TEENAGE PREGNANCY IN NOVA SCOTIA COMMUNITIES: ASSOCIATIONS WITH CONTEXTUAL FACTORS

Donald B. Langille
Gordon Flowerdew
Pantelis Andreou
Department of Community Health and Epidemiology
Faculty of Medicine
Dalhousie University

ABSTRACT: This study used data from the Nova Scotia Department of Health (1995-2000) to better assess the distribution of teenage pregnancy in Nova Scotia communities and to identify community contextual factors associated with teenage pregnancy. Pregnancy events for those aged 15 to 19 were counted and population size in Nova Scotia communities was estimated. The cumulative probability of pregnancy (CPP) among 15- to 19-year-olds was calculated for each of one hundred and one separate communities. Enumeration area centroids were overlain on community boundaries and linked to community level data from the 1996 Canadian Census. CPP ranged from 0.01 to 0.39, indicating that some communities do well with respect to this health outcome, while others do not. Factors negatively associated with CPP were increasing level of education in communities, and proportions of those indicating a religious faith. Positive associations were seen with increased proportions of single parent families, proportion of population native or black, and the rate of female participation in the work place. Seventy-three per cent of the variance in CPP was explained by these factors. Socio-economic factors, and the social support, community norms and influence of parental control, which religious affiliation and family structure may represent, are important areas to pursue further to understand why these community differences occur.

Key words: Adolescent pregnancy Community context Ecological

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INTRODUCTION

ADOLESCENT PREGNANCY IN CANADA AND OTHER COUNTRIES

In 2000, the pregnancy rate for Canadian women aged 15-19 was 38.2/1000 (Statistics Canada, March 2004). This rate includes live births, spontaneous abortions presenting to hospital, therapeutic abortions performed in hospitals and government clinics (but not private abortion clinics), and stillbirths. In 1997, 21,233 Canadian women aged 15 to 19 had abortions, for the first time surpassing the number of live births (Dryburgh, 2000). A significant proportion (about 75%) of teenage pregnancies is unintended (Henshaw, 1998), and one review has estimated that 35,000 unintended teenage pregnancies occur annually in Canada (McKay & Bissell, 2000).

Over the past three decades there has been a decline in teenage pregnancies in developed countries. In 1970, twenty-nine industrialized countries had annual rates of births to teenagers of 35/1000 or more; there were only twelve such countries by 1995 (Singh & Darroch, 2000). With respect to Canada, McKay and Bissell (2000) determined that while Canada’s decline in rates of births to teenagers was 43% from 1970 to 1995, greater declines were observed in Australia (62%), France (75%) and Sweden (77%). Of the five developed countries with which Canada was compared, only the U.S. had less decline, while that of England was identical to Canada’s (McKay & Bissell, 2000). Despite these encouraging trends,
teenage pregnancy remains a significant concern. Adolescent pregnancy can lead to low birth weight, preterm delivery, and higher infant mortality, and social consequences for teenage mothers may include decreased educational and employment opportunities (The Social Exclusion Unit, 1999). The latter associations remain incompletely understood, however, in that it may be the case that since socially disadvantaged young women more often have such outcomes, the impact of early pregnancy on their life trajectories may not be as profound as might be intuitively expected (Geronimus, 2003; Spencer, 2001; Stevens-Simon & Lowy, 1995).

**Adolescent Pregnancy in Nova Scotia**

Nova Scotia is a small province on the east coast of Canada. It has a population of approximately 900,000, of whom the vast majority are of western European descent. The largest municipal area, Halifax Regional Municipality (population 360,000), is home to most government services and three of the province’s five universities. There are eighteen counties, each with a county seat of from five to thirty thousand. Unemployment is high by Canadian standards, and though the economy is diverse, there is strong reliance on resource-based industry. Many Nova Scotian adolescents have had sexual intercourse (Beazley, King, & Warren, 1988; Langille, Beazley, Shoveller, & Johnston, 1994; Poulin, 1998), and are similar in this respect to their counterparts in the rest of the country (Boyce, Doherty, Fortin, & MacKinnon, 2003). Adolescent pregnancy rates in Nova Scotia are slightly below the Canadian average; in 2000 31.5/1,000 Nova Scotia female adolescents became pregnant. Of teenage pregnancies occurring in Nova Scotia, over one-third are terminated by therapeutic abortion (Statistics Canada, March 2004). Teenage pregnancy rates in the province vary considerably by region. Rates are higher in the central and western areas of the province. They are lowest in the eastern mainland (Nova Scotia Department of Health, 1999). Such variation raises the need to consider what it is about communities that determines why some do well with respect to this health outcome, while others do poorly.

**Community Factors Associated With Teenage Pregnancy**

Analysis of community level factors is carried out in order to understand the association of contextual issues with health status, outcomes and behaviours. Underlying such approaches is the notion that, in addition to individual level characteristics, prevailing community factors create the conditions under which community members are able to engage in health-enhancing or health-limiting behaviours. At this level, the emphasis is placed on assumptions about the mechanisms at play at the contextual or community level, as opposed to the compositional, or individual one.

The compositional view of area differences holds that places are made up of individuals of differing types and that these individual differences explain differences within communities. Contextual explanations, on the other hand, rely on arguments emphasizing that features of the social and/or physical environment influence health and health behaviours either in addition to, or by interacting with, individual characteristics (MacIntyre & Ellaway, 2000). Community contextual factors are felt to provide a means of shaping knowledge and attitudes that provide a basis for adolescents’ choices with respect to their sexual behaviours. Such factors create opportunity structures which are associated with costs of sexual activity and provide community norms which define acceptable behaviours and outcomes (Billy, Brewster, & Grady, 1994). Our focus is on such contextual concerns in Nova Scotia communities. Understanding context will allow us to consider what it is about communities themselves which can be addressed to promote the sexual health of adolescents. Moreover, community level factors can provide insights as to what needs to be further explored at both individual and contextual levels in order to better explain sexual health outcomes.

**Socioeconomic Status**

Socio-economic status (Abrahamse, Morrison, & Waite, 1988; Barnett, Papini, & Gbur, 1991) and equity of income distribution (Corcoran, Franklin, & Bennett, 2000) are felt to contribute significantly to risk of teenage pregnancy. In urban Canadian settings, teenagers living in the poorest neighbourhoods have birth rates almost five times as high as those in the
richest (Ross, Scott, & Kelly, 1996). We postulated that where socio-economic conditions are more favourable in Nova Scotia communities, lower probabilities of teenage pregnancy would be observed. Socio-economic status varies widely in Nova Scotia; some areas of the province have unemployment rates of over twenty per cent, while the provincial mean is 11% (Statistics Canada, April 2004).

Education
Educational factors have been frequently examined in relationship to teenage pregnancy at the individual level. For example, educational aspiration and non-disruptive school behaviour have been shown in a longitudinal study in the U.S. to act as factors protective against teenage pregnancy (Hanson, Myers, & Ginsburg, 1987), and lack of school completion, poor school achievement and low educational aspiration have been demonstrated to be risk factors (Santelli & Beilensen, 1992). Parental, especially maternal, education, has been shown to have an impact on pregnancy in adolescents (Kirby, Coyle, & Gould, 2001; Manlove, Terry, Gitelson, Romano Papillo, & Russell, 2000). A recent review for the Health Education Authority in England found that the educational aspirations of teenagers had profound associations with teenage pregnancy (Cheesbrough, Ingham, & Massey, 1999). We hypothesized that lower community educational achievement would be, similar to other measures of SES, associated with higher rates of teenage pregnancy in Nova Scotia communities.

Family Structure
Family structure is associated with teenage pregnancy. Being in a dual-parent family has been demonstrated to be associated with later age of first intercourse and lower levels of sexual activity (Lammers, Ireland, Resnick, & Blum, 2000), and growing up in a single-parent family has been seen to be associated with increased risk of pregnancy as a teenager (Robbins, Kaplan, & Martin, 1985), though this relationship may be confounded by lower socio-economic status (McAnarney & Hendee, 1989; Singh & Darroch, 2000). In 1996 in Nova Scotia there were approximately 40,000 single-parent families; 15% of all families fell into this category (Statistics Canada, April 2004).

Religion
Religiosity and religious affiliation have been shown in population-based studies in New Zealand (Paul, Fitzjohn, Eberhart-Philips, Herbison, & Dickson, 2000) and the U.S. (Wallace & Forman, 1998) to have an impact on sexual risk-taking, including delayed onset and decreased levels of sexual activity. There is also evidence of decreased risk-taking of several types, including sexual risk-taking, in Canadian adolescents with religious affiliation (Galambos & Tilton-Weaver, 1998). About 88% of Nova Scotians indicate having a formal religious affiliation, the vast majority being Christian (Statistics Canada, April 2004). We hypothesized that higher levels of religious affiliation in communities will have an association with lower teenage pregnancy rates.

METHODS

CONCEPTUALIZING COMMUNITIES
We conceptualized communities in Nova Scotia as geographic areas representing distinct places where people live, work, attend school and socialize together. Our thinking was that most such communities in the province are compact and very often relatively isolated towns and villages with populations from about 500 to 10,000. Though there obviously are social strata in each of these communities, most are of such a size that that youth attend the same high school, have access to the same recreation and other facilities, attend the same churches, and are in general influenced by the same contextual factors, conditions which would not prevail in larger cities.

Halifax Regional Municipality (HRM) is the largest urban area in Nova Scotia, with a population of approximately 360,000. It is an older city, with a historic context and discernible neighbourhood areas. Communities within HRM were constructed following consultation with sociologists, historians, school officials and others with special knowledge of the municipality’s characteristics, so as to divide the city into areas felt to function as distinct neighbourhoods within the metropolitan region.

Town, village and HRM community names were used to query the Nova Scotia Geomatics Centre’s Municipality Boundary File. Enumeration Area centroids were overlain on the selected Municipal
boundaries, and where they fell within the community of interest they were assigned the community name. Finally, each enumeration area grouping was visually checked to ensure a logical match with its underlying Municipal boundaries. For HRM communities, a hard copy map of community “boundaries” was created. The nearest matching Statistics Canada Enumeration Area boundary was chosen to delineate these areas. In this way, one hundred and one community areas in Nova Scotia were selected for study.

**Community Level Factors Assessed**

Community level factors that we hypothesized would be associated with CPP were extracted from the 1996 Canadian Census and linked to the community geographies. We examined average household income, proportion of owner occupied housing, average dwelling value, female workplace participation, and proportions of households headed by single parents, with common law marriages and with religious affiliation. Education level variables included proportions of those with less than high school, high school, some post-secondary education, completed trades or other post-secondary education, and university education. Since the proportion of Black and Aboriginal Nova Scotians is low (about two percent and one and one-half percent respectively), and both groups have lower socioeconomic status (Statistics Canada, April 2004), we examined these as a combined variable, with the assumption that association of this variable with teenage pregnancy would represent an SES factor, rather than ethnicity per se.

**Cumulative Probability of Teenage Pregnancy**

The Cumulative Probability of Pregnancy (CPP) estimates the likelihood of a young woman’s becoming pregnant from her 15th birthday to the day before her 20th birthday. CPP represents a single, easily interpreted, age-independent summary measure of communities’ experiences with teen pregnancy. CPP was estimated using the number of first pregnancies in women aged 15 to 19 in the years 1995-2000. Age-specific first pregnancy rates ($P_i, i = 15, \ldots, 19$) were calculated by dividing the number of first pregnancies at each age by the number of person-years at this age. This age range was chosen because pregnancy in those younger than fifteen is uncommon, and because this is the age range used by policy makers and planners when discussing teenage pregnancy. The CPP is the sum of these components, $\text{CPP} = P_{15} + P_{16} + P_{17} + P_{18} + P_{19}$. Only first pregnancies were counted; further pregnancies were not included in the numerator for subsequent years, and each of these young women was also eliminated from the denominator. Correlations between community level variables and CPP were calculated, and these factors were entered into a linear regression model with CCP as the dependent variable. A weighting variable was included in the model to account for effects introduced by community size. Where there were concerns about potential multicollinearity due to correlation of variables in our model, the variance inflation factor was assessed to provide assurance that this phenomenon was not affecting the results. Significance levels to enter and remain in the model were set at .05 and .15 respectively.
RESULTS

CPP varied greatly within the province, from 0.01 to 0.39, indicating a wide range of experience with this outcome in various communities (Figure 1). Nine communities had a CPP of 0.01 to 0.05 - remarkably few young women residing in these places experienced this outcome over the years of the study. On the other hand, twelve communities were found to have a CPP of more than 0.21, meaning that a very high probability of teenage pregnancy exists in these particular locations.

Table 1 shows average values of contextual factors for the 101 communities studied, and Table 2 correlations between CPP and these factors. Communities ranged in population size from 426 to 25,000, with a mean of 4865.1 (SD 5061.5). Median total community size was 3809. Note that for consideration of education level in Table 2, we created a weighted average of the proportions with different education levels in the community as indicated at the bottom of the table. Significant negative correlations were observed with higher: (i) average 1995 household income, (ii) proportions of the persons owning their own homes and, (iii) proportions of persons with a religious affiliation. Positive correlations with CPP were seen with (i) mean community size, (ii) proportions of population Native or Black, (iii) proportion of single parent families and, (iv) proportions of common law marriages. Of all the correlations demonstrated, that for proportion of single parent families was strongest (0.62).

When the community contextual variables were entered into the regression model, seventy-three percent of the variance in CPP was explained by five variables (Table 3). Significant negative associations were seen with higher community education level and higher proportions with religious affiliation, while positive associations existed for higher proportions of single parent families, female labour force participation and those of Native or Black ethnicity. Average household income, weakly correlated in the bivariate correlation, was not significant in the multiple regression model. Of these factors, as was seen in the correlations described above, the community proportion of single-parent families was most strongly associated with CPP ($t = 10.15$).

* CPP range is rounded to two decimal places.
DISCUSSION

We used the Cumulative Probability of Pregnancy (CPP) to determine the likelihood of a young woman becoming pregnant from her 15th birthday to the day before her 20th birthday in 101 communities in Nova Scotia. CPP represents a single, easily interpreted, age-independent summary measure of communities’ experiences with teen pregnancy. CPP ranged from 0.01 to 0.39 in one hundred and one communities, indicating considerable variability in this health outcome. Five community level factors explained 73% of the variance in CPP within Nova Scotia communities. Communities with higher levels of experience with teenage pregnancy are characterized by single parent family structure, lower SES (decreased education level and higher proportions of Blacks or Natives in the population), higher levels of female labour force participation, and lower levels of religious affiliation.

The strongest association of community level factors with CPP was with proportion of single parent families. This association is consistent with established literature. In northern Nova Scotia, living with a single mother increases risk of having intercourse before

<table>
<thead>
<tr>
<th>Factor</th>
<th>Mean Value</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean community size (SD)</td>
<td>4865.1</td>
<td>5061.5</td>
</tr>
<tr>
<td>Average household income, 1995 ($)</td>
<td>39,770.00</td>
<td>10,701.00</td>
</tr>
<tr>
<td>Education level (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Without high school certificate</td>
<td>36.1</td>
<td>11.3</td>
</tr>
<tr>
<td>With high school certificate</td>
<td>10.0</td>
<td>2.8</td>
</tr>
<tr>
<td>Some post-secondary (incomplete)</td>
<td>19.4</td>
<td>6.7</td>
</tr>
<tr>
<td>With post-secondary certificate</td>
<td>22.2</td>
<td>5.6</td>
</tr>
<tr>
<td>Completed university</td>
<td>12.4</td>
<td>10.1</td>
</tr>
<tr>
<td>Proportion owner occupied housing</td>
<td>67.4</td>
<td>17.0</td>
</tr>
<tr>
<td>Average value of dwellings ($)</td>
<td>87,045.00</td>
<td>31,891.00</td>
</tr>
<tr>
<td>Rate of female participating in work force (%)</td>
<td>51.9</td>
<td>10.3</td>
</tr>
<tr>
<td>Proportion of families headed by single parent</td>
<td>16.7</td>
<td>6.7</td>
</tr>
<tr>
<td>Proportion of common law marriages</td>
<td>12.0</td>
<td>6.3</td>
</tr>
<tr>
<td>Proportion of population native or black</td>
<td>2.3</td>
<td>1.8</td>
</tr>
<tr>
<td>Proportion with religious affiliation</td>
<td>92.4</td>
<td>4.6</td>
</tr>
</tbody>
</table>

Table 2 Correlations of Community Level Variables With CPP (N=101)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pearson Correlation Coefficient</th>
<th>p-value*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community size</td>
<td>0.33</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Average household income, 1995</td>
<td>-0.23</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Education level**</td>
<td>-0.05</td>
<td>NS</td>
</tr>
<tr>
<td>Proportion owner occupied housing</td>
<td>-0.43</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Average value of dwellings</td>
<td>-0.17</td>
<td>NS</td>
</tr>
<tr>
<td>Rate of female participating in work force (%)</td>
<td>0.04</td>
<td>NS</td>
</tr>
<tr>
<td>Proportion of families headed by single parent</td>
<td>0.62</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Proportion of common law marriages</td>
<td>0.27</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Proportion of population native or black</td>
<td>0.32</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Proportion with religious affiliation</td>
<td>-0.29</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>

* NS = not significant (p>0.05)
** Average education level was determined using a weighted average of the proportions with different education levels in the community, a weight of 1 for the proportion of persons who did not complete high school, 2 for the proportion of persons who completed high school but had no post-secondary education, ..., 5 for the proportion who obtained a university degree.
In the U.S., multiple studies have shown that living in a two-parent family is associated with adolescents’ never having had intercourse (Miller, Benson, & Galbraith, 2000). In Britain pregnant teenagers are more likely to have a mother who had a teenage pregnancy than are non-pregnant teenagers and the daughters of teenage mothers are more likely to continue their own pregnancies (Seamark & Pereira Gray, 1997). Similar results have been seen in a longitudinal Finnish study in which young women who did not live with both parents at the baseline survey had higher pregnancy risk than those who did (Vikat, Rimpela, Kosunen, & Rimpela, 2002).

Operative factors may be of several types. Children of single mothers may come to perceive, as they grow up in single mother households, that such roles are acceptable and desirable (McLanahan, 1988). Lack of social control in one-parent families may also be explanatory; two-parent families may be able to offer greater supervision whereas one-parent families may be less able to exert the control necessary to prevent outcomes such as adolescent pregnancy (Hogan & Kitagawa, 1985; Thompson, McLanahan, & Curtin, 1992). Exploring these theories and one which included the effects of response to stresses due to unstable family structure, Wu and Martin (1993), using data from the 1988 National Survey of Families and Households, found more support for association of a first premarital birth with the latter than for either of the former two hypotheses. More permissive sexual attitudes of single or divorced parents has also been suggested as an influence (Thornton & Camburn, 1987), as has the lack of paternal guidance (Robbins, Kaplan, & Martin, 1985). Enhancement of support for single-parent families may be part of the solution to teenage pregnancy.

Higher levels of education in communities was associated with lower levels of teenage pregnancy. Education, especially maternal education, has an impact on pregnancy in adolescents. Studies in the U.S. have shown that female teenagers whose mothers did not graduate from high school are more likely to give birth in their adolescent years than those whose mothers did finish high school (Manlove et al., 2000; Moore, Driscoll, & Lindberg, 1998; Roosa, Jenn-Yun, Reinholtz, & Angelini, 1997). In an ecological study, Kirby et al. (2001) demonstrated strong and consistent negative associations between community levels of college education and teenage birth rates in California. Lower educational attainment in communities indicates lower socio-economic status (Becker, 1962), and lower socio-economic status is felt to contribute significantly to risk of teenage pregnancy (Barnett et al., 1991; Cheesbrough et al., 1999; Nova Scotia Department of Health, 1999).

The association of higher CPP with communities with higher proportions of Black and Aboriginal population calls for interpretation similar to that for education. It should be kept in mind that the data, because they are not individualized, do not tell us that it is necessarily Black or Aboriginal teenagers who are becoming pregnant more frequently. When it is considered that the highest total proportion of Black and Native population in the communities examined was nine per cent, and that in the community with the highest CPP (39%), the ethnic population was eight per cent, this finding is very likely related to prevailing social and economic conditions, and not to ethnicity per se. This interpretation is compatible with the view that SES, rather than race, is a driving factor for teenage pregnancy in the United States (Corcoran, 1999). At the individual level, lower socio-economic status affects the degree of control people have over their

### Table 3

<table>
<thead>
<tr>
<th>Variable</th>
<th>Parameter Estimate</th>
<th>95% CI</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education level</td>
<td>-0.041</td>
<td>-0.062, -0.021</td>
<td>-4.04</td>
<td>0.0001</td>
</tr>
<tr>
<td>Proportion black or native</td>
<td>1.150</td>
<td>0.562, 1.739</td>
<td>3.88</td>
<td>0.0002</td>
</tr>
<tr>
<td>Proportion of single parent families</td>
<td>0.679</td>
<td>0.546, 0.812</td>
<td>10.15</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Proportion with religious affiliation</td>
<td>-0.547</td>
<td>-0.788, -0.306</td>
<td>-4.51</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Rate of female labour force participation</td>
<td>0.225</td>
<td>0.117, 0.333</td>
<td>4.13</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>
lives, including power within relationships, access to health care and ability to afford contraception (Health Canada, 1998). At the community level, the mechanism for this association may involve a lack of sanction on teenage pregnancy within poorer communities (Murry, 1992), especially where more acceptable methods of attaining adult status are not readily available (Jones, Darroch, Forrest, & Goldman, 1985). Poorer communities may have social environments in which apathy and fatalism prevail; adolescents in these communities may see fewer reasons to plan for the future, and the costs of such outcomes as teenage pregnancy may be perceived as lower (Wilson, 1987). Increasing employment and economic opportunity in Nova Scotia communities would appear to be part of the community response needed to address the problem of teenage pregnancy.

CPP’s association with female labour force participation is of note. Not much has been written about maternal employment and adolescent sexual activity or sexual health outcomes. A very small study completed in 1981 in the U.S. found that where females attending college indicated their mothers had been employed during their teenage years, they had sexual intercourse earlier, and expressed less concern about the possibility of pregnancy than those whose mothers were not employed (Hansson, O’Connor, Jones, & Blocker, 1981). Ku, Sonenstein, and Pleck (1993) found that adolescent males whose mothers had been employed during their childhood were more likely to have had intercourse than those whose mothers had not worked. We found that in Nova Scotia, mother’s working was associated with increased adolescent risk taking, including early intercourse (Langille et al., 2003). Such relationships might be explained by decreased parental supervision, which in adolescents has been shown to be associated with increased substance use (Richardson, Radziszewskia, Dent, & Flay, 1993). Studies of junior and senior high school students in the U.S. have found that parental monitoring is associated with decreased sexual activity, but that this effect was moderated by maternal employment (Jacobsen & Crockett, 2000; Small & Luster, 1994). Billy et al. (1994), examining data from the 1982 National Survey of Family Growth in the U.S., found a positive association of adolescents’ having had intercourse with the proportion of women employed full time, suggesting that this was most likely due to lack of supervision. Studies in New Brunswick and British Columbia, Canada, have shown that where women on welfare were offered and accepted employment, their adolescent children’s substance use behaviours increased (Morris & Miahalopoulos, 2000). While today’s economy very often requires that both parents be employed, our findings add weight to the importance of carefully considering whether approaches such as “workfare” help to address complex socioeconomic problems and particularly those faced by single parents.

Youth with lower degrees of religious affiliation may have increased levels of sexual risk-taking. A study in New Zealand found strong associations between involvement with religious activities and not having intercourse by age 21 for both genders (Paul et al., 2000). Using the same cohort, Paul et al. found lack of religious affiliation at age 11 predicted having sex before age 16 for males, but not females (Paul, Fitzjohn, Herbison, & Dickson, 2000). American studies also indicate that decreased sexual risk-taking occurs among more religious youth (Lammers et al., 2000; Wallace & Forman, 1998). Galambos and Tilton-Weaver (1998), using data from the Canadian 1994-95 National Population Health Survey, found that regular church attendance was negatively associated with risk behaviours, including sexual risk-taking. We have demonstrated in other work that in female adolescents in northern Nova Scotia communities, regular church attendance is associated with later onset of sexual activity (Langille & Curtis, 2002). These studies generally ask questions of individuals about the extent of their church going and the level of personal importance they attach to religion. Within communities with high levels of religiosity (as measured here by proportions declaring themselves to have a religious faith of any sort), such relationships may be explained by the creation of social ties and support, and enhancement of self-efficacy, all factors which may lead to delayed sexual activity (Ellison & Levin, 1998). Smith argues that religious activity in communities provides community standards with which adolescents are able to gauge the appropriateness of their decisions and actions (Smith, 2003). Such influences could be mediated through general community social norms and values, which have been shown in research in the U.S. to affect
young women’s decisions to become sexually active and to use contraception (Brewster, Billy, & Grady, 1993). It is felt by one prominent expert that to be successful, pregnancy prevention programs should be broad, and include parents and community generally (Kirby, 1997).

It is not surprising that experience with adolescent pregnancy varies within communities; adolescent pregnancy rates vary by province in Canada (McKay & Bissell, 2000), and rate variation is seen in different regions of Toronto (Hardwick & Patychuk, 1999). What is of interest in our study in Nova Scotia is that some communities do extremely well with respect to this outcome and others extremely poorly, and that the magnitude of difference between communities is greater here than is seen in other studies examining geography in relationship to teenage pregnancy. Hardwick and Patychuk (1999) found a birth rate for those aged 15 to 19 four times higher in the lowest income quintile of Toronto compared with the highest for the years 1995-1996. In Scotland, pregnancy rates for 1991-1995 for adolescents were approximately twice as great in least affluent areas compared with most affluent (McLeod, 2001). A study in England demonstrated a two-fold difference in pregnancy rates between the highest and lowest Regional Health Authorities (Clements, Stone, Diamon, & Ingham, 1998); while data from a region of Scotland from 1980-1990 found a six-fold difference in pregnancy rates between most deprived and most affluent areas (Smith, 1993). These studies show less magnitude of variation in teenage pregnancy than does ours, possibly because they do not represent communities as distinct places, with all their inherent complexity and uniqueness, but geographic areas as represented by postal codes or administrative regions.

Our study has limitations. Citizens of Nova Scotia are provided with a medical insurance number which is renewed every three years, and it is through this number (encrypted for research purposes) that pregnancies are counted and population size estimates are made. It is possible that some young women move (for example to obtain employment or attend school) and subsequently become pregnant and, retaining their old registration, are counted as having a pregnancy in the community of origin. We are not able to estimate the extent of this phenomenon, but feel it is not common, since most pregnancies result in deliveries, and deliveries in 19-year-olds would in many instances mean conception at 18, a time when most young women are still in high school. It also may be that after adjustment for individual level factors there will be a modified, or perhaps even no, relationship of the variables here seen to be ecologically associated with teenage pregnancy. This is unlikely, however, given that our findings are compatible with studies done at the individual level. Related to this, we should emphasize that, in any case, the ecological level variables explored here are not meant to be proxies for individual ones. These associations characterize communities with higher and lower experiences of teenage pregnancy. These data show that in Nova Scotia, just as individuals who have lower socio-economic status suffer disproportionally from many causes of morbidity and mortality (Kephart, Thomas, & MacLean, 1998), there are also associations of teenage pregnancy with community disadvantage. Examining context is appropriate when it is the potential impact of context which is of concern (MacIntyre & Ellaway, 2000), and these ecological results have implications for health services planning—scarce resources for prevention of teenage pregnancy are especially needed in poorer Nova Scotia communities. They also indicate that enhancing levels of education and economic well-being of communities and supporting families could help even further reduce this avoidable and often negative health outcome in adolescents.

Our findings allow us to understand what it is about the nature of Nova Scotia communities which makes them differ from each other with respect to experience with teenage pregnancy. Factors found to be important at the ecological level also provide a framework from which to begin to ask questions about their underlying meanings. In addition to exploring at the individual level the types of explanations provided by ecological associations, consideration of issues such as access to contraception, the availability of sexual health education, and sexual behaviours (including contraceptive behaviours) should be undertaken (Corcoran, 1999). The robustness of our ecological model provides a tool with which to explore communities further at both the contextual and individual levels. Communities with similar predicted CPP, but very different calculated CPP, will make
The ideal sites in which to explore these factors, and answer the question, “Why do some communities do well with respect to teenage pregnancy, and others do not?”

References


