Context counts: training health workers in and for rural and remote areas
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Abstract Access to well trained and motivated health workers is the major rural health issue. Without local access, it is unlikely that people in rural and remote communities will be able to achieve the Millennium Development Goals. Studies in many countries have shown that the three factors most strongly associated with entering rural practice are: (i) a rural background; (ii) positive clinical and educational experiences in rural settings as part of undergraduate medical education; and (iii) targeted training for rural practice at the postgraduate level. This paper presents evidence for policy initiatives involving the training of medical students from, in and for rural and remote areas. We give examples of medical schools in different regions of the world that are using an evidence-based and context-driven educational approach to producing skilled and motivated health workers. We demonstrate how context influences the design and implementation of different rural education programmes. Successful programmes have overcome major obstacles including negative assumptions and attitudes, and limitations of human, physical, educational and financial resources. Training rural health workers in the rural setting is likely to result in greatly improved recruitment and retention of skilled health-care providers in rural underserved areas with consequent improvement in access to health care for the local communities.

Introduction

Despite the substantial differences between developing and developed countries, the key themes in rural health are the same around the world. Access is the major rural health issue. Even in countries where the majority of the population lives in rural areas, the resources are concentrated in the cities. All countries have difficulties with transport, communication, services and resources, and they all face the challenge of shortages of health-care providers in rural and remote areas. This paper outlines how medical schools in different regions of the world are using an evidence-based and context-driven approach to training health workers for rural and remote areas. We give examples of how context influences the design and implementation of different rural education programmes and highlight major challenges to success.

The importance of rural training

Training for rural practice has become critically important in the context of continuing serious shortages of doctors and other health workers in rural areas and recognition that “the overflow effect” does not happen. Producing more health-care providers and expecting the excess to spill over from the cities into rural areas has been shown not to solve the rural medical workforce shortage. In fact, no single strategy is likely to be successful. Rather, multiple strategies are required at different levels of education and training each of which have a small effect and contribute to an overall substantial change. One key series of initiatives that has been shown to be effective involves rural-based medical education.4-7

To appreciate the requirements of rural training, it is necessary to understand rural communities, their health service needs and the nature of rural practice. There are a series of key parameters that provide the framework which determines the structure and function of rural health services, how rural practitioners work and the nature of rural practice. These parameters or “realities” are: geography and demography; the rural culture; rural morbidity and mortality patterns; resource limitations; and workforce shortages.5

Since the mid-1980s, research evidence has been accumulating regarding the specific range of knowledge and skills required by rural practitioners. This has led to the inclusion of specific curriculum content on rural health and rural practice in undergraduate medical programmes and in rural-based family medicine residency programmes.8-10 When compared to their metropolitan counterparts, rural practitioners carry a heavier workload, provide a wider range of services and carry a higher level of clinical responsibility in relative professional isolation.11 These characteristics hold true for all rural practitioners whether they are doctors, nurses, pharmacists or other health workers. Also, as rural practitioners are members of the community that they serve, they have a significant public health role that may range from issues such as clean water and sanitation to community health education.

Initially, the development of rural clinical placements by medical schools was driven by the workforce imperative, i.e. the serious shortfall of practitioners that creates an urgency to improve recruitment. The expectation was that experience in rural settings would encourage a future interest in rural practice. Subsequently research evidence demonstrated that this expectation was justified. Studies have shown that the three factors most strongly associated with entering rural practice are: (i) a rural background; (ii) positive clinical and educational experiences in rural settings as part of undergraduate medical education; (iii) targeted training for rural practice at the postgraduate level.7,12-20 In addition, there is evidence that academic involve-
ment (teaching and research) is both
a retention and recruitment factor for
physicians.\textsuperscript{6,20,21}

In response to the shortage of rural
doctors, various medical schools across
the world have developed innovative ap-
proaches to producing doctors with the
knowledge, skills and commitment to
practice in underserved, rural and remote
regions.\textsuperscript{22–25} In general, evaluation of rural
clinical placements has demonstrated that
the rural setting provides a high-quality
clinical learning environment that is of
potential value to all medical students.\textsuperscript{26}
Specifically, rural clinical education pro-
vides more “hands on” experience for stu-
dents such that they are exposed to a wide
range of common health problems and
develop greater procedural competence.\textsuperscript{27}

\section*{Training for Health Equity}

THEnet (Training for Health Equity net-
work), is a group of eight medical schools
worldwide that have been established
with a social accountability mandate. The
World Health Organization (WHO) de-
defines the social accountability of medical
schools as “the obligation to direct their
education, research and service activities
towards addressing the priority health
concerns of the community, region and
the nation that they have a mandate to
serve”.\textsuperscript{28}

Essentially, THEnet is a collaborative
network of need and outcome-driven
dental schools in neglected, rural and
remote regions of Africa, Asia, Australia,
Latin America and North America with a
core mission to increase the number, qual-
ity, retention and performance of health
professionals in underserved communi-
ties.\textsuperscript{29} Member schools recruit students
from, and produce doctors for, under-
served communities. Although THEnet
schools operate in different contexts and
employ somewhat different strategies,
they share the following core principles:
(i) health and social needs of targeted
communities guide education, research
and service programmes; (ii) students are recruited from the communities with
the greatest health care needs; (iii) pro-
gammes are located within or in close
proximity to the communities they serve;
(iv) much of the learning takes place in
the community instead of predominantly
in university and hospital settings; (v) the
curriculum integrates basic and clinical
sciences with population health and
social sciences; and early clinical contact
increases the relevance and value of theo-
retical learning; (vi) pedagogical method-
ologies are student-centred, problem and
service-based and supported by informa-
tion technology; (vii) community-based
practitioners are recruited and trained as
teachers and mentors; (viii) partnering
with the health system aims to produce
locally relevant competencies; (ix) faculty
and programmes emphasize and model
commitment to public service.\textsuperscript{30,31

Flinders University School of Medi-
cine (Australia), Northern Ontario
School of Medicine (Canada) and Zam-
boanga School of Medicine (the Philip-
pines) are three members of THEnet
whose experience is illustrative of suc-
cessful elements of rural based, socially
accountable medical education.

\section*{Flinders University School of
Medicine}

In the mid 1990s, Flinders University in
South Australia pioneered a form of rural
community-based medical education in
which a group of students complete their
core clinical learning based in rural fam-
ily practice.\textsuperscript{32} Through the Parallel Rural
Community Curriculum (PRCC), stu-
dents undertake the third year of a four-
year medical programme based in family
practice and live in a rural community for
the whole year. The learning objectives
are the same as for third-year students in
the city teaching hospital. Students cover
the major clinical disciplines in medicine
(internal medicine, surgery, paediatrics,
etc), however, rather than learning these
clinical disciplines in sequential blocks
(known as clerkships rotations), the stu-
dents learn all these clinical disciplines in
parallel for the whole year. The PRCC has
been studied closely and found to provide
learning experiences which are equivalent
to, if not better than, clinical learning in
the metropolitan teaching hospital.\textsuperscript{33}
Specifically, PRCC students consistently
outperform their colleagues based in
the city teaching hospitals in the end-of-year
examinations.\textsuperscript{34} In addition, PRCC stu-
dents were found to have a higher level of
confidence and competence and a broader
range of clinical knowledge and skills
when compared with their metropolitan
counterparts.\textsuperscript{35} After 12 years, 70% of
PRCC graduates are practising in rural
locations.\textsuperscript{36}

\section*{Northern Ontario School of
Medicine}

Although part of Ontario, the most
populous province in Canada, Northern
Ontario is geographically vast with differ-
cent economic and social characteristics
from the southern part of the province;
60% of the population lives in rural and
remote areas with a diversity of communi-
ties and cultures, most notably aboriginal
and francophone.\textsuperscript{36–41} Recognizing that
medical graduates who have grown up in
a rural area are more likely to practice in
rural settings, the Government of Ontario
decided in 2001 to establish a new med-
school with a social accountability
mandate to contribute to improving the
health of the people and communities
of Northern Ontario.\textsuperscript{39} The Northern
Ontario School of Medicine (NOSM) is
a joint initiative of Laurentian University,
Sudbury and Lakehead University, Thun-
der Bay, which are more than 1000 km
apart. NOSM is a rural, community-
based medical school which actively seeks
to recruit students from Northern Ontario
or from similar northern, rural, remote,
aboriginal or francophone backgrounds.
The holistic, cohesive curriculum relies
heavily on electronic communications to
support “distributed community engaged
learning”. In the classroom and in clinical
settings, students explore cases from the
perspective of physicians in Northern
Ontario. Clinical education takes place
in a wide range of community and health
service settings, so that the students expe-
rience the diversity of communities and
cultures in Northern Ontario. NOSM
graduates are expected to be skilled
physicians ready and able to undertake
postgraduate training anywhere, but with
a special affinity for and comfort with
pursuing training and clinical practice in
Northern Ontario.\textsuperscript{40}

Through community engagement,
communities are actively involved in
hosting students and contributing to
their educational experience. The School
has a particular focus on developing
collaborative relationships with rural,
remote, aboriginal and francophone
communities and organizations, as well
as the larger urban centres of Northern
Ontario. These relationships are fostered
through the Aboriginal Reference Group,
the Francophone Reference Group, Local
NOSM Groups, and a vast network of
formal affiliation agreements and memo-
randa of understanding. The communities become as much a part of the School as the university campuses in Thunder Bay and Sudbury. A study of the socio-economic impact of the NOSM has shown: new economic activity across Northern Ontario that is more than double the School’s budget; and optimism about the future among community participants which they attribute to NOSM.

Consistent with its social accountability mandate, NOSM seeks to reflect the population distribution of Northern Ontario in each medical school class. The selection and admissions process accepts applicants with diverse academic backgrounds in both the sciences and humanities, and favours applicants who meet the academic standards and come from northern, rural, remote, aboriginal or francophone backgrounds. Since the first medical student intake in 2005, there have been around 2000 applicants for 56 places each year. Up to 90% of each class is from Northern Ontario, with 40–50% of students from rural and remote areas, and substantial inclusion of aboriginal (8%) and francophone (20%) students. The class mean grade point average each year has been approximately 3.7 on a four-point scale, which indicates that the academic standard of the students is comparable with that of other Canadian medical schools.

The inaugural class of 56 medical students began their studies in 2005 and graduated in 2009. This class was the only Canadian medical school class for more than 10 years in which all students matched to residency programmes in the first round of national residency match and was placed in the top 30% in the national Medical Council of Canada examinations. These results demonstrate that NOSM students compare favourably to students from other schools in Canada. Seventy percent of NOSM graduates are training in predominantly rural family medicine and the others are training in various other specialties and subspecialties. Follow-up studies of family medicine residency graduates from Northern Ontario show that 67.5% of the graduates are practising in Northern Ontario or similar rural areas.

Essentially, NOSM recruits students from the local underserved rural area, provides them with medical education in the Northern Ontario context and then supports local medical graduates through continuing education and faculty development for their teaching role. The shortage of faculty willing to take a position in medical schools in underserved regions remains a challenge. This has led to the development of new models of clinical education that turn the constraints of the existing health system into teaching opportunities. NOSM has extended the culture of teaching beyond the traditional teaching hospitals and campus into family practice and other community clinical settings. Community-based health practitioners are recruited as faculty with support and training provided by NOSM. Embedding students in family-practice settings ensures that they are exposed to the full spectrum of medical conditions that occur in the community.

Zamboanga School of Medicine

Zamboanga School of Medicine in the Philippines operates on similar principles with many similarities to NOSM, but with much greater resource constraints. Zamboanga is the regional centre for Western Mindanao and the Sulu Archipelago, which is one of the most underserved areas in the Pacific region. Like NOSM, the Zamboanga School of Medicine was established through a university-community partnership with a social accountability mandate and its own board. The medical programme of the Zamboanga School of Medicine is similar to that of NOSM. Its students come predominantly from the local region and undertake an integrated curriculum with classroom-based learning in small groups and enhanced problem-based learning. First year students have clinical and community exposure with a focus on learning about the community context and population health. Clinical learning in the community setting continues throughout the programme with students spending much of their fourth year in small rural communities. The Zamboanga School of Medicine admitted its first students in 1994 and is very successful as measured by the fact that Zamboanga students’ performance on the national board examination is consistently above the national average and that more than 90% of its graduates are continuing their training and clinical practice within the region. This is particularly remarkable in the Philippines where many new medical graduates leave to work abroad as soon as they graduate. In the South Mindanao region, the infant mortality rate has declined from 75 per 1000 births in 1995 to 10 per 1000 births in 2003, a change which may be attributed in part to the medical school.

Challenges

The major obstacles to the success of rural community-based medical education are related to social attitudes, resources and the health system. Commonly, there is an assumption that activities undertaken in rural and remote areas are “second-class” or of a lesser standard than in major urban centres. This attitude is magnified within the health profession in which the predominant assumption is that specialists and subspecialists of greater value or superior to generalists. In addition, there is the assumption since Flexner’s report was published in 1910 that urban teaching hospitals are the right place for medical education. As outlined already, there is considerable evidence that these assumptions and attitudes are unjustified. Nevertheless, a stronger evidence base is needed to convince policy-makers and challenge the conventional approach to medical education. THEnet schools are developing and testing joint evaluation tools to assess the quality, outcome and impact of socially accountable medical education programmes in different parts of the world.

Resource limitations are another major challenge, particularly in low-income countries. Human resource constraints include not only shortages of healthcare providers, but also variability in the clinical skills and the teaching skills of available rural practitioners. Limitations of physical resources include poor quality or nonexistent hospitals/health services, erratic equipment and supplies, and lack of suitable housing for student health workers. In addition, education resources such as teaching aids, library support and broadband internet access are often limited. All of these resource constraints are magnified by limited funding, including little or no funding for dedicated teaching, educational infrastructure or communications technology.

The success of this education approach also requires active involvement of the health system and the wider communities. Where these are lacking, health education in and for underserved rural
community is likely to struggle. Active health system and community involvement helps student health workers feel “at home” in the host community and so they are much more likely to return to pursue their future careers.

**Conclusion**

There are several key considerations in developing and implementing successful rural-based training. The first is to recognize that context counts. Particularly with prolonged clinical attachments, students become members of the health team and active contributors to health care. This enhances the students' clinical confidence and competence, and ensures that their clinical knowledge and skills are embedded in the local setting. Another key consideration is active community participation. Communities have a critical role not only in providing social support for students, but also in contributing to the students understanding and knowledge of the local social determinants of health.

Other key considerations revolve around ensuring high standards of clinical and educational experiences for the students that meet accreditation standards and ensure comparable performance on national board exams. It is important to maintain a focus on the social accountability mandate and translate that into a clear vision and mission that guide the development and implementation of the curriculum and education programme. Particularly in the early establishment phase, it is important to establish targets and benchmarks that are based on the rural reality, and avoid being measured against indicators developed in the large urban hospital setting. This is truly a “horses for courses” situation. In this context, there is a case for introducing accreditation standards that measure social accountability.+

Based on the experience in Northeastern Ontario, Zamboanga and the other member schools of THEnet, training rural health workers in the rural setting greatly improves recruitment and retention of skilled health-care providers in rural underserved areas with consequent improvement in access to health care for the local communities.

**Competing interests:** None declared.

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**Résumé**

**De l’importance du contexte: la formation de professionnels de la santé dans et pour les zones rurales et isolées**

Pouvoir faire appel à des professionnels de la santé correctement formés et motivés est une question majeure de la santé rurale. Sans un accès local, il est peu probable que les membres des communautés rurales et isolées puissent atteindre les objectifs du Millénaire pour le développement (OMD). Des études menées dans de nombreux pays ont montré que les trois facteurs les plus fortement associés à une implantation médicale en milieu rural sont: (i) des origines rurales; (ii) des expériences cliniques et pédagogiques positives dans des situations rurales intégrées au cycle des études médicales; et (iii) une formation ciblée sur la pratique rurale au niveau postdoctoral. Cet article témoigne de l’importance des initiatives politiques impliquant la formation des étudiants en médecine issus, vivant et destinés aux régions rurales et isolées. Nous donnons des exemples d’écoles de médecine dans différentes régions du monde, qui utilisent une approche pédagogique contextuelle et fondée sur l’expérience clinique afin de former des professionnels de la santé qualifiés et motivés. Nous démontrons la façon dont le contexte influence le projet et la mise en application des différents programmes d’éducation rurales. Les programmes couronnés de succès ont vaincu les obstacles majeurs, y compris les idées préconçues et les attitudes négatives, ainsi que les limitations de ressources humaines, physiques, pédagogiques et financières. La formation de professionnels de la santé rurale en milieu rural devrait nettement améliorer le recrutement et retenir les prestataires de soins de santé qualifiés dans les régions rurales mal desservies, entraînant un meilleur accès aux soins médicaux pour les communautés locales.
Resumen

La importancia del entorno: formación de profesionales de la salud en y para áreas rurales alejadas

El acceso a los profesionales de la salud con una buena formación y disposición es uno de los retos sanitarios más importantes en el entorno rural. Sin el acceso local, es poco probable que los integrantes de las comunidades rurales alejadas puedan alcanzar los Objetivos de Desarrollo del Milenio. Diversos estudios llevados a cabo en numerosos países han reflejado que los tres factores que más influyen a la hora de optar por el ejercicio de la profesión en un entorno rural son: (a) la experiencia en el entorno rural; (b) las experiencias clínicas y formativas positivas en entornos rurales durante la formación médica universitaria; y (c) la formación especializada sobre el ejercicio de la profesión en entornos rurales durante los años de especialización. Este artículo presenta los datos de las iniciativas políticas relacionadas con la formación de los estudiantes de medicina, procedentes de entornos rurales alejados, en esos entornos y para ejercer su profesión en ellos. Ofrecemos ejemplos de las facultades de medicina de diversas regiones del mundo que emplean un enfoque educativo basado en los hechos y orientado hacia el entorno, para formar profesionales de la salud capacitados y motivados. También demostramos cómo influye el entorno en el diseño y la aplicación de los distintos programas educativos rurales. Los programas adecuados superaron importantes obstáculos, como los prejuicios y las actitudes negativas, además de las limitaciones en cuanto a los recursos humanos, físicos, educativos y económicos. La formación de profesionales sanitarios en entornos rurales facilitará la contratación y la permanencia del personal sanitario capacitado en zonas rurales y marginadas, mejorando de este modo el acceso de las comunidades locales a la atención sanitaria.

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