

Special issue with *Education for Health*

ORIGINAL RESEARCH

Advances in rural medical education in three countries: Canada, The United States and Australia

G Tesson¹, V Curran², RW Pong¹, R Strasser³

¹Centre for Rural and Northern Health Research, Laurentian University, Sudbury, Ontario, Canada.

²Faculty of Medicine, Memorial University of Newfoundland,.

³Northern Ontario School of Medicine, Laurentian University, Lakehead University, Canada

Submitted: 18 November 2004; **Resubmitted:** 25 April 2005; **Published:** 11 November 2005

Tesson G, Curran V, Pong RW, Strasser R

Advances in rural medical education in three countries: Canada, The United States and Australia
Rural and Remote Health 5: 397. (Online), 2005

Available from: <http://rrh.deakin.edu.au>

A B S T R A C T

Introduction: This article documents a number of rural medical education initiatives in Australia, Canada and the United States. A typology is created reflecting the centrality the rural mandate and characterizing different features of each school's program. Interviews with school officials are drawn on to reflect the challenges these schools face.

Method: Seven schools noted for their rural programs were selected from the three countries and interviews were conducted with senior officials. The interview data was supplemented by published material on the schools.

Results: The Typology: Three kinds of school are distinguished: *Mixed Urban/Rural Schools* (University of Washington, US, the University of British Columbia, Canada, and Flinders University, Australia); *DeFacto Rural Schools* (University of New Mexico, US, and Memorial University, Canada) and *Stand Alone Rural Schools* (James Cook University, Australia and the Northern Ontario School of Medicine, Canada). The Pipeline Approach: All of the schools adopted in varying degrees a pipeline approach to meeting the need for rural doctors focusing on: (a) early recruitment; (b) admissions; (c) locating clinical education in rural settings; (d) rural health focus to curriculum; and (e) support for rural practice.

Conclusion: The analysis does not strongly favor one model over others, although the Stand-Alone Rural schools had more opportunities to adopt innovative curricula reflecting rural health issues and to foster positive views of rural practice. Government funding targeting rural health needs will remain critical in the development of all these programs.



Key words: medical curriculum, medical education, rural health, rural recruitment.

Introduction

A number of medical school initiatives in recent years have been designed to make medical education more oriented to medical practice in rural environments. Their aim has been to produce more medical graduates willing and able to practice medicine in rural and remote areas and eventually lead towards long-term solutions to chronic problems of recruitment and retention of doctors in regions with widely dispersed populations.

This article documents a selected number of such initiatives in three countries: Canada, the United States and Australia. One important task has been to examine how the rural mandate fits within the overall mandate, the policies and practices and the curricula of the different schools. To this end, a typology of rural schools has been developed to capture such differences with an aim to understand their impact on their respective medical education programs. A second task was to reflect on the preoccupations of the academic leaders of innovative rural schools as a means of assessing where the weaknesses and strengths of these programs lie. The main focus of the article is on undergraduate medical education, although some reference is made to post-graduate residency training.

Method

Schools noted for the rural thrust to their programs were selected in each of the three countries. The intent was to choose representative examples of different approaches to rural medical education, rather than making some prior judgment as to their level of success. Interviews were conducted with officials designated as having responsibility for the rural component of each school's program. An open-ended interview process was used focusing on the respondents' perceptions of the strengths and weaknesses of

their programs, and on their preoccupations with the challenges they face in meeting their rural mandate. This study is based on an analysis of 31 interviews carried out across the seven schools. The interview data were supplemented by published material on the schools and programs studied.

Results

Typology of schools

The schools break down into different types according to the extent to which their mandate may be defined as rural. *Mixed Urban/Rural Schools* are historically urban based schools which have expanded their mandate to address the needs of specific rural and remote jurisdictions with which they have developed relationships (Table 1). The examples chosen here are the University of Washington WWAMI program in the US, the expansion of the University of British Columbia program in Vancouver, Canada (UBC) and the Flinders University program in Adelaide, South Australia. *DeFacto Rural Schools* are schools with a mandate to serve geographic regions (province or state) with substantial rural populations, but they do not necessarily define their role as rural (Table 2). The examples used here are the University of New Mexico (UNM) in the US and Memorial University of Newfoundland in Newfoundland and Labrador, Canada. *Stand Alone Rural Schools* are new schools specifically created to meet the needs of defined rural and remote regions, the examples being James Cook University (JCU) in Queensland, Australia and the Northern Ontario School of Medicine (NOSM) in Canada (Table 3). The tables outline the basic structure, admissions policy and level of rural exposure of students for each of the different schools.



Table 1: Structure of mixed urban/rural schools

School/basic structure	Admissions procedures	Rural exposure
<p>Canada - University of British Columbia, Vancouver, in collaboration with University of Victoria - University of Northern British Columbia. This expansion of UBC program, starting 2004, aims to meet the physician needs of urban, rural and remote communities throughout the province.</p>	<p>In addition to the 128 students admitted to the main Vancouver campus, 3 new streams created for 2004: 1) Vancouver/Fraser 48 students (non-rural) 2) Island Site -Victoria -24 students (rural) 3) Northern Site - Prince George 24 students (rural). Students can opt for one of these programs rather than main UBC program. Expansion sites have their own admissions committees. Applicants are given credit for rural/remote suitability. Distinct admissions process for Aboriginal students.</p>	<p>Students admitted to the Island and Rural programs, spend 4 months in Vancouver and the remainder of their program between the two expansion campuses (Victoria and Prince George) and at in-hospital and community-based clinical settings (including rural and remote sites) in Vancouver Island and in northern BC. All students follow the same curriculum.</p>
<p>USA – University of Washington (WWAMI). Provides medical education opportunities for students from, in addition to Washington, the predominantly rural states: Wyoming, Alaska, Montana and Idaho.</p>	<p>In addition to students from Washington, in 2003 WWAMI had designated seats for students from: Wyoming (10); Alaska (10); Montana (20); Idaho (18). These seats are paid for by the contributing states.</p>	<p>Students from the contributing states spend the first year in their home state university with a focus on primary care. The second year is spent on the Seattle campus. In the third year, students are offered a range of rural and community-based clinical experiences, including sites within the contributing states.</p>
<p>Australia - Flinders University, Adelaide Parallel Rural Community Curriculum, developed in 1997, involves rural sites in the Riverland and in the Greater Green Triangle (Mt Gambier) regions of South Australia. Additional clinical teaching capacity is available in the Northern Territory.</p>	<p>All students are admitted to the core Flinders Program, but a limited number can opt for the Parallel Rural Community Curriculum. Admissions criteria give recognition to: a) rural background b) Aboriginal background c) Northern Territory residency.</p>	<p>All Flinders students are exposed to a minimum of 9 weeks teaching in a rural environment. For some students (approximately 50%) the option is available for the whole of the third year, including general specialty rotations, to be taken in one of the rural clinical sites (Riverland – 8 students; Mt. Gambier – 9 students; or in the Northern Territory – 15 students)</p>



Table 2: Structure of defacto rural schools

School/basic structure	Admissions procedures	Rural exposure
<p>USA - University of New Mexico, Albuquerque. Medical school has a strong orientation to meeting the medical needs of New Mexico including its underserved urban and rural populations and acknowledging its cultural diversity.</p>	<p>Strong preference given to residents of New Mexico. Selection criteria also give recognition to attributes of applicants that indicate a clear motivation to practice in medically underserved areas of the state. The school also actively recruits students from under-represented and disadvantaged cultural groups especially Hispanic and Native American.</p>	<p>Students at UNM are required to spend a minimum of 17 weeks of their MD program in rural areas. There is a 9 week block of practical immersion experience required of all students in the first year and, in subsequent years, clinical rotations in rural areas are organized. The possibility of rural electives creates further learning opportunities in rural and under-served areas for students who seek them.</p>
<p>Canada - Memorial University, Newfoundland The only medical school in the province with a widely dispersed rural population, its mission is to educate physicians and health scientists to enhance the health of the people of Newfoundland and Labrador.</p>	<p>The majority of the places are reserved for applicants who are bona fide residents of Newfoundland and Labrador. There are a limited number of places for applicants who are residents of New Brunswick, of Prince Edward Island, of other Canadian provinces and non-Canadians.</p>	<p>Undergraduate medical students are required to participate in a 2 week rural visit in first year and a 2 week family medicine visit in second year. During the clerkship phase of training, students are required to participate in a core 4 week rural family medicine rotation. In fourth year students are also required to participate in a 4 week rural selective which encompasses a rural rotation in any general specialty area.</p>

Table 3: Structure of stand-alone rural schools

School/basic structure	Admissions procedures	Rural exposure
<p>Australia - James Cook University, Queensland New School created in 2000 with a mandate to provide programs that are responsive to the health needs of the communities of northern Australia. The school intends to be a leader in focus areas of rural and remote health, Indigenous health and tropical medicine for Australia and for the wider Asia-Pacific region.</p>	<p>Annual intake of 80 students. After an initial sorting by academic grade, strong emphasis is placed on an interview process designed to recognize strengths compatible with the needs of rural and remote practice. In each annual cohort, approximately 50% of students have been raised in defined rural areas and the annual target of 5 places for Aboriginal or Torres Strait Islander students has been met. Approximately 50% of the students are from urban and rural areas in North Queensland.</p>	<p>6 year program with a minimum of 20 weeks rural experience spread throughout the program: 4 weeks in second year; 8 weeks in fourth year; 8 weeks in sixth year. Significant additional elective opportunities in rural and remote areas. Specialty rotations are organized in large and small hospitals throughout the region.</p>
<p>Canada - Northern Ontario School of Medicine, Ontario Established in 2002 with main sites at Laurentian University in Sudbury and Lakehead University in Thunder Bay. First cohort planned for 2005. It has a mandate to meet the health needs of Northern Ontario including aboriginal, francophone, remote communities, small town rural, large rural community and regional centers.</p>	<p>Planned annual intake of 56 students, 24 to be based primarily in Thunder Bay and 32 in Sudbury. In addition to academic background, admissions criteria include:</p> <ol style="list-style-type: none"> the applicant's residency history, ie time spent living in a northern urban, rural and/or remote community a demonstrated interest in living and working in northern urban, rural and/or remote communities a demonstrated interest in working with underserved populations (wherever they are). 	<p>Students will learn in the clinical setting starting in the first year of their program. There will be a 4 week rotation in first year and two 6 week rotations in second year that will be in rural, remote and Aboriginal communities throughout Northern Ontario for all students. The third year of the program will be spent in selected communities outside Thunder Bay and Sudbury.</p>



The rural pipeline

Typically, medical students are drawn disproportionately from urban professional family backgrounds¹. Rural medical education programs have sought to admit students whose social composition more closely reflects that of the communities they serve. It has been well established that students from rural backgrounds are more likely than urban students to opt to practice in a rural community²⁻⁶, and that greater exposure of students to rural health issues during their medical training further enhances the likelihood of rural practice after graduation^{7,8}. Selecting students with a more natural affinity for rural practice, and shaping their educational experience in a way that builds on this affinity, represents an appealing non-coercive strategy for attracting more doctors into areas that have historically been shunned by medical graduates.

The passage of students, from the point where they first develop their aspiration for a career in medicine, through the shaping effects of the medical education process itself, has been compared with a pipeline in which the flow must be maintained at every point to sustain the supply of doctors to rural areas^{9,10}. Key points along the pipeline are:

1. the formation of career aspirations during the school years
2. medical school admission procedures
3. exposure during medical school and during residency training to rural clinical practice
4. a curriculum oriented to rural health delivery
5. a system of educational and professional support for practicing rural doctors.

The schools studied reported that rates of application by rural students were as low as half that of urban students and they all acknowledged the importance of increasing the profile of medicine as a career to rural school-aged children. Most of the schools had programs aimed at Aboriginal and minority populations and many had special units, such as the Hispanic and Native American Centre of Excellence at the

University of New Mexico, encouraging the recruitment of these students to their programs, and providing them with support once admitted. There were, however, few initiatives directed at rural youth in general and clearly this is an area where most schools would like to do more if they could obtain the necessary funding support.

All of the schools studied had admissions policies designed to attract students from rural backgrounds, although in the Mixed Urban/Rural Schools, these policies only applied to the rural stream students. Typically, there is a grade threshold which students must meet in order to be considered for admission but, beyond this, other factors predictive of good practice in a rural setting play a role in the selection process. The University of British Columbia, for example, assesses all applicants with a Rural/Remote Suitability score. Most of the schools had rural community members on their admissions committees to ensure that the rural mandate was respected, and most also had specific admission processes and targets for Aboriginal students.

The level of exposure to rural clinical settings within each of the programs varied considerably among the schools studied. The Mixed Urban/Rural Schools (UBC, WWAMI and Flinders) have defined streams which are exposed to an enriched rural environment in designated regions. At Flinders, this exposure extends beyond family medicine to specialty clinical disciplines and the whole of the third year is spent in rural community settings¹¹. A recent study has shown that when these rural stream students were compared with their urban counterparts based in acute care settings, the rural students showed a higher level of performance on common exams¹². The DeFacto Rural Schools (UNM and Memorial) organize the rural exposure of their students largely within their family or community medicine programs. The Stand-Alone Schools (JCU and NOSM) have the most extended opportunities for rural exposure and, like Flinders, consider the challenges of the rural health context an enriched clinical learning environment compared with acute care hospitals.



All of the schools studied provided for substantial rural training opportunities within their post-graduate family medicine residency programs, thus ensuring the strong rural orientation at the undergraduate level is sustained during the critical period prior to entry to practice. The availability of rural training sites for other speciality residencies, such as general surgery or paediatrics, was more limited, with most schools providing only short periods of rural-based training. The Stand Alone Rural Schools had the most substantial plans for rural-based speciality training, but almost all respondents saw this as an important area for future development, particularly in forming specialists with general skill sets appropriate for rural contexts.

The final stage in the pipeline is a system of support for rural doctors. All the schools studied depended on a widespread network of rural doctors to act as preceptors and tutors to their students and this network needs to be sustained by a range of academic support, professional development and information services. These services not only support the teaching function, they also enrich the skills and experience of rural doctors and serve to reduce their sense of isolation.

Designing curriculum for rural practice

The feature which most distinguishes the Stand Alone Rural Schools from the other models is their curriculum content. The Mixed Urban/Rural Schools had developed their rural programs within the framework of existing urban, acute care-based programs. As a consequence, the rural component of the program is an add-on feature, characterized largely by the special clinical experience of the rural stream students. The main framework of the curriculum, which must serve both the urban and rural students, remains relatively unchanged. Stand Alone Rural Schools, however, have had the freedom, within the framework of their national accreditation processes, to create new curricula that are more reflective of the population health and medical care needs of rural and remote populations. Advocates for rural health have stressed the importance of integrating rural health issues into the core of the curriculum^{13,14}, and the new schools have been able to do this and to capitalize on the

challenges of rural environments as a rich source of clinical learning opportunities.

James Cook University exemplifies a curriculum which places a strong emphasis on rural and remote health issues¹⁵. In addition to specific content, such as a semester-long course titled 'Rural, Remote, Indigenous and Tropical Medicine', the case materials, on which learning modules are based, reflect regional and rural health realities. A substantial part of the students' clinical training takes place in community-based settings and learning groups are led by group tutors who are mostly rural physicians. The rural focus is not limited to the family medicine components of the program, but extends to all areas of study. Similarly, NOSM has a newly designed curriculum in which Northern and Rural Health and Social and Population Health are two of the five themes that are woven through the whole four years of the program. Both of these new schools maintain that their goal is not just to produce rural physicians, but rather to take advantage of the health challenges of rural and remote environments to train students with superior skills that would serve them in a wide variety of contexts, both rural and urban.

Discussion

Notwithstanding their differences, all three types of school have shown a clear recognition of the importance of rural health. This is expressed in a positive focus on students learning about rural health and rural practice, presentation of rural practice as a positive career option, and depiction of clinical placements in rural settings as positive for students (in that they see a wide range of clinical problems and develop a broad variety of clinical skills). This contrasts with common and longstanding stereotypes of rural health as irrelevant, rural practice as the ultimate 'failure' (as compared with specialty/sub-specialty practice in metropolitan tertiary care teaching hospital) and rural clinical attachments as 'doing time' away from where the 'real medicine' is in the teaching hospital/academic health science centre.



It is a reasonable conclusion from our study that the structure most suited to maintaining this positive view of rural practice is that of the dedicated Stand Alone Rural Schools. The centrality of their rural and remote mission, the fact that this mission does not have to compete with other more specialist oriented agendas, and the fact that their government funding is largely contingent on them being successful in this mission, ensures that the positive view of rural health translates into real commitments within their programs. Thus, they show evidence of practical commitments to real curriculum time with a focus on rural health and rural practice, dedicated academics/faculty members who teach and research rural health and rural practice, and sustained investments in rural based infrastructure and resources. But it should also be noted that the two schools studied, JCU and NOSM, are relatively new ventures and the long-term impact on their regions' physician resources has yet to be demonstrated.

It is also reasonable to conclude that the Mixed Urban Rural Schools and the DeFacto Rural Schools have shown impressive results, given that their mandates are more diverse. The rural streams in the Mixed Urban Rural Schools have admission processes favouring rural students, they make provision for substantial exposure to rural clinical practice, and they have developed widespread networks of rural clinical teachers. The fact that these programs are highly dependent on targeted government funding represents both a strength and a weakness. It is a strength because the external funding means that the rural streams do not have to compete for the core funding of the host school, but it is a weakness because the contingent nature of the funding makes it harder to attract and support tenured faculty and permanent staff. Also, the fact that these streams must coexist with more traditional programs with strong biomedical orientations does inhibit the development of an overarching rural health focus to the curriculum. These weaknesses aside, the lesson for others is that strong and successful rural programs can be developed within the framework of more traditional schools in areas where the development of a Stand Alone Rural School is not warranted.

The DeFacto Rural Schools, UNM and Memorial, have adopted rural medical education strategies as a means of meeting their regional mandates largely as a result of strong leadership that has taken them in that direction. They have been helped in this by governments keen to encourage them to focus on the business of meeting the physician needs in their region. Other schools serving geographically similar populations have not necessarily adopted explicit rural orientations, preferring rather to emulate the metropolitan model. There is no doubt that leadership is an issue, particularly in fostering a positive view of rural medicine and a culture of service to otherwise neglected populations rather than one of high technology and multiple specialities and sub-specialities.

Conclusion

Academic leadership appeared an important factor in all the schools studied, but it is also clear that without the targeted government funding that supports these programs, many would not exist. The rural components of the Mixed Urban/Rural Schools are funded outside of the normal allocation model for the metropolitan university based program and both the DeFacto Rural and the Stand Alone Rural Schools are specially funded by governments with strong expectations that they meet the demand for rural doctors. Enlightened government policy toward the support of rural health has gone a long way to redressing significant imbalances in the distribution of health care that market forces alone have seemed incapable of correcting.

Acknowledgements

This study was part of a larger project: 'Strengthening the Medical Workforce in Rural Canada: The Roles of Rural/Northern Medical Education' funded by the Canadian Institutes of Health Research. Support has also been given from the Centre for Rural and Northern Health Research at Laurentian University and the Newfoundland and Labrador Centre for Applied Health Research at Memorial University.



References

1. Dhalla IA, Kwong JC, Streiner DL, Baddour RE, Waddell AE, Johnson IL. Characteristics of first-year students in Canadian medical schools. *Canada Medical Association Journal* 2002; **166**: 1029-1035.
2. Rabinowitz HK. Relationship between US medical school admission policy and graduates entering family practice. *Family Practice* 1988; **5**: 142-144.
3. Roberts A, Davis L, Wells J. Where physicians practicing in Appalachia in 1978 to 1990 were trained and how they were distributed in urban and rural Appalachia. *Academic Medicine* 1991; **66**: 682-686.
4. Stratton TD, Geller JM, Ludtke RL, Fickenscher KM. Effects of an expanded medical curriculum on the number of graduates practicing in a rural state. *Academic Medicine* 1991; **66**: 101-105.
5. Strasser RP. How can we attract more doctors to the country. *Australian Journal of Rural Health* 1992; **1**: 39-42.
6. Tepper JD, Rourke JTB. Recruiting rural doctors: ending a Sisyphean task. *Canadian Medical Association Journal* 1999; **160**: 1173-1174.
7. Rosenblatt RA, Whitcomb ME, Cullen TJ, Lishner DM, Hart LG. Which medical schools produce rural physicians? *JAMA* 1992; **268**: 1559-1565.
8. Rourke JTB. Building the new Northern Ontario Rural Medical School. *Australian Journal of Rural Health* 2002; **10**: 112-116.
9. Council on Graduate Medical Education. *Tenth report, physician distribution and health care challenges in rural and inner-city areas*. Rockville, MD: CGME, 1998.
10. Hart LG, Salsberg E, Phillips D, Lishner DM. Rural health care providers in the United States. *The Journal of Rural Health* 2002; **18**(Suppl) 211-232.
11. Worley P, Silagy C, Prideaux D, Newble D, Jones A. The parallel rural community curriculum: An integrated clinical curriculum based in rural general practice. *Medical Education* 2000; **34**: 503-504.
21. Worley P, Esterman A, Prideaux D. Cohort study of examination performance of undergraduate medical students learning in community settings. *BMJ* 2004; **328**: 207-209.
13. Kaufman A. Rurally based education: Confronting social forces underlying ill health. *Academic Medicine* 1990; **65**: S18-S21.
14. Rourke JTB, Strasser RP. Education for rural practice in Canada and Australia. *Academic Medicine* 1996; **71**: 464-469
15. Hays R. Rural initiatives at the James Cook University School of Medicine: A vertically integrated regional/rural/remote medical education provider. *Australian Journal of Rural Health* 2001; **9**(Suppl.11): S2-S5.