

Delivering on social accountability: Canada's Northern Ontario School of Medicine

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Abstract

Background: The Northern Ontario School of Medicine (NOSM) opened in 2005 with a social accountability mandate to contribute to improving the health of the people and communities of Northern Ontario. NOSM recruits students from Northern Ontario or similar backgrounds and provides Distributed Community Engaged Learning in over 90 clinical and community settings located in the region, a vast underserved rural part of Canada. This paper presents outcomes for graduates of NOSM's undergraduate and postgraduate medical education programs with emphasis on NOSM's social accountability mandate.

Methods: NOSM and the Centre for Rural and Northern Health Research (CRaNHR) used mixed methods that include administrative data from NOSM and external sources, as well as surveys and interviews of students, graduates and other informants.

Results: 92% of all NOSM students come from Northern Ontario with substantial inclusion of Indigenous (7%) and Francophone (22%) students. 62% of NOSM graduates have chosen family practice (predominantly rural) training. 94% of the doctors who completed undergraduate and postgraduate education with NOSM are practising in Northern Ontario. The socio-economic impact of NOSM included: new economic activity, more than double the School's budget; enhanced retention and recruitment for the universities and hospitals/health services; and a sense of empowerment among community participants attributable in large part to NOSM.

Discussion: There are signs that NOSM is successful in graduating doctors who have the skills and the commitment to practice in rural/remote communities and that NOSM is having a largely positive socio-economic impact on Northern Ontario.

Keywords: *Social Accountability; Community Engagement; Distributed Medical Education*

Practice Highlights

After 10 years, outcomes suggest that NOSM is successful in fulfilling its social accountability mandate including the following:

- 92% of all medical students are from Northern Ontario, including 7% Indigenous and 22% Francophone students.
- 62% of all NOSM medical graduates have chosen family practice (predominantly rural) training.
- 69% of the graduates of NOSM's postgraduate education are practising in Northern Ontario.
- 94% of the doctors who completed undergraduate and postgraduate education with NOSM are practising in Northern Ontario.
- The socio-economic impact of NOSM includes: new economic activity, more than double the School's budget; enhanced retention and recruitment for the universities and hospitals/health services; and a sense of empowerment among community participants attributable in large part to NOSM.

I. INTRODUCTION

In 1995, the World Health Organization (WHO) defined 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" (Boelen et al 1995). This followed several decades in which innovative schools had focused on connecting with and responding to community needs (Strasser et al 2015). The Network: Towards Unity for

Health began in 1979 at the instigation of the WHO with a group of 19 medical schools that implemented community oriented medical education (Schmidt et al 1991). In the 1980s, community-based education and service developed in Africa with the goal of “producing students with a sense of service and a strong inclination toward broad community care and preventive medicine” (Bollag et al 1982).

In 2001, Health Canada, Canada’s federal department of health, along with all of the Canadian medical schools, made a joint commitment to social accountability in the publication, *Social Accountability: A Vision for Canadian Medical Schools* (Health Canada 2001). When the Northern Ontario School of Medicine (NOSM) was incorporated in 2002, it became the first medical school in Canada established with an explicit social accountability mandate (Tesson et al 2009).

Northern Ontario is geographically vast (>800,000 sq km) with a volatile resource based economy and socio-economic characteristics that differ from the southern part of the province of Ontario. Forty percent of the population of Northern Ontario live in rural and remote areas where there are diverse communities and cultural groups, most notably Indigenous and Francophone peoples. These are minority groups in the rest of Ontario, but comprise a substantial proportion of the population in the North. The health status of people in the region is worse than the province as a whole (Rural and Northern Health Care Panel 2010), and there is a chronic shortage of doctors and other health professionals (Rural and Northern Health Care Panel 2010, Glazier et al 2011) which provided the impetus for the establishment of NOSM. NOSM serves as the Faculty of Medicine of Lakehead University in Thunder Bay (population 120,000) and of Laurentian University in Sudbury (population 160,000). These two universities are over 1,000 km apart and provide teaching, research and administrative bases for NOSM which views the entire geography of Northern Ontario as its campus (Strasser et al 2015).

Uniquely developed through a community consultative process, the holistic cohesive curriculum for the NOSM undergraduate program is: grounded in the Northern Ontario health context; organized around 5 themes (Strasser et al 2009) and relies heavily on electronic communications and interdependent community partnerships to support Distributed Community Engaged Learning (DCEL). In the classroom and in clinical settings, students are learning in context as if they are preparing to practise in Northern Ontario. Through Community Engagement, community members are active participants in various aspects of the School including: the admissions process; as standardized patients; ensuring that learners feel “at home” in their community; and in encouraging an understanding and knowledge of the

social determinants of health at the local level. There is a strong emphasis on interprofessional education and integrated clinical learning which takes place in over 90 communities and many different health service settings, so that the students have personal experience of the diversity of the region’s communities and cultures (Strasser et al 2009, Strasser 2010, Strasser et al 2010, Strasser et al 2013).

Integrated Clinical Learning (ICL) involves team teaching and team learning in a variety of clinical and community settings. Patients and families are the central focus of this learning in which teachers may be medical, nursing or other health professionals or the patients/families themselves, and learners may be in a mix of health disciplines and at different levels of undergraduate and postgraduate education. ICL enriches the learning experience for all and enhances capacity in small communities while maintaining high quality patient care and preparing learners to be competent health care team members (Strasser et al 2013).

NOSM was the first medical school in the world in which all students undertake a longitudinal integrated clerkship, the Comprehensive Community Clerkship (CCC) (Couper et al 2011, Strasser et al 2011). Based in family practice, the CCC is the third year of the undergraduate program. Rather than a series of clerkship block rotations, students meet patients in family practice such that “the curriculum walks through the door”. Students follow these patients and their families, including when cared for by other specialists, so as to experience continuity of care in family practice. During the year, students achieve learning objectives which cover the same six core clinical disciplines as in the traditional clerkship blocks. Students live in one of 15 large rural or small urban communities in Northern Ontario, excluding the cities of Sudbury and Thunder Bay. This allows them to learn their core clinical medicine from the family practice, community perspective, while also gaining exposure to community based specialist care.

In addition to undergraduate medical education, NOSM offers postgraduate medical education (residency training) in family medicine/general practice and eight other major general specialties. Like the undergraduate program, these programs recruit residents from Northern Ontario or similar backgrounds and provide Distributed Community Engaged Learning with clinical education in a range of community and clinical settings in the region (NOSM Postgraduate Medical Education Overview 2016).

Ten years since the official opening of the School in 2005, this paper presents outcomes for graduates of NOSM’s undergraduate and postgraduate medical education programs with emphasis on NOSM’s social accountability

mandate, including the socio-economic impact that NOSM has had on Northern Ontario.

II. METHODS

The Centre for Rural and Northern Health Research (CRaNHR) is a research centre of both Laurentian and Lakehead Universities and was established in 1992 (About CRaNHR 2016). NOSM and CRaNHR are collaborating in mixed methods studies that track NOSM undergraduate and postgraduate medical learners, as well as assessing the socio-economic impact of NOSM. These studies use administrative data from NOSM and external sources, as well as surveys and interviews of students, graduates and other informants (Hogenbirk et al 2015b). Ethics approval for these studies was granted by the Research Ethics Boards of Laurentian and Lakehead Universities.

III. RESULTS

Consistent with its social accountability mandate, NOSM seeks to reflect the population distribution of Northern Ontario in each class. Between 2005 and 2013, NOSM received 18,000 applications for 538 places. The selection and admissions process has resulted in 92% of all medical students coming from Northern Ontario with the remaining 8% from other rural and remote parts of Canada, with a substantial inclusion of Indigenous (7%) and Francophone (22%) individuals. This has been achieved without sacrificing academic excellence; the mean grade point average (GPA) of the entry class each year has been 3.7 (out of 4) comparable with that of other Canadian medical schools.

Interviews of the NOSM medical students reveal generally positive experiences with a sense that they value the learning opportunities and feel they are being prepared well for practice in rural settings. Sample comments include: "clinical experiences during (third year) are more substantial than anything in traditional med school experience"; "NOSM creates "generalists" and encourages students to maintain a broad focus"; "rural medicine... that's where you find the true generalists"; "I like how much variety there can be in the doctor's role"; "we're better off ... we will (learn) more skills in a rural centre"; and "you don't know it until you live it".

Between 2009 and 2015, there were 415 medical graduates of whom 257 (62%) chose family practice (predominantly rural) training which is approaching double the Canadian average. Almost all the other graduates (33%) have pursued training in other general specialties such as general internal medicine, general surgery and paediatrics, with a small number (5%) training in subspecialties like dermatology, plastic surgery and radiation oncology. Compared to other Canadian medical schools, NOSM graduates are very

successful in matching to residency training, including competitive sub-specialties. Most years all NOSM students match in the first round of the Canadian Residency Matching Service (CaRMS). On occasions when one student has been unmatched, that individual was matched in the second round.

69% of NOSM residency program graduates are practising in Northern Ontario. At this time, they are predominantly family practitioners (FPs) with a small number of other specialists, including in public health, internal medicine and obstetrics/gynaecology. Ninety-four percent of doctors who completed undergraduate and postgraduate education with NOSM are practising in Northern Ontario, including 33% in remote rural communities.

A study of the socio-economic impact undertaken in 2009 found that NOSM makes a substantial contribution to the economy of Northern Ontario, with direct spending in Fiscal Year 2007-2008 (FY07/08) of \$36.3 million (all values in Canadian dollars) and an additional \$1 million per year spent by undergraduate medical students. Economic contributions were greatest in the university cities of Thunder Bay (\$26.7 million) and Sudbury (\$30.4 million), and \$0.8-\$1.2 million accrued to the next 3 largest population centres. All communities might realize an economic contribution of \$7300-\$103 900 per pair of medical learners per placement. Several of the 59 interviewees remarked that the dollar amount could be small to moderate but had broader economic implications.

In terms of social impact, interviewees reported that NOSM is a source of civic pride and an affirmation of the North's potential as the region enlarges its knowledge-based economy. According to interviewees, NOSM has enriched the reputation of the universities and affiliated healthcare institutions, thereby enhancing the ability to recruit new doctors, researchers and scientists to the North. Interviewees anticipated that NOSM graduates will ultimately relieve the chronic physician shortage in Northern Ontario. Interviewees also remarked that Francophone and Indigenous students enrolled at NOSM and the School's commitment to cultural competency training should help alleviate the shortage of doctors serving these population groups.

The most impressive social impact finding was a sense of community empowerment summed up in the phrase "if we can do a successful medical school in Northern Ontario, we can do anything". The establishment of NOSM and its distributed programs offered opportunities for change and challenges to the status quo. Following the success of NOSM, Laurentian University has established an Architecture School in 2013 and Lakehead University

opened a Law School in the same year.

More recently, a further study assessed the impact of NOSM on recruitment and retention of doctors in underserved communities in Northern Ontario with populations up to 11,000 people. The main research question was: "What are the changes (if any) in recruitment and retention expenditures and practices in Northern Ontario underserved communities that have recruited NOSM graduates?" Ten key informants were interviewed from eight communities that were successful in recruiting family doctors who were NOSM graduates. All key informants agreed that NOSM plays a prominent role in the doctor recruitment to underserved communities in Northern Ontario. Five out of eight Northern Ontario communities that previously struggled with a chronic doctor shortages have moved to a more stable situation with a full or almost full complement of FPs over the past five years. In these five communities, the shortage of FPs has decreased from 29 vacant full-time equivalent (FTE) positions to only one FTE vacancy. There is much less dependency on doctors hired on short term contracts (such as locum tenens). "Decreasing desperation" in recruiting doctors has led to a reduction in the amount of financial incentives offered. For example, one community reduced their spending from \$200,000 to \$50,000 for a four-year return of service agreement. All communities reduced their spending on travel and attendance at career/job fairs in southern Ontario.

IV. DISCUSSION

Ten years since accepting its first students, this paper has presented outcomes for graduates of NOSM's medical education programs, as well as the impact of NOSM on Northern Ontario communities. Clearly, there are limitations in this research, particularly the relatively small numbers and the comparatively short timeframe. Tracking studies of NOSM graduates will continue and opportunities will be sought to investigate further the School's economic, social and other impacts (Hogenbirk et al 2015b).

Consistent with its social accountability mandate, the NOSM selection and admissions processes aim to reflect the population distribution of Northern Ontario in each class (Tesson et al 2009). This target approach has been largely successful with 92% of the students coming from Northern Ontario and 40% from remote rural community backgrounds with 22% Francophone and 7% Indigenous. For Indigenous students the target is 10%, however Indigenous applicants make up only 2% of the applicant pool. The Indigenous people themselves recommended against quotas or reserved places because of potential stigma so Indigenous applicants compete for selection according to the same criteria as all other applicants. Support and encouragement is provided to Indigenous applicants in the form of guidance in preparing their

applications and special training for the interviews. These interventions are having a positive effect with 7% of the medical students Indigenous drawn from 2% of the applicant pool. This recruitment success has occurred without lowering academic standards and has helped to ensure that NOSM students are well the challenges suited to and opportunities of Distributed Community Engaged Learning.

Students' comments suggest that they are appreciating the value and making the most of the opportunities presented to them for learning their core clinical medicine in the rural community context. Particularly during the Comprehensive Community Clerkship, students become members of the health team and active contributors to healthcare. This enhances their clinical confidence and competence, and ensures that their clinical knowledge and skills are embedded in the local rural community setting (Hauer 2012, Dube et al 2015).

NOSM graduates have been consistently successful in matching to residency training when compared to other Canadian schools (CaRMS R1 Match Reports). There is a general sense that the residency program directors of Canada are keen to recruit NOSM graduates. Of particular note is the 5% of graduates who have matched to subspecialties. This matching success is important to Northern Ontario because there is a need for subspecialists even though they are required to undertake their postgraduate medical education elsewhere. Also, the 5% of graduates matching to subspecialties indicates that the novel NOSM curriculum model does not preclude students from success in matching to the most competitive subspecialty residency programs. These results clearly contradict the common perception of lower academic standards and lesser quality in rural or community-based schools.

The proportion of NOSM graduates practising in Northern Ontario is greater than might be predicted from experience elsewhere in Canada. For example: 76% of FPs and other specialists enrolled as medical students during 1998 – 2009 were practising in Manitoba after undergraduate and postgraduate education at the University of Manitoba (Raghavan et al 2012); and 49% of Memorial University of Newfoundland's undergraduate and postgraduate trained FPs and other specialists who graduated as medical students during 1973 – 2008 were practising in Newfoundland with 16% in rural Canada in 2014 (Mathews et al 2015)

The finding that 94% of doctors who completed undergraduate and postgraduate education with NOSM are practising in Northern Ontario is seen as a strong indication that the NOSM model is showing signs of

success in addressing the long-standing workforce shortages (Strasser et al 2013, Hogenbirk et al 2016). This perception is confirmed by interviews of key informants in previously underserved small communities which have been successful in recruiting NOSM graduates. These communities have moved from perpetual crisis mode to planning recruitment efforts and have reduced their expenditures on incentive payments and other recruitment activities.

Many of the NOSM graduates practising in Northern Ontario have become faculty members and some have taken on substantial academic leadership roles. This is seen as a positive sign for the future sustainability with NOSM graduates teaching NOSM learners and pursuing academic careers in Northern Ontario.

In addition, NOSM is making a substantial economic contribution to the communities of Northern Ontario not only directly in terms of new economic activity but also indirectly through economic opportunities which are incidental to specific NOSM activities (Hogenbirk et al 2015a). These findings show that when considering the cost of medical education, it is important to look at the whole picture and not just the level of government expenditure per learner. For Northern Ontario, the high level of Ontario government contribution to NOSM is justified by the substantial return on investment for participating communities.

Although defined by WHO 1995, there are many different perceptions and perspectives on what social accountability really is and how to measure its effectiveness. Preston et al (2016) in a study which involved interviewing staff, students and community members of four socially accountable medical schools in two countries found three core elements: "Overall there were three common understandings. Socially accountable medical education was about meeting workforce, community and health needs. Social accountability was also determined by the nature and content of programs the school implemented or how it operated. Finally, social accountability was deemed a personal responsibility. The broad consensus masked the divergent perspectives people held within each school" (Preston et al 2016).

NOSM is a founding member of the Training for Health Equity network (THEnet), a group of health profession schools worldwide which are guided by a social accountability mandate. THEnet members share a core mission to recruit students from, and produce health professionals for under-served communities. Although these schools operate in different contexts and employ somewhat different strategies, they share the following core principles: 1. Health and social needs of targeted

communities guide education, research and service programs; 2. Students are recruited from the communities with the greatest health care needs; 3. Programs are located within or in close proximity to the communities they serve; 4. Much of the learning takes place in the community instead of predominantly in university and teaching hospital settings; 5. The curriculum integrates basic and clinical sciences with population health and social sciences; and early clinical contact increases the relevance and value of theoretical learning; 6. Pedagogical methodologies are student, patient and population centred, service-based and assisted by information communication technology; 7. Community-based practitioners are recruited and trained as teachers and mentors; 8. Partnering with the health system to produce locally relevant competencies; 9. Faculty and programs emphasize and model commitment to public service (Palsdottir et al 2008).

THEnet developed, piloted and published an Evaluation Framework for Socially Accountable Health Professional Education (The Training for Health Equity Network 2011, Larkins et al 2013) which provided the core content for the Global Consensus on Socially Accountable Education in 2010 (Global Consensus for Social Accountability of Medical Schools 2010). Subsequently, THEnet has been successful in researching, reporting and advocating for socially accountable education (Strasser et al 2010, Larkins et al 2013, Ross et al 2014, Larkins et al 2015). Following the GCSA, the Association for Medical Education in Europe (AMEE) has adopted social accountability as one of the elements of the ASPIRE: International Recognition of Excellence in Medical Education program (www.amee.org). NOSM was an inaugural recipient of the AMEE Aspire Award of Excellence in Socially Accountable Medical Education.

After 10 years, there are signs that the NOSM model of socially accountable education is providing benefits to Northern Ontario which go beyond simply producing more doctors. NOSM graduates are broadly skilled generalists who are members of the whole health team and are sensitive to the social, cultural, linguistic and geographic diversity of the region. In addition, the majority of these doctors are choosing to provide care in previously underserved communities. There are signs also that NOSM is contributing to other academic developments in Northern Ontario and having a positive broader socio-economic impact on the region. These are all encouraging signs that, guided by social accountability, NOSM is moving in the right direction towards improving the health of the people and communities of Northern Ontario.

Notes on Contributor

Professor Strasser is Dean and CEO, Northern Ontario School of Medicine, Canada since 2002. Previously, he was Professor of Rural Health and Head, Monash University School of Rural Health, Australia. His international roles included Chair of the Working Party on Rural Practice of the World Organization of Family Doctors (WONCA).

Acknowledgements

The author acknowledges the research teams who have contributed to the studies reported in this paper: Raymond W Pong, John C. Hogenbirk, Wayne Warry, Bruce Minore, Mary Ellen Hill, David R Robinson, Patrick Timony, Margaret G French, Oxana Mian, David C. Marsh, Sue Berry, William G. McCready, Lisa Graves, Catherine Cervin, Ken Adams and Joe Lipinski.

Declaration of Interest

The author is an employee of Northern Ontario School of Medicine and has no financial, consultant, institutional and other relationships that might lead to bias or a conflict of interest. The research reported in this article was funded by the Ontario Ministry of Health and Long Term Care.

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