Factors Affecting Adolescent Reproductive Health in Manitoba

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ABSTRACT

Objectives: To report teen pregnancy and sexually transmitted infections (STI) rates among Manitoba adolescents, and associated factors including rates of sexual intercourse and contraceptive use.

Methods: Teen pregnancy rates in females aged 15 to 19 for the fiscal years 1994/95 through 1998/99 were derived from the Population Health Research Data Repository and reported by geographical areas and income quintiles. Premature mortality rate (PMR) and the Socioeconomic Factor Index (SEFI) measured the overall health and socioeconomic well-being of regional populations. Data on sexual activity and contraceptive use were derived from the 1996 National Population Health Survey for males and females ages 15 through 19 years.

Results: The teen pregnancy rate for Manitoba was 63.2/1000, varying by geography and inversely correlated with income, PMR, and SEFI. 39% (95% CI 33-45) of teens reported sexual intercourse, with higher rates in urban areas (46%, 95% CI 35-57) and the North (48%, 95% CI 36-60) compared to South Rural (30%, 95% CI 25-34), and in low-income families (68%, 95% CI 53-83) compared with middle/high (33%, 95% CI 26-40). For sexually active females, 42% (95% CI 28-57) used the birth control pill, with higher rates in low-income families (70%, 95% CI 50-90) compared to middle/high income (31%, 95% CI 14-48). Condom use (at last sexual intercourse) was reported by 82% (95% CI 72-92) of adolescents, with trends (though not statistically significant) to lower use in low-income families and the North.

Conclusion: Reliance on the pill for contraception, combined with low rates of condom use, are public health concerns for adolescents where STI and unintended pregnancy rates are high.

La traduction du résumé se trouve à la fin de l'article.

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Canada has a universal health insurance program in each of its provinces and territories, with the administration of health programs under the jurisdiction of the provincial or territorial health ministry. The Manitoba Centre for Health Policy (MCHP), University of Manitoba, was contracted by the provincial health ministry, Manitoba Health, to produce a report on the health of Manitoba children aged 0 to 19 years.

The objective of this paper is to examine adolescent reproductive health risk factors for unintended pregnancy and sexually transmitted infection (STI) by geographic area, household income, and the health and socioeconomic well-being of the population wherein the teen resides. The specific indicators included: teen pregnancy rates, age at first intercourse, and contraceptive use by adolescents. Adolescent STI rates are derived from reports of the provincial Public Health Branch.

The Canadian teen pregnancy rate for females aged 15-19 years was 40.2/1000 in 1994,¹ whereas the USA rate was substantially higher at 98.7 per 1000 in 1996.^{2,3} Most teen pregnancies are "unintended" and pose physical, social and psychological risks to mother and baby.⁴ Adolescents who give birth face many challenges, including maintaining their social life, continuing their education, and securing employment. Teen mothers are at increased risk of raising children in single-parent households, which can in turn increase the risk of those children living in poorer socioeconomic conditions.⁵ Teen pregnancy at age 17 years or less has been associated with increased risk of preterm, low birthweight, and large-for-gestational age infants, even after controlling for major confounding factors.^{6,7}

The prevalence of use and the contraception method chosen have effects on both the unintended pregnancy rate and the STI rate.⁸⁻¹⁰ Manitoba chlamydia rates are available from the Public Health Branch's Communicable Disease Control Unit, with 1996 rates shown in Figure 1.¹¹ For females ages 15-19 years, rates varied from a low of 7.0 per 1000 to a high of 99.3 per 1000, for a provincial rate of 23.2 per 1000. Similar patterns – albeit substantially lower – are evident for males aged 15-19 years, with an overall rate of 4.75 per 1000. The Manitoba chlamydia rate in 1997 for females aged 15-24, at

20.0/1000, was the highest in any province in Canada, and over double the comparable Canadian rate of 9.4/1000.¹²

METHODS

Data for this research were obtained from two sources: provincial health care administrative data, and the 1996 National Population Health Survey (NPHS). See Brownell et al., this issue for more information on data sources.¹³

Teen pregnancy rate was defined as the number of pregnancies in females aged 15-19 years inclusive during the fiscal years 1994/95 through 1998/99, including live births, stillbirths, abortions, and ectopic pregnancies, divided by the total female population aged 15-19 years at the mid-period (December 31, 1997), and expressed per thousand. For geographical rates, Manitoba is divided into 12 health jurisdictions called "Regional Health Authorities" (RHAs). Within Winnipeg, Manitoba's capital and its largest RHA, data are also presented by 12 sub-regions called "Winnipeg Community Areas" (Winnipeg CAs). Comparisons of each RHA and Winnipeg CA were made to the following rates: provincial, Winnipeg, North (defined as the RHAs of Burntwood, Nor-Man, and Churchill) and South Rural (7 southern RHAs excluding Winnipeg and Brandon). For the teen pregnancy rates, income quintile groupings divided the urban (Winnipeg and Brandon RHAs) or rural (all other RHAs) population into five groupings, assigning each person the value of the average neighbourhood income based on 1996 census information.

The teen pregnancy rate was correlated with the premature mortality rate (PMR) and the Socioeconomic Factor Index (SEFI) by region. These measures reflect the population's overall global health and the need for health care (see Martens et al., this issue, for a further discussion of these measures).¹⁴ PMR, an age/sex-adjusted rate of death before the age of 75 years, is considered a global indicator of health status of a regional population. SEFI is derived from census-based information on regional demographics, employment and educational attainment, and as such is an indicator of socioeconomic well-being.

All figures showing RHAs and Winnipeg CAs are ordered by 5-year PMR

(Source: Notifiable Diseases Manitoba: CDC Unit Annual review calendar year 1996, Manitoba Health Public Health Branch)

Figure 1. Chlamydia crude rates for males and females aged 15-19 years by RHA, 1996

Statistical Significance:

* - Rate significantly different from Manitoba mean at p<0.05

N - Rate significantly different from mean for Northern Manitoba at p<0.05

S - Rate significantly different from mean for Rural South Manitoba at p<0.05

Figure 2. Teen pregnancy rates (females aged 15-19 years) by RHA, 1994/95-1998/99

for the years 1994/95 to 1998/99. The region with the lowest PMR (the region with the healthiest population) is on top of the y-axis, and the region with the highest (the least healthy population) is on the bottom. This construction embeds each indicator within a framework of the healthiness of the region's population, thereby giving a pictorial sense of whether one is associated with the other.

NPHS is administered by Statistics Canada, using a multi-stage, cluster design. One limitation that may affect results, especially in northern Manitoba, is the exclusion of people living in First Nations' communities. For NPHS data, household income was dichotomized to "low income" (less than \$20,000 annual income per household), and "middle/high income" (at least \$20,000).

TABLE I
Association of Teen Pregnancy Rates with Population Health/Socioeconomic Indicators

Health Indicator‡	Correlation of Indicator with Overall Population Health (Premature Mortality Rate, or PMR)	Correlation of Indicator with Regional Socioeconomic Well-being (Socioeconomic Factor Index, or SEFI)
Regional teen pregnancy rates (all non-Winnipeg RHAs and Winnipeg CAs n=23)	0.85***	0.92***
RHAs (non-Winnipeg n =11)	0.86**	0.96***
Winnipeg CAs (n=12)	0.94***	0.87**

‡ Each of the 11 non-Winnipeg Regional Health Authority regions (RHAs) and the 12 Winnipeg Community Areas (Winnipeg CAs) was included in the Spearman's correlations with PMR and SEFI. In some regions, there was suppression of the rate due to small numbers. The level of significance of the correlation coefficient is indicated by the following: *p<0.05; **p<0.001; ***p<0.0001; † p<0.10 (not statistically significant but showing a trend)

In Manitoba, it is very difficult to obtain accurate information on contraceptive use, since many clinics and health centres distribute condoms and birth control pills free to adolescents. Consequently, there is no record of a pharmaceutical purchase in the administrative databases. The NPHS 1996 survey does request this information from respondents aged 15-19 years, although the condom use question was only asked of those who had one or more sexual partners within the past 12 months, with at least one relationship lasting less than 12 months. The condom use question was, "For these relationships that lasted less than a year, did you use a condom the last time?" The birth control pill use question was, "In the past month, that is, from 1 month ago to yesterday, did you take birth control pills?" We analyzed this two ways – first, as a prevalence of all females aged 15-19 years old, and then as a prevalence of females 15-19 years old who *also* reported having sexual intercourse within the past 12 months.

RESULTS

Teen pregnancy rates and adolescent sexual activity

Teen pregnancy rates by RHA for 1994/95-1998/99 are shown in Figure 2 (see the child health report on the MCHP website, at www.umanitoba.ca/centres/mchp/ for Winnipeg CA rates). The Manitoba rate for 1994/95-1998/99 was 63.2/1000 females aged 15-19 years. RHA teen pregnancy rates varied from a low of 25/1000 (South Westman) to a high of over 140/1000 in two northern RHAs of Churchill and Burntwood. Provincial rates over the five years were rel-

atively stable and showed slight decline, at 64.3, 64.2, 64.7, 60.1, and 62.7 per thousand for the years 1994/95 to 1998/99 respectively.

Teen pregnancy rates were highly and inversely correlated with the healthiness and socioeconomic well-being of a region's population (see Table I), as well as with income (see Figure 3). Comparing the lowest to the highest quintile (Q1 to Q5), rates were 2.8 times higher in rural areas, and 5.7 times higher in urban areas. But the actual pregnancy rate in the lowest *rural* income group (111/1000) was less than the corresponding lowest income group in *urban* areas (145/1000).

Table II shows data derived from NPHS in the year 1996, for adolescents 15-19 years old (n=1049). The proportion reporting "ever having sexual intercourse" was 39% (95% CI 32.9-45.4). Although not shown, those reporting sexual intercourse within the past year was similar, at 36% (95% CI 29.7-42.1). Groups *more* likely to report having sexual intercourse within the past year include: females; adolescents living in a low income family; and adolescents living in the North or Urban Manitoba (in contrast to the South Rural area).

Of Manitoba teens aged 17-19 years, almost one quarter (22.5%, 95% CI 10.4-34.7) who had experienced sexual intercourse were 14 years old or less at the time of their first experience, and an additional half reported the age at first intercourse as 15 to 16 years old (47.8%, 95% CI 35.8-59.8). There was a trend to urban adolescents reporting a three-fold rate of sexual intercourse at age 14 years or less, but this was not statistically significant: Urban 30% (95% CI 11-49); South Rural 10% (95% CI 4-16); North 12% (95% CI 1-24).

Contraceptive use by Manitoba adolescents

Table II includes data on contraceptive use reported by adolescents aged 15-19 years who were surveyed in the 1996 NPHS. Overall, 82% (95% CI 72-92) of Manitoba's sexually active adolescents aged 15-19 years used a condom at last sexual intercourse. Because of the very small sample size for the condom use question (n=187), none of the comparisons are statistically significant. However, there does appear to be a trend to low condom use in the North, and in low-income groups.

Of Manitoba females aged 15-19 years, 20.6% (95% CI 13.5-27.7) reported taking birth control pills. The vast majority of birth control pill use was related to contraception. Of those females who were not sexually active (n=252), only 1.8% reported using birth control pills, compared to 42.4% (95% CI 27.7 to 57.1) of those who reported having sexual intercourse within the past 12 months (n=205). Females in low-income groups were more likely to use birth control pills than those in middle/high-income groups.

DISCUSSION

Manitoba public health policy and programs must address two concerns of adolescent sexual behaviour – unintended adolescent pregnancy and STI transmission – in conjunction, not as separate issues. The Manitoba teen pregnancy rate 1994/95-1998/99 was 63.2 per 1000 females aged 15-19 years, with at least double these rates in the lowest urban income quintile group. The Manitoba rate was 50% higher than the Canadian rate (40.2/1000) and higher than comparable prairie provinces of western Canada, albeit much less than the USA rate (98.7/1000). Moreover, Manitoba chlamydia rates for adolescents are the highest provincial rates in Canada. But the context of both high pregnancy and STI rates for teens includes co-related factors such as adolescent sexual activity, contraceptive use, and choice of contraceptive method.

In the context of adolescent sexual activity, 39% (95% CI 33-45) of Manitoba adolescents aged 15-19 years reported having experienced sexual intercourse – 46% of the females (95% CI 37-55) and 33% of the males (95% CI 25-42). This is at the

TABLE II
Sexual Activity and Contraceptive Use for Manitoba Adolescents Aged 15-19 Years (NPHS 1996)

	Gender		Family Structure		Geographical Area			Family Income		Manitoba
	Male	Female	Dual Parent	Single Parent	Urban	South Rural	North	Low (<\$20,000)	Middle/High (\$20,000+)	Average
Have had sexual intercourse ever?	33.4*	46.2	34.6	45.7	45.6	29.7*	48.0	67.7*	32.9	39.2
% yes (n=1049)	(24.9-41.9)	(37.1-55.3)	(26.9-42.2)	(31.1-60.3)	(34.8-56.5)	(25.3-34.0)	(36.4-59.7)	(52.7-82.6)	(25.7-40.0)	(32.9-45.4)
Condom used last time person had sexual intercourse† (n=187)	79.2	84.7	76.9	86.2	85.9	72.6	63.3	58.9	81.5	82
	(64.9-93.6)	(74.8-94.6)	(53.1-100)	(76.3-96.1)	(73.8-98.0)	(60.0-85.2)	(32.7-93.9)	(29.5-88.4)	(70.4-92.6)	(72-92)
Birth control pill use:										
All females aged 15-19 years (n=457)			16.3	22.7	21.6	18.7	36.2	39.7*	14.7	20.6
			(8.1-24.5)	(8.9-36.5)	(8.9-34.2)	(13.4-24.1)	(18.9-53.5)	(19.3-60.0)	(7.6-21.8)	(13.5-27.7)
Only females ages 15-19 years reporting sexual intercourse in past 12 months (n=205)			36.3	45.4	35.7	56.4	61.1	70.1*	31.3	42.4
			(16.7-55.9)	(17.8-73.0)	(15.0-56.5)	(43.7-69.2)	(39.0-83.1)	(50.0-90.2)	(14.4-48.1)	(27.7-57.1)

* Significantly different at the p<0.05 level within the corresponding category of gender, family structure, geography, or income

† Note: condom use question (use of condom during the last sexual intercourse) was restricted to those who had one or more partners, at least one relationship lasting less than 12 months. A smaller sample was available for the income question (n=147), resulting in values not necessarily reflecting the overall average.

middle to high end of the range compared to a nine-nation World Health Organization (WHO) survey, at 10% to 38% of girls, and 23% to 42% of boys.¹⁵ Manitoba rates were higher for adolescents living in the North or urban areas, or in low-income families. Urban and North adolescents also reported younger ages at first sexual intercourse with a correspondingly high teen pregnancy rate, when compared to South Rural adolescents. This information underscores the necessity for public health planners to look at sexual education as an important part of the health curriculum in the pre-teen stage.

In the context of contraceptive choices, 1 out of 5 females aged 15-19 years reported being on the birth control pill (21%, 95% CI 14-28), with greatest use in low-income groups. Of those females reporting sexual intercourse, almost half (42%, 95% CI 28-57) used the birth control pill, with rates highest once again in low-income groups. Condom use was reported much more frequently by females (85%, 95% CI 75-95) and males (79%, 95% CI 65-94) at the last episode of sexual intercourse. There was also a trend to higher condom use in urban areas and middle/high-income groups. Manitoba rates of condom use for adolescents appear to be at the higher end of the range in the nine-nation WHO study, at 63% to 87% for boys, and 55% to 86% for girls.¹⁵

The prevalence and type of contraceptive use affects both unintended pregnancy and STI rates.⁸⁻¹⁰ According to the other research findings, of females relying on condoms, 2% became pregnant if con-

R represents rural income quintiles, with R1 being the lowest and R5 being the highest income quintile; U represents urban income quintiles, with U1 being the lowest and U5 being the highest income quintile. Statistically significant trends in both rural and urban (p<0.0001), using two-tailed Cochran-Armitage trend test.

Figure 3. Teen pregnancy rates (females aged 15-19 years) by rural and urban income quintile, 1994/95-1998/99

doms were used consistently, and 12% if inconsistently. Percentages of women with cervical gonorrhoea were 0% for consistent use, and 55% for inconsistent use. For females relying on combined oral hormonal contraception, 0.1% became pregnant with consistent use, and 3% with inconsistent use. However, 90% of the women were infected with cervical gonorrhoea, in both the consistent and inconsistent pill use groups. The Canadian General Social Survey¹⁶ in 1995 found those *least* likely to use contraception were the young (less than 25 years olds), the least educated, and the unemployed. High school students'

reasons for not using contraceptives are often related to unanticipated situations and to perceptions of low risk – “didn’t expect to have sex”; and “just didn’t think pregnancy would occur.” Other reasons relate to lack of knowledge, fear of contraceptives and fear of parental disapproval.¹⁷ The use of oral contraceptives to avoid unintended pregnancy may also be problematic due to the potential for improper adherence to instructions, as well as lack of simultaneous use of condoms to prevent STI transmission.¹⁸⁻²²

In Manitoba, a high regional rate of sexual intercourse combined with a high

regional rate of birth control pill use and low rate of condom use is associated with the dual problem of high regional rates of unintended pregnancies and STIs. This is particularly apparent in the North, and in low-income groups – adolescents show trends towards the highest prevalence of adolescent sexual intercourse, the lowest condom use rate, and the highest birth control pill prevalence. This relationship is underscored by the high correlation between teen pregnancy rates and regions having populations with poor health status and high socioeconomic risk (see Table I).

It is essential that STI and unplanned pregnancy prevention be intertwined, since modification of unsafe sexual practices reduces the risks of both. Public health decisions must be made with the knowledge that there is a potential for power imbalance between genders – in some cultures, many females have very little control over conditions of intercourse resulting in either STIs or in unplanned pregnancy, yet the burden of adverse outcomes falls differentially upon females. Our finding that high birth control pill use and low condom use are associated with high teen pregnancy rates and high chlamydia rates indicates that consistent contraception counselling will need to be a component of any successful campaign to reduce the rate of STIs and unplanned pregnancies. Qualitative research into the barriers to condom use, beliefs about birth control pill use, and systemic barriers to accessing sexual health information for adolescents is a priority in order to understand potential strategies for social marketing approaches and systemic public health approaches. Only by looking at the culture of adolescent sexuality will we be able to establish appropriate and effective programs to address the dual problems of STIs and unintended adolescent pregnancies.

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RÉSUMÉ

Objectifs : Déterminer les taux de grossesse et d'infections transmises sexuellement (ITS) chez les adolescents manitobains, ainsi que les facteurs associés, comme les taux de rapports sexuels et d'utilisation des contraceptifs.

Méthode : Les taux de grossesse chez les adolescentes de 15 à 19 ans de 1994-1995 à 1998-1999, dérivés du Population Health Research Data Repository, sont présentés selon la zone géographique et le quintile de revenu. Le TMP et l'indice SEFI ont servi à mesurer l'état de santé global et le bien-être socio-économique des populations régionales. Les données sur l'activité sexuelle et l'utilisation des contraceptifs sont dérivées des chiffres sur les adolescents de 15 à 19 ans dans l'Enquête nationale sur la santé de la population (1996).

Résultats : Le taux de grossesse chez les adolescentes, au Manitoba, était de 63,2 %, avec quelques écarts géographiques, et était réciproquement corrélé avec le revenu, le TMP et le SEFI. Trente-neuf p. cent (IC de 95 % = 33-45) des adolescentes déclaraient avoir eu des rapports sexuels; ce taux était plus élevé dans les agglomérations urbaines (46 %, IC de 95 % = 35-57) et dans le Nord (48 %, IC de 95 % = 36-60) que dans le Sud rural (30 %, IC de 95 % = 25-34), et plus élevé dans les familles à faible revenu (68 %, IC de 95 % = 53-83) que dans celles à revenu moyen ou élevé (33 %, IC de 95 % = 26-40). Chez les adolescentes sexuellement actives, 42 % (IC de 95 % = 28-57) prenaient la pilule anticonceptionnelle; ce taux était plus élevé dans les familles à faible revenu (70 %, IC de 95 % = 50-90) que dans celles à revenu moyen ou élevé (31 %, IC de 95 % = 14-48). L'utilisation du condom (lors du dernier rapport sexuel) était déclaré par 82 % des adolescents (IC de 95 % = 72-92); on a observé des taux inférieurs (sans être statistiquement significatifs) dans les familles à faible revenu et dans le Nord.

Conclusion : La confiance en la pilule pour la contraception, combinée aux faibles taux d'utilisation du condom, posent des problèmes de santé publique chez les populations adolescentes où les ITS et les taux de grossesse non désirée sont élevés.