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HIV and ethnicity in Canada: is the HIV risk-taking behaviour of young foreign-born MSM similar to Canadian born MSM?

C. GEORGE[1], M. ALARY[2,3], R. S. HOGG[4], J. OTIS[5,6], R. S REMIS[7], B. MÂSSE[8], B. TURMEL[9], R. LECLERC[10], R. LAVOIE[6], J. VINCELETTE[11], R. PARENT[3], K. CHAN[4], S. MARTINDALE[4], M. L. MILLER[4], K. J. P. CRAIB[4], & M. T. SCHECHTER[4]

[1]*St. Michael's Hospital, Toronto, Ontario,* [2]*Centre hospitalier affilié universitaire de Québec, and Université Laval, Québec, Canada,* [3]*Institut national de santé publique du Québec, Québec, Canada,* [4]*British Columbia Centre for Excellence in HIV/AIDS, Vancouver, BC,* [5]*Université du Québec à Montréal, Montréal, Canada,* [6]*COCQ-Sida, Montréal, Canada,* [7]*University of Toronto, Toronto, Canada,* [8]*Fred Hutchison Research Center, Seattle, WA, USA,* [9]*Direction générale de la santé publique, Ministère de la santé et des services sociaux du Québec, Montréal, Canada,* [10]*Action Séro Zéro, Montréal, Canada and* [11]*Service de microbiologie, Centre hospitalier de l'Université de Montréal, Hôpital Saint-Luc, Montréal, Canada*

Abstract

There is a dearth of information on the HIV risk-taking behaviour of foreign-born men who have sex with men (MSM) in Canada. This study focused on identifying sexual risk behaviour among MSM who immigrated to Canada and compared them to MSM who were born in Canada. Baseline data from the Omega Cohort in Montreal and the Vanguard Project in Vancouver were combined to form four ethnicity/race analytical categories (n = 1,148): White born in Canada (WBIC), White born outside of Canada, non-White born in Canada (NBIC) and non-White born outside of Canada (NBOC). Psychological, demographic and sexual behaviour characteristics of the groups were similar except: NBOC were more likely to be unemployed, less likely to be tattooed, had fewer bisexual experiences and less likely worried of insufficient funds. WBOC were more likely to report unprotected sex with seropositives and more likely to have had unprotected sex while travelling. NBIC were more likely to have ever sold sex and to have had body piercing. WBOC are at high risk of acquiring as well as transmitting HIV. It is important to consider place of birth in addition to ethnicity when developing programmes to prevent the transmission of HIV.

Introduction

There is a paucity of information on the HIV risk-taking behaviour of foreign-born men who have sex with men (MSM) in Canada. HIV studies in Canada have focused on the gay population in general without specifically recruiting large samples of foreign-born MSM (Adam et al., 2003; Calzavara et al., 2002; Husbands et al., 2004; Myers et al., 2004; Strathdee et al., 1998). Although these studies give perfunctory information on risk behaviour of foreign-born MSM, more appropriate information is needed for health agencies to strategically respond to the needs of these men.

Some foreign-born Canadians come from regions of the world where HIV/AIDS is endemic and others from regions where HIV is an emerging problem. The 2001 Canadian Census reflects a shift in Canadian demography where in some parts of the country, foreign-born Canadians constitute a high proportion of the population (Statistics Canada, 2003). Immigrants to Canada are usually concentrated to the larger urban cores – Toronto, Vancouver and Montreal. The 2001 census showed that 28% of Montreal's population were born outside of Canada, with 6% having arrived within the last five years. The most important source countries of these recent immigrants were Algeria, China, France, Haiti and Morocco. Vancouver was also another important city for immigrants to Canada with 37.5% of the population being born outside of Canada, 8.6% having arrived within the past five years. China, Taiwan and India were important source countries of the new immigrants to Vancouver (Statistics Canada, 2003). Yet despite the changing demography, current HIV research tends to exclude this cohort of newer immigrants. UNAIDS 2005 HIV estimates show an increasing prevalence of HIV in the Middle East and North Africa especially in

Correspondence: M. Alary, Unité de recherche en santé des populations, Centre hospitalier affilié universitaire de Québec, Hôpital du St-Sacrement, 1050 Ch Sainte-Foy, Québec, QC, G1S 4L8. Tel: 418 682 7390. Fax: 418 682 7949. E-mail: malary@uresp.ulaval.ca

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countries such as Algeria and Morocco (UNAIDS, 2005). HIV is also increasing in Asia (UNAIDS, 2005). In certain provinces in China, diagnosed HIV infections rose by more than 67% in the first six months in 2001 and has penetrated all regions of China (Zhang et al., 2002; UNAIDS, 2002). Moreover, while almost half of the epidemic is due to intravenous drug use in China, 11.1% of it is among MSM (UNAIDS, 2005).

It has been postulated that migrants' risk behaviour may be different from those in their new country since they experience conflicting cultural values and are confused over which cultural norms to follow (Fernandez, 1998; Wiking et al., 2004). They often face a myriad of disabling factors such as underemployment, discrimination and language barriers when settling into their new society and health protection/prevention behaviour may not be a priority (Singer et al., 1996; Husbands et al., 2004). Therefore, they may adopt more liberal Western norms without fully being aware or understanding the health risks of some behavioural changes. Godin et al. (1996) found that, although more than 70% of men from Latin America, the English-speaking Caribbean and South Asia living in Toronto intended to use a condom with a new partner over a three-month period, few did so one year later. A study among Spanish speaking people in Toronto found that MSM have rudimentary knowledge of how HIV is transmitted and overall, community members still associated HIV/AIDS with gay sexuality (Cedano et al., 2002). Data from the UK showed that overall, 52% of MSM born outside of the UK may have been infected in the UK and this ranged from 39% for Central/South America MSM to 61% for Asian born MSM (Dougan et al., 2005). As few Canadian studies have explored the relationship between a person's HIV risk taking behaviour in relation to ethnicity and place of birth, the aim of the study was to identify key differences in sexual, psychological and other characteristics between foreign-born and Canadian born MSM that may increase their vulnerability for HIV.

Methods

This study uses data from two similar prospective studies of MSM in Canada. Data from the Omega Cohort (Montreal) and the Vanguard Project (Vancouver) were combined to achieve a more statistically powerful, more representative study of foreign born Canadians. Both studies have been described in detail elsewhere (Dufour et al., 2000; Strathdee et al., 2000). Briefly, data collection in the Vanguard Project (1995–2002) commenced in May 1995 for seronegative men between the ages of 15 and 30 years who self-identified as gay, bisexual or having sex with men. Recruitment was limited to men living in the Greater Vancouver region and was done through outreach work, medical clinics, and physicians' offices. Self-identified MSM were recruited into the Omega Cohort study from October 1996 to July 2003. To be included in the study, subjects had to be 16 years and older, be HIV seronegative and living in Montreal or the surrounding regions. Men were recruited through bilingual promotions in the gay print media, the annual gay pride event and community groups. To ensure comparability between the two cohorts, subjects for the present analysis from the Omega Cohort were restricted to those 30 years or less at enrolment.

Both studies were similar in their main objectives and design. The major differences between the studies are as follows: the Vanguard Project recruited men aged 30 years or less, and had a high contingent of multiple-at-risk individuals (e.g. commercial sex workers and intravenous drug users). For the Omega Cohort, the sampling frame included all MSM, with a focus of having an equal distribution of men under 30 years old and those 30 years or older. Both studies employed a self-administered questionnaire but, the Omega study utilized an additional face-to-face interview for collecting psychological data. Follow-up in the Omega Cohort was every six-month whereas it occurred once a year in the Vanguard Project. Unlike the Vanguard Project, there was a strong psychosocial aspect to the Omega study.

The analysis for this study was restricted to baseline data as of September 1999 for subjects who were 30 years or younger. The combined data consisted of 1,511 subjects, 1,337 of which had information on place of birth. Of the 1,337 subjects, 525 were from the Omega Cohort (39.3%) and 812 (60.7%) from the Vanguard Project. One hundred and two subjects had no information on ethnicity and 87 subjects born in Canada self identified as Canadian Aboriginals, leaving 1,148 subjects with data suitable for analysis. Canadian Aboriginals were excluded form this analysis since their risk behaviour compared to the general population has already been studied (Heath et al., 1999). Four groups were formed consisting of 907 subjects who self-identified as White and were born in Canada (WBIC) (79%), 95 White born outside of Canada (WBOC) (8.3%), 38 non-White born in Canada (NBIC) (3.3%) and 108 non-White born outside of Canada (NBOC) (9.4%). Most of the men in the analytic category WBOC were born in continental Europe (41%), the US (24.2%), the UK (10.5%) and Africa (9.5%). NBOC was made up of mostly MSM born in Asia (49%) and Central/South Americans (25.9%). As some analytic groups were small, to prevent disclosure of individual's identity, no further analyses

are reported by place or continent of birth. Key variables, such as age, place of birth (by country), ethnicity (self-identification as White, Hispanic, Jewish, Middle Eastern, Quebecois, French Canadian, Asian, South Asian, Black), religious background, first language, HIV serostatus, recent travel and sexual behaviour, were abstracted from the databases. Unprotected sex was defined as having anal or vaginal sex without a condom at least once during the previous year. Travel included trips taken outside of the home province.

Although both cohorts were similar in design, with the limitations outlined above, responses to questions were not always worded in the same way. For example, the response options to a question in the Omega questionnaire may have been 'never', 'once', 'sometimes', 'often', 'very often' whereas Vanguard's options may have been 'never', 'sometimes', 'often', 'very often'. Response options were then re-coded combining 'once' and 'sometimes' responses. Preliminary examination of the distribution of responses for both cohorts showed similar distribution. Further, most items were dichotomized in the final analysis.

Respondents were asked to respond to sexual behaviour and other high-risk activities at baseline retrospectively, using a one-year reference period in the Vanguard project and a six-month period for Omega. Exploratory analyses revealed that responses to questions with a six-month reference period were similar to those of a one-year period. This may reflect a fact that MSM tend to have sex repeatedly with the same circle of sexual partners and partially due to recall bias. Therefore the information reflects a six-month to one-year period. Some questions from both questionnaires referred to lifetime history. Responses of MSM who did not respond to the question on travelling outside of their home province were coded as not travelled.

Categorical variables for the four groups were compared using Pearson's chi-squared test. Fisher's exact test was used when the expected cell count was less than five. For these univariate analyses, the analytic group (ethnicity/place of birth) was used as the dependent variable. As the analysis was exploratory in nature and given the data limitations, multivariate analyses were done as a measure of strength of association and not as predictors of risk behaviour. For multivariate analyses, the analytic group (ethnicity/place of birth) was coded as an independent variable and modelled as dummy variables. We conducted separate stepwise logistic regression for the main risky behaviours, unprotected sex while travelling and having sex with a seropositive person, coded as dependent variables, and all other variables significant at pvalue 0.05 in univariate analyses were entered into the models. The analyses were adjusted for age (modeled as a continuous variable) and cohort (Vanguard/Omega). All analyses were done using the SAS® 8.0 software, Cary, NC.

Results

The cohorts were similar with some important differences. There were no significant differences between the two cohorts for the variable 'place of birth'. Foreign-born men represented 17% of the Omega Cohort whereas they represented 18% of the Vanguard Project ($p = 0.60$). The Vanguard Project had a significant number of persons who used drugs and who had no fixed address, which was not observed in the Omega Cohort. A detailed comparison of the overall similarities and differences between the cohorts has already been published (Weber et al., 2001).

Demographics with respect to place of birth and ethnicity/race

When ethnicity/race was taken into account, there were borderline differences between the four groups for education ($p = 0.07$) and annual income ($p = 0.06$) (Table I). WBOC were most likely to have a university degree (38%), however, NBIC were most likely to report a higher income (49%). There were no differences between the groups in current receipt of social assistance. With respect to employment, NBOC were most likely to be unemployed (41%, $p < 0.0001$).

Psychosocial variables with respect to place of birth and ethnicity/race

Table II refers to selected psychological preoccupations. All groups were similar except for problems with insufficient resources and a lack of free time. WBIC were most likely to be bothered by insufficient funds (77%) and NBOC were least affected (62%). There was a borderline difference between the groups for lacking free time, WBIC (47.9%) being most affected compared to NBOC (35.2%).

Behavioural variables with respect to place of birth and ethnicity/race

Variables associated with sex and sexuality are shown in Table III. WBOC reported the highest risk behaviours for HIV in being most likely to have sex with a known seropositive person (27% vs. WBIC 20%, NBIC 19%, NBOC 10% $p = 0.03$) and most likely to have unprotected sex while travelling outside of their province of residency (21% vs. 8% all other groups, $p = 0.0005$). NBOC were least likely to have had sex for goods or services and to have had

Table I. Demographic characteristics of MSM by place of birth and ethnicity/race. White born in Canada (WBIC, 79%), White born outside of Canada (WBOC, 8.3%), non-White born in Canada (NBIC, 3.3%), non-White born outside of Canada (NBOC, 9.4%).

	WBIC (n = 907)		WBOC (n = 95)		NBIC (n = 38)		NBOC (n = 108)		
Variable	n‡	% §	n‡	% §	n‡	% §	n‡	% §	P-value
Age (yrs)									
16–18	21	2.3	2	2.1	4	10.5	5	4.6	
19–21	156	17.2	18	18.9	8	21.1	18	16.7	
22–24	205	22.7	24	25.3	8	21.1	31	28.7	
25–30	523	57.8	51	53.7	18	47.3	54	50.0	0.10
Education*									
No certificate	79	8.7	8	8.4	5	13.2	12	11.1	
High School/Tech.	606	66.8	51	53.7	27	71.0	71	65.7	
University	222	24.5	36	37.9	6	15.8	25	23.2	0.07
Social Assistance (current)									
No	584	66.7	69	74.2	25	75.0	76	74.5	
Yes	292	33.3	24	25.8	9	25.0	26	25.5	0.16
Annual Income ($)									
<20,000	527	60.9	54	59.3	19	51.4	68	73.1	
20,000+	339	39.1	37	40.7	18	48.6	25	26.9	0.06
Employment									
Unemployed	184	20.3	14	14.9	9	23.7	44	40.7	
Employed	721	79.7	80	85.1	29	76.3	64	59.3	<0.0001
Housing†									
Stable	836	92.4	91	96.8	34	89.5	102	94.4	
Unstable	69	7.6	3	3.2	4	10.5	6	5.6	0.31

Notes:
*No certificate refers to not having completed high school or equivalent
†Stable housing refers to accommodations where individuals are living in a house, apartment, condominium, school residence or with family. Unstable housing refers to no address, squatting, rooming housing, YMCA etc.
$ Annual income in Canadian dollars
‡ Some categories may not add up to the sample size indicated above due to missing values
§ Percentages may not add up to 100% due to rounding

body piercing, least likely to be tattooed, least likely to be sexually experienced with women (68% never had sex with women) and had fewer female sexual partners. WBIC were most likely to be tattooed (22%) and to be sexually experienced with women (57%).

As having unprotected sex while travelling was the most important risk which differentiated the groups, and is most important for prevention initiatives, we conducted further analysis to determine the factors associated with this variable. In a logistic regression model, using place of birth (Canada vs. elsewhere) and ethnicity (white vs. non white) as independent variables, the results showed that being born outside of Canada was significantly associated with unprotected sex while travelling (OR 3.53, 95% CI 1.91 – 6.49), as was being white (OR 2.76, 95% CI 1.10 – 6.99). Other variables associated with this behaviour were unemployment (OR 1.91, 95% CI 1.10 – 3.22), having 20 or more lifetime partners (OR 2.30, 95% CI 1.34 – 3.98) and having a seropositive partner (OR 1.89, 95% CI 1.13 – 3.19). There was a borderline association with having a casual partner (OR 2.08, 95% CI 0.90 – 4.77) to unprotected sex while travelling. In another model where the four groups of subjects were entered as indicator variables, compared to WBIC, being WBOC was significantly associated with unprotected sex while travelling (OR 3.31, 95%CI 1.84 – 5.94) but not NBOC (OR 1.19, 95% 0.56 – 2.50) or NBIC (OR 1.07, 95% CI 0.32 – 3.84). Other variables associated with unprotected sex while travelling were being unemployed (OR 2.10, 95% CI 1.28 – 3.45), having sex with a seropositive partner (OR 2.01, 95% CI 1.24 – 3.25), and having sex with casual partners (OR 2.27, 95% CI 1.09 – 4.77). Having 20 or more lifetime partners (OR 1.54, 95% CI 0.96 – 2.50) was of borderline significance. Cohort affiliation (Vanguard/Omega) was not associated with unprotected sex while travelling. The Cochran-Armitage test for trend showed that with increasing age there was a borderline increase in unprotected sex while travelling ($p = 0.06$).

Having sex with a seropositive partner is a risk factor for HIV in this cohort of young HIV negative men and differentiated the ethnicity/race groups of WBOC and NBOC in the univariate analysis. In a

Table II. Selected psychosocial characteristics of MSM by place of birth and ethnicity/race. White born in Canada (WBIC, 79%), White born outside of Canada (WBOC, 8.3%), non-White born in Canada (NBIC,%), non-White born outside of Canada (NBOC, 9.4%). Reference period refers to the last 2 weeks.

	WBIC (n = 907)		WBOC (n = 95)		NBIC (n = 38)		NBOC (n = 108)		
Variable	n‡	%§	n‡	%§	n‡	%§	n‡	%§	P-value
Heavy Responsibility									
Never/Sometimes	568	63.1	65	69.1	22	61.1	75	70.7	
Often/Very often	332	36.9	29	30.9	14	38.9	31	29.3	0.31
Insufficient Resources*									
Never/Sometimes	689	76.6	64	68.1	30	81.1	75	72.1	
Often/Very often	210	23.4	30	31.9	7	18.9	29	27.9	0.19
Unsatisfactory sex									
Never/Sometimes	541	60.0	63	67.0	24	68.6	73	68.2	
Often/Very often	360	40.0	31	33.0	11	31.4	34	31.8	0.18
Insufficient funds†									
Never/Sometimes	238	26.3	30	31.9	13	35.1	40	37.7	
Often/Very often	666	76.7	64	68.1	24	64.9	66	62.3	0.05
Lacking free time									
Never/Sometimes	470	52.2	50	53.8	22	61.1	68	64.8	
Often/Very often	431	47.8	43	46.2	14	38.9	37	35.2	0.08

Notes:
*Insufficient resources refer to not having adequate transportation etc.
†Insufficient funds refer to not having enough money
‡ Some categories may not add up to the sample size indicated above due to missing values
§ Percentages may not add up to 100% due to rounding

stepwise logistic regression analysis modelling the analytic group ethnicity/race as a dummy variable and adjusting for cohort, the variables WBOC (OR 1.84, 95% CI 1.06 – 3.19), having 20 or more lifetime sexual partners (OR 2.18, 95% CI 1.50 – 3.17), having unprotected sex while travelling (OR 1.74, 95% CI 1.02 – 2.96), having a regular partner (OR 1.70, 95% CI 1.04 – 2.78), difficulties in finding sufficient resources such as transportation (OR 1.52, 95% CI 1.02 – 2.26) and increasing age (continuous variable) (OR1.14, 95% CI 1.08 – 1.21) were associated with sex with seropositive partners. MSM affiliated with the Omega cohort were less likely to have sex with a seropositive partner (OR 0.53, 95% CI 0.37 – 0.75).

Discussion

White foreign-born MSM (WBOC) were more likely to have unprotected sex while travelling outside of the region in which they live compared to men from other groups. The question posed was not specific to travelling to a foreign country but included travelling to another province. Nevertheless, it warrants further examination. Foreign-born Canadians often return to their countries of origin for visits. Although there are no studies on the sexual behaviour of foreign born MSM while travelling outside of their new residence, general population studies show that men are likely to establish new sexual relationships while travelling, especially to their countries of origin (Fenton et al., 2001; Kramer et al., 2005; de Graaf et al., 1998; Hawkes & Hart, 1993). Having unprotected sex outside of their place of residence may help to explain findings of others that migration helps the spread of HIV, whether it is from the former country to the new country or the reverse (Lyttleton & Amarapibal, 2002).

Reasons for migrating are complex and particular risk behaviours are associated with patterns of migration (UNAIDS, 2002). It may be the norm for men to have few sexual partners where they live but to have multiple partners and sex with commercial sex workers while working/living outside of their region (de Graaf et al., 1997). Reasons for having unprotected sex abroad include fearing stigmatizing local residents (where condom use was synonymous with HIV infection) or leaving it up to the local residents to negotiate condom use (de Graaf et al., 1998). In the past, MSM have been said to practice safe sex since they did not want to be demonized by the gay community for practicing unsafe sex (Scarce, 1999). However, in Canada, community norms around condom use may be changing as shown by the recent increase in unprotected anal intercourse (UAI) (George et al., 2006; Lampinen et al., 2005), thus the concerns of these men of having UAI while travelling may be reduced.

Another significant finding of our study was that WBOC MSM were more likely to have unprotected

Table III. High-risk behaviour for HIV transmission of MSM by place of birth and ethnicity/race. Sexual behaviour time frame is between 6 months and 1 year unless otherwise stated. White born in Canada (WBIC, 79%), White born outside of Canada (WBOC, 8.3%), non-White born in Canada (NBIC, 3.3%), non-White born outside of Canada (NBOC, 9.4%).

	WBIC (n = 907)		WBOC (n = 95)		NBIC (n = 38)		NBOC (n = 108)		
Variable	n‡‡	%§§	n‡‡	%§§	n‡‡	%§§	n‡‡	%§§	P-value
Regular partners*									
No	180	20.1	21	22.3	7	20.6	26	25.0	
Yes	715	79.9	73	77.7	27	79.4	78	75.0	0.68
Casual partners†									
No	204	22.8	19	20.7	6	17.7	21	20.6	
Yes	689	77.2	73	79.3	28	82.3	81	79.4	0.82
Lifetime partners‡									
<20	432	47.6	49	51.6	16	42.1	60	55.6	
20+	475	52.4	46	48.4	22	57.9	48	44.4	0.33
Sex with seropositive partner									
No	696	80.3	66	73.3	26	81.3	90	90.0	
Yes	171	19.7	24	26.7	6	18.8	10	10.0	0.03
Serostatus									
Negative	864	98.5	91	97.9	35	97.2	101	99.0	
Positive	13	1.5	2	2.1	1	2.8	1	1.0	0.84
Unprotected travel sex§									
No	834	92.0	75	79.0	35	92.1	99	91.7	
Yes	73	8.0	20	21.0	3	7.9	9	8.3	0.0005
Sold sex‖									
No	672	74.7	74	79.6	27	71.0	95	88.8	
Yes	228	25.3	19	20.4	11	29.0	12	11.2	0.009
Bought sex‖									
No	795	89.4	77	83.7	30	83.3	94	88.7	
Yes	94	10.6	15	16.3	6	16.7	12	11.3	0.30
Tattoo									
No	694	77.9	76	81.7	32	86.5	102	94.4	
Yes	197	22.1	17	18.3	5	13.5	6	5.6	0.0005
Body piercing									
No	453	50.9	53	56.4	15	40.5	68	64.1	
Yes	437	49.1	41	43.6	22	59.5	38	35.9	0.03
Sex with women									
No	384	42.8	41	43.6	19	51.4	72	67.9	
Yes	513	57.2	53	56.4	18	48.6	34	32.1	<0.0001
Number of Women									
0	383	43.0	41	43.6	19	51.4	72	67.9	
1–5	358	40.3	37	39.4	13	35.1	25	23.6	
6+	148	16.7	16	17.0	5	13.5	9	8.5	0.0005

Notes:

* A regular partner is someone with whom the participant had sex with at least twice, or someone he intended to see again. That person could be – a husband, lover or boyfriend.

† A casual partner is defined as someone with whom the participant had sex only once (one-night stand) and did not intend to see again. If a subsequent encounter did occur, it was purely by chance

‡ Total number of sexual partners whether regular, casual or commercial

§ Having unprotected sex while travelling

‖Commercial sexual relationship refers to sexual encounters with the goal of exchanging sex for money, food, drugs or lodging (selling or buying sex).

‡ ‡ Some categories may not add up to the sample size indicated above due to missing values

§§ Percentages may not add up to 100% due to rounding

sex with a seropositive person, a behaviour that increases their chance of acquiring HIV. Although these men may have been involved with a single regular partner, the breadth of the study cannot explain why they would knowingly engage in this high-risk activity. It may be that MSM may have

been practicing 'strategic positioning' by taking on the insertive role in UAI with serodiscordant partners (Van de Ven et al., 2002). Our data shows that having a regular partner was associated with sex with a serodiscordant partner but we were unable to test the hypothesis of strategic positioning in the dataset.

It is often assumed that White foreign-born men have risk profiles that are similar to North American Whites since there are less barriers preventing assimilation to the North American culture. Therefore, findings that WBOC MSM had higher sexual risk profiles compared to other foreign-born or Canadian-born MSM were surprising. The results are difficult to interpret since the category White immigrant MSM is a heterogeneous group. Although many of these men in the study were born in western European countries, some were born in Eastern Europe and other countries, each having traditions and customs which are different from each other. There are few studies looking at high risk behaviour among White immigrant populations. An earlier investigation of clinic attendees at UK genitourinary clinics indicated the importance of analysing sexually transmitted infections data by country of birth and ethnicity, as non UK born European males had a higher prevalence of HIV compared to those who were born in the UK (McGarrigle & Nicoll, 1998).

The important observation of risky sexual behaviours while travelling was not a major theme in the two cohort studies. Although we believe that most trips were out-of-country, there is a possibility that some travelling could have been to another province. However, careful scrutiny of the data showed that most 'travel' was reported by foreign-born MSM and it is likely that these men were travelling outside of Canada. A major drawback to the study was our inability to measure a 'dose-response' relationship on the length of residency in Canada (or other acculturation theory constructs) since the data was unavailable. Studies of populations' risk perceptions for HIV showed that Hispanics who were less acculturated showed higher risks for HIV (Chng & Geliga-Vargas, 2000; Marin et al., 1993). In Canada, attitudes and behaviour towards condoms were observed to be different for the Latin American, South Asian and English speaking Caribbean communities (Godin et al., 1996).

We did not include Canadian Aboriginal people in our analyses since Heath et al. (1999) have previously examined the characteristics of these individuals in comparison with other Canadians using a portion of this dataset (Heath et al., 1999). Also, reports and surveys show that the health behaviour of Canada's Aboriginal people is markedly different from other Canadians.

We were unable to form psychosocial constructs (such as depressive symptomatology) from the variables present since both the two studies used different measurement period and varying scales. Ideally, it would have been more useful to condense these variables into a single scale.

When the data were stratified by ethnicity/race, White foreign-born MSM were more likely to have unprotected sex while travelling outside of their province and to have sex with a seropositive individual. As epidemiologic research normally groups MSM, particularly Caucasians, as a homogenous unit, failing to locate individuals by cultural identity and place of birth may result in confounded outcomes.

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References

Adam, B.D., & Husbands, W., et al. (2003). *Renewing HIV Prevention for Gay and Bisexual Men. A research report on safer sex practices among high-risk men and men in couples in Toronto*. Toronto: Canadian Strategy on HIV/AIDS, Health Canada.

Calzavara, L., Burchell, A.N., et al. (2002). Increases in HIV incidence among men who have sex with men undergoing repeat diagnostic HIV testing in Ontario, Canada. *AIDS*, *16*, 1655–61.

Cedano, J., & Allman, D., et al. (2002). Spanish -Speaking MSM experiencing HIV and AIDS in Toronto: An analysis of culture as depicted in Qualitative interviews. Paper presented at the 11th Annual Canadian Conference on HIV/AIDS Research, Winnipeg, Manitoba, Canada.

Chng, C.L., & Geliga-Vargas, J. (2000). Ethnic identity, gay identity, sexual sensation seeking and HIV risk taking among multiethnic men who have sex with men. *AIDS Education and Prevention*, *12*, 326–39.

De Graaf, R., Van Zessen, G., Houweling, H., Ligthelm, R.J., & Van Den Akker, R. (1997). Sexual risk of HIV infection among

expatriates posted in AIDS endemic areas. *AIDS*, *11*, 1173–81.

De Graaf, R., Van Zessen, G., et al. (1998). Underlying reasons for sexual conduct and condom use among expatriates posted in AIDS endemic areas. *AIDS Care*, *10*, 651–65.

Dougan, S., Elford, J., Sinka, K., Fenton, K.A., & Evans, B.G. (2005). Men who have sex with men who are born abroad and diagnosed with HIV in England and Wales: an epidemiological perspective. *International Journal of STD and AIDS*, *16*, 618–21.

Dufour, A., Alary, M., et al. (2000). Risk behaviours and HIV infection among men having sexual relations with men: baseline characteristics of participants in the Omega Cohort Study, Montreal, Quebec, Canada. *Canadian Journal of Public Health*, *91*, 345–49.

Fenton, K.A., Chinouya, M., et al. (2001). HIV transmission risk among sub-Saharan Africans in London travelling to their countries of origin. *AIDS*, *15*, 1442–45.

Fernandez, I. (1998). Vulnerable to HIV/AIDS. Migration. *Integration*, *Fall*, 36–42.

George, C., & Alary, M., et al. (2006). Non-negligible increasing temporal trends in unprotected anal intercourse among men who have sexual relations with other men in Montreal. *Journal of Acquired Immune Deficiency Syndromes*, *41*, 365–70.

Godin, G., Maticka-Tyndale, E., et al. (1996). Understanding use of condoms among Canadian ethnocultural communities: methods and main findings of the survey. *Canadian Journal of Public Health*, *87*(Suppl 1), S33–37, S36–41.

Hawkes, S.J., & Hart, G.J. (1993). Travel, migration and HIV. *AIDS Care*, *5*, 207–14.

Heath, K.V., Cornelisse, P.G., et al. (1999). HIV-associated risk factors among young Canadian Aboriginal and non- Aboriginal men who have sex with men. *International Journal of STD and AIDS*, *10*, 582–87.

Husbands, W., Lau, C., et al. (2004). *Party Drugs in Toronto's Gay Dance Club Scene: Issues for HIV Prevention*. Toronto: AIDS Committee of Toronto.

Kramer, M.A., et al. (2005). Sexual risk behaviour among Surinamese and Antillean migrants travelling to their countries of origin. *Sex Transm Infect.*, *81*, 508–510.

Lampinen, T.M., Ogilvie, G., Chan, K., Miller, M.L., Cook, D., Schechter, M.T., et al. (2005). Sustained Increase in HIV-1 Incidence Since 2000 Among Men Who Have Sex With Men in British Columbia, Canada. *Journal of Acquired Immune Deficiency Syndromes*, *40*, 242–44.

Lyttleton, C., & Amarapibal, A. (2002). Sister cities and easy passage: HIV, mobility and economies of desire in a Thai/Lao border zone. *Social Science and Medicine*, *54*, 505–18.

Marin, B.V., Tschann, J.M., et al. (1993). Acculturation and gender differences in sexual attitudes and behaviors:Hispanic vs non-Hispanic white unmarried adults. *American Journal of Public Health*, *83*, 1759–61.

McGarrigle, C.A., & Nicoll, A. (1998). Prevalence of HIV-1 among attenders at sexually transmitted disease clinics: analyses according to country of birth. *Sexually Transmitted Infections*, *74*, 415–20.

Myers, T., Allman, D., et al. (2004). *Ontario Men's Survey*. Toronto: HIV Social, Behavioural and Epidemiological Studies Unit, University of Toronto.

Scarce, M. (1999). *Smearing the queer: medical bias in the health care of gay men*. Binghamton, NY: Harrington Park Press an Imprint of The Haworth Press Inc.

Singer, S.M., Willms, D.G., Adrien, A, et al. (1996). Many voices–sociocultural results of the ethnocultural communities facing AIDS study in Canada. *Canadian Journal of Public Health*, *87*(Suppl 1), S26–32, S28–35.

Statistics Canada (2003). *Canada's ethnocultural portrait: The changing mosaic*, 2003, from http://www12.statcan.ca/english/census01/products/analytic/companion/etoimm/pdf/96F0030XIE2001008.pdf.

Strathdee, S.A., Hogg, R.S., et al. (1998). Determinants of sexual risk-taking among young HIV-negative gay and bisexual men. *Journal of Acquired Immune Deficiency Syndromes and Human Retrovirology*, *19*, 61–66.

Strathdee, S.A., Martindale, S.L., et al. (2000). HIV infection and risk behaviours among young gay and bisexual men in Vancouver. *Canadian Medical Association Journal*, *162*(1), 21–25.

UNAIDS (2002). *Report on the global HIV/AIDS Epidemic 2002*. Barcelona: Joint United Nations Programme on HIV/AIDS-http://www.unaids.org/barcelona/presskit/barcelona%20report/Global_estimate.pdf.

UNAIDS (2005). *AIDS epidemic update*. Joint United Nations Programme on HIV/AIDS-http://www.unaids.org/epi2005/doc/report_pdf.html

Van de Ven, P., Kippax, S., Crawford, J., Rawstorne, P., Prestage, G., Grulich, A., et al. (2002). In a minority of gay men, sexual risk practice indicates strategic positioning for perceived risk reduction rather than unbridled sex. *AIDS Care*, *14*, 471–80.

Weber, A.E., Chan, K., et al. (2001). Risk Factors Associated With HIV Infection Among Young Gay and Bisexual Men in Canada. *Journal of Acquired Immune Deficiency Syndromes and Human Retrovirology*, *28*, 81–88.

Wiking, E., Johansson, S.-E., et al. (2004). Ethnicity, acculturation, and self reported health. A population based study among immigrants from Poland, Turkey, and Iran in Sweden. *Journal of Epidemiology and Community Health*, *58*, 574–82.

Zhang, K.L., & Ma, S.J. (2002). Epidemiology of HIV in China. *British Medical Journal*, *324*, 803–4.