

the Métis
Nation *of*
Ontario

CANCER IN THE MÉTIS NATION OF ONTARIO

TECHNICAL REPORT
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BACKGROUND AND RATIONALE

In the general population, the overall incidence and mortality rates of cancer have been stable or declining over the past decade. However, cancer rates are likely to increase in Aboriginal communities over the coming decades, based on past cancer trends and information on risk factor prevalence among Aboriginal persons. Since many cancers are preventable or treatable in their early stages, it is of paramount importance to anticipate possible increases in cancer incidence and prevalence, and to develop appropriate primary and secondary prevention strategies¹.

Métis people comprise approximately 30% of the Aboriginal population in Canada, according to the 2006 census. Métis people trace their ancestry to the offspring of European men and First Nations women, and are a distinct Aboriginal people set apart from First Nations and Inuit by language, culture and history. At present there are few specific population-based health and healthcare data and subsequent peer-reviewed studies on the health of the Métis^{1,2}.

The health and healthcare of the Métis are a primary interest of the Métis Nation of Ontario (MNO), the sole representative body for the Métis in Ontario. The main purpose of the MNO is to support and further the development of self-government institutions for the Métis Nation in Ontario and to represent and advocate for the distinct interests of the Métis people in Ontario. In order to examine population-based data on cancer and its consequences in the Métis population in Ontario, the MNO launched a research initiative with funding from the Public Health Agency of Canada.

Because Ontario health data do not include identifiers for individuals' ethnic or cultural background, an alternative way of identifying the Métis population was needed. In order to access health administrative data for the province of Ontario necessary for this initiative, a research agreement was developed between the MNO and the Institute for Clinical Evaluative Sciences (ICES). This research agreement permits linkage of the MNO citizenship registry with Ontario healthcare administrative data in a secure environment. ICES is an independent, non-profit organization, whose core business is to conduct research that contributes to the effectiveness, quality, equity and efficiency of health care and health services in Ontario. Key to the knowledge produced at ICES is its ability to anonymously link population-based health information on an individual patient basis, using unique ICES identifiers that ensure the privacy and confidentiality of health information. Linked data allow researchers to obtain a more comprehensive view of specific health care issues than could be achieved with unlinked data. This report describes the data linkage, the analytic methods undertaken, and the results of the analysis related to cancer among Métis who are MNO Citizens, for the period 2005 to 2006.

LITERATURE REVIEW

Cancer is a significant cause of illness and death in Canada's general population. Unfortunately, we currently lack information about cancer among the Métis. Much of the existing Métis-specific statistical information on cancer must be interpreted with a good deal of caution because it is based either on studies that relied on self-reported data or extremely small samples. For instance, according to the 2006 Métis Nation British Columbia Provincial Survey, 15.3% of the 1509 respondents reported that either they or a family member had a diagnosis of cancer³. A small study undertaken by Manitoba Health and Cancer Care Manitoba in 2002 linked their databases with 2,177 members of the Manitoba Metis Federation, a sample which over-represented Métis living in one specific rural district. This study found that the incidence and prevalence of some conditions, including cancer, was 4.2% lower among Métis men compared to other Manitobans but 2.4% higher among Métis women⁴.

More recently the Manitoba Centre for Health Policy in collaboration with the Manitoba Metis Federation released a comprehensive report on the health status and healthcare utilization patterns of the Métis population in Manitoba⁵. This is an extraordinarily detailed report offering information on a myriad of topics including mortality rates, prevalence of chronic disease conditions, prevalence of prevention and screening, ambulatory physician services and hospital separation rates. Although this material provides a good glimpse at the health of Métis people

in Manitoba, the report does not include any information on the prevalence or incidence of common cancers. The report does however include a discussion of the proportion of total mortality attributable to cancer, 30.6% compared with 27.8% for 'other' Manitobans. This suggests a higher rate or higher case fatality.

RESEARCH METHODS

DATA SOURCES

Formed in 1994, the MNO is the representative body for Métis persons in Ontario. The registry of the Métis Nation of Ontario issues Métis citizenship to those who can supply genealogical documentation and proof of Aboriginal ancestry⁶. The MNO's citizenship registry as of August 2009 was provided to ICES. It included 14,480 individuals.

Initial data cleaning of the citizenship registry included range checks and removal of duplicate records. Individual MNO citizens were then linked with the Registered Persons Database (RPDB), a registry of all persons eligible for a health card in Ontario. Of the 14,480 individuals in the citizenship registry, 14,021 (96.8%) were successfully linked, of whom 13,439 (92.8%) had a valid Ontario address recorded in the RPDB and were 18 years of age and older. These individuals comprise the Métis cohort used in this study. This is the Métis population that was studied in this report; in the report, we refer to them simply as "the Métis", or "the Métis population". All other Ontario residents aged 18 and older were considered to be part of the general population.

Each person's health card number was then anonymized using a reproducible encryption algorithm. The encrypted health card number is linkable with other Ontario administrative health care data sources, all of which share the same encrypted health card number to identify individuals. As a result, individuals can be linked between data sources and across time. For the purpose of this particular study, individuals were linked to the Ontario Cancer Registry (OCR), which is a computerized database of information on all Ontario residents who have been newly diagnosed with cancer ("incidence") or who have died of cancer ("mortality"). All new cases of cancer are registered, with the exception of non-melanoma skin cancer. The OCR is over 95% complete in the general Ontario population⁷.

EPIDEMIOLOGY OF CANCER

Person-time incidence rates of cancer (the number of persons newly diagnosed with cancer over a given period of time among a specified population) for the period 2005-2007 were calculated for both the Métis population and the general Ontario population. Since the demographic structure of the MNO citizenship registry is different from that of the general Ontario population, overall rates were indirectly standardized according to age and sex.

Rates were calculated overall and by age, sex and cancer type. The types of cancer considered are listed in Appendix 1, along with their corresponding International Classification of Diseases, 9th revision (ICD-9) codes.

FINDINGS

DEMOGRAPHIC CHARACTERISTICS OF THE POPULATIONS

Table 1 : Demographic characteristics of the Métis Nation of Ontario citizenship registry versus the Métis population in Ontario identified in the 2006 Census.

Characteristic	Métis Nation of Ontario Citizens Registry	Ontario Métis people identified in the 2006 Census
Number of persons	13,439	73,605
Age		
<65	88.8%	94.8%
65+	11.2%	5.2%
Sex		
Female	45.9%	50.0%
Male	54.1%	50.0%

The MNO citizenship registry included in this analysis represents approximately 18% of the total Métis population in Ontario, based on self-report in the 2006 Census by Statistics Canada⁷. The people included in the citizenship registry are older and more likely to be male than the Métis census population.

Table 2 : Demographic characteristics of the Métis Nation of Ontario citizenship registry versus the rest of the general population of Ontario.

Characteristic	Métis Nation of Ontario Citizens Registry	General population
Number of persons	13,439	9,897,757
Age (%)		
<65	88.8	83.4
65-74	7.8	8.7
75+	3.4	7.8
Sex (%)		
Female	45.9	51.1
Male	54.1	48.9
Rurality ¹ (%)		
<i>Missing</i>	4.9	0.0
Urban	65.6	87.7
Rural	29.5	12.2
Income Quintile ² (%)		
<i>Missing</i>	0.1	0.0
1	21.8	18.2
2	20.8	19.5
3	20.5	20.2
4	19.8	21.4
5	17.0	20.8
Local Health Integrated Network (LHIN) (%)		
<i>Missing</i>	4.9	0.0
Erie St. Clair	2.4	5.1
South West	3.4	7.3
Waterloo Wellington	2.2	5.5
Hamilton Niagara Haldimand Brant	5.1	10.9
Central West	1.2	5.9
Mississauga Halton	1.6	8.4
Toronto Central	2.3	9.4
Central	2.0	12.6
Central East	4.8	11.7
South East	2.7	3.9
Champlain	5.3	9.4
North Simcoe Muskoka	17.3	3.4
North East	29.3	4.5
North West	15.5	1.8

¹Based on the Statistics Canada definition of rurality (Statistics Canada. Standard Geographical Classification (SGC): Volume 1 - The Classification. Ottawa, ON: 2007). ²Neighbourhood income is calculated by Statistics Canada and is updated every five years when new census data become available. Ontario neighbourhoods are now classified into one of five approximately equal-sized groups (quintiles), ranked from poorest (Q1) to wealthiest (Q5). These income quintiles are related to population health status and levels of health care utilization. We generated the income quintile distribution for urban areas only.

MNO citizens are slightly younger and have a greater proportion of males than the general population. A much higher proportion of the general population lived in urban areas compared with MNO citizens. When considering only those residing in urban areas, MNO citizens were more likely to live in lower income neighbourhoods than the general population. The majority of MNO citizens lived in the North of the province, with the largest group in the North East.

EPIDEMIOLOGY OF CANCER

Table 3 : Frequency ranking of cancers newly diagnosed during 2005-2007 among the Métis and among the Ontario General Population, by type.

Cancer Type	Cases among Métis (n)	Frequency Ranking among Métis	Cancer Type	Cases among General population (n)
Total			Total	
Lung	29	1	Prostate	27,917
Prostate	23	2	Breast	23,662
Colorectal	22	3	Colorectal	21,092
Breast	19	4	Lung	21,563
Non-Hodgkin			Non-Hodgkin	
Lymphoma	6	5	Lymphoma	7,977
Uterus	<=5	6	Uterus	4,962
Ovary	<=5	7	Ovary	3,112
Cervix	<=5	8	Cervix	1,575
Overall	168		Overall	160,971
Males			Males	
Prostate	23	1	Prostate	27,917
Lung	13	2	Lung	11,546
Colorectal	12	3	Colorectal	11,514
Non-Hodgkin			Non-Hodgkin	
Lymphoma	<=5	4	Lymphoma	4,389
Overall	87		Overall	83,336
Females			Females	
Breast	19	1	Breast	23,662
Lung	16	2	Colorectal	9,578
Colorectal	10	3	Lung	10,017
Uterus	<=5	4	Uterus	4,962
Non-Hodgkin			Non-Hodgkin	
Ovary	<=5	5	Lymphoma	3,588
Non-Hodgkin			Ovary	3,112
Lymphoma	<=5	6	Cervix	1,575
Cervix	<=5	7	Cervix	1,575
Overall	81		Overall	77,635

Cell sizes of less than 5 have been suppressed.

The most frequent types of newly diagnosed cancer among the Métis in order were lung, prostate, colorectal and breast. In the general population they were prostate, breast, lung and colorectal.

Table 4 : Incidence of cancer per 1000 persons during 2005 to 2007 among the Métis and among the Ontario General Population, by type and sex.

Crude Incidence per 1000 population (95% CI), by type	Métis	General population
Total		
Breast	1.05 (0.63, 1.64)	1.48 (1.46, 1.50)
Cervix	-	0.10 (0.09, 0.10)
Colorectal	0.56 (0.35, 0.85)	0.67 (0.66, 0.67)
Lung	0.74 (0.49, 1.06)	0.68 (0.67, 0.69)
Non-Hodgkin Lymphoma	0.15 (0.06, 0.33)	0.25 (0.25, 0.26)
Ovary	0.17 (0.03, 0.48)	0.19 (0.19, 0.20)
Prostate	1.10 (0.70, 1.65)	1.82 (1.80, 1.84)
Uterus	0.27 (0.09, 0.64)	0.31 (0.30, 0.32)
All Cancers	4.40 (3.76, 5.12)	5.25 (5.22, 5.27)
Males		
Colorectal	0.57 (0.30, 1.00)	0.74 (0.73, 0.76)
Lung	0.62 (0.32, 1.06)	0.74 (0.73, 0.76)
Non-Hodgkin Lymphoma	0.24 (0.08, 0.55)	0.28 (0.27, 0.29)
Prostate	1.10 (0.70, 1.65)	1.82 (1.80, 1.84)
All Cancers	4.24 (3.40, 5.23)	5.54 (5.50, 5.58)
Females		
Breast	1.05 (0.63, 1.64)	1.48 (1.46, 1.50)
Cervix	-	0.10 (0.09, 0.10)
Colorectal	0.55 (0.26, 1.01)	0.59 (0.58, 0.60)
Lung	0.88 (0.50, 1.43)	0.62 (0.61, 0.63)
Non-Hodgkin Lymphoma	0.06 (0.00, 0.31)	0.22 (0.21, 0.23)
Ovary	0.17 (0.03, 0.48)	0.19 (0.19, 0.20)
Uterus	0.27 (0.09, 0.64)	0.31 (0.30, 0.32)
All Cancers	4.59 (3.64, 5.70)	4.97 (4.93, 5.00)

CI: Confidence Interval

The overall crude incidence of cancer is 20 percent lower in the Métis population than in the general Ontario population. The lower crude rates of cancer among the Métis remain when looking at specific types of cancer overall and by sex, with the exception of lung cancer, which appears to be 1.4 times higher among Métis women.

Table 5 : Crude and age-sex standardized annual incidence of cancer per 1000 persons among the Métis, 2005 to 2007.

Incidence per 1000 population, by year	Métis		General population	
	Crude Rate (CI)	Indirectly Standardized Rate (CI)	Crude Rate (CI)	Indirectly Standardized Rate (CI)
2005	5.29 (4.10, 6.72)	5.43 (4.21, 6.90)	5.17 (5.13, 5.22)	5.19 (5.15, 5.24)
2006	3.93 (2.92, 5.18)	3.93 (2.92, 5.19)	5.26 (5.21, 5.30)	5.26 (5.21, 5.30)
2007	3.99 (2.97, 5.24)	3.89 (2.89, 5.11)	5.31 (5.26, 5.35)	5.29 (5.24, 5.33)

CI: Confidence Interval

Standardizing for age and sex did not substantially change the annual incidence rates of cancer among either the Métis or the general Ontario population. Cancer incidence was 1.3 to 1.4 times lower among the Métis compared to the general population in the years 2006 and 2007. A comparison of the crude and age standardized rates per year can be found in Appendix 2.

Table 6 : Incidence of cancer per 1000 persons during 2005 to 2007 among the Métis and among the Ontario General Population, by age and sex.

Crude Incidence, per 1000 population (95% CI)	Métis*	General population**
Total		
< 65 years	2.79 (2.27, 3.41)	2.87 (2.85, 2.89)
65-74 years	17.76 (13.00, 23.69)	16.87 (16.71, 17.03)
75+ years	28.57 (18.49, 42.18)	20.25 (20.06, 20.43)
Overall	4.40 (3.76, 5.12)	5.25 (5.22, 5.27)
Males		
< 65 years	2.56 (1.89, 3.40)	2.70 (2.67, 2.72)
65-74 years	18.72 (12.23, 27.43)	21.51 (21.24, 21.77)
75+ years	32.26 (17.18, 55.16)	27.27 (26.91, 27.62)
Overall	4.24 (3.40, 5.23)	5.54 (5.50, 5.58)
Females		
< 65 years	3.07 (2.27, 4.05)	3.04 (3.01, 3.07)
65-74 years	16.65 (10.17, 25.72)	12.71 (12.52, 12.90)
75+ years	25.42 (13.14, 44.41)	15.89 (15.67, 16.10)
Overall	4.59 (3.64, 5.70)	4.97 (4.93, 5.00)

CI: Confidence Interval

The overall incidence rate of cancer was slightly higher among the Métis than the general population for persons over age 65. The incidence rates of cancer were slightly higher among Métis men and women across the different age categories, except among Métis men aged less than 75.

LIMITATIONS

Administrative data have been widely advocated for chronic disease surveillance because they are an efficient means to obtain population-based measures of disease burden. Administrative data in Ontario are readily available, electronically readable, easily linkable, relatively inexpensive and virtually population-based. However, administrative data have a number of limitations including lack of clinical detail, coding errors and biases related to the method of data collection, such as physician claims data. The OCR also has a number of limitations as it does not provide cancer stage information and excludes certain types of cancer-related diagnoses such as non-melanoma skin cancer and carcinoma in situ of the breast (which accounts for over 30% of “breast cancer” diagnoses). In addition, the citizenship registry of the MNO may not be representative of the entire Métis population in Ontario. Individuals who are not registered citizens may be different (in demographic, behavioural or clinical terms) than registered citizens, so generalizing these results to all Métis people in Ontario may not be appropriate. These non-registered Métis people were included in the general population of this study.

DISCUSSION

In this analysis we found that while the overall incidence of cancer among the Métis population was slightly lower than the general population for the two most recent years of the study period, 2006 and 2007. However these rate estimates were based on very small numbers of newly diagnosed cases in the Métis population, meaning that little significance can be attributed to this finding. Furthermore, when the rates were broken down by age and sex, the rates were lower only among Métis men under the age of 75.

Unfortunately, other province-level registry-based statistics on cancer incidence in the Métis do not exist in the published or grey literature with which to compare these findings. Tjepkema et al⁸ used the Canadian census mortality follow-up study to compare mortality rates of Métis and Registered Indian adults to the rest of the non-Aboriginal population. Disease-specific age-standardized mortality rates (ASMRs) per 100,000 person-years at risk were calculated for Métis, Registered Indians and non-Aboriginal persons. Across the range of cancers analyzed, ASMRs for Métis were lower than for Registered Indians but higher than for the general population. The differences in these rates were not statistically significant. Looking specifically at Métis, the highest rates of death for both men and women were for cancers of the trachea, bronchus and lung (68.6 per 100,000 person-years at risk for men aged 25 and older and 49.0 per 100,000 person-years for women), followed by ‘other’ cancers (27.8 per 100,000 person-years for men, 29.0 per 100,000 person-years for women) and prostate cancer for men (18.0 per 100,000 person-years) and ovarian and uterine cancer for women (25.3 per 100,000 person-years).

While these statistics show that cancer incidence was slightly lower among the Métis than the general population, these findings should not be interpreted as being indicative of any major systematic differences between these populations. There are a number of limitations in our data which must be taken into account when interpreting our findings. First, there may potentially be incomplete ascertainment of cancer cases among the Métis in the Ontario Cancer Registry. Specifically, a sizeable proportion of the Métis population live in North Western Ontario. Because the distance to the nearest cancer centre in Thunder Bay is far, residents of North Western Ontario are eligible to seek cancer care in Winnipeg⁹ and thus may be registered in the Manitoba Cancer Registry. Comparing cancer incidence and screening rates by geographic region would substantiate this explanation if they were found to be different between the Métis and the general population in this region. Second, persons registered in the MNO citizens registry do not appear to be fully representative of the greater Métis population in Ontario. This research was about people who were older and more likely to be male than those identifying themselves as Métis in the 2006 Census. Further study with a larger cohort over a longer period of time is warranted, as would be a comparison with rates among people who self-identify as Métis in the Census.

Cancer incidence rates are likely to increase in Aboriginal communities over the coming decades, based on past cancer trends and information on risk factor prevalence among Aboriginal persons². Most notably, smoking rates are estimated to be around 37% among the Métis population compared to 22% among the non-Aboriginal popu-

lation in Canada¹. It is likely that the high rate of smoking among Métis people will result in an increase in the incidence of lung cancer compared with the general population.

CONCLUSIONS

Citizens of the Métis Nation of Ontario had slightly lower rates of cancer in 2006 and 2007 compared with the Ontario general population, based on Ontario Cancer Registry statistics. These analyses were based on very small numbers of events and do not point to any substantial systematic differences between the populations. For now it should be assumed that the rates are similar and this needs to be investigated further in more comprehensive research involving larger numbers of Métis studied over longer periods.

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APPENDIX 1: Cancer diagnoses

	ICD-9	DESCRIPTION
Colorectal	1530	MAL NEO HEPATIC FLEXURE
	1531	MAL NEO TRANSVERSE COLON
	1532	MAL NEO DESCEND COLON
	1533	MAL NEO SIGMOID COLON
	1534	MALIGNANT NEOPLASM CECUM
	1536	MALIG NEO ASCEND COLON
	1537	MAL NEO SPLENIC FLEXURE
	1538	MALIGNANT NEO COLON NEC
	1539	MALIGNANT NEO COLON NOS
	1540	MAL NEO RECTOSIGMOID JCT
	1541	MALIGNANT NEOPL RECTUM
Lung	1620	MALIGNANT NEO TRACHEA
	1622	MALIG NEO MAIN BRONCHUS
	1623	MAL NEO UPPER LOBE LUNG
	1624	MAL NEO MIDDLE LOBE LUNG
	1625	MAL NEO LOWER LOBE LUNG
	1628	MAL NEO BRONCH/LUNG NEC
	1629	MAL NEO BRONCH/LUNG NOS
	Breast	1740
1741		MAL NEO BREAST-CENTRAL
1742		MAL NEO BREAST UP-INNER
1743		MAL NEO BREAST LOW-INNER
1744		MAL NEO BREAST UP-OUTER
1745		MAL NEO BREAST LOW-OUTER
1746		MAL NEO BREAST-AXILLARY
1748		MALIGN NEOPL BREAST NEC
1749		MALIGN NEOPL BREAST NOS
Ovary	1830	MALIGN NEOPL OVARY
Uterus	1820	MALIG NEO CORPUS UTERI
	1821	MAL NEO UTERINE ISTHMUS
	1828	MAL NEO BODY UTERUS NEC
	179	MALIG NEOPL UTERUS NOS
Cervix	1800	MALIG NEO ENDOCERVIX
	1801	MALIG NEO EXOCERVIX
	1808	MALIG NEO CERVIX NEC
	1809	MAL NEO CERVIX UTERI NOS
Prostate	185	MALIGN NEOPL PROSTATE

APPENDIX 2 : Crude and age/sex standardized incidence of cancer per 1000 people among the Métis and among the Ontario General Population per year, by type and sex.

Incidence, per 1000 population	Cases (n)	Overall Crude Rate (CI)	Métis*					
			2005		2006		2007	
			Crude Rate (CI)	ISR (CI)	Crude Rate (CI)	ISR (CI)	Crude Rate (CI)	ISR (CI)
Total								
Breast	19	1.05 (0.63, 1.64)	1.51 (0.69, 2.86)	1.53 (0.70, 2.90)	1.16 (0.47, 2.40)	1.16 (0.47, 2.40)	0.49 (0.10, 1.44)	0.49 (0.10, 1.42)
Cervix	<=5	-	-	-	-	-	-	-
Colorectal	22	0.56 (0.35, 0.85)	0.31 (0.08, 0.79)	0.33 (0.09, 0.83)	0.69 (0.32, 1.31)	0.69 (0.31, 1.31)	0.68 (0.31, 1.30)	0.65 (0.30, 1.23)
Lung	29	0.74 (0.49, 1.06)	0.77 (0.37, 1.42)	0.77 (0.38, 1.46)	0.76 (0.37, 1.40)	0.77 (0.37, 1.41)	0.68 (0.31, 1.30)	0.66 (0.30, 1.25)
Non-Hodgkin Lymphoma	6	0.15 (0.06, 0.33)	0.23 (0.05, 0.67)	0.24 (0.05, 0.70)	0.08 (0.00, 0.43)	0.08 (0.00, 0.43)	0.15 (0.02, 0.55)	0.15 (0.02, 0.53)
Ovary	<=5	0.17 (0.03, 0.48)	0.33 (0.04, 1.20)	0.34 (0.04, 1.21)	0.17 (0.00, 0.92)	0.17 (0.00, 0.92)	0.00 (NA)	0.00 (NA)
Prostate	23	1.10 (0.70, 1.65)	1.58 (0.79, 2.83)	1.66 (0.83, 2.96)	0.72 (0.23, 1.67)	0.72 (0.23, 1.67)	1.00 (0.40, 2.06)	0.96 (0.38, 1.97)
Uterus	<=5	0.27 (0.09, 0.64)	0.33 (0.04, 1.20)	0.33 (0.04, 1.21)	0.33 (0.04, 1.19)	0.33 (0.04, 1.19)	0.16 (0.00, 0.91)	0.16 (0.00, 0.90)
All Cancers	168	4.40 (3.76, 5.12)	5.29 (4.10, 6.72)	5.43 (4.21, 6.90)	3.93 (2.92, 5.18)	3.93 (2.92, 5.19)	3.99 (2.97, 5.24)	3.89 (2.89, 5.11)
Males								
Colorectal	12	0.57 (0.30, 1.00)	0.43 (0.09, 1.26)	0.45 (0.09, 1.32)	0.43 (0.09, 1.25)	0.43 (0.09, 1.25)	0.85 (0.31, 1.85)	0.81 (0.30, 1.77)
Lung	13	0.62 (0.32, 1.06)	0.57 (0.16, 1.47)	0.60 (0.16, 1.53)	1.00 (0.40, 2.05)	1.00 (0.40, 2.06)	0.28 (0.03, 1.02)	0.27 (0.03, 0.99)
Non-Hodgkin Lymphoma	<=5	0.24 (0.08, 0.55)	0.43 (0.09, 1.25)	0.46 (0.09, 1.30)	0.14 (0.00, 0.79)	0.14 (0.00, 0.79)	0.14 (0.00, 0.79)	0.14 (0.00, 0.76)
Prostate	23	1.10 (0.70, 1.65)	1.58 (0.79, 2.83)	1.66 (0.83, 2.96)	0.72 (0.23, 1.67)	0.72 (0.23, 1.67)	1.00 (0.40, 2.06)	0.96 (0.38, 1.97)
All Cancers	87	4.24 (3.40, 5.23)	5.42 (3.82, 7.48)	5.61 (3.95, 7.73)	3.51 (2.25, 5.22)	3.52 (2.25, 5.23)	3.79 (2.47, 5.55)	3.67 (2.40, 5.73)
Females								
Breast	19	1.05 (0.63, 1.64)	1.51 (0.69, 2.86)	1.53 (0.70, 2.90)	1.16 (0.47, 2.40)	1.16 (0.47, 2.40)	0.49 (0.10, 1.44)	0.49 (0.10, 1.42)
Cervix	<=5	-	-	-	-	-	-	-
Colorectal	10	0.55 (0.26, 1.01)	0.17 (0.00, 0.93)	0.18 (0.01, 0.99)	0.99 (0.36, 2.15)	0.99 (0.36, 2.14)	0.49 (0.10, 1.43)	0.46 (0.10, 1.36)
Lung	16	0.88 (0.50, 1.43)	1.00 (0.37, 2.17)	1.03 (0.38, 2.24)	0.50 (0.10, 1.45)	0.50 (0.10, 1.45)	1.14 (0.46, 2.35)	1.10 (0.45, 2.29)
Non-Hodgkin Lymphoma	<=5	0.06 (0.00, 0.31)	0.00 (NA)	0.00 (NA)	0.00 (NA)	0.00 (NA)	0.16 (0.00, 0.91)	0.17 (0.00, 0.92)
Ovary	<=5	0.17 (0.03, 0.48)	0.33 (0.04, 1.20)	0.34 (0.04, 1.21)	0.17 (0.00, 0.92)	0.17 (0.00, 0.92)	0.00 (NA)	0.00 (NA)
Uterus	<=5	0.27 (0.09, 0.64)	0.33 (0.04, 1.20)	0.33 (0.04, 1.21)	0.33 (0.04, 1.19)	0.33 (0.04, 1.19)	0.16 (0.00, 0.91)	0.16 (0.00, 0.90)
All Cancers	81	4.59 (3.64, 5.70)	5.13 (3.46, 7.33)	4.42 (2.89, 6.48)	4.42 (2.89, 6.47)	4.42 (2.89, 6.47)	4.22 (2.73, 6.22)	4.14 (2.68, 6.11)

*Rate calculated per 1000 person-years for the cases incident in 2005, 2006 and 2007 using the observation time contributed by the population in each year as the denominator.

**Rate calculated per 1000 people for the cases incident in 2005, 2006 and 2007 using 2006 population as the denominator.

APPENDIX 2, CONTINUED : Crude and age/sex standardized incidence of cancer per 1000 people among the Métis and among the Ontario General Population per year, by type and sex.

Cases (n)	Overall Crude Rate (CI)	General population**					
		2005		2006		2007	
		Crude Rate (CI)	ISR (CI)	Crude Rate (CI)	ISR (CI)	Crude Rate (CI)	ISR (CI)
23,662	1.48 (1.46, 1.50)	1.47 (1.44, 1.50)	1.47 (1.44, 1.50)	1.48 (1.45, 1.51)	1.48 (1.45, 1.51)	1.49 (1.45, 1.52)	1.48 (1.45, 1.52)
1,575	0.10 (0.09, 0.10)	0.10 (0.09, 0.10)	0.10 (0.09, 0.10)	0.09 (0.09, 0.10)	0.09 (0.09, 0.10)	0.10 (0.09, 0.11)	0.10 (0.09, 0.11)
21,092	0.67 (0.66, 0.67)	0.66 (0.65, 0.68)	0.67 (0.65, 0.68)	0.67 (0.65, 0.68)	0.67 (0.65, 0.68)	0.67 (0.65, 0.68)	0.66 (0.65, 0.68)
21,563	0.68 (0.67, 0.69)	0.70 (0.68, 0.71)	0.70 (0.68, 0.72)	0.68 (0.66, 0.70)	0.68 (0.66, 0.70)	0.66 (0.65, 0.68)	0.66 (0.64, 0.67)
7,977	0.25 (0.25, 0.26)	0.26 (0.25, 0.27)	0.26 (0.25, 0.27)	0.24 (0.24, 0.25)	0.24 (0.24, 0.25)	0.25 (0.24, 0.26)	0.25 (0.24, 0.26)
3,112	0.19 (0.19, 0.20)	0.18 (0.17, 0.20)	0.19 (0.17, 0.20)	0.19 (0.18, 0.20)	0.19 (0.18, 0.21)	0.20 (0.19, 0.21)	0.20 (0.19, 0.21)
27,917	1.82 (1.80, 1.84)	1.78 (1.74, 1.81)	1.79 (1.75, 1.82)	1.84 (1.81, 1.88)	1.84 (1.81, 1.88)	1.83 (1.79, 1.87)	1.82 (1.78, 1.86)
4,962	0.31 (0.30, 0.32)	0.28 (0.27, 0.30)	0.29 (0.27, 0.30)	0.31 (0.30, 0.33)	0.31 (0.30, 0.33)	0.32 (0.31, 0.34)	0.32 (0.30, 0.33)
160,971	5.25 (5.22, 5.27)	5.17 (5.13, 5.22)	5.19 (5.15, 5.24)	5.26 (5.21, 5.30)	5.26 (5.21, 5.30)	5.31 (5.26, 5.35)	5.29 (5.24, 5.33)
11,514	0.74 (0.73, 0.76)	0.74 (0.71, 0.76)	0.74 (0.72, 0.77)	0.75 (0.73, 0.77)	0.75 (0.73, 0.78)	0.74 (0.72, 0.77)	0.74 (0.71, 0.76)
11,546	0.74 (0.73, 0.76)	0.76 (0.74, 0.79)	0.77 (0.74, 0.79)	0.75 (0.72, 0.77)	0.75 (0.72, 0.77)	0.72 (0.70, 0.74)	0.71 (0.69, 0.74)
4,389	0.28 (0.27, 0.29)	0.29 (0.27, 0.30)	0.29 (0.27, 0.30)	0.27 (0.26, 0.29)	0.27 (0.26, 0.29)	0.29 (0.28, 0.31)	0.29 (0.27, 0.30)
27,917	1.82 (1.80, 1.84)	1.78 (1.74, 1.81)	1.79 (1.75, 1.82)	1.84 (1.81, 1.88)	1.84 (1.81, 1.88)	1.83 (1.79, 1.87)	1.82 (1.78, 1.86)
83,336	5.54 (5.50, 5.58)	5.45 (5.38, 5.51)	5.48 (5.41, 5.55)	5.58 (5.51, 5.64)	5.58 (5.51, 5.65)	5.59 (5.52, 5.65)	5.55 (5.49, 5.62)
23,662	1.48 (1.46, 1.50)	1.47 (1.44, 1.50)	1.47 (1.44, 1.50)	1.48 (1.45, 1.51)	1.48 (1.45, 1.51)	1.49 (1.45, 1.52)	1.48 (1.45, 1.52)
1,575	0.10 (0.09, 0.10)	0.10 (0.09, 0.10)	0.10 (0.09, 0.10)	0.09 (0.09, 0.10)	0.09 (0.09, 0.10)	0.10 (0.09, 0.11)	0.10 (0.09, 0.11)
9,578	0.59 (0.58, 0.60)	0.60 (0.58, 0.62)	0.60 (0.58, 0.62)	0.59 (0.56, 0.61)	0.58 (0.56, 0.61)	0.59 (0.57, 0.61)	0.59 (0.57, 0.61)
10,017	0.62 (0.61, 0.63)	0.63 (0.61, 0.66)	0.64 (0.61, 0.66)	0.62 (0.59, 0.64)	0.62 (0.60, 0.64)	0.60 (0.58, 0.62)	0.60 (0.58, 0.62)
3,588	0.22 (0.21, 0.23)	0.23 (0.21, 0.24)	0.23 (0.21, 0.24)	0.22 (0.21, 0.23)	0.22 (0.21, 0.23)	0.22 (0.21, 0.23)	0.22 (0.21, 0.23)
3,112	0.19 (0.19, 0.20)	0.18 (0.17, 0.20)	0.19 (0.17, 0.20)	0.19 (0.18, 0.20)	0.19 (0.18, 0.21)	0.20 (0.19, 0.21)	0.20 (0.19, 0.21)
4,962	0.31 (0.30, 0.32)	0.28 (0.27, 0.30)	0.29 (0.27, 0.30)	0.31 (0.30, 0.33)	0.31 (0.30, 0.33)	0.32 (0.31, 0.34)	0.32 (0.30, 0.33)
77,635	4.97 (4.93, 5.00)	4.91 (4.85, 4.97)	4.92 (4.86, 4.98)	4.95 (4.89, 5.01)	4.95 (4.89, 5.01)	5.04 (4.98, 5.10)	5.03 (4.97, 5.09)