

## Anogenital Warts in Manitoba

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**2000-2011**

Epidemiology & Surveillance  
Public Health Branch  
Public Health and Primary Health Care Division  
Manitoba Health, Healthy Living and Seniors

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## **Abbreviations**

AGW	Anogenital warts
CI	Confidence interval
HPV	Human papillomavirus
ICD	International classification of diseases
MHLS	Manitoba Health, Healthy Living and Seniors
RHA	Regional health authority

## **Acknowledgments**

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***Let us know what you think.*** We appreciate your feedback! If you would like to comment on any aspect of the report, please send an email to: [outbreak@gov.mb.ca](mailto:outbreak@gov.mb.ca)

## **Executive Summary**

*Epidemiology Update: Anogenital Warts in Manitoba (2000-2011)*, presents an overview of reported cases of anogenital warts (AGW) from 2000 to 2011. This is the first report on AGW prepared by Manitoba Health, Healthy Living and Seniors (MHLS). This report describes trends in cases of AGW by regional health authority (RHA), sex, and age group.

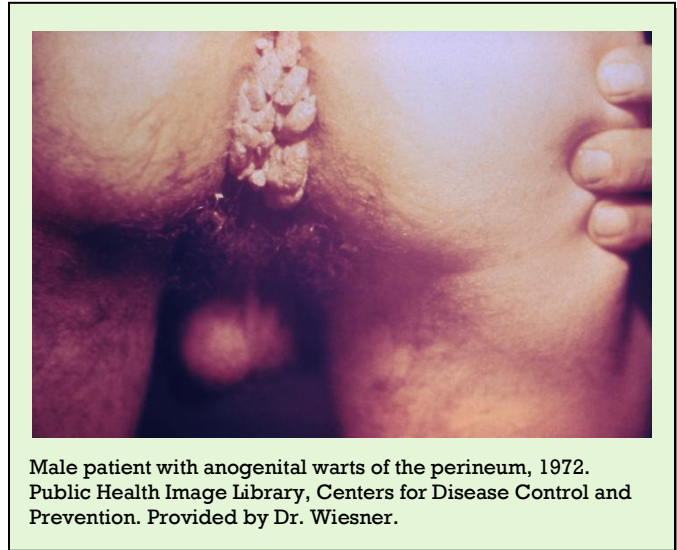
Cases of AGW were identified using the administrative databases of Physician Claims and Hospital Discharge Abstracts. This report, therefore, only includes cases of AGW for which treatment was obtained by a physician, or in hospital, and likely understates the true incidence of AGW.

Generally, males had a higher incidence of AGW than females. While the incidence of both sexes increased over the 12 year period from 2000 to 2011, the male incidence rate increased by a larger amount than the female incidence rate. From a regional perspective, the incidence of AGW was highest in Winnipeg Regional Health Authority.

## Introduction

Anogenital warts (AGW) are caused by the most common sexually transmitted infection, human papillomavirus (HPV)<sup>1</sup>. Asymptomatic or symptomatic HPV infection is common. For example, asymptomatic cervical HPV infection may be detected in 5% to 40% of women of reproductive age<sup>2</sup>. Over time, it is possible for an individual to be infected with different HPV subtypes; it is also possible for some HPV infections may clear naturally<sup>3 4</sup>.

The majority of AGW (90%) are caused by HPV type 6 and HPV type 11<sup>5 6</sup>. AGW may appear as single or multiple flesh-coloured bumps in the anogenital region (i.e. the vulva, perineum, perianal area, vagina, cervix, penis, anus, scrotum, or urethra). Whether treated or not, AGW are highly infectious and recurrent<sup>7</sup>. A study of the costs associated with AGW in British Columbia from 1998 to 2006 found that, on average, the treatment of one episode of AGW cost \$176 for males and \$207 for females<sup>8</sup>.



Male patient with anogenital warts of the perineum, 1972. Public Health Image Library, Centers for Disease Control and Prevention. Provided by Dr. Wiesner.

In Manitoba between 1985 and 1999, the incidence rate of AGW was higher among females than among males, with the incidence rates for both sexes peaking in 1992 (170.8 cases per 100,000 females; 149.9 cases per 100,000 males)<sup>9</sup>. After 1992, the incidence rate of AGW in males continued to increase (in almost all age groups) while the incidence rate of AGW decreased among females. Beginning in the year 2000, the incidence rate of AGW was higher among males than females. In 2004, the incidence rate of AGW was 152.0 cases per

<sup>1</sup> Gross G, Pfister H. Role of human papillomavirus in penile cancer, penile intraepithelial squamous cell neoplasias and in genital warts. *Med Microbiol Immunol (Berl)*, 2004; 193:35-44.

<sup>2</sup> Franco EL, et al. Epidemiology of cervical human papillomavirus infection. In: Franco EL, Monsonégo J, editors. *New developments in cervical cancer screening and prevention*. Oxford (UK): Blackwell Science; 1997. p. 14-22.

<sup>3</sup> Glass AG, et al. Persistence of type-specific human papillomavirus infection among cytologically normal women. *J Infect Dis* 1994;169:235-40.

<sup>4</sup> Franco EL, et al. Epidemiology of acquisition and clearance of cervical human papillomavirus infection in women from a high-risk area for cervical cancer. *J Infect Dis* 1999; 180:1415-23.

<sup>5</sup> Castellsague X, et al. Prevalence of penile human papillomavirus DNA in husbands of women with and without cervical neoplasia: a study in Spain and Colombia. *J Infect Dis* 1997, 176:353-361.

<sup>6</sup> Greer CE, et al. Human papillomavirus (HPV) type distribution and serological response to HPV type 6 virus-like particles in patients with genital warts. *J Clin Microbiol* 1995; 33:2058-2063.

<sup>7</sup> Centers for Disease Control and Prevention: *Sexually Transmitted Diseases Treatment Guidelines*. *MMWR* 2006, 55(No. RR-11): 62-67.

<sup>8</sup> Marra F, et al. Epidemiology and costs associated with genital warts in Canada. *Sex Transm Infect*. 2009 Apr;85(2):111-5.

<sup>9</sup> Kliewer EV, et al. Twenty-year trends in the incidence and prevalence of diagnosed anogenital warts in Canada. *Sexually Transmitted Diseases*, 2009, 36(6):380-386.

100,000 males and 120.0 cases per 100,000 females. These rates were calculated from diagnosed cases of AGW. Some people with AGW may not be diagnosed, so the actual incidence of AGW is likely higher than calculated.

HPV infection is linked to cancer and accounts for roughly 5.2% of the global cancer burden<sup>10</sup>. The majority of cervical and anal cancer cases are caused by HPV infection; HPV types 16 and 18 cause approximately 70% of cervical cancer cases and 90% of anal cancer cases. It is estimated that approximately 1 in 138 women develop cervical cancer and 1 in 384 die of cervical cancer<sup>11</sup>. HPV types 6 and 11 have not been found to be associated with cervical cancer.

In Manitoba, all females in Grade 6 who were born on, or after, January 1, 1997 are eligible to receive the HPV vaccine at no cost. With support from the Provincial Vaccine Advisory Committee, MHHLS is currently seeking approval to start immunizing males in Grade 6. In the meantime, MHHLS continues to work with the RHAs in a concerted effort to increase vaccine uptake rates in the Grade 6 program and to catch-up those who have missed 1 or more doses. The vaccine protects against HPV types 6, 11, 16, and 18<sup>12</sup>.

### Objective

The objective of this report is to provide updated information on AGW epidemiology in both men and women in Manitoba from 2000 to 2011. The overarching goal of this analysis is to describe the epidemiology of AGW in Manitoba. Geographic and demographic characteristics of AGW over the recent 12-year period are also provided in this report.

<sup>10</sup> Tota JE, Chevarie-Davis M, Richardson LA, Devries M, Franco EL. Epidemiology and burden of HPV infection and related diseases: implications for prevention strategies. *Prev Med.* 2011 Oct;53 Suppl 1:S12-21.

<sup>11</sup> Canadian Cancer Society and National Cancer Institute of Canada, 2006.

<sup>12</sup> HPV Eligibility Criteria and Information for Health Care Providers.  
[http://www.gov.mb.ca/health/publichealth/cdc/docs/hpv\\_phn.pdf](http://www.gov.mb.ca/health/publichealth/cdc/docs/hpv_phn.pdf)



## Methodology

This report presents the annual crude and age-standardized incidence of AGW in Manitoba from 2000 to 2011 by RHA, sex, and age group. Note that cases from Churchill are included in the Winnipeg RHA count.

### Case Definition

Each incident AGW infection (case) was defined as one “episode of care” to distinguish it from subsequent infections (see below). AGW-specific condyloma tariff (physician billing) codes listed in two administrative databases (Physician Claims; Hospital Discharge Abstracts) from 2000 to 2011 were used to identify AGW cases (see Appendix C Table 15).

For those AGW that were treated during a hospital stay and did not generate a record in the physician claims database, a combination of ICD (9/10) diagnosis codes (Appendix C Table 16) and procedure codes (Appendix C Table 17, and Table 18) were used to identify the AGW cases.

The case definition used in this report was consistent with the case definition used for previous reports of AGW<sup>13</sup>.

### “Episode of Care” of Anogenital Warts and Incident Anogenital Warts Cases

An “episode of care” includes all AGW diagnoses and AGW-related billing which occurred within a twelve month period of time. If another AGW claim occurred more than twelve months after a previous AGW episode of care, it was considered a **new** AGW episode (i.e. a new AGW case).

Episodes of care were identified using the hospital and physician claims databases. If any of the below occurred more than twelve months after a previous AGW episode of care, it is considered a new AGW episode:

- a. an AGW-related tariff code (Appendix C Table 15), OR
- b. an AGW ICD-9/10 code (Appendix C Table 16), OR
- c. an AGW-related procedure code (Appendix C Table 17 and Table 18) followed by another claim within two weeks that had an AGW-related ICD code (ICD9 = 078, Other disease due to viruses and Chlamydia), OR
- d. one of the tariff codes listed in Table 19 (Appendix C).

If any of the above occurred within 12 months of a previous episode of care, then it is considered as part of the same AGW episode of care.

The diagnostic date for a new AGW case was defined as the earliest date listed in hospital or physician claims for that particular episode of care. If a person died or moved out of province within the twelve month period of the AGW episode of care, the coverage cancellation date, recorded in the Manitoba Population Registry, was used as the *end* of that episode of care.

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<sup>13</sup> Kliewer EV, et al. Twenty-year trends in the incidence and prevalence of diagnosed anogenital warts in Canada. *Sexually Transmitted Diseases*, 2009, 36(6):380-386.

## Data Sources

This report utilizes data from the centralized MHHLS databases including the Manitoba Population Registry, Physician Claims, and Hospital Discharge Abstracts.

- The Manitoba Population Registry was used to identify all Manitobans who were eligible for provincial health insurance benefits.
- Physician Claims (including shadow billing) and Hospital Discharge Abstracts were used to identify cases of AGW. Specifically, the de-identified, individual, line-level data from physician and hospital claims (which captured AGW cases diagnosed and treated in Manitoba) were utilized.

Shadow billings are claims submitted to the provincial government, by physicians who are not fee-for-service, for administrative purposes only (i.e. as a record of services provided).

Manitoba population data for June 30<sup>th</sup> of each year were provided by MHHLS' Health Information Management Branch.

## Grouped Analyses & Exclusions

Using residential postal codes, the data were grouped according to RHA (Winnipeg, Prairie Mountain, Interlake-Eastern, Northern, and Southern Health–Santé Sud Regional Health Authorities) for regional level data analyses and reporting. Cases that had a missing or unknown RHA, and cases originating out of province, were excluded from the RHA-specific analyses.

## Descriptive Statistical Analyses

Crude incidence rates were calculated using incident cases as the numerator and mid-year (June 30<sup>th</sup>) populations as the denominator. For stratified analyses, the denominator used was specific to the type of stratification. For example, if male cases from a specific region were examined, then the male population of that region was used as the denominator. All incidence rates are reported as per 100,000 persons.

Ninety-five percent confidence intervals (95%CI) were calculated for the incidence rates, and formal statistical testing for incidence rate ratios was undertaken using Poisson regression, with the natural log of the population as an offset variable. Directly adjusted and age-standardized incidence rates were calculated using the 2001 Canadian population. Age-standardization allows for incidence rates to be compared between different populations which may have a different age composition by essentially eliminating the effect of the different age compositions.

## Results

### Overall Time Trends of Anogenital Warts in Manitoba

The incidence of AGW was higher among males compared to females from 2000 to 2011 (Figure 1). Among males, the age-standardized AGW incidence rate increased from 123.7 cases per 100,000 persons in 2001 to 175.3 cases per 100,000 persons in 2010 (Figure 1). Consequently, the male to female incidence rate ratio steadily increased from 1.1 in 2000 and 2001 to 1.5 in 2010 and 1.4 in 2011.

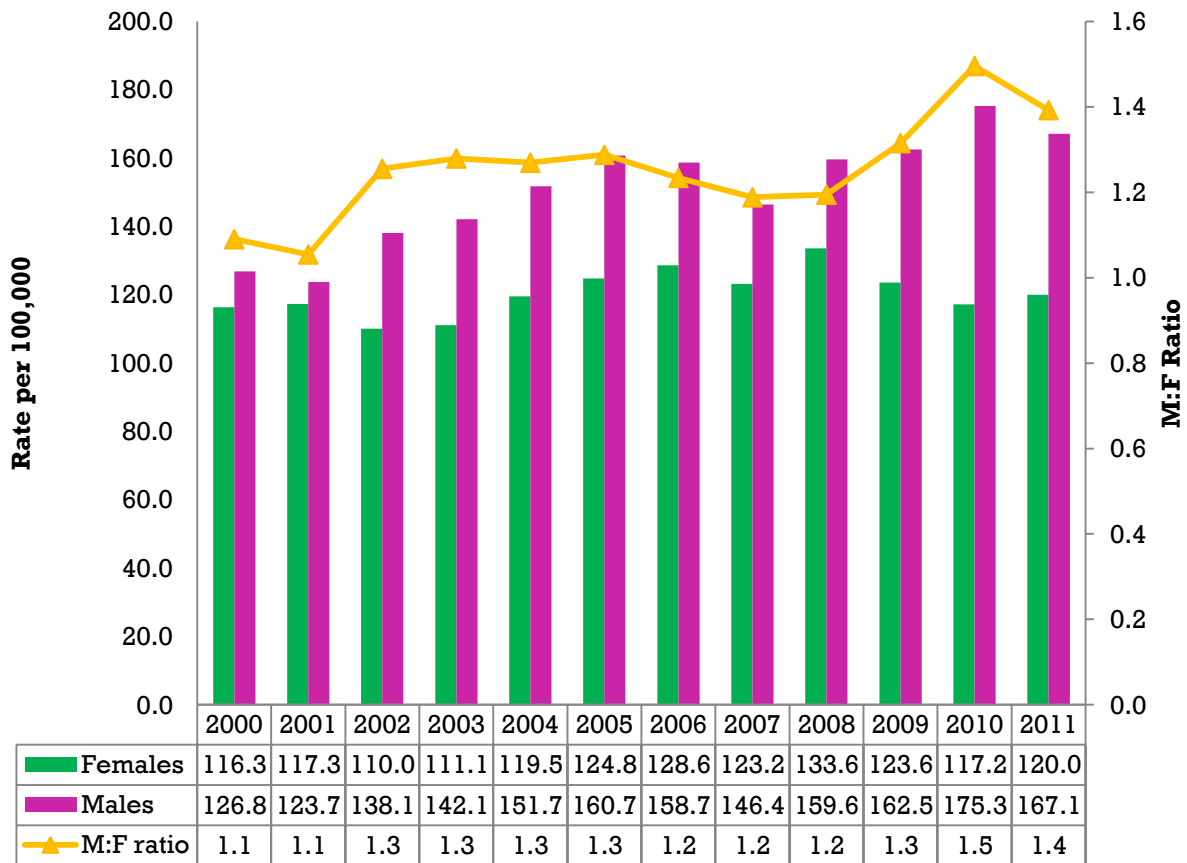


Figure 1. Age-Standardized Incidence (per 100,000) of AGW in Manitoba, 2000-2011

## Incidence of AGW in Manitoba, 2011

In 2011, there were 1591 cases of AGW in Manitoba. The overall incidence rate of AGW was 127.2 cases per 100,000 persons with the incidence rate for each sex being 106.4 cases per 100,000 females and 148.5 cases per 100,000 males (Table 1).

Table 1. Age-Specific Incidence (per 100,000) of AGW Cases in Manitoba, 2011

Age Group in years	Females			Males			Both		
	Cases	Rate /100,000	95% CI	Cases	Rate /100,000	95% CI	Cases	Rate /100,000	95% CI
0-14	8	6.9	2.1, 11.7	10	8.2	3.1, 13.3	18	7.6	4.1, 11.1
15-19	120	277.7	228.1, 327.4	47	103.8	74.1, 133.4	167	188.7	160.1, 217.3
20-24	186	422.8	362.2, 483.5	230	511.6	445.7, 577.6	416	467.7	422.9, 512.6
25-29	112	264.5	215.6, 313.5	180	427.8	365.4, 490.1	292	345.9	306.3, 385.5
30-39	118	146.0	119.7, 172.4	219	273.8	237.6, 310	337	209.6	187.2, 232
40-49	75	85.8	66.4, 105.2	129	147.9	122.4, 173.4	204	116.8	100.8, 132.8
50-59	33	38.3	25.2, 51.3	69	79.8	61, 98.7	102	59.1	47.6, 70.5
60+	21	15.8	9.1, 22.6	10	8.2	3.1, 13.3	55	22.6	16.7, 28.6
<b>Total</b>	673	106.4	98.4, 114.5	918	148.5	138.9, 158.1	1591	127.2	121.0, 133.5

In 2011, the incidence rate was highest in the 20-24 age group for both females (422.8 cases per 100,000 persons) and males (511.6 cases per 100,000 persons) (Figure 2). The male to female ratio compares the AGW incidence rate for each sex, in each age group. In Figure 2, the male to female ratio shows the incidence of AGW among males was similar to, or higher than, the incidence of AGW among females, in all age groups, except the 15-19 age group. In the 15-19 age group, the incidence of AGW among males is less than half the incidence of AGW among females. However, by the age of 25 the incidence of AGW among males was one-and-a-half to two times the incidence of AGW among females.

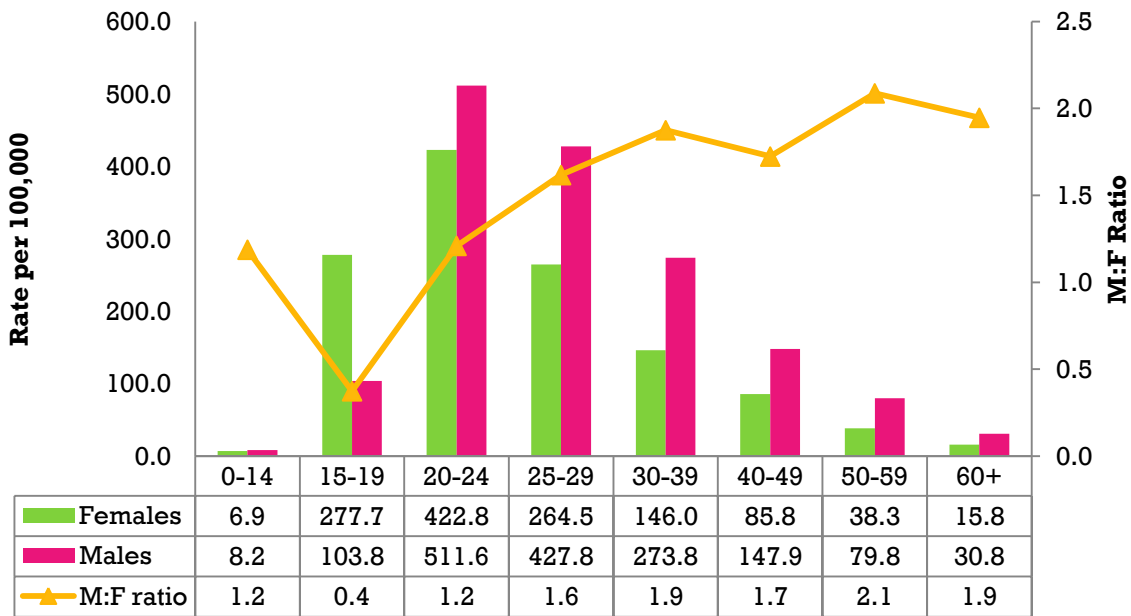


Figure 2. Crude Incidence (per 100,000) of AGW in Manitoba by Sex and Age Group, 2011

### Time Trends of AGW Incidence in Manitoba (2000-2011)

From 2000 to 2011, there was a steady increase in the crude incidence of AGW, particularly among males (Figure 3). In 2000 the incidence rate of AGW among males and females was relatively similar (113.4 cases per 100,000 persons and 103.1 cases per 100,000 persons, respectively). However, by 2011, the incidence among males had increased to 148.5 cases per 100,000 persons compared to 106.4 cases per 100,000 persons among females.

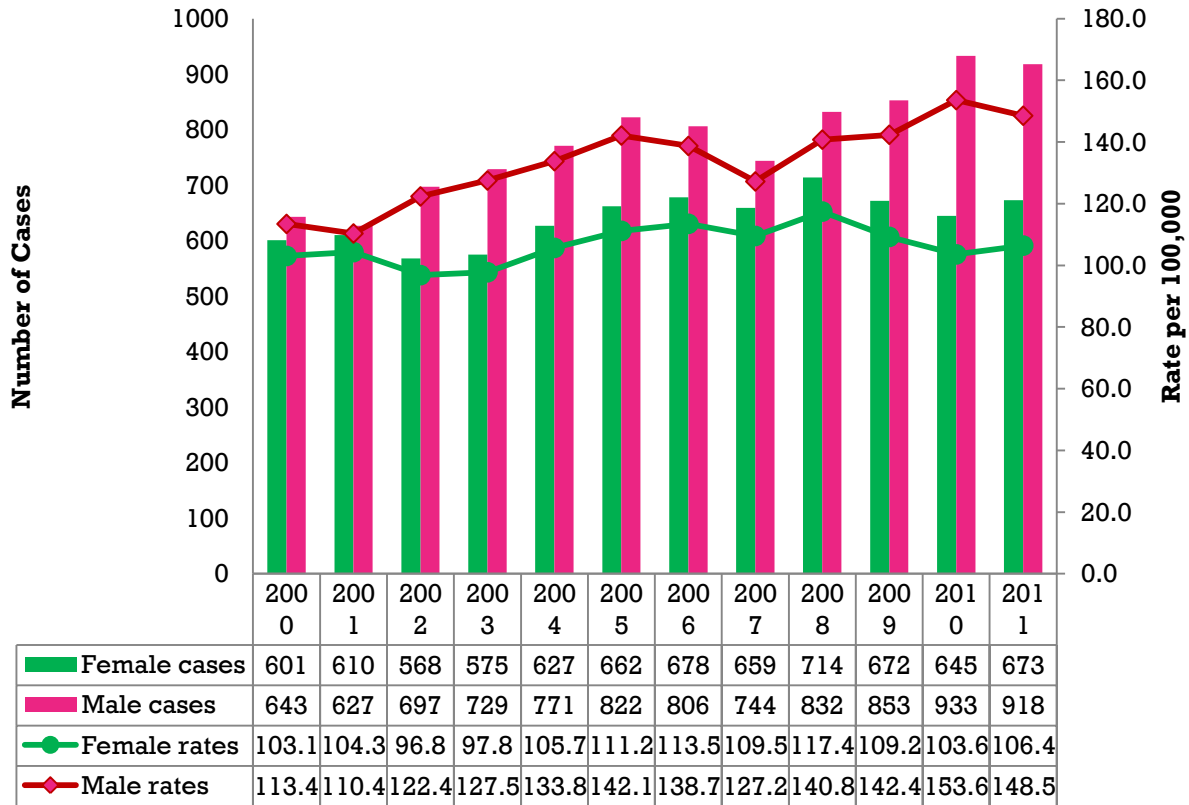


Figure 3. Cases and Crude Incidence (per 100,000) of AGW in Manitoba by Sex, 2000-2011

## Time Trend of Age-Specific Anogenital Warts Cases and Incidence in Manitoba, 2000-2011

### Females

The overall incidence of AGW among females between 2000 and 2011 ranged from 96.8 cases per 100,000 persons in 2002 to 117.4 cases per 100,000 persons in 2008 (Table 2).

Table 2. AGW Cases and Incidence (per 100,000) in Manitoba by Age Group, 2000-2011 (Females)

Age group in years		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
0-14	Cases	8	14	7	12	8	7	8	6	12	8	6	8
	Rates	6.8	11.9	6.0	10.4	6.9	6.1	7.1	5.3	10.6	7.0	5.2	6.9
15-19	Cases	128	131	98	114	121	133	110	112	122	121	113	120
	Rates	324.2	328.5	243.3	282.1	295.2	320.9	262.4	263.9	284.7	280.1	261.1	277.7
20-24	Cases	169	176	172	170	194	205	208	210	220	202	182	186
	Rates	444.7	462.8	450.3	441.0	495.5	517.2	519.8	518.7	539.3	487.7	426.0	422.8
25-29	Cases	95	87	85	89	95	97	117	107	119	108	127	112
	Rates	250.5	231.9	229.0	238.9	250.9	256.6	308.6	279.6	304.4	269.8	309.0	264.5
30-39	Cases	105	101	112	96	99	97	108	89	110	113	97	118
	Rates	122.1	119.9	135.8	119.5	125.2	124.9	140.4	115.7	141.6	143.8	122.3	146.0
40-49	Cases	51	54	56	55	76	72	66	74	76	69	65	75
	Rates	58.7	61.2	62.5	60.8	83.2	78.6	72.3	82.0	85.1	77.8	73.9	85.8
50-59	Cases	29	27	23	29	21	35	41	40	32	33	39	33
	Rates	45.7	41.0	33.8	41.2	28.7	46.1	52.7	50.5	39.6	40.0	46.3	38.3
60+	Cases	16	20	15	10	13	16	20	21	23	18	16	21
	Rates	14.1	17.5	13.1	8.6	11.1	13.6	16.8	17.3	18.5	14.1	12.3	15.8
Total	Cases	601	610	568	575	627	662	678	659	714	672	645	673
	Rates	103.1	104.3	96.8	97.8	105.7	111.2	113.5	109.5	117.4	109.2	103.6	106.4

AGW incidence rates were relatively stable in females, across all age groups, over the 12 year period from 2000 to 2011. However, the incidence of AGW was consistently highest among those in the 20-24 age group (Figure 4).

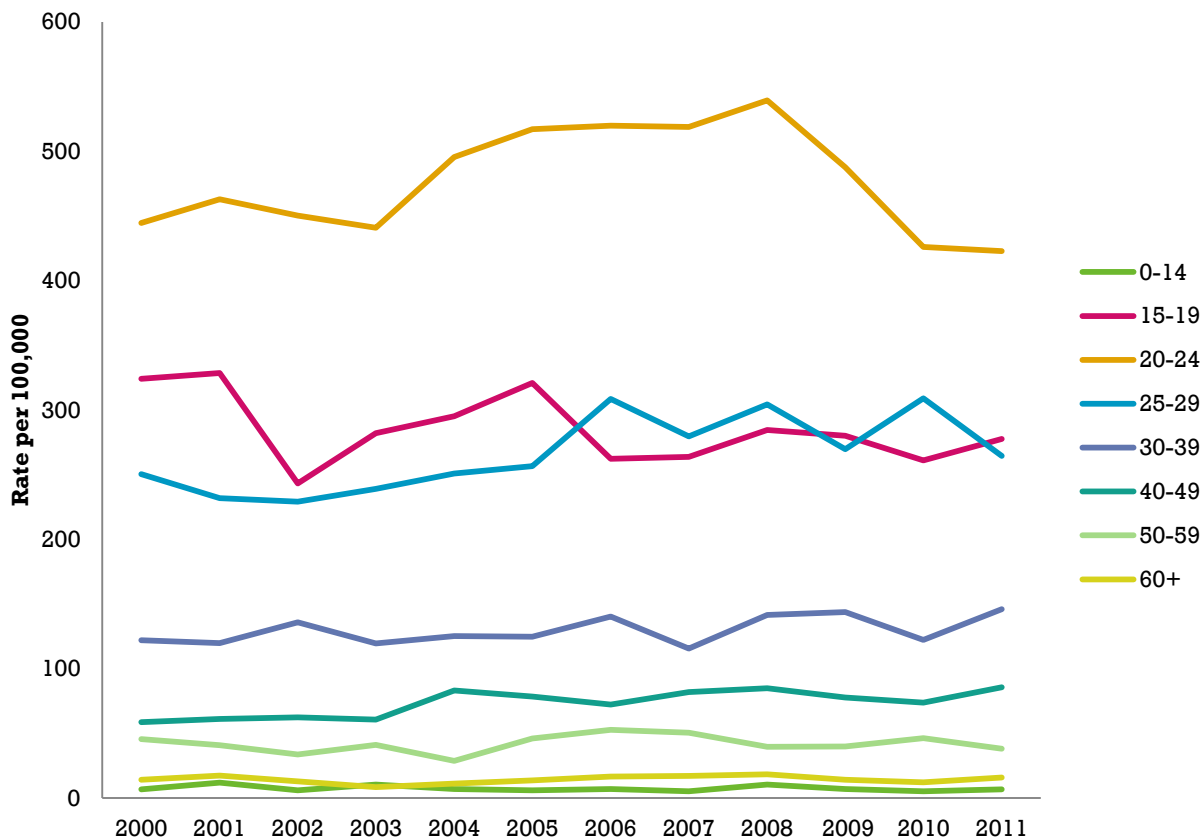


Figure 4. AGW Incidence (per 100,000) in Manitoba by Age Group, 2000-2011 (Females)



**Males**

The overall incidence of AGW among males between 2000 and 2011 ranged from 110.4 cases per 100,000 persons in 2001 to 153.6 cases per 100,000 persons in 2010 (Table 3).

Table 3. AGW Cases and Incidence (per 100,000) in Manitoba by Age Group, 2000-2011 (Males)

Age Group in years		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
0-14	Cases	17	28	7	13	13	14	15	12	9	14	10	10
	Rates	13.7	22.7	5.7	10.8	10.8	11.7	12.7	10.2	7.6	11.7	8.3	8.2
15-19	Cases	36	32	37	55	44	47	51	40	45	47	45	47
	Rates	86.4	76.1	87.2	129.7	102.6	108.3	116.7	90.8	101.6	104.4	99.5	103.8
20-24	Cases	138	118	151	168	179	221	193	172	210	190	216	230
	Rates	358.2	307.1	387.7	426.8	448.1	547.7	474.6	419.9	511.1	455.2	497.1	511.6
25-29	Cases	126	131	137	124	149	159	148	145	183	188	221	180
	Rates	330.6	347.0	367.6	332.0	397.6	425.3	394.1	381.3	470.7	469.9	541.0	427.8
30-39	Cases	181	163	190	187	200	183	212	206	178	209	217	219
	Rates	210.2	194.3	232.7	234.1	254.3	236.6	276.8	269.0	231.0	268.4	276.1	273.8
40-49	Cases	79	96	100	103	112	129	112	89	98	98	127	129
	Rates	90.9	107.9	110.9	112.8	121.5	140.0	122.3	98.5	109.6	110.1	144.4	147.9
50-59	Cases	37	30	45	42	45	39	44	47	71	57	63	69
	Rates	58.5	45.9	66.2	60.1	62.3	52.2	57.1	60.0	88.7	69.6	74.9	79.8
60+	Cases	29	29	30	37	29	30	31	33	38	50	34	34
	Rates	33.0	32.7	33.6	40.9	31.5	32.1	32.5	33.5	37.5	47.9	31.7	30.8
Total	Cases	643	627	697	729	771	822	806	744	832	853	933	918
	Rates	113.4	110.4	122.4	127.5	133.8	142.1	138.7	127.2	140.8	142.4	153.6	148.5

Among males, the incidence of AGW was consistently highest for those between the ages of 20 and 29 years; the incidence rates in this age group increased over the 12 years from 2000 to 2011 (Figure 5).

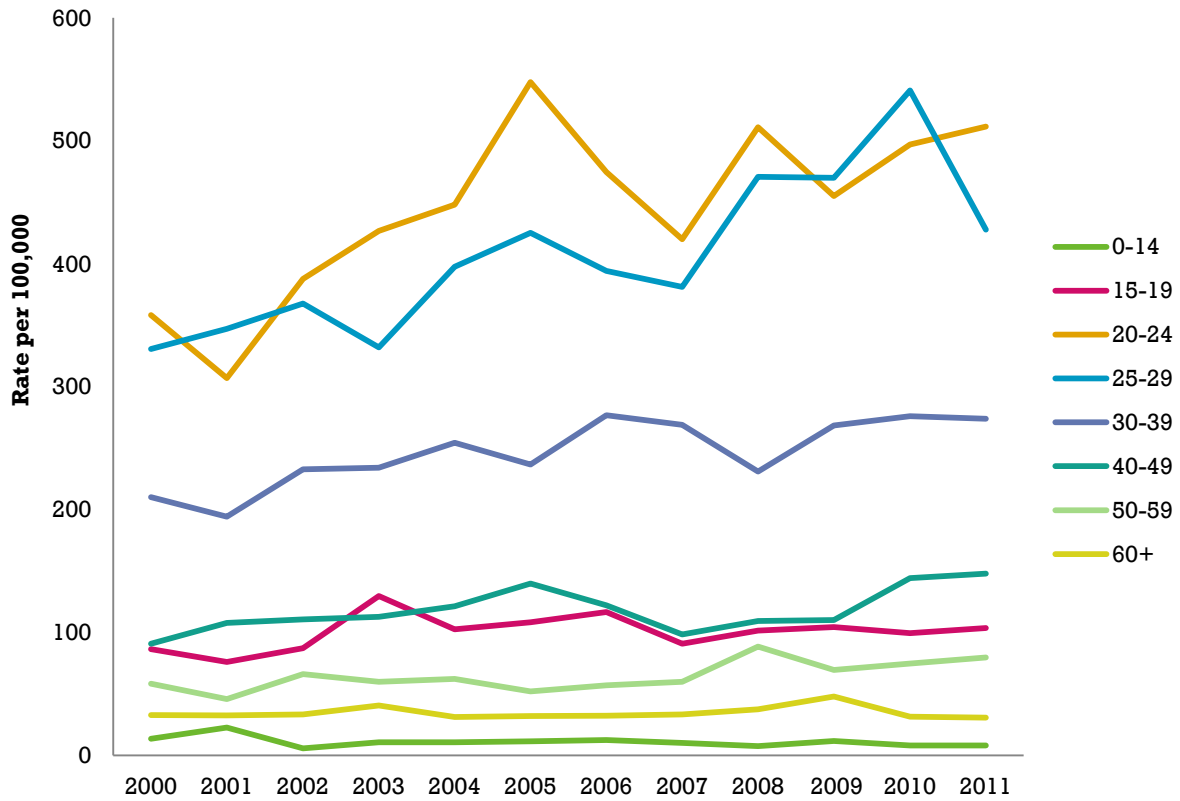


Figure 5. AGW Incidence (per 100,000) in Manitoba by Age Group, 2000-2011 (Males)

### Incidence of AGW by Regional Health Authority, 2011

For both males and females, the highest incidence of AGW, in 2011, was observed in Winnipeg RHA (Figure 6). The age-standardized incidence rate was higher among males (201.5 cases per 100,000 persons) compared to females (142.8 cases per 100,000 persons).

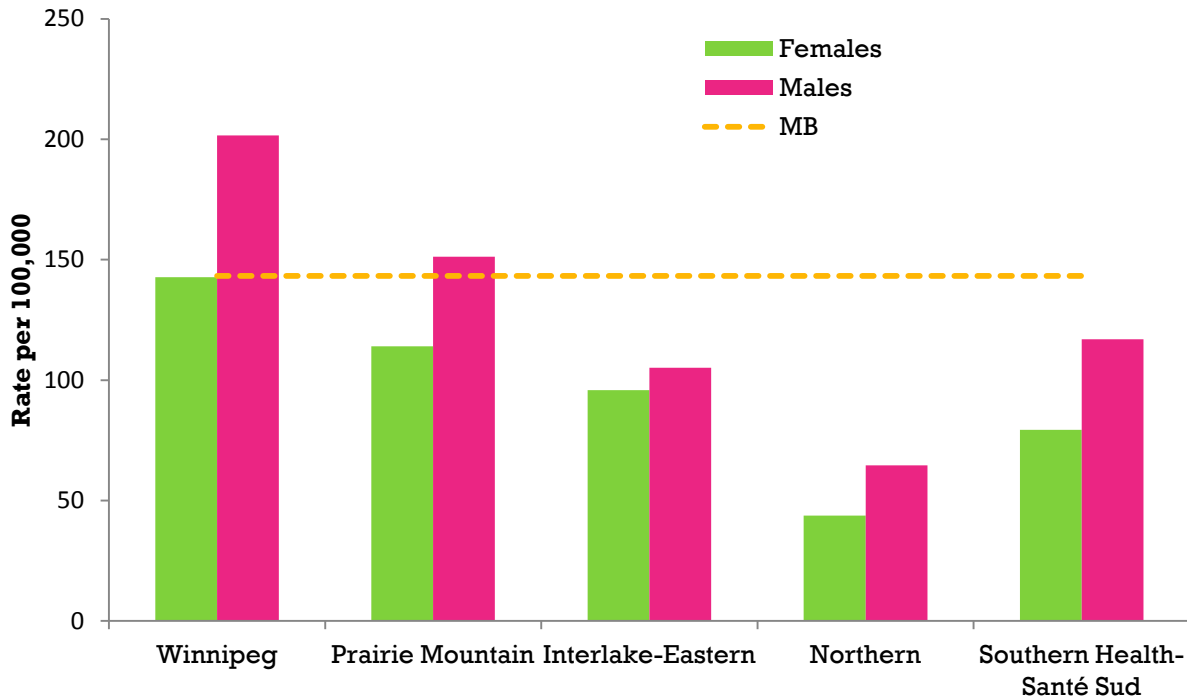


Figure 6. Age-standardized Incidence (per 100,000) of AGW in Manitoba by RHA, 2011

Table 4 shows the number of cases, the crude incidence rate, and age-standardized incidence rate of AGW, in 2011, by RHA and sex. Prairie Mountain RHA had the second highest AGW incidence rate, after Winnipeg RHA. The lowest incidence was observed in Northern RHA, with an age-adjusted incidence of 64.6 cases per 100,000 males and 43.8 cases per 100,000 females. Appendix A contains tables presenting incidence trends over time by RHA.

Table 4. Crude and Age-Standardized Incidence (per 100,000) of AGW in Manitoba by Sex and RHA, 2011

Sex	RHA	Cases	Crude Rate	95% CI	Adjusted Rate	95% CI
<b>Males</b>	Winnipeg	649	186.8	172.4, 201.1	201.5	185.7, 217.3
	Prairie Mountain	104	128.3	103.7, 153.0	151.2	121.5, 180.9
	Interlake-Eastern	54	87.3	64.1, 110.6	105.1	75.6, 134.7
	Northern	22	59.0	34.4, 83.6	64.6	36.78, 92.5
	Southern	88	97.4	77.0, 117.7	116.9	91.9, 141.9
	Total	917*	148.5	138.9, 158.1	167.1	156.0, 178.1
<b>Females</b>	Winnipeg	468	128.8	117.2, 140.5	142.8	129.7, 155.9
	Prairie Mountain	81	97.5	76.3, 118.8	114.0	88.6, 139.3
	Interlake-Eastern	43	71.3	50.0, 92.6	95.8	65.7, 125.8
	Northern	15	41.3	20.4, 62.1	43.8	21.1, 66.4
	Southern	66	73.8	56.0, 91.6	79.3	59.8, 98.8
	Total	673	106.4	98.4, 114.5	120	110.8, 129.2
<b>Both</b>	Winnipeg	1117	157.2	147.9, 166.4	171.7	161.4, 181.9
	Prairie Mountain	185	112.7	96.5, 129.0	132.5	113.0, 152.1
	Interlake-Eastern	97	79.4	63.6, 95.2	100.9	79.8, 122.1
	Northern	37	50.2	34.1, 66.4	54.2	36.2, 72.2
	Southern	154	85.7	72.1, 99.2	97.8	82.0, 113.7
	Total	1590	127.3	121.0, 133.5	143.3	136.1, 150.4

\*Note: One male could not be assigned to an RHA and was not included in this table.

### Time Trends of AGW Incidence by Regional Health Authority

Figure 7 shows an increased AGW incidence rate was observed among males in all RHAs, except for Northern RHA. Here a decline in the male AGW incidence rate from 2006 to 2008 was observed. Winnipeg RHA had the highest incidence of AGW for males over the 12 year period from 2000 to 2011.

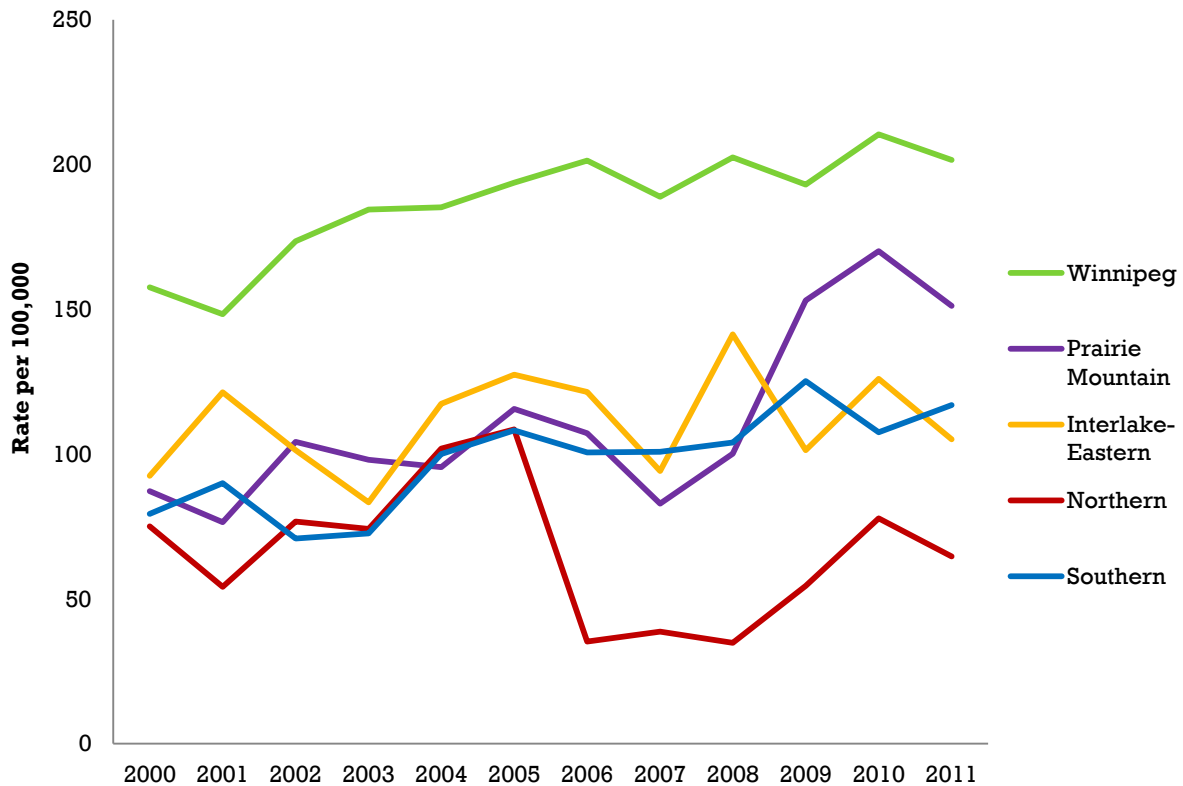


Figure 7. Age-standardized Incidence (per 100,000) of AGW in Manitoba by RHA, 2000-2011 (Males)

While the incidence of AGW among females was generally highest in Winnipeg RHA over the 12 year period (Figure 8), the difference was not as pronounced as it was among the males. Additionally, the observed AGW incidence rates among females lacked the increasing trend observed among males. Appendix B contains tables presenting the age-specific incidence of AGW by sex and by RHA, from 2000 to 2011.

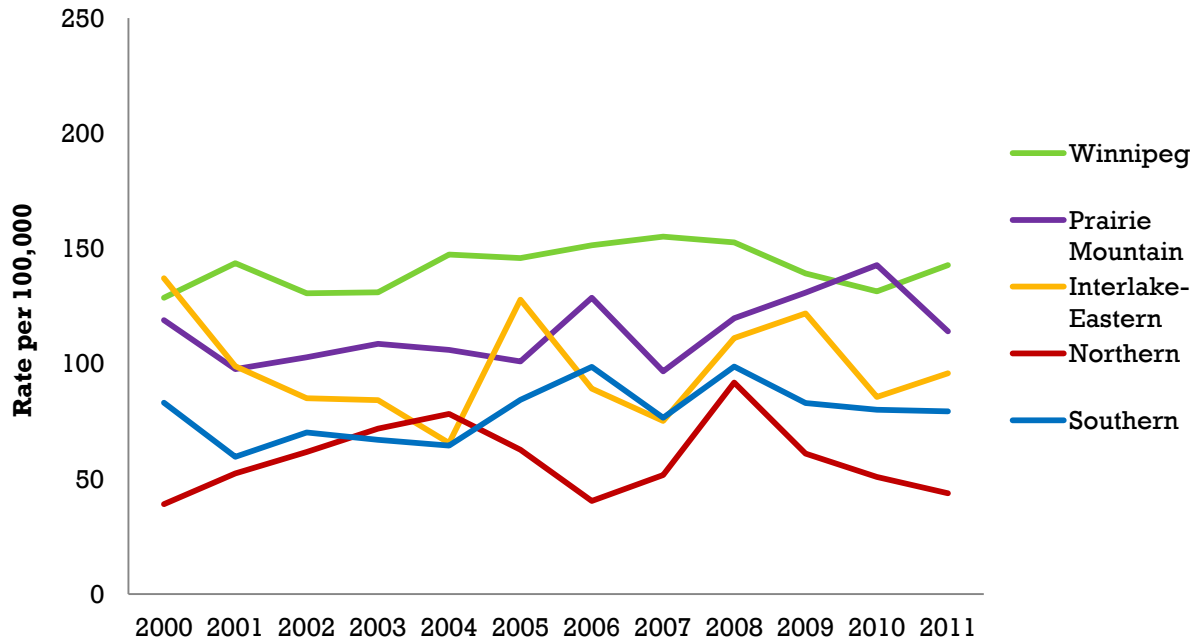


Figure 8. Age-standardized Incidence (per 100,000) of AGW in Manitoba by RHA, 2000-2011 (Females)

## Discussion

This study provided population-based descriptive epidemiologic information about AGW in Manitoba for the 12 year period from 2000 to 2011. During this period of time, the incidence of AGW was higher among males than females and the gap between the sexes widened over time. Consequently, the male to female incidence rate ratio also steadily increased as the incidence rate of AGW among males grew to be 50% higher than females by 2010. In Manitoba, the incidence rates of AGW were highest among females aged 20-24 and males aged 20-24 and 25-29. This represents a reversal from the previously reported time period, 1985 to 1999, when the incidence was higher among females than males<sup>14</sup>.

It is notable that the incidence of AGW among males was similar to, or higher than, the incidence of AGW among females, for all age groups, except in those aged 15-19 years. In the 15-19 age group, the incidence of AGW among males was less than half the incidence among females. However, by the age of 25 the incidence of AGW among males was one-and-a-half to two times the incidence of AGW among females.

Of the RHAs in Manitoba, the highest incidence rate of AGW occurred in Winnipeg RHA, followed by Prairie Mountain RHA. The lowest incidence rate overall was observed in Northern RHA. An increase in the incidence of AGW among males was observed in all RHAs except for Northern RHA, which showed a decline in the incidence of AGW from 2006 to 2008. While the incidence of AGW among females was generally highest in Winnipeg RHA, the difference between the Winnipeg RHA and the other RHAs was not as pronounced as it was among males.

## Limitations

The data presented in this report is subject to a number of limitations. It likely underestimates the actual occurrence of AGW in Manitoba as it relies on diagnosed cases and does not include those cases for which treatment was not sought. Further, incomplete shadow billing by physicians who are not fee-for-service and the exclusion of emergency department data may also result in an underestimate. The data presented in this report were obtained from existing administrative databases that were compiled for other purposes. Cases were based on clinical treatments and observations. Furthermore, insurance administrative database lack sexual risk factors, such as condom use and multiple sex partners. Therefore, further data on sexual behaviours are required to interpret the reasons behind why males residing in Winnipeg and Prairie Mountain regions had the highest incidence of AGW.

## Conclusions

In Manitoba, Winnipeg RHA and Prairie Mountain RHA had the highest incidence of AGW between 2000 and 2011. Overall, the incidence of AGW was highest among females aged 20-24 years and males aged 20-29 years. Males had a higher incidence of AGW compared to females and this gap grew over the 12 year period. Introducing a publicly funded HPV vaccination program among boys in Grade 6 may help reduce the high incidence of AGW

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<sup>14</sup> Kliewer EV, et al. Twenty-year trends in the incidence and prevalence of diagnosed anogenital warts in Canada. *Sexually Transmitted Diseases*, 2009, 36(6):380-386.

among males. Sexual health services, including access to free condoms and encouragement to use them, may also prevent some AGW cases.

Research of the cost-effectiveness of the HPV vaccine in Manitoba and an evaluation of the acceptability and effectiveness of the Grade 6 vaccination program in reducing AGW incidence rates would provide useful information for programs.



## Appendix A: Crude and Age-Standardized Incidence Tables -- AGW by Regional Health Authority, 2000-2011

Table 5. Crude and Age-Standardized AGW Incidence per 100,000 in Winnipeg Regional Health Authority

Sex	Year	Cases	Rate /100,000	95% CI	Adjusted Rate /100,000	95% CI
<b>Males</b>	2000	465	146.6	133.3-159.9	157.6	143.1-172.1
	2001	437	137.3	124.5-150.2	148.3	134.2-162.3
	2002	511	159.9	146.0-173.7	173.5	158.2-188.7
	2003	548	170.8	156.5-185.1	184.4	168.8-200.1
	2004	550	170.2	156.0-184.4	185.2	169.4-200.9
	2005	576	177.7	163.2-192.2	193.7	177.6-209.8
	2006	595	183.0	168.3-197.6	201.4	184.9-217.8
	2007	558	170.5	156.4-184.7	188.8	172.9-204.7
	2008	610	184.3	169.7-199.0	202.4	186.1-218.8
	2009	589	175.4	161.2-189.5	193.1	177.2-208.9
	2010	655	192.1	177.4-206.8	210.4	194.0-226.8
	2011	649	186.7	172.4-201.1	201.5	185.7-217.3
Total	6743	171.5	167.5-175.6	172.7	168.5-176.8	
<b>Females</b>	2000	381	113.6	102.2-125.0	128.6	115.6-141.6
	2001	430	127.8	115.7-139.9	143.6	129.9-157.3
	2002	392	116.1	104.6-127.5	130.5	117.4-143.6
	2003	394	116.3	104.8-127.8	131.0	117.9-144.1
	2004	447	131.0	118.8-143.1	147.3	133.5-161.1
	2005	448	131.0	118.9-143.1	145.9	132.2-159.6
	2006	462	134.8	122.5-147.1	151.4	137.4-165.4
	2007	482	139.9	127.4-152.4	155.1	141.1-169.2
	2008	472	135.4	123.2-147.6	152.6	138.7-166.6
	2009	443	125.6	113.9-137.3	139.1	126.0-152.3
	2010	422	118.1	106.8-129.4	131.4	118.7-144.1
	2011	468	128.8	117.2-140.5	142.8	129.7-155.9
Total	5241	126.6	123.1-130.0	131.0	127.4-134.5	
<b>Both</b>	2000	846	129.7	120.9-138.4	142.6	132.9-152.3
	2001	867	132.4	123.6-141.2	145.7	135.9-155.5
	2002	903	137.4	128.4-146.3	151.6	141.6-161.6
	2003	942	142.8	133.7-151.9	157.3	147.1-167.4
	2004	997	150.1	140.7-159.4	165.8	155.4-176.2
	2005	1024	153.8	144.3-163.2	169.4	158.8-179.9
	2006	1057	158.2	148.7-167.8	176.0	165.2-186.8
	2007	1040	154.8	145.4-164.2	171.7	161.1-182.3
	2008	1082	159.2	149.8-168.7	177.0	166.3-187.7
	2009	1032	149.9	140.7-159.0	165.5	155.2-175.7
	2010	1077	154.3	145.0-163.5	170.3	160.0-180.7
	2011	1117	157.1	147.9-166.4	171.7	161.4-181.9
Total	11984	148.5	145.8-151.1	151.4	148.7-154.1	

Table 6. Crude and Age-Standardized AGW Incidence per 100,000 in Prairie Mountain Regional Health Authority

Sex	Year	Cases	Rate /100,000	95% CI	Adjusted Rate /100,000	95% CI
Males	2000	56	70.2	51.8-88.5	87.185	63.8-110.6
	2001	50	63.1	45.6-80.5	76.507	54.7-98.3
	2002	69	87.6	67.0-108.3	104.191	78.9-129.5
	2003	67	84.9	64.6-105.3	97.959	73.7-122.2
	2004	62	78.6	59.0-98.1	95.469	71.0-119.9
	2005	77	97.9	76.0-119.7	115.543	89.0-142.0
	2006	70	89.0	68.1-109.8	107.206	81.2-133.2
	2007	58	74.0	55.0-93.0	82.834	60.8-104.9
	2008	64	81.1	61.3-101	100.156	75.0-125.3
	2009	105	132.1	106.8-157.3	152.997	122.9-183.1
	2010	113	140.8	114.9-166.8	170.043	137.9-202.2
	2011	104	128.3	103.7-153.0	151.211	121.5-180.9
	Total	895	94.1	87.9-100.3	103.472	96.5-110.4
Females	2000	87	105.7	83.5-127.9	118.879	93.3-144.5
	2001	69	84.3	64.4-104.2	97.689	74.1-121.3
	2002	73	89.8	69.2-110.4	102.745	78.5-127.0
	2003	72	88.5	68.1-109.0	108.648	82.9-134.3
	2004	75	92.1	71.2-112.9	105.991	81.1-130.9
	2005	69	84.9	64.9-104.9	100.953	76.4-125.5
	2006	89	109.7	86.9-132.4	128.614	100.9-156.3
	2007	67	82.6	62.8-102.4	96.71	72.8-120.6
	2008	84	103.6	81.5-125.8	119.676	93.6-145.8
	2009	88	107.8	85.3-130.3	130.843	103.0-158.7
	2010	97	117.6	94.2-141.0	142.771	113.7-171.8
	2011	81	97.5	76.3-118.8	113.969	88.6-139.3
	Total	951	97.0	90.9-103.2	105.334	98.5-112.2
Both	2000	143	88.2	73.8-102.7	102.781	85.5-120.1
	2001	119	73.8	60.6-87.1	86.616	70.6-102.6
	2002	142	88.7	74.1-103.3	102.928	85.5-120.4
	2003	139	86.8	72.3-101.2	102.776	85.2-120.4
	2004	137	85.4	71.1-99.7	100.705	83.3-118.1
	2005	146	91.3	76.5-106.1	108.281	90.2-126.4
	2006	159	99.5	84.0-114.9	117.681	98.7-136.6
	2007	125	78.4	64.6-92.1	89.512	73.3-105.7
	2008	148	92.5	77.6-107.4	109.604	91.5-127.7
	2009	193	119.8	102.9-136.7	141.89	121.4-162.4
	2010	210	129.1	111.6-146.5	156.357	134.7-178.0
	2011	185	112.7	96.5-129.0	132.524	113.0-152.1
	Total	1846	95.6	91.2-100.0	104.183	99.3-109.1

Table 7. Crude and Age-Standardized AGW Incidence per 100,000 in Interlake-Eastern Regional Health Authority

	Year	Cases	Rate /100,000	95% CI	Adjusted Rate /100,000	95% CI
<b>Males</b>	2000	43	74.3	52.1-96.5	92.439	64.0-120.9
	2001	59	102.0	76.0-128	121.33	89.1-153.5
	2002	44	75.9	53.5-98.4	101.335	70.3-132.3
	2003	40	68.7	47.4-90.0	83.332	56.5-110.2
	2004	57	96.9	71.8-122.1	117.385	85.7-149.1
	2005	58	98.1	72.9-123.4	127.384	93.3-161.4
	2006	58	97.9	72.7-123.0	121.412	88.5-154.4
	2007	44	73.7	52.0-95.5	94.192	65.0-123.4
	2008	64	106.9	80.7-133	141.281	104.8-177.7
	2009	50	82.7	59.8-105.7	101.289	71.8-130.8
	2010	64	104.8	79.2-130.5	125.937	93.2-158.7
	2011	54	87.3	64.1-110.6	105.128	75.5-134.7
Total	635	89.2	82.3-96.1	102.275	94.0-110.6	
<b>Females</b>	2000	67	119.0	90.6-147.5	137.051	103.2-170.9
	2001	50	88.7	64.1-113.2	98.862	70.6-127.1
	2002	37	65.4	44.4-86.5	85.03	56.7-113.4
	2003	39	68.7	47.2-90.3	84.1	56.5-111.7
	2004	32	55.7	36.4-75.0	65.479	42.1-88.8
	2005	61	105.7	79.2-132.2	127.798	94.3-161.3
	2006	42	72.7	50.7-94.7	89.149	60.6-117.7
	2007	37	63.6	43.1-84.0	75.192	49.7-100.7
	2008	54	92.0	67.5-116.5	111.095	79.8-142.4
	2009	55	93.0	68.4-117.5	121.837	88.1-155.6
	2010	43	72.1	50.6-93.7	85.532	58.8-112.3
	2011	43	71.3	50.0-92.5	95.762	65.7-125.8
Total	560	80.6	73.9-87.3	89.794	82.0-97.6	
<b>Both</b>	2000	110	96.4	78.4-114.4	112.808	91.1-134.5
	2001	109	95.4	77.5-113.3	109.273	88.0-130.5
	2002	81	70.8	55.3-86.2	93.091	72.1-114.1
	2003	79	68.7	53.6-83.8	83.393	64.2-102.6
	2004	89	76.6	60.7-92.5	91.075	71.4-110.7
	2005	119	101.9	83.6-120.2	126.234	102.6-149.9
	2006	100	85.4	68.7-102.2	105.413	83.6-127.2
	2007	81	68.7	53.8-83.7	84.645	65.3-104.0
	2008	118	99.5	81.6-117.5	126.63	102.5-150.7
	2009	105	87.8	71.0-104.6	110.763	88.5-133.0
	2010	107	88.7	71.9-105.5	105.999	84.8-127.2
	2011	97	79.4	63.6-95.2	100.911	79.7-122.1
Total	1195	84.9	80.1-89.8	95.722	90.1-101.4	

Table 8. Crude and Age-Standardized Incidence per 100,000 of AGW in Northern Regional Health Authority

	Year	Cases	Rate /100,000	95% CI	Adjusted Rate /100,000	95% CI
<b>Males</b>	2000	24	67.3	40.4-94.2	75.007	43.8-106.2
	2001	20	56.0	31.4-80.5	54.14	29.8-78.5
	2002	25	70.2	42.7-97.8	76.715	45.4-108.1
	2003	25	70.5	42.9-98.1	74.136	43.4-104.8
	2004	34	95.1	63.1-127	101.877	67.0-136.8
	2005	34	94.9	63-126.8	108.506	70.6-146.4
	2006	13	36.3	16.6-56.0	35.247	15.5-55.0
	2007	13	36.1	16.5-55.7	38.626	17.1-60.1
	2008	11	30.6	12.5-48.7	34.801	13.6-56.0
	2009	18	49.6	26.7-72.4	54.434	27.4-81.4
	2010	23	62.5	37.0-88.1	77.814	43.1-112.5
	2011	22	59.0	34.4-83.6	64.597	36.7-92.5
	Total	262	60.6	53.3-68.0	60.871	53.2-68.6
<b>Females</b>	2000	11	32.2	13.2-51.3	39.019	14.8-63.3
	2001	20	58.7	33.0-84.4	52.295	28.9-75.7
	2002	21	61.4	35.2-87.7	61.714	34.9-88.6
	2003	23	67.5	39.9-95	71.805	42.1-101.5
	2004	29	84.3	53.7-115	78.23	49.1-107.3
	2005	23	66.6	39.4-93.8	62.601	36.2-89.0
	2006	13	37.5	17.1-57.9	40.358	18.0-62.7
	2007	17	48.8	25.6-72.0	51.639	26.1-77.2
	2008	30	85.8	55.1-116.5	91.869	58.2-125.5
	2009	21	59.3	33.9-84.6	61.009	33.8-88.2
	2010	18	50.2	27.0-73.4	50.838	26.7-75.0
	2011	15	41.3	20.4-62.1	43.764	21.1-66.4
	Total	241	57.7	50.4-65.0	54.018	47.0-61.0
<b>Both</b>	2000	35	50.2	33.5-66.8	57.209	37.4-77.0
	2001	40	57.3	39.5-75.0	53.359	36.4-70.3
	2002	46	65.9	46.9-85.0	68.955	48.4-89.5
	2003	48	69.0	49.5-88.5	73.045	51.7-94.4
	2004	63	89.8	67.7-112.0	89.981	67.2-112.7
	2005	57	81.0	60.0-102.1	84.963	62.1-107.8
	2006	26	36.9	22.7-51.1	37.798	22.9-52.7
	2007	30	42.4	27.2-57.5	45.14	28.4-61.8
	2008	41	57.8	40.1-75.5	63.614	43.6-83.6
	2009	39	54.4	37.3-71.4	57.787	38.7-76.9
	2010	41	56.4	39.2-73.7	63.633	43.1-84.2
	2011	37	50.2	34.1-66.4	54.216	36.2-72.2
	Total	503	59.2	54.0-64.4	57.361	52.2-62.5

Table 9. Crude and Age-Standardized Incidence per 100,000 of AGW in Southern Health –Santé Sud Regional Health Authority

	Year	Cases	Rate /100,000	95% CI	Adjusted Rate /100,000	95% CI
<b>Males</b>	2000	55	72.2	53.1-91.2	79.333	57.9-100.7
	2001	60	77.9	58.2-97.5	89.894	66.6-113.2
	2002	48	61.7	44.3-79.2	70.836	50.3-91.4
	2003	49	62.6	45.1-80.1	72.618	51.8-93.4
	2004	66	82.8	62.8-102.8	100.048	75.3-124.8
	2005	77	95.3	74.0-116.6	108.173	83.3-133.0
	2006	69	84.2	64.3-104.0	100.565	76.3-124.8
	2007	70	83.8	64.2-103.4	100.735	76.6-124.9
	2008	82	96.0	75.2-116.7	104.006	80.9-127.1
	2009	91	104.4	83.0-125.9	125.168	98.9-151.4
	2010	78	88.1	68.6-107.7	107.458	83.1-131.8
	2011	88	97.4	77.0-117.7	116.912	91.9-141.9
	Total	833	84.4	78.7-90.1	91.524	85.2-97.9
<b>Females</b>	2000	55	73.2	53.9-92.5	83.108	60.7-105.5
	2001	40	52.7	36.3-69.0	59.556	40.7-78.4
	2002	45	58.6	41.5-75.8	70.096	49.2-91.0
	2003	47	60.9	43.5-78.3	66.944	47.4-86.5
	2004	44	55.8	39.3-72.3	64.397	44.9-83.9
	2005	61	76.3	57.2-95.5	84.297	62.6-106.0
	2006	72	88.8	68.3-109.3	98.551	75.3-121.8
	2007	56	67.6	49.9-85.3	76.501	56.1-96.9
	2008	74	87.4	67.5-107.3	98.764	75.8-121.7
	2009	65	75.3	57.0-93.6	82.879	62.3-103.5
	2010	64	73.1	55.2-91.0	79.94	60.0-99.9
	2011	66	73.8	56.0-91.6	79.339	59.8-98.8
	Total	689	70.6	65.4-75.9	73.439	67.8-79.0
<b>Both</b>	2000	110	72.7	59.1-86.2	80.564	65.2-96.0
	2001	100	65.3	52.5-78.2	75.02	60.0-90.1
	2002	93	60.2	48.0-72.4	70.175	55.6-84.8
	2003	96	61.8	49.4-74.1	69.531	55.3-83.8
	2004	110	69.4	56.4-82.4	82.309	66.5-98.1
	2005	138	85.9	71.5-100.2	96.377	79.9-112.9
	2006	141	86.5	72.2-100.7	99.256	82.5-116.0
	2007	126	75.7	62.5-88.9	88.316	72.5-104.1
	2008	156	91.7	77.3-106.1	101.215	85.0-117.5
	2009	156	90.0	75.8-104.1	103.994	87.3-120.7
	2010	142	80.7	67.4-93.9	93.373	77.7-109.1
	2011	154	85.7	72.1-99.2	97.839	82.0-113.6
	Total	1522	77.6	73.7-81.5	82.347	78.1-86.6

## Appendix B: Age-Specific Incidence of AGW Tables- by Sex and Year by Regional Health Authority, Manitoba, 2000-2011

Table 10. Incidence per 100,000 of AGW in Winnipeg Regional Health Authority by Age Group and Year (2000-2011)

		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<b>Males</b>													
<b>00-14</b>	Cases	10	18	3	8	7	13	6	9	6	4	6	6
	Rate	15.5	28.2	4.7	12.7	11.2	21.3	9.9	15.0	9.9	6.6	9.8	9.7
<b>15-19</b>	Cases	20	16	27	38	28	26	35	22	34	33	25	27
	Rate	94.2	74.2	123.6	174.0	126.2	115.7	154.4	95.8	145.7	139.2	104.5	112.3
<b>20-24</b>	Cases	94	79	101	123	120	135	140	122	146	116	142	149
	Rate	431.6	364.4	458.9	555.3	538.2	594.7	612.4	529.7	631.6	490.1	577.0	584.4
<b>25-29</b>	Cases	98	89	102	100	110	117	109	111	142	133	159	122
	Rate	428.2	394.3	455.7	445.7	484.6	516.8	479.3	482.4	608.9	554.2	645.1	480.3
<b>30-39</b>	Cases	136	124	149	145	146	135	165	166	134	156	161	170
	Rate	262.7	245.7	303.4	301.8	309.1	290.6	359.1	360.6	290.3	334.2	341.4	352.8
<b>40-49</b>	Cases	59	69	76	79	84	99	85	68	76	74	96	100
	Rate	116.0	132.6	143.9	147.6	155.5	183.0	158.2	128.4	145.1	141.7	185.4	193.6
<b>50-59</b>	Cases	29	25	32	32	37	30	33	36	46	43	44	54
	Rate	79.9	66.5	81.6	79.4	88.6	69.5	74.1	79.7	99.8	91.1	91.2	108.8
<b>60+</b>	Cases	19	17	21	23	18	21	22	24	26	30	22	21
	Rate	39.6	35.1	42.9	46.3	35.6	40.9	42.0	44.3	46.5	52.0	37.1	34.4
<b>Total</b>	Cases	465	437	511	548	550	576	595	558	610	589	655	649
	Rate	146.6	137.3	159.9	170.8	170.2	177.7	183.0	170.5	184.3	175.4	192.1	186.7
<b>Females</b>													
<b>00-14</b>	Cases	3	5	4	9	4	1	8	4	7	5	2	3
	Rate	4.9	8.2	6.6	15.1	6.7	1.7	13.9	7.0	12.2	8.7	3.4	5.1
<b>15-19</b>	Cases	74	82	67	78	78	84	72	75	77	68	68	72
	Rate	360.4	395.4	318.7	367.0	360.9	384.5	325.7	335.7	337.4	295.3	294.2	310.7
<b>20-24</b>	Cases	111	128	120	113	140	137	146	153	146	128	105	132
	Rate	498.5	573.2	536.4	504.9	616.3	591.2	626.2	649.3	612.6	527.9	423.7	520.9
<b>25-29</b>	Cases	68	69	58	60	72	70	85	75	79	70	91	83
	Rate	294.8	301.9	255.7	262.5	310.8	302.4	365.6	318.0	329.8	284.8	360.1	319.6
<b>30-39</b>	Cases	72	76	81	66	72	71	73	72	84	83	69	82
	Rate	140.4	151.0	164.0	137.2	152.3	152.7	158.7	156.6	180.6	176.3	144.8	167.8
<b>40-49</b>	Cases	35	32	39	42	62	54	39	60	46	50	46	57
	Rate	67.2	60.7	73.1	78.1	114.2	99.6	72.5	112.8	87.5	95.8	88.9	110.2
<b>50-59</b>	Cases	14	22	12	20	13	24	28	27	21	27	28	24
	Rate	37.2	55.9	29.4	47.2	29.6	52.8	60.1	57.3	43.9	55.4	56.3	47.4
<b>60+</b>	Cases	4	16	11	6	6	7	11	16	12	12	13	15
	Rate	5.9	23.7	16.2	8.8	8.7	10.1	15.7	22.3	16.3	16.0	16.9	19.1
<b>Total</b>	Cases	381	430	392	394	447	448	462	482	472	443	422	468
	Rate	113.6	127.8	116.1	116.3	131.0	131.0	134.8	139.9	135.4	125.6	118.1	128.8

Table 11. Incidence per 100,000 of AGW in Prairie Mountain Regional Health Authority by Age Group and Year (2000-2011)

		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<b>Males</b>													
<b>00-14</b>	Cases	4	3	2	1	0	0	1	1	0	1	1	0
	Rate	23.7	18.2	12.4	6.3	0	0	6.5	6.6	0	6.7	6.5	0
<b>15-19</b>	Cases	5	3	3	6	5	5	7	6	3	5	7	8
	Rate	80.3	48.3	48.6	98.0	82.0	81.9	115.6	101.8	52.0	86.9	123.4	144.2
<b>20-24</b>	Cases	19	16	24	14	20	33	18	17	20	36	35	37
	Rate	361.6	308.3	458.5	263.2	367.3	609.3	324.7	310.6	364.5	667.0	631.5	654.5
<b>25-29</b>	Cases	10	13	11	9	13	15	12	10	14	20	25	26
	Rate	212.9	280.1	242.9	194.7	285.3	328.9	263.2	217.5	286.7	397.2	496.6	504.3
<b>30-39</b>	Cases	12	6	11	15	11	9	15	6	17	19	26	11
	Rate	118.2	61.2	114.8	159.9	119.5	99.8	167.4	67.3	185.2	201.3	271.3	113.5
<b>40-49</b>	Cases	3	5	9	11	8	8	10	9	4	11	8	12
	Rate	26.0	42.8	77.0	94.1	68.5	69.4	89.0	82.5	37.4	104.5	77.9	119.3
<b>50-59</b>	Cases	3	1	4	6	3	3	5	4	4	7	9	4
	Rate	33.4	10.8	42.0	61.0	29.9	28.9	46.8	37.0	36.6	63.3	79.3	34.8
<b>60+</b>	Cases	0	3	5	5	2	4	2	5	2	6	2	6
	Rate	0	18.8	31.4	31.1	12.4	24.8	12.2	30.1	11.8	34.8	11.4	33.7
<b>Total</b>	Cases	56	50	69	67	62	77	70	58	64	105	113	104
	Rate	70.2	63.1	87.6	84.9	78.6	97.9	89.0	74.0	81.1	132.1	140.8	128.3
<b>Females</b>													
<b>00-14</b>	Cases	0	2	0	0	0	0	0	1	2	1	0	1
	Rate	0	12.6	0	0	0	0	0	6.9	14.0	6.9	0	6.7
<b>15-19</b>	Cases	24	24	19	17	13	13	18	15	19	18	20	21
	Rate	412.7	412.9	332.1	292.5	224.0	223.4	311.4	259.3	342.1	325.2	367.3	392.7
<b>20-24</b>	Cases	21	17	21	22	22	22	26	21	33	34	33	23
	Rate	414.2	341.4	418.3	428.5	424.3	425.1	492.0	400.2	628.3	645.0	605.1	412.6
<b>25-29</b>	Cases	11	7	9	15	9	11	12	12	9	14	19	13
	Rate	235.7	151.7	198.4	331.3	196.9	241.2	264.3	263.0	192.1	295.0	387.9	256.1
<b>30-39</b>	Cases	9	7	6	9	12	9	14	6	5	11	14	9
	Rate	85.6	69.1	61.0	94.2	128.0	98.8	154.1	65.9	54.7	118.1	146.7	93.3
<b>40-49</b>	Cases	11	10	9	8	9	7	9	3	11	5	6	7
	Rate	96.6	86.6	76.9	68.2	76.7	59.3	77.5	26.7	100.7	46.4	56.8	67.8
<b>50-59</b>	Cases	5	1	6	1	4	3	4	7	1	2	4	3
	Rate	55.6	10.8	64.1	10.4	40.0	29.1	38.0	65.4	9.1	18.0	35.4	26.1
<b>60+</b>	Cases	6	1	3	0	6	4	6	2	4	3	1	4
	Rate	30.5	5.1	15.3	0	30.5	20.4	30.4	10.0	19.8	14.7	4.9	19.3
<b>Total</b>	Cases	87	69	73	72	75	69	89	67	84	88	97	81
	Rate	105.7	84.3	89.8	88.5	92.1	84.9	109.7	82.6	103.6	107.8	117.6	97.5

Table 12. Incidence per 100,000 of AGW in Interlake-Eastern Regional Health Authority by Age Group and Year (2000-2011)

		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<b>Males</b>													
<b>00-14</b>	Cases	0	1	0	0	1	0	3	0	1	2	0	2
	Rate	0	8.0	0	0	8.3	0	25.4	0	8.6	17.4	0	17.5
<b>15-19</b>	Cases	3	4	0	4	4	3	4	5	2	2	7	5
	Rate	68.0	89.3	0	87.2	86.4	64.9	86.7	109.4	43.6	42.7	148.7	106.2
<b>20-24</b>	Cases	9	8	9	9	15	15	11	11	19	11	14	15
	Rate	258.3	231.5	261.0	256.3	411.1	408.5	297.5	290.6	503.7	285.7	351.1	370.4
<b>25-29</b>	Cases	6	8	13	4	5	9	10	8	14	9	10	9
	Rate	187.8	253.9	425.1	133.0	170.6	311.5	347.6	274.7	478.3	297.5	321.2	273.6
<b>30-39</b>	Cases	14	19	10	11	16	18	12	11	13	10	13	8
	Rate	175.4	248.1	134.6	153.7	228.0	263.8	181.0	167.7	198.5	154.6	200.9	125.1
<b>40-49</b>	Cases	6	11	9	8	8	9	11	3	8	6	10	5
	Rate	66.4	118.8	96.2	84.0	83.8	93.5	114.6	31.5	85.8	65.1	110.6	56.6
<b>50-59</b>	Cases	1	2	1	1	2	2	4	4	6	1	6	9
	Rate	14.2	27.8	13.3	12.9	24.7	24.1	46.3	45.2	66.3	10.9	63.5	92.2
<b>60+</b>	Cases	4	6	2	3	6	2	3	2	1	9	4	1
	Rate	40.1	59.4	19.5	28.5	55.4	18.0	26.4	17.0	8.3	71.9	31.0	7.5
<b>Total</b>	Cases	43	59	44	40	57	58	58	44	64	50	64	54
	Rate	74.3	102.0	75.9	68.7	96.9	98.1	97.9	73.7	106.9	82.7	104.8	87.3
<b>Females</b>													
<b>00-14</b>	Cases	3	2	0	1	1	2	0	0	1	1	2	1
	Rate	24.7	16.7	0	8.6	8.7	17.5	0	0	9.1	9.1	18.5	9.3
<b>15-19</b>	Cases	17	14	5	6	10	15	8	9	9	12	7	10
	Rate	421.0	340.0	122.2	148.3	243.3	355.8	188.3	207.3	206.5	278.0	161.3	230.0
<b>20-24</b>	Cases	19	14	10	12	11	20	8	11	12	12	12	5
	Rate	605.9	450.9	319.4	369.2	335.5	630.7	248.4	337.6	368.4	359.1	337.7	135.8
<b>25-29</b>	Cases	8	3	7	5	2	8	6	4	8	12	6	6
	Rate	268.8	103.6	253.5	182.7	71.6	287.9	220.7	148.9	287.2	419.9	208.1	199.3
<b>30-39</b>	Cases	7	6	10	6	4	6	8	5	8	8	5	15
	Rate	85.6	75.4	129.5	80.1	54.7	85.3	117.8	74.9	120.3	121.4	77.2	233.9
<b>40-49</b>	Cases	3	8	3	1	2	4	7	4	8	9	5	2
	Rate	34.9	91.3	33.4	11.1	21.7	42.8	74.5	42.7	85.9	98.0	55.4	22.4
<b>50-59</b>	Cases	7	2	1	5	2	4	4	4	5	1	4	3
	Rate	103.4	28.9	14.0	67.2	25.8	49.3	48.0	47.1	58.0	11.3	44.1	31.9
<b>60+</b>	Cases	3	1	1	3	0	2	1	0	3	0	2	1
	Rate	28.8	9.3	9.1	26.9	0	17.2	8.4	0	23.6	0	14.9	7.2
<b>Total</b>	Cases	67	50	37	39	32	61	42	37	54	55	43	43
	Rate	119.0	88.7	65.4	68.7	55.7	105.7	72.7	63.6	92.0	93.0	72.1	71.3



Table 13. Incidence per 100,000 of AGW in Northern Regional Health Authority by Age Group and Year (2000-2011)

		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<b>Males</b>													
<b>00-14</b>	<b>Cases</b>	1	4	1	4	3	1	2	1	2	4	1	2
	<b>Rate</b>	8.8	35.3	8.9	36.0	26.9	8.9	18.0	8.9	18.2	36.1	9.0	17.9
<b>15-19</b>	<b>Cases</b>	3	3	3	4	3	3	3	1	0	1	1	3
	<b>Rate</b>	95.3	95.0	95.3	125.0	91.1	88.7	87.2	28.8	0	29.3	29.1	88.3
<b>20-24</b>	<b>Cases</b>	5	4	6	6	12	10	3	3	0	1	7	5
	<b>Rate</b>	188.8	151.7	228.7	229.5	460.3	387.6	116.2	114.5	0	36.5	242.9	166.3
<b>25-29</b>	<b>Cases</b>	4	5	4	2	4	6	1	1	3	3	2	3
	<b>Rate</b>	148.1	189.3	157.7	80.8	164.3	250.0	42.6	42.5	127.1	123.8	79.5	116.9
<b>30-39</b>	<b>Cases</b>	5	2	5	5	8	6	3	3	2	4	4	6
	<b>Rate</b>	92.7	37.8	97.0	97.6	157.5	122.2	61.0	62.2	41.8	84.7	85.3	127.8
<b>40-49</b>	<b>Cases</b>	4	1	3	1	3	5	1	2	1	2	3	1
	<b>Rate</b>	86.7	21.1	62.6	20.8	61.3	102.6	20.5	41.1	20.8	41.5	62.8	20.9
<b>50-59</b>	<b>Cases</b>	1	1	2	1	0	1	0	2	2	2	2	1
	<b>Rate</b>	31.1	30.2	58.3	28.9	0	27.7	0	54.9	53.3	51.9	50.2	24.3
<b>60+</b>	<b>Cases</b>	1	0	1	2	1	2	0	0	1	1	3	1
	<b>Rate</b>	39.0	0	38.0	74.3	36.2	70.6	0	0	31.8	30.5	88.4	28.3
<b>Total</b>	<b>Cases</b>	24	20	25	25	34	34	13	13	11	18	23	22
	<b>Rate</b>	67.3	56.0	70.2	70.5	95.1	94.9	36.3	36.1	30.6	49.6	62.5	59.0
<b>Females</b>													
<b>00-14</b>	<b>Cases</b>	0	4	2	1	2	1	0	1	0	0	1	0
	<b>Rate</b>	0	37.1	18.6	9.3	18.6	9.3	0	9.4	0	0	9.3	0
<b>15-19</b>	<b>Cases</b>	1	6	3	2	12	10	2	4	6	8	3	3
	<b>Rate</b>	32.9	196.9	95.8	65.6	382.5	312.2	60.0	118.9	177.4	238.5	89.5	91.4
<b>20-24</b>	<b>Cases</b>	2	6	5	8	7	5	1	4	6	3	7	3
	<b>Rate</b>	76.2	229.1	195.3	316.7	272.2	190.8	38.0	149.5	223.6	108.0	239.3	97.7
<b>25-29</b>	<b>Cases</b>	0	3	0	4	3	1	3	5	5	3	2	5
	<b>Rate</b>	0	114.9	0	155.9	115.9	40.2	121.7	205.8	204.2	120.4	77.4	187.3
<b>30-39</b>	<b>Cases</b>	6	1	7	6	3	2	4	1	8	4	4	3
	<b>Rate</b>	114.8	19.3	136.6	119.4	60.4	40.7	82.1	20.6	164.9	82.7	84.3	63.5
<b>40-49</b>	<b>Cases</b>	1	0	1	1	1	2	2	1	3	1	1	0
	<b>Rate</b>	23.3	0	22.7	22.5	22.1	43.6	43.6	22.0	66.7	22.2	21.8	0
<b>50-59</b>	<b>Cases</b>	0	0	3	1	1	1	1	0	2	1	0	1
	<b>Rate</b>	0	0	103.7	34.1	32.6	31.8	31.1	0	59.0	28.5	0	26.9
<b>60+</b>	<b>Cases</b>	1	0	0	0	0	1	0	1	0	1	0	0
	<b>Rate</b>	38.3	0	0	0	0	35.2	0	33.4	0	31.2	0	0
<b>Total</b>	<b>Cases</b>	11	20	21	23	29	23	13	17	30	21	18	15
	<b>Rate</b>	32.2	58.7	61.4	67.5	84.3	66.6	37.5	48.8	85.8	59.3	50.2	41.3

Table 14. Incidence per 100,000 of AGW in Southern Regional Health Authority by Age Group and Year (2000-2011)

		2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
<b>Males</b>													
<b>00-14</b>	Cases	2	2	1	0	2	0	3	1	0	3	2	0
	Rate	10.6	10.6	5.3	0	10.3	0	15.2	5.0	0	14.3	9.4	0
<b>15-19</b>	Cases	5	6	4	3	4	10	2	6	6	6	5	3
	Rate	75.5	90.3	60.0	45.1	59.9	146.7	28.8	84.2	83.2	80.6	66.5	39.5
<b>20-24</b>	Cases	11	11	11	16	12	28	21	19	25	26	18	24
	Rate	205.3	201.2	195.5	277.4	201.6	467.8	351.2	313.8	413.6	427.6	279.9	355.6
<b>25-29</b>	Cases	8	16	7	9	16	12	15	15	10	23	25	20
	Rate	172.6	337.6	147.1	187.0	330.1	244.8	298.3	291.0	185.6	416.0	451.3	353.2
<b>30-39</b>	Cases	14	11	15	11	18	15	17	19	12	20	13	24
	Rate	129.5	103.0	144.7	108.2	178.3	148.1	167.7	185.4	115.5	189.3	121.5	218.0
<b>40-49</b>	Cases	7	10	3	4	9	8	5	7	9	5	10	11
	Rate	64.3	89.0	25.9	34.0	74.9	66.5	41.1	57.7	73.5	40.9	83.0	92.3
<b>50-59</b>	Cases	3	1	6	2	3	3	2	1	12	4	2	1
	Rate	38.8	12.6	72.4	23.4	33.9	32.5	20.9	10.1	117.3	37.6	18.1	8.8
<b>60+</b>	Cases	5	3	1	4	2	1	4	2	8	4	3	5
	Rate	44.3	26.3	8.7	34.5	16.9	8.3	32.3	15.7	60.6	29.4	21.4	34.5
<b>Total</b>	Cases	55	60	48	49	66	77	69	70	82	91	78	88
	Rate	72.2	77.9	61.7	62.6	82.8	95.3	84.2	83.8	96.0	104.4	88.1	97.4
<b>Females</b>													
<b>00-14</b>	Cases	2	1	1	1	1	3	0	0	2	1	0	3
	Rate	11.2	5.6	5.6	5.6	5.5	16.2	0	0	10.3	5.0	0	14.8
<b>15-19</b>	Cases	12	5	4	11	8	11	10	9	11	15	15	14
	Rate	198.0	81.2	63.4	175.9	126.4	173.0	154.8	136.1	163.2	215.5	213.5	198.4
<b>20-24</b>	Cases	16	11	16	15	14	21	27	21	23	25	25	23
	Rate	326.1	220.4	312.8	285.2	259.2	381.9	485.0	366.0	398.6	432.2	415.8	363.9
<b>25-29</b>	Cases	8	4	11	5	9	7	11	11	18	9	9	5
	Rate	176.5	88.1	242.3	109.5	189.4	145.0	222.7	219.7	344.9	167.8	164.7	89.1
<b>30-39</b>	Cases	11	11	8	9	8	9	9	5	5	7	5	9
	Rate	102.1	103.7	76.9	88.7	78.9	88.9	88.7	48.4	47.5	65.0	46.0	80.6
<b>40-49</b>	Cases	1	4	4	3	2	5	9	6	8	4	7	9
	Rate	9.6	37.2	36.0	26.3	17.2	42.7	75.9	50.3	66.6	33.3	58.5	75.7
<b>50-59</b>	Cases	3	2	1	2	1	3	4	2	3	2	3	2
	Rate	41.1	26.6	12.7	24.9	11.8	34.0	43.7	21.0	30.3	19.5	28.2	18.1
<b>60+</b>	Cases	2	2	0	1	1	2	2	2	4	2	0	1
	Rate	15.0	14.9	0	7.3	7.2	14.2	14.0	13.7	26.7	13.0	0	6.2
<b>Total</b>	Cases	55	40	45	47	44	61	72	56	74	65	64	66
	Rate	73.2	52.7	58.6	60.9	55.8	76.3	88.8	67.6	87.4	75.3	73.1	73.8

## Appendix C: Tariff Codes and ICD9/10 Codes for AGW

Table 15. Tariff codes used to identify a person with AGW in the medical claims

Code	Description
3372	Anus, condyloma, single or multiple, internal or external, destruction, in hospital
3433	Anus, condyloma, external, electrodesiccation, initial, per sitting
3434	Anus, condyloma, external, electrodesiccation, subsequent, per sitting
4120	Penis, penile skin lesion, including warts, local excision or fulguration, per sitting
4412	Vulva, condylomata excision or destruction any method less than 10 warts up to 25% of vulva
4413	Vulva, condylomata excision or destruction any method 10 or more warts more than 25% of vulva
4415	Vagina, condylomata excision or destruction any method less than 5 warts up to 25% of vagina
4416	Vagina, condylomata excision or destruction any method 5 or more warts more than 25% of vagina
4422	Vulva, condyloma accuminata local excision, fulguration, chemical application or injection or other treatment, per sitting
4427	Vulva, condyloma accuminata, extensive removal under general anaesthesia
4430	Vulva, condylomata excision or destruction any method less than 10 warts up to 25% of vulva
4432	Vulva, condylomata excision or destruction any method 10 or more warts more than 25% of vulva
4472	Vagina, condylomata excision or destruction any method less than 10 warts up to 25% of vagina
4475	Vagina, condylomata excision or destruction any method 10 or more warts more than 25% of vagina

Table 16. ICD-9/10 diagnosis codes for anogenital warts

Database date	ICD codes	Procedure Codes
Before April 1994	078.1	Table B2.2
April 1994 – March 2004	078.11, or 078.10, or 078.19	Table B2.2
After March 2004	A630 or B07	Table B2.3

Table 17. ICD 9 procedure codes used to assist in the identification of a person with anogenital warts

Code	Description
48.82	Excision of perirectal tissue
49.04	Other excision of perianal tissue
49.3	Local excision or destruction of other lesion or tissue of anus
49.31	Endoscopic excision or destruction of lesion or tissue of anus
49.39	Other local excision or destruction of other lesion or tissue of anus
58.3	Excision or destruction of lesion or tissue of urethra
58.31	Endoscopic excision or destruction of lesion or tissue of urethra
58.39	Other local excision or destruction of lesion or tissue of urethra
61.3	Excision or destruction of lesion or tissue of scrotum
64.2	Local excision or destruction of lesion of penis
67.32	Destruction of lesion of cervix by cauterization – electroconization of cervix
67.33	Destruction of lesion of cervix by cryosurgery – cryoconization of cervix
67.39	Other excision or destruction of lesion or tissue of cervix
70.33	Excision or destruction of lesion of vagina
71.3	Local excision or destruction of vulva and perineum

Table 18. ICD 10 procedure codes used to assist in the identification of a person with anogenital warts

Code	Description
1RS59CAGX	Destruction vagina using per orifice approach and device NEC
1NT59CAGX	Destruction anus using per orifice approach and device NEC
1PQ59LAGX	Destruction urethra using open approach and device NEC
1RW59JAGX	Destruction vulva using external approach and device NEC
1RW59JAX7	Destruction vulva chemocautery agent
1RY87LA	Excision, partial perineum

Table 19. Tariff codes used to assist in the identification of a person with anogenital warts.

<b>Code</b>	<b>Description</b>
0253	Excision & simple closure – single lesion, any location
0254	Excision & simple closure – each additional lesion to a maximum of four
0255	Excision & closure – multiple lesions, extensive
0397	Laser vaporization, other than face, one lesion
0398	Laser vaporization, other than face, two lesions
0399	Laser vaporization, other than face, three or more lesions
0400	Cautery (electro, chemo) destruction or simple surgical excision of benign or premalignant lesions
0401	Cautery (electro, chemo, or simple surgical excision, one lesion) elsewhere
0402	Warts & fibrocutaneous tags - simple
0404	Cryocautery, etc., of benign lesion of skin, etc., second lesion
0405	Cryocautery, etc., of benign lesion of skin, etc., subsequent lesions (each)
0406	Cryocautery, etc., of benign lesion of skin, etc., complicated lesions
3300	Rectum, villous papilloma of rectum, extensive, local excision
3301	Rectum, unlisted or unusually complicated
3311	Rectum, proctosigmoidoscopy
3315	Rectum, proctosigmoidoscopy with removal of polyp or papilloma, single
3317	Rectum, proctosigmoidoscopy with removal of polyp or papilloma, multiple
3429	Anus, unlisted or unusually complicated
3994	Urethroscopy, therapeutic, polyps, urethral, excision of fulguration with or without urethroscopy
4000	Urethra, urethroscopy, diagnostic, initial or subsequent
4120	Penis, unlisted or unusually complicated
4221	Scrotum, skin lesion, local excision
4229	Scrotum, unlisted or unusually complicated
4611	Cervix, local excision of lesion, cauterization of biopsy, one or more sites
4641	Cryosurgery of the cervix for other conditions
8470	General practice visit – regional gynaecological exam – including cytological smear - cervix
8471	General practice visit – regional gynaecological exam – no cytological smear
8495	Obstetrics / gynaecology visit – complete gynaecological exam – including cytological smear - cervix
8496	Obstetrics / gynaecology visit – regional gynaecological exam – including cytological smear - cervix
8497	Obstetrics / gynaecology visit – regional gynaecological exam – no cytological smear
8498	General practice visit – complete gynaecological exam – including cytological smear - cervix

- 8499 General practice visit – complete gynaecological exam – no cytological smear
  - 8501 Office visits, regional, history and examination
  - 8502 Office visits, complete or extensive re-examination for same illness
  - 8507 Office visits, subsequent visit
  - 8509 Office visits, regional or subsequent visit or well baby care
  - 8529 Office visits, regional intermediate visit or subsequent visit or well baby care
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\* Only included if the ICD-9 diagnosis code was 078 and if an anogenital wart tariff claim followed it within two weeks.