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**Summary Report**  
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***Examining prenatal services in Newfoundland***

Rhoda Hoskins, Catherine Donovan, Serge Merhi, Manuel Salcedo, Anne Cockcroft and Neil Andersson

# examining prenatal services

**Eastern Newfoundland Health and Community Services  
Region**

**Local Public Health Infrastructure Development (LoPHID) Project**

Rhoda Hoskins, Catherine Donovan, *Health and Community Services Eastern*  
Serge Merhi, Manuel Pascual-Salcedo, Anne Cockcroft, Neil Andersson, *CIETcanada*

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The regional sample of 20 representative population enumeration areas was designed by Dr. Jean Dumais of Statistics Canada, using the 1996 national census as a sampling frame. This project was funded by Health Canada, as part of the Local Public Health Infrastructure Development Project. Technical support was provided by CIETcanada.

For further information on this report contact the:

Research Analyst  
Health and Community Services Eastern  
P.O. Box 70  
Holyrood, NF A0A 2R0  
709 229 1577 (Phone)  
709 229 1590 (Fax)

## **EXECUTIVE SUMMARY**

This project focussed on collecting and analysing data for improving the prenatal services provided by Health and Community Services Eastern. A survey was conducted across 20 sites of the Eastern Region. In all, 750 mothers participated, providing information about 816 pregnancies. Additional qualitative information was gathered in focus groups. Key informant questionnaires were also completed by health professionals.

### **Prenatal classes**

The survey results confirmed that attendance at prenatal classes is low. Mothers attended classes in less than a third of pregnancies (31%). Women with lower education levels and lower income are less likely to attend prenatal classes. The main reason given for not attending prenatal classes was that the women felt they did not need or want to attend (28%). This was more likely to be cited as the main reason by women with less than a post-secondary education and by women in urban areas. Twelve percent said the main reason for not attending prenatal classes was that they were unaware the classes existed, with women from households with an annual income of less than \$15,000 being more likely than women from higher income households to cite this as their main reason for not attending classes. Thirteen percent indicated that the non-availability of classes in their area was the main reason for not attending; women in rural areas were more likely to say this was the main reason than women in urban areas. Women who did not attend prenatal classes were generally more inclined to be in favour of other options for receiving prenatal education beyond the traditional format.

Use of prenatal services could be increased by raising awareness and specific referrals. In particular, ways of reaching women with less education and lower income need to be explored. Encouragement from health professionals could be particularly effective. Women who said they were encouraged to attend were more likely to actually attend classes. In about one in five pregnancies, women reported being encouraged by the family doctor and in 8% by the public health nurse. Health professionals felt that awareness and referrals, especially from the family doctor, were key to increasing prenatal education attendance.

In nearly all cases (94%), women who attended prenatal classes reported that they were helpful. Attendance at prenatal classes is associated with healthier behaviours during pregnancy including taking folate, making positive changes in diet, not smoking, and consuming less caffeine. These associations are present, even after taking other factors into account. However, it cannot necessarily be concluded that prenatal classes result in healthier behaviours. Possibly, women who are more concerned about health are more likely to both attend prenatal classes and have healthier behaviours.

## **Health practices**

Nearly a third of women reported taking multivitamins or folic acid before the pregnancy. Almost three-quarters (72%) took folate during pregnancy and 41% took iron during pregnancy. Over two-thirds (68%) of women said they changed their diet during pregnancy. Almost all of them (98%) reported eating a more healthy diet. Nearly all the women (87%) said they exercised before pregnancy, and slightly less (81%) reported that they exercised during pregnancy. Forty percent of women smoked before pregnancy; 25% smoked during pregnancy. Women who are younger, have lower education levels, and have lower household incomes are more at risk. In programming, particular emphasis need to be placed on the risks of smoking and not taking folic acid.

## **Breastfeeding**

Less than half the babies (48%) were started on breastfeeding. Moreover, 40% of mothers who initiated breastfeeding said they added other liquids during the first month. Looking directly at exclusive breastfeeding by age of the child at the time of the survey, only a fifth of all children were being exclusively breastfed among those 0-3 months old. When examining factors related to breastfeeding, it was found that more educated mothers and women from a higher income household (over \$15,000 per year) are more likely to initiate breastfeeding. Also, women who attend prenatal classes are more than twice as likely to initiate breastfeeding than those who do not attend classes. About a quarter of those that start breastfeeding, stop within the first month and women who were younger and women who have less education are more likely to stop breastfeeding in the first month. More promotion and support of breastfeeding is needed.

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## **INTRODUCTION**

The project was designed with the aim of developing the local public health infrastructure for improved prenatal services. The decision to focus on prenatal services for this project, the second LoPHID cycle in Eastern Newfoundland, was based on several key considerations. Prenatal services have long been an integral component of the public health programming of Health and Community Services, but there are major gaps in the regional information related to prenatal services. If these gaps could be filled, this would provide a better evidence base for program planning.

Existing regional information indicates that only about a third of pregnant women attend prenatal education classes in the Region (Live Birth Notification System). A number of factors may affect women, and their partners, accessing prenatal services. Examining which factors affect people accessing prenatal services at a local level will provide regional information pertinent to planning services that reach the whole population, including women at higher risk.

Regional information is further lacking in that it is not known whether the current prenatal education program and other prenatal services are meeting the needs of the target population. There has been no evaluation of the current programming to determine to what extent those availing of it benefit and to what extent they are satisfied with the services.

There is also a recognition that the preconception period needs to be addressed to improve pregnancy outcomes. Thus, longer term strategies may also need to pay attention to improving preconception knowledge and decision-making. In the longer term, primary preventive strategies will be developed through a focus on pre-conception knowledge, attitudes and practices relevant to *future* pregnancies (for example, breastfeeding). In this project, some data about preconception knowledge and practice was gathered, as a first step towards providing information for these long term policies.

For optimal service delivery, it is also important to obtain information about referrals among professionals who provide services to prenatal clients and how the liaisons among these professionals could be strengthened.

The results should help Health and Community Services and other bodies to develop strategies for improving prenatal services and making these services more accessible and attractive to those who do not use them, particularly those people identified as high risk for poor pregnancy outcomes.

## **Goals and Objectives**

The main **goal** of the project is to help mother and child to have the healthiest possible pregnancy, delivery, and early postpartum outcomes by better matching the prenatal services of Health and Community Services to the needs of the community.

The specific **objectives** of the project were as follows:

1. To assess the health decision-making of women and men prior to and during a pregnancy.
2. To determine what factors contribute to women and men not accessing services available to them during a pregnancy.
3. To determine the quality of experiences of women and men accessing prenatal services of Health and Community Services, Eastern and obtain direction to improving services.
4. To examine the relationships between our prenatal services and pregnancy outcomes, including breastfeeding rates and birth weights.
5. To share the information on prenatal care, produced by the project, with the community.
6. To ensure the use of project information by Health and Community Services, Eastern, to improve prenatal services.
7. To monitor progress towards reinforcing healthy preconception and prenatal choices.

## **METHODS**

As with other LoPHID cycles, the project used a standard methodological approach (see Annex 1 for LoPHID methods). In this cycle, the main information was gathered from household interviews with women who had delivered a child in the last three years. Complementary information was gathered in focus groups with mothers. Moreover, many health professionals provided their input through key informant questionnaires. The Live Birth Notification database for the years 1996, 1997, and 1998 was also examined for comparison purposes.

### **Survey Sample**

As with all LoPHID cycles, the sample was drawn by Statistics Canada. A random sample of 20 Enumeration Areas in the region was selected, after stratifying into rural and urban areas. Within each Enumeration Area, women who had delivered a child within the last three years were identified from live birth records held in the nursing offices. To expand the sample size, live birth records from similar, surrounding areas were also included. The enumeration areas in the sample are shown in Annex 2.

### **Instruments**

The instruments for the survey were developed in discussion with staff in different disciplines from Eastern Health and Community Services. Questions from existing instruments, particularly those used in the LoPHID project in the other pilot regions, were reviewed and included whenever appropriate. The instruments (Annex 3) included a household questionnaire administered to women who had delivered a child within the last three years. This questionnaire was pilot tested and modified slightly prior to use. The questionnaire included questions about the pregnancy (support, prenatal classes, visits from community health nurses, use of services, diet, exercise, smoking, alcohol and caffeine intake); questions about breastfeeding and post-natal services; and questions about pre-pregnancy. In addition, a guide for focus groups with women and men was developed that further explored issues related to prenatal needs and service delivery. Questionnaires for community health nurses, other Health and Community Services staff, doctors, and hospital nurses, were also developed. Generally, the questionnaires focussed on the delivery of prenatal services, encouraging access of services, and professional education needs but details differed for each group (Annex 3).

### **Ethics**

The project proposal was reviewed by the Ethics Committee of Health and Community Services, Eastern Region to ensure relevant ethical issues were addressed. These issues include the confidentiality of the information, both during and after data collection, the mechanisms for obtaining voluntary consent, the insurance that participation is not harmful, and that the information collected is

valuable.

Confidentiality in the LoPHID initiative is a strong focus. No record is made of the name or address of the household informant alongside any information that they provide. Thus, there is no way to trace back to any individual participant. Personal information such as age, gender, level of education and household level of income is collected from the respondents but no identifying information is included in the records other than noting the EA where the data is collected. At the beginning of each cycle, field workers sign a “Declaration of Confidentiality” form.

### **Training and Fieldwork**

The interviews with women in households were conducted by eighteen interviewers. All interviewers had a one day training on the administration of the questionnaire and worked under the supervision of one of four regional supervisors from Health and Community Services. Training was also given to focus group facilitators and reporters.

Women in the sample areas identified as having a child within the last three years were contacted by telephone to arrange a time to visit them and complete the questionnaire. The fieldwork of telephoning and interviewing women took place over about three weeks in February-March 1999.

Questionnaires were distributed to the health professionals during the period of data collection from households.

Focus groups in the sample communities were scheduled in the weeks after the household interviews were completed. Potential participants were identified during the household interviews.

### **Data Management**

Data entry was programmed and undertaken using the statistical and database package Epi Info. Data from the household interview with women was entered twice and validated before further cleaning and logical checks.

### **Data Analysis**

Analysis was undertaken using Epi Info. Frequencies of key indicators were calculated. Contrasts between groups were examined using the Mantel-Haenszel  $X^2$  procedure. Risk contrasts are reported in terms of the Odds Ratio. The relationships between health practices and prenatal classes were examined, taking other factors into account by stratification. Similarly, the relationships between health practices, including prenatal class attendance, and outcomes of pregnancy (in terms of birth weight and initiation of breastfeeding) were examined.

## **FINDINGS**

### **Information Base**

#### **The Survey Population**

In total, 1,307 women who had given birth in the last three years were identified for the sample. Of these, 460 (35%) could not be contacted. The remainder (846, 65%) were contacted by telephone. A few (11%, 96/846) refused to be interviewed. A total of 750 mothers were visited and interviewed, providing information on 816 pregnancies in the previous three years.

The average age of the women at the time of the interview was 29.1 years; 19% (139/744) were under 25 years old at the time of the survey. Using the age of the child to calculate the age of the mother at the time of delivery, the average age was 27.6 years and 31% (229/744) were under 25 years of age. At the time of the survey, one in five of them (21% 155/747) had not received a grade 12 diploma, while 15% (111) had a university degree. Over half (53%, 398/747) had some post-secondary education. Some 18% (122/683) reported an annual household income of less than \$15,000. At the time of the interview, most of the women (73%, 547/746) reported they were married, 13% (94) said they were in a common-law marriage, 14% (101) said they were single and less than 1% (4) said they were separated. None reported they were divorced.

In comparing the age, education, and marital status characteristics of the survey respondents with the Live Birth Notification database, it seems that the sample obtained is representative of the population. According to the database, the mean age of the women at the time of delivery was 26.8 years and 35% of mothers were under 25. This mean age is comparable to the mean age in our sample and only a slightly higher proportion is under 25 compared with our sample. Fifty percent had a post-secondary education. Our sample had a slightly higher percentage (53%) with post-secondary education but there was a time lapse since delivery during which more mothers could have obtained a post-secondary education. Most women (63%) were married, 13% were in a common-law marriage, 24% were single, and less than 1% were either divorced or separated. While there seems to be more married women in the sample and less single women compared to the database, it is likely that some women in our sample got married after the birth of the baby. It is possible that single mothers are somewhat under-represented in the sample but the difference would only be slight.

The average age of the 816 children (all identified as born within the last three years) at the time of the survey was 19.2 months. A few (24) older children aged between 37 and 47 months were included. More than half (54%; 439/812) of the children were male.

#### **Key Informants**

Questionnaires were distributed to 69 community health nurses, 80 other Health and Community Services front-line staff, 2 obstetricians, 101 general practitioners/ pediatricians, and approximately 65 hospital nurses.<sup>2</sup>

Twenty-seven community health nurses completed a questionnaire (39%), providing information on the delivery of prenatal education services. Of the 21 (26%) front-line staff who completed questionnaires, 29% (6/21) were mental health counselors, 38% (8/21) were child welfare social workers, 19% (4/21) were child and family services specialists/social workers, 10% (2/21) were addictions counselors and one was a nurse consultant. There were only a few managers involved and the data are not reported here.

In total, fifty-seven medical professionals completed questionnaires. Of the general practitioners 37 (37%) completed questionnaires and 1 of the 2 obstetricians completed a questionnaire. Nineteen (29%) of the hospital nurses completed questionnaires.

### Focus Groups

Twelve focus groups were held. Only four had an attendance of five or more. More had been planned (22) but had to be cancelled due to lack of interest.

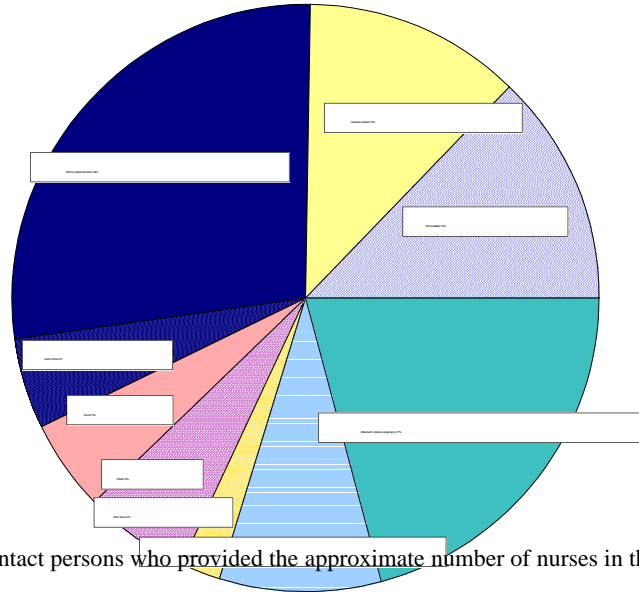
### Prenatal Care

#### Attendance at Prenatal Classes

In the last three years prior to the survey, mothers attended prenatal classes in less than a third of pregnancies (31%; 251/815).

Among mothers who gave reasons for not attending prenatal classes, 21% (117/547) said they had attended in a previous pregnancy, 28% (152) said they did not need or want to attend prenatal classes, 13% (71) said prenatal classes were not available in their community and 12% (64)

Figure 1. Reasons for not attending prenatal classes



<sup>2</sup>Hospital nurses questionnaires were distributed through contact persons who provided the approximate number of nurses in the hospitals.

said they were not aware they existed (Figure 1).

Non-availability of classes as the main reason for not attending was more likely to be cited by women living in rural areas than by women living in urban areas<sup>3</sup>. Women from households with an annual income of less than \$15,000 were more likely than women from higher income households to give as their main reason that they were not aware of classes<sup>4</sup>. Not wanting or needing to attend was more likely to be cited by women with less education<sup>5</sup> and by women in urban areas<sup>6</sup>.

Few women (6%; 47/799) said they had been uncomfortable about going to prenatal classes during the pregnancy. Among those who were uncomfortable, various reasons were given including they knew others in the class, they did not like the videos, and the schedule was not flexible. The proportion uncomfortable was not any higher among those who did not attend than among those who did attend.

For more than half the pregnancies (55%; 443/801) women said no one encouraged them to attend prenatal classes. In a fifth of pregnancies (22%; 179/801) they were encouraged to attend by their family doctor, and in 8% (66/801) by public health nurses. Women who reported being encouraged to attend prenatal classes were twice as likely to report actually attending classes, compared with women who were not encouraged to attend<sup>7</sup>.

Around 10% (25/251) of women who attended prenatal classes said they attended the first class during the first trimester of pregnancy, with 61% (154/251) attending their first class by the end of the second trimester. In most of the pregnancies where the woman reported going to classes (81%; 202/250) she went with her partner.

Community Health Nurses felt that the main reason people do not avail of prenatal education is lack of awareness of the service (70%,19/27). Thirty percent (8/27) also said transportation is an issue, as is lack of support (33%, 9/27) and lack of interest (33%, 9/27). To increase the number of people accessing prenatal education services, almost half of the nurses (12/27) said that more promotion is needed, and 41% (11/27) said more doctor referrals (41%, 11/27) are needed. Several (22%, 6/27) also mentioned improved coordination between doctors and Health and Community Services would help improve access to prenatal education services.

“Your doctor should set it up for you and inform you when it is.”  
Focus Group Participant

Likewise, other front-line staff of Health and Community Services felt that raising awareness would

<sup>3</sup> 64/414 (16%) vs 7/133 (5%). Odds Ratio 3.33 (95% CI 1.39-8.33)

<sup>4</sup> 19/103 (18%) vs 37/396 (9%). Odds Ratio 2.19 (95% CI 1.14-4.19)

<sup>5</sup> 93/290 (32%) vs 58/256 (23%). Odds Ratio 1.61 (95% CI 1.08-2.42)

<sup>6</sup> 52/133 (39%) vs 100/414 (24%). Odds Ratio 2.02 (95% CI 1.30-3.13)

<sup>7</sup> 151/250 (60%) vs 207/555 (37%). Odds Ratio 2.56 (95% CI 1.86-3.54)

improve the rate of people accessing prenatal education services (38%, 8/21). Making the service more accessible was also mentioned frequently by this group (33%, 7/21). Twenty-four percent (5/21) mentioned more support would improve access and 14% (4/21) mentioned doctor's referrals.

Raising awareness was also the key way that medical professionals felt would encourage people to access prenatal education services (41%, 24/57). Another 31% (18/57) said doctor referrals would encourage access.

In focus groups, women often expressed the view that they should be told about prenatal classes by their doctors, or even that their doctors should arrange their attendance.

### **Experience of Prenatal Classes**

In nearly all cases (94%; 235/249), women who attended prenatal classes reported they were helpful. Nearly two-thirds of women (63%; 155/247) who attended prenatal classes said 'nothing' was needed to improve the classes and 5% (11/247) could not say what would improve the classes. The most common suggestions were for more information about delivery (7%, 16/247) and for more information in general (5%, 12/247).

Most nurses (93%, 25/27) always ask clients what they want to talk about in prenatal education. Nurses indicated they typically cover many topics in prenatal education. Lifestyle/physical activity, infant feeding/breastfeeding, preparation for childbirth, breathing and relaxation, and labour and pain management are generally covered by all nurses. The least covered topics tend to be complications of pregnancy (56%, 15/27), family interaction (59%, 16/27), and stress management (59%, 16/27).

The nurses indicated that clients mostly ask questions related to the actual delivery including labour and pain management (96%, 26/27), breathing and relaxation (93%, 25/27), and preparation for childbirth (78%, 21/27). Seventy percent (19/27) also mentioned infant feeding/breastfeeding as an area their clients often ask about.

### **One-on-One Visits From Community Health Nurse**

Only a few women (7%; 59/811) reported having a one-on-one visit from a community health nurse in the pregnancy. The proportion having a one-on-one visit was only slightly different between women who attended prenatal classes (9%, 21/235) and those who did not attend prenatal classes (5%, 30/555). In most cases (91%; 53/58), those who had one-on-one visits found them helpful.

Questionnaires completed by community health nurses confirmed that they see women for one-on-one education because of client requests (52%, 14/27), because there are not enough pregnant women to

run classes (48%, 13) or because clients are unwilling to attend classes (37%, 10). Overall, 35% (286/811) of women had prenatal education in their pregnancy: either by attending classes or by one-on-one visits; only slightly higher than the 31% with prenatal classes alone.

### Preferences for Prenatal Education Provision

Women were asked about their preferences for a number of options for delivery of prenatal education. Table 1 shows the proportion of women who were in favour of each option for those that attended and those that did not attend separately.

**Table 1. Preferences for provision of prenatal education**

Option	% (number) women in favour	
	Attended PNC	Did not attend PNC
Classes earlier in pregnancy	50% (105)	59% (314)
Classes on weekends	44% (93)	60% (314)
One-on-one classes	27% (57)	36% (190)
Fewer classes	10% (21)	16% (85)
One day workshop	44% (93)	57% (300)
More classes	47% (98)	32% (167)
Shorter classes	14% (29)	22% (119)
More discussion than teaching	47% (98)	55% (294)

The most popular options are classes earlier in pregnancy, weekend classes, a one day workshop, more classes, and more discussion than teaching in the classes. Women who did not attend prenatal classes are generally more in favour of the alternative delivery options than those who did attend, who are presumably more comfortable with the present delivery of the classes.

*Among women who attended classes*, women without post-secondary education are more likely to say they would prefer one-on-one classes<sup>8</sup>, and to say they would prefer more classes<sup>9</sup>. Younger women are more likely to express a preference for shorter classes<sup>10</sup>.

*Among women who did not attend classes*, women without post-secondary education<sup>11</sup> and women

<sup>8</sup> 28/76 (37%) vs 29/133 (22%). Odds Ratio 2.09 (95% CI 1.07-4.11)

<sup>9</sup> 44/76 (58%) vs 54/133 (41%). Odds Ratio 2.01 (95% CI 1.09-3.74)

<sup>10</sup> 17/69 (25%) vs 12/138 (9%). Odds Ratio 3.43 (95% CI 1.42-8.37)

<sup>11</sup> 126/282 (45%) vs 64/247 (34%). Odds Ratio 2.31 (95% CI 1.56-3.41)

from households with low income<sup>12</sup> are more likely to express a preference for one-on-one classes. Shorter classes are more likely to be favoured by women from urban communities<sup>13</sup>. Women over 25 years old are more likely to favour a workshop<sup>14</sup>.

### Characteristics of Women who Attend and Do Not Attend Prenatal Classes

*Age.* There is a small difference in the proportion of women attending prenatal classes in those below 25 years old (33%, 50/151) and those aged 25 years and above (30%, 188/649). The difference is not statistically significant and could easily be due to chance.

*Income.* Women from lower income households are less likely to attend prenatal classes. With a household income above \$15,000/year, a woman is significantly more likely to attend prenatal classes compared with a woman having a lower income<sup>15</sup>.

Comments in focus groups confirmed that financial constraints can limit women's attendance at prenatal classes.

"It's difficult when you have other children too, and you can't afford a baby sitter for your classes." Focus Group Participant

*Education.* Women with higher education are more likely to attend prenatal classes (Figure 2). A woman with post-secondary education is twice as likely to attend prenatal classes compared with a woman having less education<sup>16</sup>.

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<sup>12</sup> 45/96 (47%) vs 128/387 (33%). Odds Ratio 1.79 (95% CI 1.10-2.89)

<sup>13</sup> 38/126 (30%) vs 81/405 (20%). Odds Ratio 1.73 (95% CI 1.07-2.79)

<sup>14</sup> 220/369 (60%) vs 77/157 (49%). Odds Ratio 1.54 (95% CI 1.03-2.27)

<sup>15</sup> 31/137 (23%) vs 198/606 (33%). Odds Ratio 1.7 (95% CI 1.05-2.6)

<sup>16</sup> 164/425 (39%) vs 86/387 (22%). Odds Ratio 2.2 (95% CI 1.59-3.0)

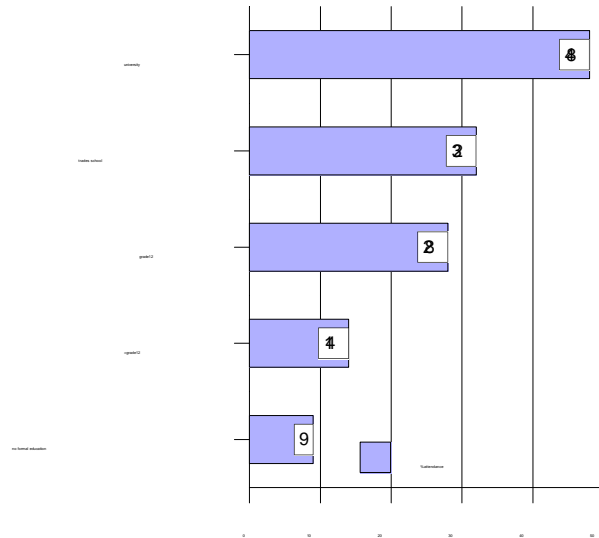
It is of concern that women with lower income and less education are less likely to attend prenatal classes than women with higher income and more education, as prenatal education is intended to reach the whole population in the Region. Possibly women with lower income and less education may be less likely to be aware of classes and/or they may be more reluctant to attend. Indeed, in examining the reasons for not attending, women with lower incomes were more likely to say the main reason for not attending was that they were unaware of the service while those with lower education were more likely to say they did not need or want the classes.

Either way, it seems that those who may need it the most are not attending. Different ways of promoting and delivering prenatal education are needed in order to ensure that women with less education and lower income can also benefit from it.

*Area of residence.* There is no significant difference in the rate of attendance at prenatal classes between women in urban and rural areas. However, there is considerable variation between the sample communities in the proportion of women who attended prenatal classes, ranging from 12% to 56% (Figure 3)<sup>17</sup>. When one-on-one visits are also considered, the variation in the proportion of women who received any prenatal education (classes or visits) is less marked, ranging from 25% to 56%. In a few communities, one-on-one visits make a substantial contribution to the overall prenatal education provision.

**Doctors' Visits**

**Figure 2. Level of education and attendance at prenatal classes**

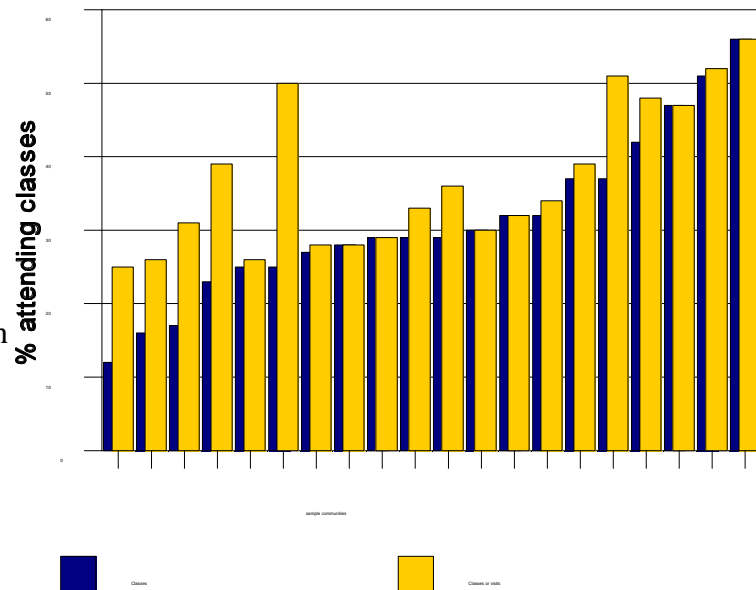


<sup>17</sup>Community identities are available for internal planning.

**Figure 3. Attendance at prenatal classes and one-on-one visits in different communities**

Virtually all the women interviewed saw a doctor in each pregnancy. Only one woman responded that she did not see a doctor.

Nearly all women (94%; 761/810) saw the doctor during the first trimester. This compares to 92% of women in the Live Birth Notification database. Nearly a third (30%; 246/810) saw the doctor during the first month of pregnancy. On average, each woman saw a doctor at least 14 times during pregnancy.



There was no evidence that the number of doctors' visits or the month in pregnancy when they started had any particular relationship with breastfeeding, healthy choices during pregnancy or prenatal class attendance.

### Support During Pregnancy

Most women (81%; 658/814) cited their partner/father of the child as their main family support during pregnancy, either alone or along with another relative. About one in ten (11%; 90/814) said their mother was their main support.

The main supporter from health services that was most commonly mentioned was the family doctor (86%; 705/815). Some 8% (62/815) considered the public health nurse their main support from the health services and 4% (35/815) identified another doctor/specialist as their main health service support.

### Health Practices Before and During Pregnancy

#### Use of Multivitamins and Folic Acid

Nearly a third of women (29%, 231/809) reported taking multivitamins or folic acid *before* the pregnancy. Especially for folic acid, this

"I did not know until later that I should have taken folic acid even before I got pregnant."  
Focus group participant

suggests that some are aware of the need to take it before pregnancy. Women less than 25 years old at the time of the birth<sup>18</sup>, women from poorer households<sup>19</sup>, and women with less education<sup>20</sup> are less likely to have taken multivitamins or folic acid *before* the pregnancy. In the focus groups, many women indicated that they had not been aware of the recommendation to take folic acid before pregnancy.

Most women (86%, 697/813) reported taking some sort of vitamin/iron supplement *during* pregnancy. Nearly three-quarters (72%; 588) took preparations containing folic acid but less than half (41%, 330) took preparations containing iron (many preparations contain both folate and iron). Focus group discussions indicated that women generally found out about folic acid through their doctors.

Most (72%) women took folic acid during pregnancy but only 41% took iron.

Again, younger women<sup>21</sup>, women from poorer households<sup>22</sup>, and less educated women<sup>23</sup> are less likely to have taken folic acid during pregnancy. The differences by age, economic status and education level are less marked for taking folic acid during pregnancy than for taking it before pregnancy, indicating the benefit of advice from health professionals during pregnancy. There were no differences in the proportions of women taking iron during pregnancy by age, economic status or education level.

## Diet

Two-thirds of women (68%, 553/816) said they changed their diet during pregnancy. Among those who said they made some change, two-thirds (67%, 368/550) said they ate more during pregnancy, a quarter (26%, 141) said they ate the same amount, and less than one in ten (8%, 41) said they ate less.

Among those who reported changing their diet in pregnancy, almost all (98%, 539/552) reported eating a more healthy diet. Nearly half (45%, 246/552) did not specify in what way their diet was more healthy, while others said they consumed more milk, more fruit and vegetables, less fat or less sugar.

Combining the information about whether and how they changed their diet, two-thirds of women (66%, 538/814) reported making a change towards a more healthy diet during pregnancy. Women are less likely to have made a positive

Two-thirds of women changed to a healthier diet in pregnancy.

<sup>18</sup> 30/250 (12%) vs 197/554 (36%). Odds Ratio 0.25 (95% CI 0.16-0.38)

<sup>19</sup> 10/136 (7%) vs 212/604 (35%). Odds Ratio 0.15 (95% CI 0.07-0.30)

<sup>20</sup> 46/383 (12%) vs 183/424 (43%). Odds Ratio 0.18 (95% CI 0.12-0.26)

<sup>21</sup> 161/252 (64%) vs 422/55 (75%). Odds Ratio 0.56 (95% CI 0.40-0.78)

<sup>22</sup> 92/136 (68%) vs 452/605 (75%). Odds Ratio 0.71 (95% CI 0.46-1.09)

<sup>23</sup> 270/386 (70%) vs 316/424 (75%). Odds Ratio 0.80 (95% CI 0.58-1.10)

change to their diet during pregnancy if they are under 25 years of age<sup>24</sup>, come from poorer households<sup>25</sup>, or have less education<sup>26</sup>.

## Exercise

Nearly all the women (87%; 680/784) who responded to the questions about exercise said they did some exercise before pregnancy; and most (81%; 631/779) said they also exercised during pregnancy. Nearly three-quarters (72%; 567/784) said they exercised for 90 minutes or more per week before pregnancy (similar to the 30 minutes three times a week recommended). Around two-thirds of women (63%; 488/779) said they exercised at this level during pregnancy. There were no differences in the proportions of women exercising for 90 minutes per week during pregnancy by age, economic status or educational level.

## Smoking

Four out of ten women (40%; 320/811) smoked before their pregnancy. This proportion fell to 25% (200/809) during pregnancy. Among those 320 women who smoked before the pregnancy, more than a third (38%; 122) stopped smoking during the pregnancy and a further 45% (145) reduced the amount they smoked.

A quarter (25%) of women smoked during pregnancy.

Women are more likely to have smoked before pregnancy if they are under 25 years old<sup>27</sup>, from poorer households<sup>28</sup>, or have less education<sup>29</sup>. Among smokers, cessation during pregnancy is less likely in those from poorer households<sup>30</sup> or with less education<sup>31</sup>. Smoking during pregnancy is nearly twice as likely in women under 25 years old<sup>32</sup>, four times more likely among women from poorer households<sup>33</sup>, and nearly six times more likely among women with less education<sup>34</sup>.

When women were asked who influenced their decision to stop or reduce smoking, the most common response was “nobody” (68%; 158/234). Some were influenced by their family doctor (14%; 32) and

<sup>24</sup> 148/254 (57%) vs 384/554 (68%). Odds Ratio 0.62 (95% CI 0.45-0.85)

<sup>25</sup> 77/136 (57%) vs 419/606 (69%). Odds Ratio 0.58 (95% CI 0.39-0.87)

<sup>26</sup> 208/387 (54%) vs 327/424 (77%). Odds Ratio 0.34 (95% CI 0.25-0.47)

<sup>27</sup> 129/253 (51%) vs 189/553 (34%). Odds Ratio 2.00 (95% CI 1.46-2.75)

<sup>28</sup> 85/134 (63%) vs 200/606 (33%). Odds Ratio 3.52 (95% CI 2.33-5.32)

<sup>29</sup> 213/384 (56%) vs 107/425 (25%). Odds Ratio 3.70 (95% CI 2.71-5.06)

<sup>30</sup> 21/85 (25%) vs 86/200 (43%). Odds Ratio 0.43 (95% CI 0.24-0.80)

<sup>31</sup> 59/213 (28%) vs 63/107 (52%). Odds Ratio 0.27 (95% CI 0.16-0.45)

<sup>32</sup> 82/252 (33%) vs 117/552 (21%). Odds Ratio 1.79 (95% CI 1.26-2.55)

<sup>33</sup> 65/135 (48%) vs 115/603 (19%). Odds Ratio 3.94 (95% CI 2.60-5.98)

<sup>34</sup> 156/386 (40%) vs 44/421 (10%). Odds Ratio 5.81 (95% CI 3.93-8.62)

some by their husband (6%; 14) or other relative (6%; 13).

Women who were still smoking during pregnancy (149) responded to a question about what would have helped them stop smoking in pregnancy; but most (79%, 117) responded that “nothing” would have helped them to stop. A few (6%; 9) said a health problem would have made them stop, or support from relatives and friends (5%; 7), advice from the doctor (4%; 6), or more activity (4%; 6).

In the focus groups, increase in the awareness of risks, counselling, and support from family and professionals were seen as ways to encourage women to stop smoking.

“There’s not a lot of support to stop.” Focus group participant

## Caffeine

Women were asked about caffeine intake in terms of how many cups of coffee and tea and how many cans of cola they drank per day, before and during pregnancy. Their caffeine intake was calculated on the basis of 120 mg caffeine per cup of coffee, 100 mg per cup of tea, and 50 mg per can of cola. The median total caffeine intake before pregnancy was 250 mg per day (among 805 women, with 8% taking no caffeine at all). Of the 738 women consuming any caffeine before pregnancy, more than half (59%; 438) reduced their intake during pregnancy. The median total caffeine intake during pregnancy was 150 mg per day (among 807 women, with 20% avoiding caffeine altogether).

Before pregnancy, one in five women (21%; 166/805) had a caffeine intake above the recommended limit of 450 mg/day. During pregnancy, just 8% (67/807) reported a caffeine intake above 450 mg per day.

8% of women consumed more than 450 mg of caffeine per day during pregnancy.

There was little difference in caffeine intake before pregnancy by age, economic status or educational level. However, during pregnancy, women are more likely to consume more than 450 mg/day of caffeine if they come from poorer households<sup>35</sup> or if they have less education<sup>36</sup>.

## Alcohol

Almost all the women (97%; 778/805) said they did not drink alcohol at all during the pregnancy. Most of the remainder (3%; 22) said they drank less than one drink per week. Only five women said they drank as much as 1 or 2 drinks per week. Drinking alcohol during pregnancy was rare in all women irrespective of age, economic status or educational level. The women were not asked about drinking

<sup>35</sup> 21/137 (15%) vs 40/600 (7%). Odds Ratio 2.53 (95% CI 1.38-4.64)

<sup>36</sup> 48/385 (13%) vs 19/420 (5%). Odds Ratio 3.01 (95% CI 1.67-5.44)

alcohol before pregnancy.

## **Relationship Between Prenatal Class Attendance and Health Practices**

Women who attended prenatal classes were more likely to report taking folate during the pregnancy<sup>37</sup> and more likely to report making a positive change to their diet during pregnancy<sup>38</sup>, compared with women who did not attend prenatal classes. They were less likely to smoke during pregnancy<sup>39</sup> and less likely to consume more than 450 mg caffeine per day during pregnancy<sup>40</sup>, compared with women who did not attend any prenatal classes. There was no difference in the proportion taking iron or the proportion doing 90 minutes per week of exercise during pregnancy between those who attended and did not attend prenatal classes.

These relationships between health practices during pregnancy and attendance at prenatal classes are still present when age, income level, education level and area of residence (urban vs rural) are taken into account (by stratified analysis). Thus, although personal and demographic characteristics are related both to health practices during pregnancy (see above) and to attending prenatal classes, this does not explain the relationship between attending the classes and positive health practices in pregnancy. For example, even if we only consider women with more education, those who attended prenatal classes are more likely to have taken folic acid during pregnancy than those who did not attend prenatal classes.

Nevertheless, we still cannot conclude that it is necessarily the actual attendance at prenatal classes that is responsible for the associated healthy practices during pregnancy. There may be other characteristics of the women, that we did not measure, that mean they both adopt healthy practices and attend prenatal classes.

There is some evidence in this study that women who have healthier behaviours before pregnancy are more likely to attend prenatal classes. Women who took supplements of folic acid and/or iron before pregnancy were more likely to attend prenatal classes<sup>41</sup>. Those who did not smoke before pregnancy were more likely to attend prenatal classes but only among women who were in the higher income category<sup>42</sup>. There were no significant relationships between prenatal classes attendance and exercise or caffeine intake before pregnancy.

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<sup>37</sup> 185/237 (78%) vs 395/562 (70%). Odds Ratio 1.50 (95% CI 1.03-2.19)

<sup>38</sup> 180/238 (76%) vs 349/562 (62%). Odds Ratio 1.89 (95% CI 1.32-2.71)

<sup>39</sup> 37/236 (16%) vs 160/559 (29%). Odds Ratio 0.46 (95% CI 0.30-0.70)

<sup>40</sup> 10/233 (4%) vs 54/560 (10%). Odds Ratio 0.42 (95% CI 0.20-0.88)

<sup>41</sup> 96/227 (42%) vs 140/568 (25%). Odds Ratio 2.24 (95% CI 1.59-3.15)

<sup>42</sup> 141/401 (35%) vs 51/198 (26%). Odds Ratio 1.56 (95% CI 1.05-2.33)

## Birth Weight

Only 4% (33/813) of the babies were born with a weight less than 2.5 Kg (<5lb.8oz pounds). The proportion of children with low birth weight did not differ between women who did and did not attend prenatal classes, nor by education level, by income level or between urban and rural sites. Women who smoked during pregnancy were twice as likely to have a low birth weight baby as women who did not smoke<sup>43</sup>.

## The Postnatal Period

### Postnatal Services

In nearly all the deliveries, the mother reported being contacted by the public health nurse after the birth (97%; 792/814). Of those who specified the type of contact, nearly all (96%; 744/778) reported a home visit by the public health nurse. Nearly all women (93%; 735/791) who had a postnatal contact from a public health nurse found it helpful in some way.

### Breastfeeding

Less than half the babies (48%; 383/803) were started on breastfeeding. Of those who were started, two-thirds (254/383) were put to the breast one hour or less after birth. Those mothers who said they initiated breastfeeding were asked at what point they added other liquids to the infant's diet. Four out of ten mothers (40%; 146/369) who were no longer exclusively breastfeeding said they added other liquids during the first month. Two-thirds of them (65%; 241/369) reported they had added other liquids within the first three months; and almost all of them (94%; 348/369) reported they had added other liquids by six months. Looking directly at exclusive breastfeeding by age of the child at the time of the interview, only a fifth of all the children (19%; 7/36) were being exclusively breastfed among those 0-3 months old, and less than one in ten (8%; 6/74) of children aged 4-6 months. No children over six months old were still being exclusively breastfed. Mothers who initiated breastfeeding reported when they stopped breastfeeding. Among those not still breastfeeding, a quarter (26%; 83/319) said they

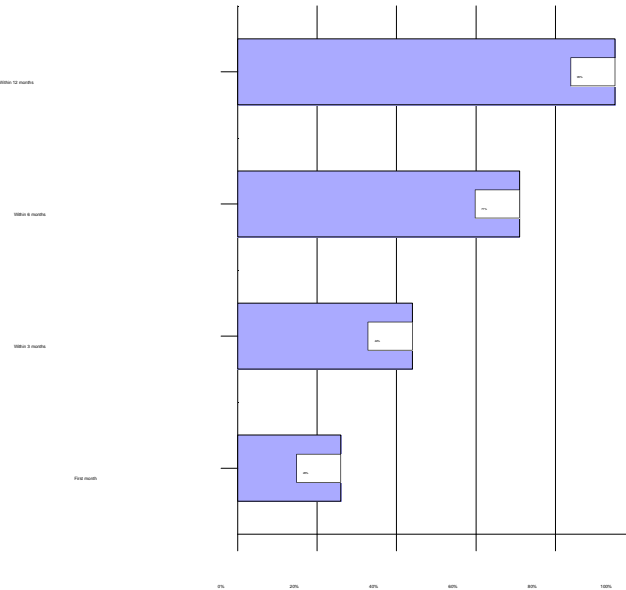
Less than half (48%) of babies are started on breastfeeding.

<sup>43</sup>13/199 (7%) vs 20/607 (3%). Odds Ratio 2.05 (95% CI 0.94-4.45)

stopped within the first month, nearly half (44%; 141) said they stopped within three months, most (71%; 226) within six months, and nearly all (95%; 302) within twelve months (Figure 4). Looking directly at breastfeeding by age of the child, less than four out of ten (39%; 14/36) children aged 0-3 months were being breastfed, falling to 15% (12/78) among those aged 7-9 months.

Among mothers who initiated breastfeeding, stopping within the first month was more likely if the mother was less than 25 years old at the time of the birth<sup>44</sup> or if she did not have a post-secondary education<sup>45</sup>.

**Figure 4. Percentage that stopped breastfeeding by age of child (among those that started but were no longer breastfeeding)**



### ***Factors Related to breastfeeding initiation***

Women with post-secondary education are more likely to have initiated breastfeeding than women with less education<sup>46</sup>. Women from a household with an income below \$15,000 per year<sup>47</sup> and women aged less than 25 years<sup>48</sup> are less likely to have initiated breastfeeding.

Women who smoked during pregnancy are less likely to have initiated breastfeeding than women who did not<sup>49</sup>. Similarly, women with a caffeine intake of more than 450 mg per day in pregnancy are less likely to have initiated breastfeeding<sup>50</sup>. Women who made a healthy change to their diet during pregnancy are more likely to have initiated breastfeeding<sup>51</sup>.

Women who attended prenatal classes are more than twice as likely to have initiated breastfeeding than

<sup>44</sup> 28/72 (34%) vs 54/244 (22%). Odds Ratio 2.24 (95% CI 1.22-4.10)

<sup>45</sup> 42/102 (41%) vs 41/215 (19%). Odds Ratio 2.97 (95% CI 1.70-5.20)

<sup>46</sup> 261/416 (63%) vs 120/384 (31%). Odds Ratio 3.70 (95% CI 2.70-5.00)

<sup>47</sup> 39/135 (29%) vs 323/598 (54%). Odds Ratio 0.35 (95% CI 0.22-0.53)

<sup>48</sup> 86/250 (34%) vs 294/547 (54%). Odds Ratio 0.45 (95% CI 0.33-0.62)

<sup>49</sup> 46/197 (23%) vs 334/599 (56%). Odds Ratio 0.24 (95% CI 0.16-0.36)

<sup>50</sup> 21/67 (31%) vs 355/727 (49%). Odds Ratio 0.48 (95% CI 0.27-0.85)

<sup>51</sup> 277/531 (52%) vs 106/270 (39%). Odds Ratio 1.69 (95% CI 1.24-2.31)

those who did not attend classes<sup>52</sup>. This relationship between attending prenatal classes remains after taking account of smoking and caffeine intake during pregnancy, education level of the women, and age of the women. Considering economic status, the relationship between attending prenatal classes and initiating breastfeeding is largely confined to women from households with an annual income above \$15,000 per year. Among women from lower income households, there is no relationship between attending prenatal classes and initiating breastfeeding. It is probable that encouragement and information about breastfeeding in prenatal classes does help support women's decision to breastfeed. Women from low income households are less influenced to breastfeed if they attend prenatal classes, presumably because there are other obstacles to breastfeeding that they experience.

Among those that breastfed, 56% (215/382) said that no one had influenced their decision about breastfeeding. Eleven percent (40) said they had mainly been influenced by their family doctor and 5% (18) by their community health nurse. Husbands were the main influence for 5% (17) while other family members were the main influence for 13% (48).

"I would never have thought of breastfeeding if I hadn't been to the Healthy Baby Club."

Focus group participant

In the focus groups, more awareness, information and support were seen as ways to encourage breastfeeding and support from families and professionals were seen as ways to help women breastfeed longer.

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<sup>52</sup> 145/237 (61%) vs 230/552 (42%). Odds Ratio 2.21 (95% CI 1.59-3.06)

## **DISCUSSION AND RECOMMENDATIONS**

The purpose of this project was to help fill in some of the gaps in existing regional information; information that is needed for more effective program planning. One of the challenges faced in the Region is how to increase use of prenatal services, especially prenatal classes. Another is ensuring that the focus of prenatal services is on the topics that need the most attention. Moreover, it is important that the current delivery of prenatal services is in line with the needs and preferences of the target population. Information that looks at preconception and postnatal issues is also relevant in addressing pregnancy outcomes.

As expected, the proportion of women who attend prenatal classes is low. In only 31% of pregnancies did women attend prenatal classes. Some of those who did not attend (21%) said they had attended in a previous pregnancy, suggesting that these women feel that repeating the classes would be of no benefit. Twelve percent were not aware that classes were available and 13% said that classes were not available in their community. One of the main challenges faced in many communities in delivering prenatal services is the low number of pregnancies. Additionally, there is a problem with awareness of services that many health professionals point out. In addition to increased awareness, health professionals indicate that more referrals to prenatal education services from various health professionals are needed. The family doctor in particular is often the main contact for pregnant women and would have opportunities to refer them to prenatal education services and to encourage them to attend.

**Recommendation 1:** Raise awareness of the availability of prenatal education through advertising.

**Recommendation 2:** Promote referrals to prenatal education services from health professionals that come into contact with women during pregnancy, particularly family doctors.

In particular, there is a lower likelihood of attending among women with lower income and lower education levels. Since this group are potentially 'at risk' more efforts need to be made to reach this group with prenatal classes or visits appropriate to their needs. Women from households with a lower income were more likely than women from higher income households to give that they were not aware of classes as their main reason for not attending prenatal classes. Not wanting or needing to attend was more likely to be cited by women with less education. Among both those that attended and those that did not attend prenatal classes, women without post-secondary education were more likely to say they preferred one-on-one classes. Among those that did not attend, women from households with lower income were also more likely to prefer one-on-one classes. This further suggests that women from lower income households and with less education are uncomfortable with the traditional prenatal education class format.

**Recommendation 3:** Examine different ways of promoting and delivering prenatal education to reach women with lower income and lower education.

Attendance at prenatal classes is associated with healthier behaviours during pregnancy but this may be because health-conscious women both adopt healthy behaviours and attend prenatal classes. These relationships are difficult to disentangle without a longitudinal study that obtained information from women before as well as during pregnancy. There is some evidence in this study that at least for smoking and taking supplements, that women who have healthier behaviours before pregnancy are more likely to attend prenatal classes.

In terms of health practices, one significant concern is that 25% of women smoked during pregnancy. Ways to encourage and support women to stop smoking are needed as well as increased awareness of the professional supports available to pregnant women who smoke. Information in prenatal classes, family doctor referrals, and community health nurse referrals, in addition to general public awareness campaigns- on the available professional supports could help facilitate women accessing these services.

**Recommendation 4:** Increase awareness of the risks of smoking during pregnancy among women prior to pregnancy as well as during pregnancy in prenatal education and other contacts with pregnant women.

**Recommendation 5:** Refer the issue of smoking and pregnancy to groups working in general smoking prevention activities.

**Recommendation 6:** Increase awareness of the availability of professional supports to help women who are pregnant quit smoking.

Another concern is the low number of women taking folic acid prior to pregnancy. Women who are younger, those with lower income, and those without post-secondary education are less likely to take folic acid both before and during pregnancy. The differences by age, economic status and education level are less marked for taking folic acid during pregnancy than for taking it before pregnancy, suggesting that advice from health professionals during pregnancy has an influence. This increase in use once women are aware their pregnant along with comments from women during focus groups indicate that awareness of the benefits is an important factor in whether women take folic acid. Other factors such as cost, might also play a role but were not explored in the present study.

**Recommendation 7:** Increase the awareness of the importance of folic acid both before and during pregnancy and especially target those who are less likely to take it: women who are younger, with lower incomes, and with lower education levels.

Breastfeeding rates are low in the Region; less than half of babies are ever started on breastfeeding. According to the Nutrition Committee of the Canadian Paediatric Society, breastfeeding rates have progressively increased from 38% in 1963 to as high as 87% in 1990. However, they indicated that the lowest breastfeeding rates were in Atlantic Canada, with the highest in British Columbia<sup>53</sup>.

In the *1994 Nova Scotia Infant Feeding Survey*, breastfeeding initiation rate was documented at 62.5%. For the Northern region of Nova Scotia the rate was 69% and for Eastern Nova Scotia, 49%. For Labrador, excluding most costal communities (except Black Tickle and Cartwright which were surveyed), the rate was 50%. Compared with these, Eastern Newfoundland has among the lowest breastfeeding rates in Canada. Moreover, among those who start breastfeeding, other liquids are added very early and breastfeeding is terminated altogether quite early.

Breastfeeding is less often initiated by women who smoked during pregnancy or had a high caffeine intake during pregnancy, and women who are younger, have lower incomes and have less education. Among women that start breastfeeding, those that are younger and those without a post-secondary education are more likely to stop within the first month. Programming to encourage breastfeeding needs to take these factors into account for appropriate targeting.

Attendance at prenatal classes is associated with a higher rate of breastfeeding, after taking account of the other factors related to breastfeeding. However, the effect of prenatal classes is not found among women from the lowest income households. The encouragement to breastfeed in prenatal classes does seem to influence women's choices after the birth. This is a reason for trying to ensure that more women attend prenatal classes.

**Recommendation 8:** Make promotion and support of breastfeeding in the Region a priority, taking into account the characteristics of those less likely to breastfeed.

In this study, the influence of risk behaviours prior to pregnancy and the socioeconomic determinants of health on health practices during pregnancy are evident.

**Recommendation 9:** Issues related to health and health practices in pregnancy should be addressed in the context of a more general approach to health promotion and the determinants of health among women of childbearing age.

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<sup>53</sup> Nutrition Committee, Canadian Paediatric Society. Breast-feeding - fifteen years of progress? *The Canadian Journal of Paediatrics* 1994; Vol. 1 (5): 156-159.