women are summarized in the following table [72]:

Most Commonly Used Theories in HIV Prevention Interventions for Women

Theory	Focus
Social Cognitive Theory	(self-efficacy, condom negotiation and sexual history conversations)
Theory of Gender and Power	(partner/social norms and communication skills)
Diffusion of Innovations with Community Mobilization	(low income women, high risk populations)
Stages of Change	(stage tailored counseling)
AIDS Risk Reduction Model	(harm reduction through condom use and needle exchanges)
Perception of Risk	(to predict condom use)

An important component of theories used in HIV prevention, is where responsibility to prevent HIV is placed. Once researchers and practitioners started

looking at social determinants of health, the onus for change was still initially placed on the individual. With time this started to shift and HIV researchers started to look at issues of social responsibility, the potential of policy reform, and how inequality and human rights influenced HIV prevention risk in the broader social context [73,74]. Macro level theories were seen as taking the focus off of the individual and looking at the interdependence of social system characteristics, such as organizations, economic, public policies and relationships in shaping people's thoughts and behaviours. Although health care systems are increasingly supporting notions of health promotion and population health and consequently promoting shared responsibility for health with the individual, some feel more should be done at the structural and social level [74, 75,76]. Specifically, they believe that public health officials and politicians have to take more responsibility for creating healthy public policies that will improve the public's general health. Larger, social/structural approaches to HIV prevention are seen as having more potential to effect long-term maintenance of supportive environments for promoting behaviour changes.

One limitation of most existing theories, however, is a lack of focus on culture and gender as two important variables for influencing behaviours. Without considering gender and culture, these models are not able to help explain how to tailor HIV prevention programming for segments of the population disproportionately vulnerable to HIV. For example, modifying women's sexual risk for HIV, Heise and Elias [32] argue that most existing HIV prevention theories focus too narrowly on a 'three pronged approach' that includes partner reduction, condom promotion and STI treatment. The authors suggest such approaches de-value the complexity of sexual encounters and assume women are able to successfully negotiate safer sex with their partners. They

believe these individual approaches rely too heavily on generalizations, without considering the impact of social inequality and the reality of women's lives. Specific groups of women, namely ethnic minorities and women from HIV endemic countries, sex trade workers, injection drug users and prison inmates, are particularly vulnerable to HIV and can benefit from more tailored approaches to HIV prevention that consider their unique needs [6,73,74].

In addition to micro and macro level theories of HIV prevention, 'messo theories' promote the idea of seeing society as broken up into subcultures that exert influence on individual behaviour. Harm reduction strategies have been used at this level, most notably through the establishment of needle exchange programs [77]. These strategies rely on the backing of community members and government collaboration. Community-based research projects created for and by community members are becoming increasingly recognized as being critical for community buy-in and for appreciating the unique cultural needs of 'hard to reach' populations [78].

Best practices in terms of HIV prevention theories, appear to involve identifying risk groups and tailoring information and interventions at a micro level, creating inclusive macro level interventions that make health resources accessible, encouraging collaboration, providing forums for community-participation and advocacy, and offering multiple approaches simultaneously [2,72]. Approaches involving participants in the conceptualization, planning, implementation and evaluation stages are encouraged in order to ensure participant buy-in and cultural competence [78]. A necessary addition to most of these theories is a consideration of gender.

HIV Prevention Communication Strategies

Finding the most appropriate and effective communication routes and messages for HIV prevention is complicated. Different communities will have various needs based on audience, available resources, and assigned priorities. It is important to examine the context in which the HIV prevention message is being delivered and evaluate whether or not it is being effectively heard and influencing behaviours.

Aggleton reviewed a wide variety of communication interventions to determine how they contribute to decreasing high risk behaviours, produce supportive environments and overcome accessibility and sociocultural obstacles to HIV prevention [79]. He found that the most effective communication strategies shared certain key characteristics: designed specifically for a target group; secured government commitment; ensured the continued involvement of non-government and community-based organizations; and stressed linkages between treatment, care and support. He added that specific efforts should be made to reach marginalized populations, involve HIV positive persons in the design and implementation of strategies, open up discussions around drug use and sexuality, and integrate HIV prevention into other, more broad health care activities (ie – women's health centers).

Other research into HIV prevention communication strategies have emphasized the importance of ensuring the communicated message is understood by the audience through evaluation measures, creating a dialogue between the audience, stakeholders and educators, and understanding cultural norms, beliefs, values and myths [80].

Behavioural Interventions

As described earlier in this section, the underlying hypothesis behind HIV prevention behavioural interventions is that if people understand their risk and are provided with information telling them how to lower this risk, they will modify their behaviours to correspond. A downfall of behavioural approaches to HIV prevention is that they ignore social and structural influences on HIV risk and place responsibility for healthy behaviours primarily on the individual without an exploration of control and social determinants of health. That being said, these theoretical approaches have been effective in increasing general awareness about behavioural HIV risk factors [69].

In terms of general review papers on women and HIV prevention, Wingwood and DiClemente composed a literature review of HIV prevention approaches and found that effective behavioural interventions for women shared key characteristics. Namely, the authors found that programs based on social cognitive theory were effective at increasing women's ability to influence consistent condom use and improved sexual communication and that this often led to sustained skills. Of all the interventions, that looked at both intrapersonal and interpersonal factors, gender, peer-led skills training that attempted to modify social norms were found to be the most consistently effective [81].

More recently, Ickovics et al. [82] identified seven types of HIV prevention interventions most likely to be found in the literature, they are: small group, community-wide, media, HIV counseling and testing, individual counseling, classroom education and laboratory experiment. In their review of the literature, the authors found that both community-wide and small group interventions were the most likely approaches to be effective. For women, it was also found that lower intensity (less than five sessions),

small group programs were preferred. The authors also stated that their review found that individual counseling as primary prevention was less effective with women. However, they stipulated that this approach has been found to work well in secondary prevention interventions with serodiscordant[5] couples. In a review of international HIV prevention research focused on women, Ikovics et al. suggest that a common, problem is many interventions lack theoretical frameworks and a built-in evaluation component.

Harm Reduction

Harm reduction has been described as: "Policies and programs which attempt primarily to reduce the adverse health, social and economic consequences of mood altering substances to individual drug users, their families and communities, without requiring a decrease in drug use" [83]. Harm reduction in terms of HIV prevention, is a classification of interventions that focus on minimizing a person's individual harm and keeping them as safe as possible from high risk HIV behaviours. This approach recognizes that risk behaviours occur and may continue to occur despite risk. Harm reduction's core idea is that it is important to maintain a value neutral, human rights perspective when trying to meet the health needs of individuals. In practice, individuals are not punished if they do not abstain from harm behaviours, but instead are taught how to make those behaviours less harmful. Non-judgmental policies and programs that define harm reduction, encourage people to live safer lives and gain self-confidence and improved health through their achievements. Harm reduction has been most often used as a conceptual model for framing the unique needs of persons using drugs. Initial fears

[5] A serodiscordant relationship is one where one partner is HIV positive and the other is HIV negative.

that harm reduction programs for injection drug users (IDUs) would encourage existing use and aid in the recruitment of new users, have been dispelled [84]. Examples of harm reduction strategies are needle and crack pipe exchange programs, methadone maintenance treatment, outreach and education programs for high risk populations, law enforcement cooperation, medical prescription of heroin and other drugs, and safer injection sites [85]. It is important to ensure that harm reduction interventions are offered in conjunction with other support services such as crisis intervention, health care resources, shelter, housing, outreach programs and counseling.

Female-Controlled Preventive Technologies

Microbicides can substantially reduce transmission of STIs, including HIV, when applied either in the vagina or rectum prior to sexual intercourse. Microbicides can be produced in many possible forms, such as gels, creams, suppositories, films, lubricants, or in the form of a sponge or a vaginal ring that slowly releases the active compound.

The International Partnership for Microbicides (IPM) have announced a new partnership with pharmaceutical companies, Merck and Co., Inc. and Bristol-Myers Squibb to work on the development of microbicides. The two partnering pharmaceutical companies have donated royalty-free licenses and intellectual property rights to IPM to develop, manufacture and distribute compounds they discover that may act as effective microbicides. These compounds are a new class of antiretrovirals[6] known as 'entry inhibitors' that directly bind to HIV and the receptor cells to prohibit infection. Animal trials are underway and early results suggest these compounds are showing some success.

[6] Antiretrovirals are a class of drugs that inhibit retroviruses like HIV.

If proven effective, scientists predict that microbicides will be marketed in Canada in five to ten years [86]. IPM will prioritize the distribution of microbicides to women living in third world countries where HIV is pandemic. At this time, it is estimated that even if only partially effective, microbicides could prevent millions of infections of HIV among women.

The female condom is a polyurethane condom worn by a woman during intercourse. It lines the vagina and helps to prevent both pregnancy and STIs, including HIV. The female condom was first marketed in Europe in 1992. The World Health Organization (WHO) and the Joint United Nations Plan on HIV/AIDS (UNAIDS) have promoted the female condom in most parts of the world, however, its adoption has been more successful in certain African countries, where HIV rates are highest, and it has proven less popular in other countries [87]. The female condom has advantages and disadvantages. It is effective in reducing the chance of contracting an STI or having an unplanned pregnancy, however, many users do not find it easy to use, affordable or appealing. In third world countries, where it is most actively being promoted as a vital female-controlled barrier method for HIV, questions have arisen as to whether or not it could be re-used more than once to increase its cost-effectiveness. WHO does not recommend or promote reuse of female condoms but has released a document together with guidelines and advice for community-based health care providers who may consider counseling people on how to reuse the condoms [87].

Lastly, researchers are trying to develop a preventive HIV/AIDS vaccine. Such a vaccine would be administered in the form of an injection or pill. A vaccine would eliminate the need for partner negotiation and consequently would grant women more

power to protect themselves from the virus. There is some indication that a partially effective microbicide might be able to be used in combination with a partially effective vaccine to strengthen prevention efforts for women [86]. However, much research is still needed on both compounds before a potential combination is attempted. It is likely that an effective microbicide will reach the market before a vaccine is developed.

In 2002, the Canadian Government announced that it was going to allocate resources to the creation of a Canadian HIV Vaccines Plan. Since then, a Steering Committee and a draft plan have been developed. In 2005, a variety of stakeholders from government, research, industry and community sources, pledged to collaborate on the development of a Canadian Microbicides Action Plan. An environmental scan has been conducted and a draft plan is being created. Both plans will describe Canada's role in local and international efforts to develop preventive technologies to stop the spread of HIV. Canada will be the first country to have drafted work plans for both vaccines and microbicides and hope to disseminate the plans at the XVI International AIDS Conference in Toronto and the 2006 Microbicides International Conference in Cape Town, South Africa [88].

Once developed, it is crucial that women will have access to safe and affordable preventive technologies. Research and advocacy are necessary to ensure that continued support for the development of such prevention methods results in women receiving products that work in the context of their HIV prevention needs. Plans should be drafted for community participation in clinical trials, distribution methods of approved products and comprehensive research into the effectiveness of the products.

Policy

HIV Prevention Policy refers to existing guidelines for monitoring and managing HIV risk. In Canada, existing HIV policy is passed down from the Public Health Agency of Canada through their 'Federal Initiative to Address HIV/AIDS in Canada' [89] to provincial governments and community-based AIDS service organizations. More than ever, collaborative efforts at policy development are being encouraged and conducted, with community consultations and national funding framework templates being used to keep government and community connected. The existing system, however, has caused some solutions as well as many tensions. Community-based organizations often express having insufficient funds and resources to adequately address many policy recommendations and question whether high risk groups' needs are being adequately prioritized [36,90].

The Canadian Public Health Association (CPHA), a national not-for-profit organization, has created a list of five key principles for drafting HIV policy. They are:

1. Strategic partnerships, including those with affected communities, should be used as key resources in the research, planning and development of policies.
2. Policy development should focus on attainable goals, increased funding, adaptable content, evaluation and accountability, action, 'less politics', and development of inclusive processes.
3. Policy development should take into account the broader context in which HIV/AIDS exists as a disease (it is not the only Sexual Transmitted Infection, or the only blood-borne pathogen), the broader reality of the populations most vulnerable to infection (HIV is not the only health/life issue facing most populations at risk), and the requirements for a broader continuum of prevention messages and reinforcement (support for behaviour change should be consistent wherever a person goes, and different populations need very different approaches to accomplish that).
4. Policies should be forward looking, not just focusing on the situation as defined by current statistics and situations, but identifying appropriate responses to emerging trends and populations as can be responsibly projected.

5. CPHA should ensure that information on its policy development activity is distributed as widely and frequently as possible – both to ensure that partners at all levels are aware of the work that is going on, and to generate broader support for that work.

[91].

In Ontario, the Ontario AIDS Network (AON) works to create connections between government, researchers and over 50 AIDS service organizations and AIDS service programs. According to an OAN survey of its members completed in 2004, community-based AIDS organizations are currently coping with a 40% increase in demands, a 15% decrease in real funding and fewer community resources. Because of this situation, organizations are now spending the majority of their time seeking out additional sources of funding and struggling to provide the services their clients need [90].

Thailand has been able to illustrate the impact of public policy on HIV prevention at the national level. In 1992, HIV prevention became a priority with a national, four-part policy. The first policy was to develop a Multi-Sectoral National AIDS Prevention and Control Committee. Second, a mass public information campaign was initiated. Next, a "100% Condom Program" was adopted throughout Thailand's legalized commercial sex trade. Many antiquated policies were reversed, to allow for the abolishment of mandatory name reporting and the removal of immigration prohibitions for people living with HIV/AIDS. Instead, a focus was placed on the importance of voluntary, anonymous testing and counseling. These policies set a precedent for other developing countries and illustrate the importance of political leadership and policy reinvigoration [92].

SECTION 6: CANADIAN WOMEN WITH DIFFERENT EXPERIENCES AND HIV PREVENTION NEEDS

Young Women

In 2001, the highest percentage of new positive HIV tests occurred among Canadian women aged 15 to 29 years old, accounting for 45% of overall cases among women. This differs from Canadian men, who are more likely to test positive at an older age. Consequently, researchers are interested in discovering why young women are particularly at risk and what sort of risk behaviours they engage in. To date, it has been found that women during their 'childbearing years' are more at risk than older or younger women, partly due to this being a time of initiation into sexual and drug exploration [15]. This is also true for young men, however, due to a lower transmission rate of HIV to men from women, the likelihood of contracting HIV is higher among young women. Social factors such as violence directed towards young women, conflicting messages about sexuality, and a potential economic dependence on men, also increase this population's risk of infection [15]. Specific high-risk behaviours, such as unprotected sexual intercourse and drug/alcohol use, are increasingly putting this group at risk for HIV.

In 2002, the Canadian Council of Ministers of Education conducted a study to determine youth's knowledge about HIV/AIDS and the use of condoms by youth aged 14 to 17 [93]. The researchers compared their findings to a similar study conducted with Canadian youth in 1989 and found that today's youth were less knowledgeable about HIV/AIDS than the students in the previous study. According to their findings, only 25% of young sexually active women regularly used a condom if on the birth control pill and

half of the students interviewed believed there was a cure for HIV/AIDS. In general, the findings indicate a strong need for future studies that explore the contexts within which youth learn sex education information and misinformation and make decisions about sexual behaviours.

In Health Canada's 'HIV/AIDS among youth in Canada' document, a great deal of evidence is brought forward to illustrate that youth are engaging regularly in HIV risk behaviours and experiencing high rates of STIs [94]. Specifically alarming is that many young women are engaging in unprotected intercourse, engaging in sexual intercourse at earlier ages and currently reporting having more sexual partners than previous generations of adolescents.

A study was conducted in 2003 in Nova Scotia to identify information gaps and obstacles to sexual health decision-making among young heterosexual men in relation to their women sexual partners in an effort to prevent the further spread of HIV infection [64]. This study involved interviewing young men (aged 15 to 24), sexual health care providers and, in its second year, interviewing young women (aged 15 to 24). The general findings suggest themes among this population: 1) young men were less likely to talk openly about sex and seek information/resources for fear of looking unknowledgeable; 2) most youth reported not using condoms consistently; 3) pregnancy prevention was the major concern of youth; 4) most youth did not feel they were personally at risk of acquiring HIV; and 5) young women interviewed generally reported taking on the responsibility for birth control and safer sex. These findings suggest that increased education for both male and female youth is necessary and that young men must be more actively involved in conversations and programs that stress their role in

HIV prevention.

Other studies, focused on school-based sex education curriculums, have found mixed results in terms of program effectiveness [95]. The most successful school-based programs have been modeled after the Social Cognitive Theory and have employed the use of peer educators for HIV education [96,97]. Research into peer norms have shown that youth are more likely to model their behaviour after those that seem most like them. Programs based on such models have been found to increase condom use and sexual initiation delay [98,99].

Additional studies have looked at the role of mentoring. In Nigeria, a non-governmental organization (NGO) has created a program called 'Girls' Power Initiative' which teaches young women between the ages of 10 and 18 about sexual and reproductive health and human rights through mentoring. Girls meet once a week with community leaders, parents, teachers and health care workers to learn leadership skills, work on sexual negotiation and provide support to one another. The researchers concluded that HIV prevention programmes for girls must reflect their realities, build self-confidence, and improve or teach decision making and negotiation skills [100].

Large scale studies looking at youth's knowledge and behaviours related to HIV must be conducted more regularly and must effectively include the voices of hard-to-reach pockets of youth. The Canadian Youth, Sexual Health and HIV/AIDS Study (CYSHHAS) recommends using theory-based research models for conducting studies with youth, with a particular emphasis on the cross-section between the health determinants, sexuality and sexual health [93].

Population-Specific Recommendations

1. Create accessible, youth-friendly (age appropriate), gender-sensitive health resources for young women and men.
2. Ensure accessible HIV, STI, teenage pregnancy, drug and alcohol abuse information is available for all youth.
3. Ensure condoms are readily available to youth.
4. Create opportunities for youth to discuss sexual decision-making, roles, responsibilities and risks.
5. Involve youth in the planning, implementation, evaluation and dissemination phases of HIV prevention interventions aimed at youth.
6. Use theory and existing literature to help guide youth interventions (ie – Social Cognitive Theory, peer educators, mentoring programs, skill building).
7. Tailor HIV and STI education programs for youth with different lived experiences, such as ethnic minority youth, street-involved youth, youth in detention facilities or youth IDUs.
8. Promote HIV testing and counseling for youth engaging in risk behaviours.

Women Who Use Drugs

Over time, there has been a dramatic increase in the annual proportion of positive HIV test results among adult and adolescent Canadian women attributed to injection drug use. Since 1996, approximately one-third to one-half of new HIV test reports among women has been attributed to injection drug use [11]. Before 1995, this exposure category accounted for 37% of new positive HIV tests among adult women, whereas in 1999 that proportion had increased to the highest level recorded of 48%. In 2001, the proportion of positive HIV tests among adult women attributed to injection drug use declined to 33% and then rose slightly to 36% in the first half of 2002.

Heterosexually active women who inject drugs and whose sexual partners also inject drugs confront HIV-related risks associated with their own HIV risk-related injection practices, and also from the HIV-related risk practices of their partner [57]. Across many studies differentiated by time, country of origin and population of IDUs

studied, the finding is consistent that women who inject drugs are significantly more likely than men who inject drugs to have a sexual partner who injects drugs, and are more likely to be living with another drug user [53,54,55,57]. Unprotected sexual intercourse within this relationship is therefore likely to carry elevated HIV-related risk for these women through their partner's possible unsafe injection and drug use practices. Speculation as to why this unequal pattern of partnering persists among people who inject drugs is far ranging and inconclusive. The finding that the initiation of women into drug and alcohol use is often directly associated with the presence of a substance-using male sexual partner suggests one perspective on the issue [56]. Another theory is the statistical probability associated with the higher number of male injection drug users in general. Existing research has solidified the theory that gender is a key determinant of HIV risk among injection drug users [53, 54,55,56,57].

The use of other drugs such as non-injected drugs and alcohol have also been found to influence HIV risk. There is evidence to suggest that HIV may be transmitted through the sharing of smoking equipment [62,63] and that alcohol consumption can decrease the likelihood of engaging in safer sex [64, 65, 66].

The specific interventions often used with women who use drugs have focused on harm reduction principles, such as needle exchanges. Outreach efforts may be necessary to make interventions accessible to particularly hard-to-reach drug users. Incarcerated female drug users have a harder time accessing harm reduction programs, as well as HIV testing, counseling and health care services in general [101,102]

Population-Specific Recommendations

1. Create non-stigmatizing, community-tailored HIV prevention services and resources for drug users and whenever possible involve drug users in the design, implementation and evaluation of prevention initiatives.
2. Provide improved HIV education and drug education curriculums for health care professionals and counselors.
3. Investigate the impact of all forms of drug and alcohol use on HIV risk behaviours.
4. The sharing and lending of injecting drug use equipment has gendered elements that must be addressed**.**
5. Create partnerships between AIDS service organizations (ASOs), drug treatment organizations and community groups (harm reduction, women's centers and detox).
6. Support harm reduction approaches to HIV prevention for drug users (ie – NEPS, SIFs, SSFs, methadone maintenance, condom distribution).
7. Advocate for consistent access to anonymous HIV testing sites.
8. Create gender-sensitive and culturally-competent HIV prevention programs for drug users.
9. Improve general knowledge about interaction between safer sex, substance use and HIV prevention.
10. Explore the injection drug use and HIV prevention needs of women in both urban and rural communities.

Women Involved in the Sex Trade

Women who trade sex for money, drugs or survival needs are at an increased risk of violence, sexual assault, murder, STIs and HIV. Exaggerated notions of sex trade workers being 'vectors' of HIV who knowingly infect their male clients illustrate the pervasive stigma and discrimination that plague sex trade work [2]. However, research has shown that sex trade workers, themselves, are much more at risk of acquiring HIV, STIs or injuries related to violence through their employment [103,104]. In Canada, as in other countries, sex trade workers are made more vulnerable to HIV infection because of marginalization and unjust laws that make accessing HIV prevention, health services and legal protection more difficult [105].

Poverty, financial dependence, unemployment, drug addiction and previous sexual and physical abuse are some variables that have been linked to women's involvement in the sex trade [106]. Once involved in sex work, women experience ranging levels of HIV risk depending on their unique experiences and context. Individual sex trade workers may increase their risk by engaging in unprotected sex for a variety of reasons. Some women may receive higher rates to perform unprotected sex acts and accept these conditions to support themselves, family members or an addiction. In other cases, women may not have control over safer sex negotiation and find themselves dependent on their client's intent to practice safer sex. Street involved sex trade workers and transgendered sex trade workers are at higher risk of violence than are male sex trade workers or those employed by sex venues or establishments [105].

The interaction between sex with clients, sex with intimate sexual partners and injection drug use may heighten HIV risk among women sex trade workers. A recent study found that 40% of female IDUs reported engaging in commercial sex work as a means of securing funds for drugs and basic survival needs. When asked if the women used condoms with their male clients, 92% of participants reported always using condoms with male clients. However, when asked about their use of condoms at home with their casual or regular partners, fewer than 33% of the women used condoms although many women reported using injection drugs and/or sleeping with men IDUs [57]. This exemplifies the potential complex layering of HIV risk in women's lives.

Population-Specific Recommendations

1. Ensure non-stigmatizing access to condom promotion, HIV/STI testing and counseling, HIV/AIDS education, harm reduction, detox and addiction counseling.
2. Encourage partnerships between HIV prevention programs, social services, health care services and drug treatment programs as a means of diminishing access barriers.
3. Promote lower risk sexual and drug use activities via harm reduction methods and skill building.
4. Promote safer sex behaviours with both paying sexual clients and personal, non-paying sexual partners.
5. Advocate for policy reform that protects the human rights of sex trade workers.
6. Advocate for the development of accessible female-controlled preventive technologies.

Street-Involved Women

Street-involved women in Canada are highly marginalized and may struggle with multiple health challenges, such as unstable housing, addiction, survival sex, and elevated risk of sexual and drug-related harms, including HIV infection. Research is needed to find ways to reach this marginalized group and find out important baseline information on their HIV prevention needs. This group is at the high risk of acquiring HIV because of multiple risk factors and lack of access to mainstream health venues and services. Street outreach programs for HIV education, condom and needle distribution, as well as testing and counseling referrals are needed. When combined with broader community-wide HIV prevention efforts, these approaches can help reach the most marginalized social groups [107,108].

Research has found that street-involved youth tend to engage in sexual intercourse at a younger age then their non-street-involved peers and have a lower rate of condom use [107]. Additionally, street-involved youth may trade sex for certain goods, such as money, food, housing or drugs. The importance of obtaining basic survival needs will

outweigh the importance of STI/HIV prevention in some cases.

Youth who inject drugs are at a higher risk of HIV infection, due to potentially sharing injecting equipment and the risk of engaging in unprotected sexual intercourse while under the influence of drugs. A Montreal study of street youth found that over 47% had injected drugs at some point in their lives [109].

Additionally, ethnic and sexual minority street-involved youth may have an even harder time accessing HIV prevention services due to stigma and discrimination based on racism, homophobia and transphobia [108].

Population-Specific Recommendations

1. Promote studies that explore antecedents to street-involvement, such as abuse, unemployment, poverty, drug use, lack of housing options, mental illness, sex trade work.
2. Measure attitudes toward and knowledge of HIV among street-involved youth/women.
3. Ensure access to condoms and harm reduction programs.
4. Determine effective communication strategies for reaching a transient population.
5. Explore impact of racism and homophobia on street-involved women.
6. Study the coping mechanism and social units formed by street youth/women and generate HIV prevention programming that is culturally competent.
7. Create partnerships between AIDS service organizations (ASOs), reproductive health centers, mental health services, social services, drug treatment organizations and community groups (harm reduction and detox).

Aboriginal Women[7]

Unfortunately, data limitations pose a great challenge to a meaningful examination of HIV data estimating HIV prevalence or incidence among Aboriginal

[7] The descriptor 'Aboriginal Women' is used in this paper to refer to the indigenous inhabitants of Canada. This terminology is used by the Royal Commission on Aboriginal Peoples and refers to First Nations, Metis and Inuit.

women or for conducting an examination of the associated HIV risk factors. Ontario and Quebec do not provide ethnicity data to the CIDPC resulting in possible systematic underestimates of the determinants and rates of HIV incidence and prevalence among Aboriginal peoples. AIDS data among Aboriginal women must therefore be used primarily as a means of extrapolating the impact of both HIV and AIDS on this community.

Despite this limitation, some telling and alarming data on ethnicity and HIV/AIDS in Canada exists. There were 106 Aboriginal women in Canada diagnosed with AIDS as of June 30, 2002. Among those women, 64.4% identified their exposure category as IDU, 31.7% identified risk through heterosexual contact, 2% had received blood products, and 2% were infected through perinatal transmission [110].

Before 1993, females made up 11.9% of the reported AIDS cases among Aboriginals in Canada. By 2003, this percentage had risen to 44%. When compared to the Caucasian Canadian population, where women make up 16% of infections, it becomes clear that Aboriginal women are differentially and disproportionately affected by HIV/AIDS [110].

Aboriginal populations are diverse with various sub-groups (First Nations, Inuit and Metis) that encompass different traditions, backgrounds and languages. However, all Aboriginal populations experience a disproportionate amount of social and economic challenges that increase their HIV risk. For example, a study of Aboriginal pregnant women in British Columbia uncovered that HIV rates were approximately seven times higher in this group than among non-Aboriginal pregnant participants [111]. Specifically problematic for Canadian Aboriginal populations are increased rates of poverty,

substance abuse and sexually transmitted diseases and limited access to health care services [110].

The Public Health Agency of Canada has stated that "…available evidence suggests that Aboriginal persons are infected at a younger age than non-Aboriginal persons, that injection drug use is the most important mode of transmission, and that the HIV epidemic among the Aboriginal community shows no sign of abating. Furthermore, the mobility of Aboriginal persons between inner cities and rural areas may bring the risk of HIV to even the most remote Aboriginal community. Better data on HIV/AIDS epidemiology and HIV testing among Aboriginal persons in Canada are needed to guide prevention and control strategies" [110, p. 10].

Interventions aimed at Aboriginal women have found that community-based, culturally sensitive approaches are most effective when trying to determine sexual norms, cultural taboos and addiction issues for women within various Aboriginal groups [112]. The sexual and drug HIV-related risk behaviours of Aboriginal persons are different from non-Aboriginal Canadians and different across gender. Culturally sensitive research must continue to explore the sexual and drug use patterns among this population and not act based on existing social stereotypes. Specifically, community-based, peer led or community leader led, prevention programs are needed. Additional ethnicity data for persons living with HIV or for those most at risk are needed in order to properly interpret HIV prevalence and incidence among Aboriginals as well as the determinants of health that shape their risk.

Population-Specific Recommendations

1. The sexual and drug HIV-related risk behaviours of Aboriginals are different from non-Aboriginal Canadians and different across gender and must be further studied.
2. There is a disproportionate level of addiction found among Aboriginal Canadians. Additional research must look at this phenomenon and further explore gender differences.
3. Recognize the intersection of race, gender, class and HIV risk and advocate against stigma and discrimination.
4. Aboriginal organizations/persons should direct HIV prevention interventions tailored for Aboriginal populations. If not directing the interventions, Aboriginal persons should make up community-advisory boards and steering committees to inform the interventions of appropriate cultural competence. This will maintain community control over programs, improve quality, longevity and sense of ownership.
5. Traditional Aboriginal values and customs should be incorporated into interventions.

Women from African and Caribbean Countries

In 1998, a number of agencies in Ontario started collaborating to form the 'HIV Endemic Task Force (HETF)' [113]. The group wished to develop a clearer understanding of the HIV/AIDS epidemic among people from African and Caribbean countries living in Ontario. In 1999, a study was commissioned which found that there were 2,627 persons from HIV-endemic regions (1, 366 from sub-Saharan Africa and 1,261 from the Caribbean) living with HIV in Ontario in 2002 [114]. This number represents 11% of the overall number of people diagnosed with HIV in Ontario (23,563), a high rate considering that only 2.6% of the province's population is made up of people from African and Caribbean countries. Similar data on Canadians living with AIDS and HIV infection originating from HIV-endemic countries are not available at the federal level.

Based on this study HETF determined that immediate action was needed on behalf of government, health care agencies, community organizations, AIDS service organizations, settlement agencies, social services and the affected communities [114]. HETF began developing a province wide strategy, education resources, partnerships with existing services, and advocating for provincial and national attention to the issue.

During the same time, concern over HIV rates among women from endemic countries was generated by an elevated rate of HIV diagnoses found among women undergoing abortions in Montreal [115]. When tested for HIV, the women participants from endemic countries, especially Haiti, were more likely to be HIV-positive than were women born in Canada. This study illustrated that immediate action was needed to explore the impact of HIV on women born in HIV-endemic countries and the factors that contributed to their HIV risk.

Further study found that among women born in HIV-endemic countries, 98%, of the 83 reported first-time HIV-positive diagnoses were assigned the exposure category HIV-endemic, indicating that the presumed route of HIV transmission was heterosexual contact. Only two cases in Metro Toronto, representing just 2% of the total cumulative HIV-positive diagnoses among women in Ontario from HIV-endemic countries, were attributed to injection drug use [114]. HIV prevalence rates among immigrant women are slightly higher than the rates among Canadian-born women and women born in non-endemic countries. Women from endemic countries are at an increased risk of HIV due to possible contact through heterosexual intercourse and/or exposure to contaminated blood or blood products in the endemic country.

Attempts at increasing our understanding of the unique HIV prevention needs of women from HIV-endemic countries may be helped by consistent collection of ethnicity data in epidemiological reporting as well as building collaborative partnerships among community organizations for advocacy and service provision [42,43]. At present most information that exists in Canada on women from HIV-endemic countries is based on two studies [the *HIV/AIDS Stigma, Denial, Fear and Discrimination* report produced by the African and Caribbean Council on HIV/AIDS in Ontario (ACCHO) and the HIV Studies Unit, University of Toronto and *The Silent Voices of the HIV/AIDS Epidemic: African and Caribbean Women in Toronto, 2002-2004* produced by Women's Health in Women's Hands (WHIWH)] and the HIV Prevention Guidelines and Manual: A tool for service providers working with African and Caribbean communities living in Canada produced by ACCHO and WHIWH [37,38,41]. More HIV prevention research is required to ensure an in-depth understanding of African and Caribbean women's specific HIV prevention needs and issues.

Population-Specific Recommendations

1. Recognize the intersection of race, gender, class and HIV risk and advocate against stigma and discrimination.
2. Use an anti-racism and anti-oppression service delivery and research framework to facilitate equity, social justice and to support African and Caribbean women in mobilizing and building their capacity for self-determination.
3. Advocate for the cultural competence of all HIV prevention interventions.
4. The label 'women from endemic countries' should be problematized and broken down to reflect the fact that not all women living with HIV who are from an endemic country will have acquired HIV while in that country and that 'endemic' doesn't provide information on route of exposure.
5. Recognize the cultural and sexual norms, values, and beliefs of women from African and Caribbean countries.

6. Actively involve women from African and Caribbean countries in planning, implementing, evaluating and disseminating HIV prevention interventions aimed at their peer group.
7. Recognize potential barriers to HIV prevention experienced by women from different ethnocultural backgrounds.
8. Provide improved HIV education resources and training for ethnocultural communities to health care professionals and counselors.
9. Create partnerships between AIDS service organizations (ASOs), settlement associations, cultural organizations, women's health centers and community groups/churches to facilitate access to HIV prevention for women from African and Caribbean countries.
10. Link HIV prevention services and programs targeted to African and Caribbean women to the broader *African and Caribbean Strategy on HIV/AIDS for Ontario.*

Women in Prison

Higher than average rates of HIV infection in prisons combined with a lack of access to HIV education, counseling, testing and harm reduction tools perpetuate the problem of HIV in the prison system. Needle sharing is a considerable problem in prison, due to the fact that there is no access to sterile injection equipment and limited access to methadone therapy [101]. Studies carried out in Quebec found a higher rate of HIV prevalence among female prisoners versus male prisoners [116,117]. This is true across Canada with the rate for women at 4.1% and men at 1.66% of the incarcerated population [118]. Seropositivity in women prisoners was associated with involvement in the sex trade or contact with an HIV-positive partner through either heterosexual intercourse or injection drug equipment sharing. At present there is little information to determine whether HIV infection among women prisoners is occurring pre- or post-incarceration, but it appears clear that many of the same factors that put women at risk of being incarcerated, also put them at risk of being exposed to higher HIV-risk activities.

A national study looking at women's HIV and Hep C prevention needs in prison conducted by the Prisoners with HIV/AIDS Support Action Network (PASAN) found that current programs and services were plagued by inconsistent implementation and accessibility [102]. This was found within individual institutions and across the national system as a whole. The study also identified that confidentiality was a major concern of prisoners seeking harm reduction or HIV-related services. New and innovative approaches to meet the HIV and Hep C prevention needs of female prisoners across Canada are crucial.

Population-Specific Recommendations

1. Ensure accessible, consistent access to HIV and Hep C prevention interventions, anonymous testing and counseling, and HIV educational resources. HIV and Hep C education materials should be discreet, comprehensive and language/literacy level appropriate.
2. Harm reduction programs/tools, including the provision of clean needles, bleach, condoms, dental dams and lubricants must be consistently available and discreetly distributed.
3. Information should be made available on safer tattooing and piercing practices.
4. Access to appropriate general health care resources and mental health resources should be improved.
5. Program providers must respect that confidentiality and privacy are crucial to HIV prevention, treatment and support service in prison systems.

Transgendered Individuals

HIV/AIDS prevention should specifically consider the needs of transgendered and transsexual people and target this population. HIV rates among transgendered people are uniformly high when compared with the rest of the population. In a sample of 515 transgendered people in San Francisco, 27% were HIV positive; in a sample of 252 transgendered people in Washington, DC, 25% were HIV positive [119]. High HIV

prevalence was also found among male-to-female (MTF) sex workers in Atlanta, U.S.A. (68%), Tel Aviv, Israel (11%), and Rome, Italy (46%) [120].

The transgendered/transsexual population has been largely ignored in terms of previous and existing HIV prevention initiatives and research. A study in Chicago found that female-to-male (FTM) transgendered persons had a significantly lower level of HIV knowledge than their male-to-female (MTF) counterparts and that very few were being tested for HIV even though they engaged in high risk behaviours [121]. The study also reported a higher level of HIV infection among MTF transgender people, particularly those involved in the sex trade. This most likely reflects the continuing misconception that HIV affects primarily the gay male population and the subsequent focus on men's HIV risk. However, FTM persons appear to be taking more HIV risks, likely due to a lack of information or focus on their risk. Much additional research is needed to explore the dynamics of HIV risk for both FTM and MTF transgendered individuals.

A qualitative study conducted in Minnesota asked transgendered persons about the impact of HIV on their lives, their risk factors, their service needs and recruitment strategies for future studies [122]. Findings indicated that HIV-related stigma compounds existing stigma about 'coming out', sexual experimentation and sex reassignment. Some issues that were identified as putting transgendered persons at increased risk for HIV were: sexual identity conflict, shame, confidentiality, prostitution and needle sharing while injecting hormones. Community-based, peer driven interventions were suggested as necessary components for HIV prevention.

In an Ontario study conducted by the Coalition for Lesbian and Gay Rights in 1995 [123] 33 transsexual/transgendered individuals were interviewed in regards to their

experiences with traditional health care resources and social services. The research uncovered that participants felt they did not receive the same rights and access to health care and social services as the majority of Ontario residents. Participants described discrimination from police, rejection from shelters and drug treatment programs and difficulty in finding sympathetic doctors willing to work with them. This was seen as an important HIV risk factor, as some participants reported injecting hormones without the supervision of a physician as a last resort to not being able to find assistance for their treatments. Recommendations for improved access to health care and social services included: safe access to resources and supervision for hormone injecting, the creation of a gender identity clinic, health service and social service provider training on transsexual/transgender issues, and the development of non-discriminatory policies for shelters and drug treatment centers.

A follow-up study in 2004 conducted by Syrus Ware, the AIDS Committee of Toronto (ACT) and the 519 Community Centre [124] found that although many participants knew of 'trans-friendly' services provided at ACT and other community-based agencies, several barriers still existed that prevented them from regularly accessing them. These barriers were often systemic, ranging from issues of economic inequality, inappropriate or disrespectful health care experiences, transphobia, isolation, and a general lack of advocacy or support. Participants felt that community groups, agencies and services could benefit from increased information about trans issues by consulting with members of the trans community and by forming partnerships with trans groups. It was determined that solid steps must be taken to improve trans acceptance and inclusion in the community, particularly in relation to decreasing barriers to health care and social

services.

Population-Specific Recommendations

1. Accessible, relevant, and non-discriminatory health care and social services for transgendered persons, including sensitive and knowledgeable primary care that includes hormone therapy.
2. Inclusion of appropriate injection equipment at needle exchanges in Ontario, particularly larger gauge needles for hormone injections.
3. The production and distribution of trans-specific 'safer injection and safer sex' resources.
4. Health service and social service provider training on transgender health issues, including HIV prevention needs, hormone therapy and the social determinants of trans health.
5. The development of sexual health literature and training programs that are relevant to trans lives, trans bodies and trans sexualities.
6. Partnerships and collaborations for non-discriminatory policies for ASOs and community organizations that provide HIV prevention services.

Asian and South Asian Women

Although the percentage of overall HIV/AIDS diagnoses among Asian and Pacific Islanders in Canada remains low when compared with other ethnic groups, research suggests that the surveillance data does not provide a full picture of the epidemic and issues faced by this understudied and underserved population. In 1997, Chin, Durvasula and Wyatt reported that Asian and Pacific Islander women have been widely overlooked in regards to HIV/AIDS research [125].

Within the Asia-Pacific region, approximately 8.3 million adults and children are living with HIV/AIDS, of whom 5.7 million live in India and intervention due to a misconception that they were not at risk [126]. Women account for approximately 2.4 million cases of HIV/AIDS found among the adult Asian population [127]. The primary route of HIV transmission for Asian women is through heterosexual intercourse with an

HIV-positive partner. Internationally, it is estimated that almost 50% of cases of HIV/AIDS among Asian women are a result of heterosexual transmission [128]. Among female Asian populations it was found that HIV infection is often the result of women's monogamous sexual relationships with their long-term male partners [125]. Asian women have expressed difficulty negotiating condom use with partners and accessing HIV information based on cultural taboos around sexuality and a general lack of discussion of sexual topics [129, 130]. Additionally, many Asian women only learn about their HIV/AIDS status after their partner becomes ill or they visit a health service provider concerning a pregnancy or unrelated medical exam [131].

In Canada, between 1998 and 2005, there were 134 persons diagnosed with HIV who identified as 'South Asian/West Asian/Arab' and 169 persons diagnosed with HIV who identified as 'Asian'. These numbers likely under-represent the actual numbers of HIV diagnoses and cases among the Asian Canadian population as not all provinces collect ethnicity data [132]. Additionally, a great number of Canadians living with HIV are currently undiagnosed because they are not tested. This is a particular problem in communities where cultural taboos result in a lack of communication about HIV/AIDS and sexual health.

A Canadian study looking at safer sex behaviour practices among 208 women of various ethnicities found that high risk behaviours, risk denial and incomplete knowledge about AIDS were prevalent among their participants [133]. White and Asian women are often perceived by doctors as being at low risk of HIV infection, this stereotype results in later diagnoses and less gender and culturally appropriate medical care and counseling [131].

In 2006, the Alliance for South Asian AIDS Prevention (ASAAP), a community-based organization in Toronto, reported a 10% increase in the number of women clients who contacted their agency for HIV/AIDS-related services and resources [134]. The majority of new women clients were between the ages of 25 and 40. Local problems such as the social invisibility of immigrant populations, refugee and non-status women, the potential depression and isolation related to migration, poverty, unemployment and lack of culturally or linguistically appropriate HIV education and prevention resources, increase HIV risk.

Population-Specific Recommendations

1. Recognize the intersection of race, gender, class and HIV risk and advocate against stigma and discrimination.
2. Advocate for the cultural competence of all HIV prevention interventions and the routine collection of detailed, ethnoculturally descriptive HIV surveillance data.
3. Create broad social marketing campaigns developed and implemented in Asian communities to open up a discourse on HIV/AIDS.
4. The label 'women from Asian countries' should be problematized and broken down to reflect the fact that there over 40 different nationalities that speak over 100 languages and dialects represented in Canada's 'Asian' community (ACAS).
5. Recognize the cultural and sexual norms, values, and beliefs of women from Asian countries.
6. Promote the development of community-oriented and family-friendly resources on sexual health, safer sex and harm reduction.
7. Create a discourse with Asian and South Asian men in regards to sexual health, gender equality and HIV prevention.
8. Actively involve women from Asian communities in planning, implementing, evaluating and disseminating HIV prevention interventions aimed at their peer group. Empowering women and educating them about HIV risk, may help increase their bargaining power both inside and outside the home.
9. Recognize potential barriers to HIV prevention experienced by women from different ethnocultural backgrounds.
10. Provide improved HIV education resources and training for ethnocultural communities to health care professionals and counselors.
11. Create partnerships between AIDS service organizations (ASOs), settlement associations, cultural organizations, women's health centers and community

groups/churches to facilitate access to HIV prevention for women from Asian and South Asian countries.

SECTION 7: CONCLUSION AND RECOMMENDATIONS

From AIDS case reports and positive HIV test reports at the national and provincial levels, a picture emerges in Canada of a steadily increasing epidemic of HIV infection among women, suggesting an increased need for innovative approaches to prevention. From a provincial perspective, the increase in AIDS case reports and the trend in the increasing number of HIV positive test results among females in Ontario further support the importance of continued and evolving research and interventions in Ontario.

Policy and programming should be multi-pronged with: 1) HIV prevention education that understands the needs and life circumstances of women and that succeeds in challenging and lessening gender inequalities; 2) Culturally sensitive prevention and care that reflects the diversity of the female Canadian population and is based on community-identified need; 3) Compassionate, accessible, gender-sensitive HIV prevention, care, treatment and support for women infected or affected by HIV/AIDS; 4) Approaches that investigate how heterosexual females and males can lessen the risk of heterosexual transmission of the virus; 5) Information sharing and partnerships as a route for strengthening prevention efforts and taking the strain off of individual groups; 6) The development of national and provincial infrastructures to support the trying of new HIV prevention options as they come to be discovered through continued, progressive research and surveillance; and lastly, 7) Emphasis placed on the importance of female-controlled preventive technologies, such as microbicides, the female condom and a future HIV vaccine.

Gaps and Next Steps

In 2004, the Ontario HIV Treatment Network (OHTN), a not-for-profit NGO, released a strategic plan for the years 2004 to 2010. Along with the Ontario provincial strategy, the national 'Federal Initiative' document, and the Canadian Public Health Association's 'Survey of Canadian HIV/AIDS Prevention Policy and Program Priorities' publication, a clear picture of HIV prevention gaps starts to emerge. Recommendations for addressing the key gaps in HIV prevention for women in Canada and Ontario are outlined in the following 'best practices' for policy, research and programming:

Policy

- Policy-makers must be constantly reminded of the social determinants of health and the links of social issues to health and to HIV specifically, such as STIs, teen pregnancy, sex trade work, addiction and Hepatitis C;
- Specific policy and/or programming must be developed to address the impact of HIV/AIDS among diverse groups of women, such as in correctional settings, Aboriginal communities, and street-involved populations, immigrants from HIV endemic countries, sex trade workers;
- Harm reduction must be advocated, as traditional HIV program directions are not working for all women;
- Aboriginal approaches to HIV/AIDS prevention must be respected and encouraged in community-tailored policy;
- Funding should be increased and evaluation frameworks must be made user friendly for front-line HIV prevention intervention providers;
- Policy on the accessibility of services and programs to all 'at risk' groups of women must be made available and supplement women-friendly services for the general public.

Research and Surveillance

- Further research is needed to explore the context of the two most prominent routes of transmission of HIV to women: heterosexual sex and injection drug use;
- Research into woman-controlled preventive technologies such as microbicides, female condoms and vaccines, are desperately needed;
- Harm reduction approaches to HIV prevention research must be supported;
- Exposure category hierarchies that place women in one group, must be made more nuanced to properly represent women's lived experiences;
- Little Canadian data currently exists on women from African and Caribbean countries and most information on this population is based on care, treatment and support rather than prevention;
- More qualitative and quantitative descriptive data is needed to complement existing epidemiology on additional determinants of health such as income, education, disability, rural/urban, co-infections, drug/alcohol use, sex trade involvement, sexual assault/abuse, homelessness, incarceration, etc.;
- Additional information should be gathered on testing patterns/rates for females and males that test both positive and negative for HIV and more research should explore why many people don't get tested;
- Additional research is needed on the lack of focus on the existing and potential role of heterosexual males in the heterosexual spread of HIV to women;
- More psychosocial research is needed to explore why HIV is an increasing issue among young women (ie – depression rates, alcohol/drug/sexual experimentation, birth control onus, relationship dynamics);
- More research is needed on sexual identity, preference and behaviours and their impact on HIV;
- More research is needed to explore Ontario's high rate of injection drug use among women;
- Continued research is needed on addiction across gender, age and ethnicity;
- Efforts to create an enforced national HIV/AIDS prevention and sexual health education curriculum should be proposed with recommendations for how it can be adapted by provincial/ territorial educators;
- Best practice HIV prevention intervention guides with suggestions on financial and resource efficiency should be made easily available to agencies in rural and urban communities;

Programming

- Ensure that prevention messages reflect underlying issues like sexual negotiation, substance abuse, and other factors that contextualize risk;
- Develop and provide training materials for different groups such as schools, women's health centres, workplaces, NGOs, ASOs, etc.;
- Provide ongoing forums where HIV prevention for women can be addressed;
- Promote the use of harm reduction strategies, such as methodone treatment facilities and needle exchange programs;
- Support local education and fundraising activities around women and HIV.
- Involve women in collaborative discussions and HIV prevention initiatives aimed at women, including women who are marginalized;
- Determine community leaders, organizations and assets (ie –potential partnerships) to help in HIV prevention;
- Community-based and peer-led programs have been used effectively for HIV prevention;
- Use local research resources for assistance in the development, evaluation and monitoring of interventions;
- Tailored, culturally appropriate prevention models and curriculum resources are needed;
- Look to theory and past research on prevention programs as a starting point for developing HIV prevention interventions;
- Look at prevention work that has attempted collaborations and community partnerships for HIV prevention targeted at specific at-risk populations;
- Tailored, youth-driven, youth-friendly HIV prevention programs must be encouraged;
- Link HIV prevention programs with existing women's health centers to provide a more accessible option for many women;
- Advocate against HIV-related stigma and discrimination;
- Create partnerships between public health and correctional facilities to ensure that inmates are provided with adequate HIV education, testing and counseling facilities and needle exchanges;
- Use gender-based analysis tools and consistently evaluate programs;
- Promote 'positive' prevention to prevent re-infections since many women are living longer with HIV and are continuing to be sexually active.

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HIV Infection in Women: Biological considerations for increase in susceptibility

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Summary: Worldwide about 85% of cases of HIV transmission occurs through heterosexual contact. Currently, the fastest growing phase of this pandemic is by heterosexual transmission, in women. The cellular events that occur in the female genital tract during and following exposure to HIV-1 are poorly understood. There is some evidence that HIV-1 is transmitted through both cervix and vaginal mucosa. The first barrier that sexually transmitted pathogens need to cross in the genital tract mucosa is the epithelial cell. The epithelial cells of the upper and lower reproductive tract are distinct physically and functionally. While the lower reproductive tract is lined by multiple layers of squamous epithelium the upper reproductive tract is lined by a single layer of columnar epithelium. The squamo-columnar junction, in the transition zone of the cervix, between these two epithelia is a particularly active zone; it is a target for entry of pathogens and also the site that has maximum immunological surveillance. The increased susceptibility to HIV-1 in women, compared to men, is likely a function of a number of genetic, innate and adaptive factors. Some of these are modifiable. Among these are innate factors such as the composition of the genital microflora and presence of inflammation in the genital tract. Another significant correlate for risk of acquiring sexually transmitted infections, including HIV-1 has been shown to be race. Black women are highest risk for HIV-1 infection compared to other races. However, more studies need to be done to examine the role of biological factors in ethnicity related differences in HIV-1 susceptibility. Presence of other sexually transmitted infections, in particular HSV-2, is also a correlate in increased susceptibility to HIV-1 in women. Finally, female sex hormones, either during the menstrual cycle or following use of hormonal contraceptives, especially depomedroxyprogestoerne use, may alter the susceptibility of women to HIV-1. All these factors, many of which are modifiable, need to be taken into consideration for HIV-1 prevention strategies in women.

1.0 HIV Transmission in Women

Worldwide about 85% of cases of HIV transmission occurs through heterosexual contact (7). According to UNAIDS, currently there are about 45 million people infected with HIV and in some of the Sub-Saharan African countries, 1 out of every 3 adults is infected with HIV. In Dec 2004 UNAIDS reported that for the first time, women constitute almost half of the infected adult population (60). In fact, the fastest growing phase of this pandemic is currently by heterosexual transmission in women (59).

From a biological point of view, HIV transmission depends on "infectiousness" and "susceptibility" (12). HIV infectiousness is determined by the size of the inoculum, i.e. the concentration of the virus and phenotypic factors such as viral subtype. For example, there are reasons to believe that HIV Clade B virus found in N. America is not as infectious as the Clade C virus found in Africa (14). As far as susceptibility is concerned, epidemiologic studies have estimated the risk of HIV transmission to range from 1:400 to 1:2000 penile/vaginal acts (13). However, such low transmissibility numbers fail to explain the rapid spread of infection, especially in certain populations. Such numbers could be misleading, since the actual risk could be significantly modified by other factors. Studies have shown that in male to female transmission, there is a clear correlation between the concentration of HIV in ejaculate. Compared to a probability of transmission of 1 in 1,000 at a viral concentration of 50,000 RNA copies/ml, the estimated probability increases markedly to 1 in 100 or higher at viral concentration of $1X10^6$ RNA copies/ml (13). This is supported by studies showing high viral loads present in semen during acute infection is associated with markedly increased risk of transmission (15).

2.0 HIV transmission in the female genital tract

The cellular events that occur in the female genital tract during and following exposure to HIV-1 are poorly understood. The information that exists is controversial; some evidence suggests that vaginal mucosa is the primary route of transmission, since HIV can be recovered from the vagina of women who have had total hysterectomy (39). Others believe that most of the virus arises from the cervix and upper genital tract (16). Given the fact that within minutes of artifical insemination, spermatozoa can be found in uterus and fallopian tubes, it is likely that the virus present in the seminal fluid and associated with cells in the ejaculate has access to both the upper and lower reproductive tract.

Whether the genital epithelium itself gets infected by HIV is still an open question. In vitro studies have shown that genital tract epithelial cell lines can be infected by HIV (3, 47). The presence of alternative receptors, such as Gal-Cer that can associate with HIV raise the possibility that virus could get into epithelial cells using these alternative receptors (4, 66). A recent study showed that an X4-tropic strain of HIV (T-tropic), was able to replicate in cultured human primary uterine cells (2). However, R5-tropic strain (macrophage tropic) was taken up and released from the cells, unmodified. The prevailing opinion from work done on primary intestinal epithelium is that HIV does not infect the epithelium *per se*, but is able to cross the mucosal epithelium by trancytosis and infect target cells underneath (7, 8, 26). The primary target of the virus are immune

cells, including CD4+ DCs and T cells in the lamina propria of the mucosa. Whether this is the case for the reproductive tract mucosa as well, remains to be established. Clearly, this is an area which needs further investigation.

3.0 Epithelial lining of the female genital tract

The epithelial lining of mucosal surfaces including digestive tract, lung and uro-genital tract provide the first barrier between the body and potential pathogens. Epithelial cells of the genital tract are the first barrier that sexually transmitted pathogens need to cross. These epithelial cells provide not just a physical barrier but also respond to external "danger signals" such as pathogens by producing an array of innate factors as well as as chemokines and cytokines that transmit signals to the cells and tissues underneath the mucosal barrier (51, 58, 63).

The epithelial surface and the underlying stroma in the reproductive tract of women undergo dynamic changes within the menstrual cycle as well as throughout the life time of women. The lower reproductive tract in women is composed of exo-cervix and the vaginal tract. The mucosal lining here consists of stratified squamous epithelium that can be more than 25 cell layers thick (40). In contrast, the upper reproductive tract, made up of the endocervix and endometrium, are composed of a single layer of columnar epithelum that rest on a continuous, thin basement membrane (16). The columnar epithelium is characterized by the presence of tight junctions between cells that makes it impermeable to entry of any large molecules and particulate matter, including pathogens. The thick stratified epithelium of the lower reproductive tract, although not impermeable, is robust and provides a substantive physical barrier compared to the delicate single layer of columnar epithelium of the upper reproductive tract. Both the columnar and squamous epithelium are exquisitely responsive to, and functionally regulated by reproductive hormones, estradiol and progesterone (64). From an immunological point of view, the lower reproductive tract is exposed to the external environment, as well as commensal flora. Therefore, epithelial cells lining the lower tract are constantly exposed to pathogens and must differentiate between commensal flora and pathogens. The epithelium of the endometrium is the site of implantation and development of the fetus, and its function therefore is primarily for reproduction. The upper reproductive tract is is therefore mostly a sterile environment. The squamo-columnar junction between the exocervix and the endocervix where the squamous epithelium abruptly changes to the single layer of columnar epithelium, called the transitional or transformation zone, is the most vulnerable point in the epithelium and an easy target as an entry point for pathogens such as HIV-1. In fact, presence of ectopy (the protrusion of the cervical transformation zone outside the external os) of the cervix has been associated with increased risk of heterosexual transmission of HIV(41). Immunologically, the transformation zone is the most active site in the reproductive tract; lymphocytes and antigen presenting cells are present in abundance in normal women with no inflammation (50). In the presence of infection or inflammation, the transformation zone has greatly increased numbers of activated lymphocytes and lymphoid aggregates (50).

4.0 Factors affecting susceptibility to HIV-1

Susceptibility to HIV infection is determined by factors such as hereditary resistance, innate resistance and acquired immune resistance (10). Hereditary resistance includes CCR5 co-receptor deletion that makes a small percentage of white population resistant to HIV infection (10). An acquired immune resistance has been implicated in studies where resistance to HIV infection is correlated with humoral and cell-mediated mucosal immune response(5, 11, 31). Such responses against HIV-1 have been described in the genital tract of highly exposed persistently sero-negative (HEPS) sex workers as well as exposed, sero-negative (ESN) partners of HIV-infected individuals (19, 27, 28, 34, 35). These studies suggest that these individuals have acquired robust immune responses due to repeat mucosal exposures to sub-infectious doses of HIV. Subsequently, they may be protected from high dose exposure to HIV-1.

The following section will focus on some of the innate and other modifiable biological factors that could potentially play an important role in determining the susceptibility of women to HIV-1 infection.

4.1 Innate factors

4.1.1 Genital Microflora : Lactobacilli and Bacterial vaginosis.

The vaginal tract in women has a resident microflora characterized by dozens of species of commensal organisms that exist in a delicate balance and complex relationship with each other and other vaginal co-factors (23). Differences seen in vaginal flora among different women is a good example of factors that could affect innate resistance to infection. For example, hydrogen peroxide producing Lactobacillus species inhibit HIV-1 in vitro; those species of Lactobacillus that do not produce hydrogen peroxide fail to inhibit HIV-1 (24, 25, 29). Again, presence of Lactobacillus lowers the vaginal pH and inhibits lymphocyte activation whereas higher pH associated with bacterial vaginosis is associated with lymphocyte activation (22). Bacterial vaginosis on the other hand is frequently correlated with inflammation (23). Lymphocyte activation and inflammation are both associated with increased HIV-1 susceptibility (16). In addition, various organisms associated with bacterial vaginosis including Mycoplasma hominis, Gardenella vaginalis and Peptostreptococcus aschcharolyticus appear to increase HIV-inducing factor (HIF) (1, 46, 54). This factor appears to upregulate HIV expression by activating the viral LTR and also stimulating AP-1-dependent transcription. Thus, bacterial vaginosis associated microflora activate HIV expression in female genital tract (1) (54). Thus, presence of Lactobacillus correlates with decreased risk of infection whereas presence of bacterial vaginosis correlates with increased susceptibility to HIV-1.

4.1.2 Presence of Inflammatory cells in the genital tract

Presence of cervico-vaginal inflammation has been shown in various studies to be correlated with increased risk of HIV acquisition. Inflammation in the genital tract has also been shown to increase HIV-1 loads both in cervical and vaginal secretions (21). Cervico-vaginal infections such as those due to gonorrhea and Chlamydia also lead to increased inflammation and are associated with increased risk of acquiring HIV-1 (52). In one study, the amount of HIV-1 present in vaginal secretions increased by 10,000 fold in the presence of cervical inflammation (65). Other causes of vaginal inflammation such as

douching and surfactant based spermicides have also been implicated in increased susceptibility to HIV-1 (20, 53). The rationale for increased infection in the presence of inflammation is possibly due to more than one factor associated with inflammation. First, inflammation is associated with increased number of lymphocytes and macrophages in the genital tract; these cells provide increased and easy access as targets for HIV-1 infection (16, 39). Further, upregulation of proinflammtory cytokines such as IL-1, IL-6, TNF-alpha can directly stimulate HIV-1 replication by activating the LTR sequence of HIV (57).

4.1.3. Ethnic considerations

Epidemiological data clearly indicates that race is a significant correlate for risk of acquiring sexually transmitted infections (STIs). Incidence of STI is highest among black men and women and lowest among white individuals with the Asian and Hispanic population incidence in between (6) . The reason for this disparity is not clearly understood. Some studies suggest that there may be biological factors for these differences. A recent study reported increase in inflammatory cells in the cervico-vaginal lavages of black versus white and Hispanic women after adjustments for known potential confounders (21). Others have suggested that innate factors such as type of vaginal flora found in different ethnic populations may contribute to HIV acquisition (1, 54). Recent studies indicate that women in North America have vaginal flora rich in Lactobacilli and generally free of bacterial vaginosis, thus conferring some protection against HIV acquisition (54). In contrast about 70% of women in Africa have vaginal flora consisting of few lactobacilli and predominantly anaerobic flora more conducive to HIV infection (1, 46). Other studies suggest that the STI differences among races may be correlated with other demographics such as socio-economic status. Clearly additional studies are needed to explore whether ethnic background contributes to increased risk of acquisition and transmission of HIV-1.

4.2 Co-infection with other STI's

Data from clinical and epidemiological studies strongly suggest that other STIs increase acquisition and transmission of HIV in uninfected individuals (12, 38). The diagnosis of genital ulcers or sexually transmitted bacterial infection has been linked to subsequent HIV infection (44, 45). STIs potentially facilitate HIV infection in a number of different ways. They potentially increase susceptibility by reducing the physical and mechanical barriers, increase the number of target cells or receptors on cells by causing persistent inflammation. They potentially produce a change in the vaginal environment (flora) that is more conducive to transmission. STIs could also affect the infectiousness by evoking more infectious HIV variants (48). They potentially also increase HIV concentrations in genital lesions, semen or both (15). Co-transmission of HIV with other STDs is very common. Odds ratio for HIV seroconversion increase in the presence of Chlamydia, gonorrhea, trichomonaiasis and genital ulcers (12, 52). Although this correlation is well established, the data on the effects of STDs and the mechanisms of the effects on HIV transmission are inadequate, partly because STD studies have focused in acquisition rather than transmission and on epidemiologic rather than biologic studies. More research is needed to understand how the risk of transmission can be reduced in individuals co-infected with HIV and other STDs.

4.2.1.Effect of HSV-2 infection on HIV acquisition, transmission and shedding

HSV-2 is the most common cause of genital ulcers globally (17). It is also one of the most common sexually transmitted viral infections. Approximately, 1 in 4-5 persons in N. America are infected with HSV-2. Among African Americans, nearly 70% have acquired HSV-2 by the age of 50. Of approximately 50 million affected people, only 1 million have lesions, but all infected individuals shed virus intermittently. The evidence for facilitated HIV acquisition in the presence of HSV-2 is strongly suggestive (61). Meta-analysis of large body of literature on the effect of HSV-2 in HIV acquisition indicates that risk is increased by approximately two-fold (61). As such the interactions between HSV-2 and HIV-1 are particularly important to examine. A number of epidemiologic studies have indicated that HSV-2 infection is linked to increased susceptibility to HIV-1 (36, 37). Although these epidemiologic studies have been carried out, the mechanism by which HSV-2 may increase risk of HIV acquisition has not been extensively examined in biologic studies and is the aim of the present investigation.

The biologic studies to date have shown that recurrent herpes infection leads to disruption of genital epithelium and recruitment of activated CD4 T cells (30). These activated T cells could provide ready targets for HIV, facilitating its acquisition following exposure to infected genital fluids. In addition to association with increases susceptibility to HIV, HSV-2 also has an effect on HIV transmission, although this is less understood to date (42). This is thought to be mainly due to increase HIV viral load in genital secretions and plasma levels seen during HSV-2 reactivation (12). These studies being the only biologic studies describing the mechanisms of the interaction between HIV and HSV-2 reveal a paucity of understanding justifying the importance for further investigation.

4.3. Sex hormones, immune responses and HIV.

The reproductive tract in women is a unique mucosal surface, because of the diverse, even contrary, nature of immunological functions it fulfills. Its primary physiological role is to provide a protective environment for the semi-allogeneic fetus, which demands down-regulation of immune responses against the allograft. On the other hand, it also has to provide constant immunological surveillance against pathogens that can potentially be introduced at any time, associated with or during, sexual intercourse. The female reproductive hormones, estradiol and progesterone are known to profoundly influence immune responses in the genital tract. These hormones also have an influence on susceptibility to and subsequent immune responses to genital infections.

A number of clinical, epidemiological and basic studies illustrate the influence of female sex hormones, estradiol and progesterone on genital tract infection in women. There is also strong evidence to show the interaction between sex hormones and immune system. Stage of the menstrual cycle and oral contraceptives influence susceptibility to Candidiasis, gonorrhoea, HSV-2, HIV-1 and *Chlamydia* in women (9, 56). It has also been shown that stage of the menstrual cycle influences the ability to detect *Chlamydia trachomatis*, infections being more commonly detected during the latter part of the cycle(18). In a prospective cohort study done on female sex workers in Kenya, factors significantly associated with HIV-1 infection included use of Depo-medroxyprogesterone and high dose oral contraceptive pills (32). Another recent study described upregulation of HIV co-receptors in genital tract of normal women on oral contraceptives (49). In another prospective study, increase in cervical HIV-1 DNA detection was reported following starting of hormonal contraception (62). Oral contraception and depo-medroxyprogesterone use and pregnancy have also been positively correlated with cervical HSV shedding in HIV co-infected women (43). Depomedroxyprogesterone has been shown to produce changes in the vaginal flora by decreasing hydrogen peroxide producing Lacobacillus colonization (40). It also thins out vaginal epithelial layers. Both of these effects have been associated with increased risk of HIV-1 infection. In rhesus macaque models, subcutaneous implants of progesterone made the monkeys more susceptible to SIV vaginal transmission, while estrogen was able to protect against SIV infection (33, 55). These studies indicate that changes in levels of sex hormones, either during the menstrual cycle or following use of hormonal contraceptives may alter the susceptibility of women to HIV-1.

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