What is the financial state of medical students from rural backgrounds during tuition fee deregulation?

**Introduction**: We sought to examine the financial state of medical students from rural backgrounds during a time of tuition fee deregulation.

**Methods**: We surveyed incoming classes from 2007 to 2011 at the University of Calgary. Community background, expected educational debt at graduation, educational debt at entry to medical school and parental income were collected for analysis. Data were analyzed using the $\chi^2$ test, analysis of variance and the Newman–Keuls multiple comparison test.

**Results**: The overall response rate was 95.3%. Of the 571 (93.5%) respondents who supplied data on their background and debt, 94.4% expected to have educational debt at graduation. The mean projected educational debt at graduation by medical students from both rural ($107,226 [95% confidence interval (CI) $98,030–$116,423]$) and regional ($99,456 [95% CI $91,905–$107,006]$) backgrounds was significantly greater than the debt projected by students from metropolitan ($88,565 [95% CI $85,607–$93,524]$) backgrounds. Medical students who came from rural backgrounds had the highest mean debt at entry to medical school ($33,053 [95% CI $25,715–$40,391]$) compared with their peers from regional ($23,253 [95% CI $16,621–$29,885]$) and metropolitan ($22,053 [95% CI $17,344–$26,762]$) backgrounds. Students of rural origin also had parents whose mean income ($104,024 [95% CI $75,976–$132,173]$) was significantly lower than the mean parental income of their peers who originated from regional ($143,167 [95% CI $119,898–$166,435]$) and metropolitan ($150,339 [95% CI $135,241–$165,438]$) centres.

**Conclusion**: Rising tuition and subsequent debt may be affecting the diversity of medical students’ backgrounds. Financial programs dedicated to rural-background students and their interest in medicine may become necessary.

Original Article

**Introduction** : Nous voulions étudier la situation financière des étudiants en médecine provenant de milieux ruraux en période de déréglementation des frais de scolarité.


**Résultats** : Le taux global de réponse s’est établi à 95,3 %. Sur les 571 répondants (93,5 %) qui ont fourni des données au sujet de leur origine et de leur dette, 94,4 % s’attendaient à avoir une dette d’études au moment de la graduation. La dette d’études moyenne, au moment de la graduation, des étudiants en médecine originaires des milieux ruraux (107 226 $ [intervalle de confiance à 95 % (IC), 98 030 $–116 423 $]) et régionaux (99 456 $ [IC à 95 %, 91 905 $–107 006 $]) était significativement plus élevée que la dette que les étudiants des régions métropolitaines prévoyaient avoir (88 565 $ [IC à 95 %, 83 607 $–93 524 $]). Les étudiants en médecine provenant de
INTRODUCTION

The concern about insufficient numbers of rural physicians across Canada has been well-documented.1–6 It has been shown that medical students from rural backgrounds are more likely to eventually practise in rural communities.3,7–10 However, the proportion of students with rural backgrounds who apply to medical school is not reflective of the population that resides in rural Canada.11,12 Getting more students from rural communities to apply to medical school has been a significant challenge. This is unfortunate because recent evidence suggests that once students of rural origin apply to medical school, they are as successful in gaining entry as other candidates.13,14

Across Canada, tuition fees for medical school have been on the rise. Although rising tuition fees have had an impact on the debt projected by first-year medical students in Ontario,15 research surrounding the financial challenges faced by medical students from rural backgrounds is limited. In a study including students from 12 Canadian medical schools, Kwong and colleagues12 found that a greater proportion of students from rural backgrounds not only came from families of lower socio-economic status (parental income < $40,000) than their nonrural peers, but also entered medical school with debt and anticipated having debt at graduation. That study, however, which included students from the University of Calgary, was conducted in 2001 and before the wave of deregulation of tuition fees that swept across universities in western Canada. For example, the final year of tuition-fee control at the University of Calgary was in 2002 (class of 2005) when medical school tuition was $6992. Following the deregulation of tuition fees in 2003, fees increased to $9950 (class of 2006), then to $12,788 (classes of 2007, 2008 and 2009) and $13,210 (classes of 2010 and 2011).

The primary aim of this study was to examine the projected educational debt at graduation of rural-background medical students during the time of tuition fee deregulation. We also investigated the educational debt at entry to medical school of rural-background medical students and how the socio-economic status of their parents compared with that of their nonrural peers.

METHOD

Incoming students (classes 2006–2011) to the 3-year medical program at the University of Calgary were surveyed using a paper–pencil questionnaire during orientation week, which occurs during the first week of medical school. All medical students registered in the respective incoming classes were eligible to complete the survey. Students were assured during the orientation that participation was voluntary and that the decision to participate or not participate would not affect their academic standing. To maintain confidentiality, a code number was assigned to each questionnaire. Students’ decision to complete the questionnaire was accepted as indication of consent and willingness to participate.

To focus on financial measures collected during the time of greatest impact, data provided by the class of 2006 was not included, as these students didn’t experience the full effect of tuition fee deregulation and were likely in the application pipeline when the deregulation was initiated. Data provided by international students were also excluded. Consequently, study participants in the group affected by tuition fee deregulation consisted of classes 2007–2011.

Demographic information collected included sex, age and community background. Financial information collected included projected educational debt at graduation, educational debt at entry and parental...
intended for this study. Educational debt was defined as “debt incurred due to educational costs that must be paid back.” Student background designation was based on the population of the community where the student was primarily raised (rural < 10 000, regional 10 000–200 000, metropolitan > 200 000). In the analysis, financial figures were treated as interval data to better understand the magnitude of both educational debt and parental income. Data were analyzed using the χ² test, analysis of variance and the Newman–Keuls multiple comparison test.

The Conjoint Health Research Ethics Board at the University of Calgary granted ethical approval for this study.

RESULTS

Of the 582 (95.3%) medical students who returned a survey, 94, 145 and 344 students reported rural, regional and metropolitan backgrounds, respectively. One female student did not report the background in which she was primarily raised. The 3 groups varied slightly in the proportion of female students: rural (57.5%), regional (50.4%) and metropolitan (52.3%) (p > 0.05). The mean age of students from both rural (25.4 [standard deviation (SD) 4.5] yr) and regional (25.3 [SD 3.6] yr) backgrounds was significantly greater than the mean age of students from metropolitan (24.2 [SD 3.5] yr) backgrounds (p < 0.05).

Complete information on community background and expected educational debt at graduation was provided by 571 (93.5%) respondents. Nearly all (n = 539, 94.4%) of these students expected to have educational debt at graduation (97.9% rural, 97.1% regional, 92.3% metropolitan; p > 0.05). Using data supplied by the students who expected to have educational debt at graduation, a one-way (community background) analysis of variance on projected educational debt at graduation revealed significant differences (F = 7.29, p < 0.001). The mean projected educational debt at graduation (Table 1) was significantly greater for rural- and regional-background medical students compared with metropolitan-background medical students.

Of the 577 (94.4%) respondents who provided complete information about their background and educational debt at entry, 228 (39.5%) were in debt on entry to medical school. The proportion of rural-background medical students with educational debt at entry (52.1%) was significantly greater than the proportion of metropolitan-background medical students with educational debt at entry (54.8%) (p < 0.05). The proportion of regional-background medical students with educational debt at entry (42.6%) did not differ from their peers. Using data provided by 228 respondents with educational debt at entry, a one-way (community background) analysis of variance revealed significant differences (F = 3.22, p < 0.05). Rural-background medical students had significantly greater educational debt at entry than medical students from both regional and metropolitan backgrounds (Table 2).

A separate one-way (community background) analysis of variance on parental income using data provided by 487 (79.9%) respondents was significant (F = 4.09, p < 0.02). Mean parental income (Table 3) reported by students from regional and metropolitan backgrounds was significantly greater than parental income reported by students from rural backgrounds.

Of note, the median total family income of Albertans was $78 400 in 2006, which is when the class of 2009 began, and is the midpoint of our 5-class cohort. When reviewing parental income, 32% of respondents in this study originated from families whose income was below the provincial median.

<p>| Table 1. Mean projected educational debt at graduation of 539 medical students, by community background |</p>
<table>
<thead>
<tr>
<th>Community background</th>
<th>Projected debt, $</th>
<th>95% CI, $</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural, n = 91</td>
<td>107 226</td>
<td>98 030–116 423</td>
</tr>
<tr>
<td>Regional, n = 135</td>
<td>99 456</td>
<td>91 905–107 006</td>
</tr>
<tr>
<td>Metropolitan, n = 313</td>
<td>88 565</td>
<td>83 607–93 524</td>
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<tr>
<td>CI = confidence interval.</td>
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<p>| Table 2. Mean educational debt of 228 students at entry to medical school, by community background |</p>
<table>
<thead>
<tr>
<th>Community background</th>
<th>Debt at entry, $</th>
<th>95% CI, $</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural, n = 49</td>
<td>33 053</td>
<td>25 715–40 391</td>
</tr>
<tr>
<td>Regional, n = 60</td>
<td>23 253</td>
<td>16 621–29 885</td>
</tr>
<tr>
<td>Metropolitan, n = 119</td>
<td>22 053</td>
<td>17 344–26 762</td>
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<td>CI = confidence interval.</td>
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<p>| Table 3. Mean income of the parents of 487 medical students, by community background |</p>
<table>
<thead>
<tr>
<th>Community background</th>
<th>Parental income, $</th>
<th>95% CI, $</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rural, n = 82</td>
<td>104 024</td>
<td>75 976–132 173</td>
</tr>
<tr>
<td>Regional, n = 120</td>
<td>143 167</td>
<td>119 898–166 435</td>
</tr>
<tr>
<td>Metropolitan, n = 285</td>
<td>150 339</td>
<td>135 241–165 438</td>
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<td>CI = confidence interval.</td>
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DISCUSSION

Medical students from rural backgrounds projected high educational debt at graduation, and the income of their parents was the lowest of the 3 groups studied. Not only did a greater proportion of medical students from rural backgrounds report educational debt at entry compared with those from metropolitan backgrounds, but medical students from rural backgrounds also displayed the highest educational debt at entry of all groups. Living away from home to attain medical school entry requirements is probably the main reason why rural-background medical students have the highest educational debt at entry. Interestingly, medical students from both rural and regional backgrounds were significantly older at entry to medical school than their peers from metropolitan backgrounds. This may suggest that it takes students from nonmetropolitan backgrounds longer to attain medical school entry requirements and the finances to proceed with medical training.

Rising tuition may not only serve as a deterrent to qualified candidates, but also may limit the diversity (i.e., background) of medical students, which ultimately has implications for the profession’s ability to understand and solve major health issues. In particular, 32% of respondents in this study reported parental income below the provincial median, suggesting that most students in this study originated from families of higher socio-economic status. As tuition fees rise, a threshold may eventually be reached whereby some students may consider the financial realities of entering medical school to be overwhelming. It is reasonable to presume that for students of lower income families, this may have already occurred. Rising tuition may be especially detrimental to students from rural backgrounds, as financial support from parents may not be as readily available to these students as it is to their nonrural peers. With regard to exit from medical school, the level of perceived debt may also prove to be a disincentive for some potential applicants. However, the actual amount of debt that may dissuade students from applying to medical school remains somewhat elusive. This may be due, in part, to tuition fee increases that, so far, have had limited impact on higher income families.

Of particular note is that the mean projected educational debt at graduation of rural-background medical students is above $100,000. Earlier research found that the impact of financial stress on career-related decisions will change as debt soars is an important question and worthy of future study.

Limitations

These results reflect the financial state of students at one medical school and therefore may not generalize to students attending other schools across Canada. For example, the medical program at the University of Calgary is 3 years in duration. Medical students training in other programs, which are typically 4 years in length, will presumably assume larger debt by the time they graduate. On the other hand, students in a 4-year medical program have much more vacation time than students in a 3-year program, which allows them to earn income to cover the cost of attending medical school. How these factors interact to have an impact on educational debt of medical students training in programs of different duration is unknown.

It is also possible that students from lower income families tend to select 3-year medical programs. Examining the proportion of students from families whose income is below the median and who are attending other Canadian medical schools would clarify this and whether the projected debt reported in this study was inflated because of the students (32%) from lower income families.

Although students from rural backgrounds reported greater debt, gaining insight into the reasons for their indebtedness was beyond the scope of this study. Reported debt at graduation reflected a projected or anticipated debt that may prove to be somewhat inaccurate at the time of graduation. Additionally, several students did not report parental income, presumably because they did not know the information. This reduced the number of participants in the analysis of parental socio-economic status. It is possible that students who did not report parental income represented a particular socio-economic group (upper or lower) and simply chose not to disclose the information, thereby biasing the results. On the other hand, those who did report parental income may have done so without truly knowing the income of their parents. That is, the income they reported may be an approximation.

CONCLUSION

The anticipated educational debt at graduation of medical students from rural backgrounds, who
come from families less affluent than those of their peers, remains high. As tuition fees increase, financial programs to support rural-background students and their interest in medicine may become necessary. In fact, several strategies to assist students from rural backgrounds have been proposed.1 There is an urgent need for rural general practitioners and it is therefore important that the financial state of rural-background students maintain a prominent position on the rural human resources radar screen.

REFERENCES