Chapter 1.2.1

THE SOCIO-ECONOMIC BENEFITS OF RURAL MEDICAL EDUCATION

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Introduction

While other chapters in this guidebook highlight the proven success of Rural Medical Education (RME) in producing rural practitioners, there is nonetheless the perception that RME is expensive and that the additional costs may not be justified. This perception is based on the usual urban model of medical education involving large classes at universities and in academic health centres/teaching hospitals, with associated comparatively lower per learner costs.

By way of contrast, RME generally involves small groups of learners at multiple sites in regional, rural and remote communities. Consequently, this model is associated with additional costs for transport, communications, educational infrastructure and housing, and learner and faculty support.

In this context, it is important to consider the complete picture — including from the perspective of communities — in order to assess the return on investment or value for money of expenditures related to implementing rural medical education. This chapter explores the wider socio-economic benefits of rural medical education.

Evidence

In the USA and Canada, there have been many studies which assess the economic impact of medical schools and academic health centres but relatively few studies focusing on medical education in regional and rural settings.[1] The most common study design is the Input-Output model. This determines the economic impact of an initial investment in the economy of a predefined area by tracking how the investments recirculate within that area, depending on the interdependencies of the region's industries, and uses regional- and industry-specific multipliers. The Economic Base Theory model requires considerable longitudinal data and uses a population-sensitive equation to yield community specific multipliers.[2]

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Almost all published studies on the economic impact of medical schools and academic health centres utilise variations of the Input-Output model, many undertaken by the American consulting firm Tripp Umbach.[2] There is often a strong emphasis on research funding and related employment, usually in the larger urban centres. For example, Tripp Umbach calculated the direct effect of Canadian medical schools by including operating expenditures and spending by students and visitors. Their analysis concluded that in the 2012-13 fiscal year (FY), Canadian faculties of medicine and teaching hospitals had a total economic impact of $66.1 billion and supported 295,000 jobs.[3]

There is a common assumption that education and services in rural areas are second class or of a lesser standard. It is also often assumed that these small-scale operations are inherently less efficient. Generally, these assumptions are accepted without any investigation as to whether the evidence supports them. One exception is analysis by the Australian Independent Hospital Pricing Authority (IHPA) that explored the cost effectiveness of small rural hospitals. This has shown that some services in small rural hospitals cost less, particularly where the service providers are rural generalists and there are more than 1,000 average complexity patients served in the year.[4]

Northern Ontario School of Medicine

The Northern Ontario School of Medicine (NOSM) opened in 2005 and is the first school in Canada to be established with an explicit social accountability mandate focused on improving the health of the people of Northern Ontario, a vast region with many underserved remote rural communities. NOSM was created with the support of northern communities, health care organisations and two universities — Laurentian in Sudbury and Lakehead in Thunder Bay — with the expectation that NOSM would bring benefits to these stakeholders, as well as to Northern Ontario as a whole. NOSM's model of distributed community engaged learning has led to the active involvement of more than 90 communities across Northern Ontario in NOSM's educational and research activities.[5-7]

Economic impact

In this context, NOSM collaborates with the Centre for Rural and Northern Health Research (CRaNHR) at Laurentian and Lakehead Universities to undertake a series of tracking and impact studies,[8] including studies of the economic impact of NOSM for FY 2007-08 and 2014-15.[1,9,10] In FY 2007-08, NOSM had been operating for three years, with its charter class being one year away from graduation.

Since then, NOSM has produced ten cohorts of medical graduates and has assumed responsibility for postgraduate training in family medicine and eight other general specialties. NOSM also administers education programmes in Northern Ontario for dietitians, rehabilitation therapists, physician assistants, pharmacists and medical physicists, as well as continuing education professional development and graduate studies. In addition, NOSM promotes health careers to young people in Northern Ontario, particularly through high school health sciences summer camps, and has an active research programme throughout the region.[7]

Using the Economic Base Theory model, the CRaNHR studies included expenditures on research, as well as medical and health professions education programmes and salary payments to postgraduate trainees/residents. An established formula was used to estimate a low and a high economic impact, and to estimate the impact on full-time employment.[1,9,10]

In FY 2014-15, a total of $57.6 million was spent in NOSM's service region, consisting of $46.4m spent on NOSM's education and research programmes, as well as support for clinical teachers, and $11.2m was spent by the learners. More than three quarters (77%) of spending occurred in Northern Ontario's two largest population centres (Sudbury and Thunder Bay). All of this spending translated into an economic impact in NOSM's service region of $122m to $134m in FY 2016-17. For Sudbury and Thunder Bay, this impact ranged from $39m to $48m. The smaller Northern Ontario communities also saw an impact ranging from $0.7m to $5.4m.

NOSM's employment of around 362 full-time equivalent (FTE) positions translated into an estimated total of 729 to 802 FTEs in the region.[10] Further analysis in the 2009 study showed that the economic benefits flowed to the small communities as well as the larger population centres at a rate that is roughly proportional to the number of learners in the community.[1] Overall, expenditures in FY 2016-17, combining government funding and learner spending, translated into a substantial positive economic impact to the region of 2.2 to 2.5 times the original investment by the Ontario government.[10]

These findings are likely to underestimate the full economic impact because of the study design and also because it has excluded visitor spending, construction costs, changes in recruitment incentives paid by the community to attract physicians, local economic activity of health practitioners who relocated to the area because of NOSM, and spending by research graduate students.[10]

Social impact

The 2009 study also explored the social impact of NOSM through individual and focus group interviews. 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 health care 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.[9,11]

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 programmes 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.[6]

Health care professionals

More recently, a study in 2015 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 chronic doctor shortages have moved to a more stable situation with a full, or almost full, complement of family physicians (FPs) over the past five years. In these five communities, the shortage of FPs has decreased from 30 vacant 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 the south of Ontario.[12]

An holistic view

The findings in these studies 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.

Broader applicability

The NOSM impact studies demonstrate the importance of considering the complete picture in order to assess the return on investment or value for money of expenditures on rural medical education.

This perspective is consistent with the findings of a 2015 World Bank study entitled *The Economics of Health Professional Education and Careers: Insights from a Literature Review* which commented:

> *'The marked differences in return to medical specialization relative to medical generalism and primary care and to serving the rural, remote, and disadvantaged relative to the urban elite for all health professionals exemplify the conflict between health labor market forces and stated policy intentions. ...*
>
> *It may be easier to improve returns to the choice to train for socially valued roles by allocating training subsidies accordingly. Community-based and*
> *-focused training schools have demonstrated their greater capacity to produce health professionals for socially valued roles in a diverse range of settings. This understanding should also influence the distribution of public subsidy to a greater extent than is usually the case."*[13]

In 2016, the World Health Assembly adopted the *Global Strategy on Human Resources for Health: Workforce 2030,* which highlighted the World Bank estimated shortfall of 18 million health workers if the *Sustainable Development Goal 3* (Good Health and Well-Being) is to be achieved by 2030.[14] Later in 2016, the United Nations High-Level Commission on Health Employment and Economic Growth report entitled *Working for Health and Growth: Investing in the Health Workforce* recommended a paradigm shift from viewing health expenditure as sunk cost to human capital investment. One of the commissioners and Nobel laureate economist, Prof Joseph E Stiglitz stated

> *'The Commission concludes that, to the extent that resources are wisely spent and the right policies are put in place, investment in education and job creation in the health and social sectors will make a critical positive contribution to inclusive economic growth.'*

The Commission recommended five immediate actions including to accelerate investment in transformative education, skills and job creation.[15]

This recommendation reflects the view not only that health expenditure contributes to economic growth, but also that investments should be focused on producing a health workforce that has the skills and commitment to provide care where it is needed, responding to population health needs. This approach is consistent with social accountability which the World Health Organization (WHO) defines for medical schools as 'the obligation to direct education, research and service activities towards addressing the priority health concerns of the community, region and/or nation they have a mandate to serve'.[16] Over the last decade, the Training for Health Equity network (THEnet), a global network of socially accountable health professions education institutions, of which NOSM is a founding member, has explored many dimensions of socially accountable health workforce education, including socio-economic impact. THEnet concludes that:

> *'Health workforce education that is socially accountable, aligned to meet the needs of the societies served and uses a collaborative approach to define and meet those needs, promises to be a key mechanism to maximize the impact of educational investments.'*[17]

Social Return on Investment

Taking this further, there is growing interest in the concept of Social Return on Investment (SROI) which is a framework for measuring and accounting for a much broader concept of value than economic value. It seeks to reduce inequality and environmental degradation and improve wellbeing by incorporating social, environmental and economic costs and benefits.

SROI measures change in ways that are relevant to the people or organisations that experience or contribute to it. It tells the story of how change is being created by measuring social, environmental and economic outcomes and uses monetary values to represent them. This enables a ratio of benefits to costs to be calculated. Money is simply a common unit and, as such, is a useful and widely accepted way of conveying value.[18]

What to do

A key to success in demonstrating the socio-economic benefits of rural medical education is to **start recording data and measuring specific indicators,** quantitative and qualitative, from the very beginning. This includes tracking students, beginning with the admissions process, and following them through undergraduate medical education to postgraduate education and rural practice, as well as recording expenditures. In developing and implementing this research, it is important also to be guided by community perspectives.

It is also essential to undertake the first study of the economic impact early so that pre-existing medical education can be documented as a **baseline** and the new rural medical education expenditures can be identified and monitored. When considering economic impact, it is important to look at the **whole picture of expenditure**, including economic benefits to the communities and cost savings resulting from improved local access to care.

In addition to economic impact, it is useful to **study other impacts** including social impact, employment impact, quality and quantity of workforce supply, the learners/graduates' experiences — and, ultimately, health outcomes. Always keep the **overall focus on population health needs** as the ultimate indicator of successful rural medical education.

What not to do

There will be many doubters and detractors as you develop and implement rural medical education. In most cases, their views will be based on assumptions and convictions which are not supported by evidence, although they may be presenting 'conventional wisdom'. It is important to listen to and respect the views of all critics without allowing them to distract you from your ultimate goals.

Avoid the trap of **adopting benchmarks and indicators used by established metropolitan medical schools**. It is important to describe success in your own context. Develop target indicators which measure your success quantitatively and qualitatively. Always maintain your **commitment to quality and standards**, so as to counter the assumption that anything rural is substandard or second-class.

Conclusion

This chapter has provided an introduction to the socio-economic benefits of rural medical education, with an emphasis on demonstrating overall return on investment, or value for money by considering the complete picture, including the communities' perspectives. This is particularly important to counter the common perception that the additional costs of rural medical education are not justified. Northern Ontario School of Medicine provides one example of a rural medical school which has demonstrated substantial socio-economic benefits to Northern Ontario, as well as measuring other impacts on the region.

The developing concept of Social Return on Investment presents an opportunity for a more contextualised approach which is consistent with social accountability and the global recommendations of the United Nations and World Health Organization.

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