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Trina M. Fyfe, MISt, PhD; Ralitsa Akins, MD, PhD; Pierre Gagné, MD, MSc, FRCP(C); Craig Cheifetz; Sarina Petrocelly; Geoffrey W. Payne, PhD

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Regional Medical Campuses in Canada and the United States: A Systematic Review

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Abstract

Introduction
The development of Regional Medical Campuses (RMCs) in Canada and the United States (US) has been a response to increase undergraduate medical student enrollment and meet the societal needs of healthcare access by addressing physician shortages in underserved and rural areas. We systematically reviewed the literature on undergraduate RMCs in Canada and the US to identify types of studies and leading themes.

Methods
Literature searches were performed within the following databases: Medline OVIDSP, Evidence-Based Medicine Reviews OVIDSP, CINAHL EBSCO, ERIC EBSCO, PsycInfo EBSCO, and Web of Science ISI. Articles were included in the review if they discussed undergraduate medical education in allopathic schools in Canada and the US, were written in English and related to RMCs. Each article was reviewed and assessed by two of the authors, and information extracted from the literature was thematically analyzed. All selected articles fit the definition of RMC developed by the Association of American Medical Colleges' Group on Regional Medical Campuses (GRMC). The GRMC has defined that RMCs could be of four distinct types: basic science campuses, where students study pre-clinical (basic sciences) courses; clinical campuses, where clerkship training is completed; longitudinal model (for example, Longitudinal Integrated Clerkships) and, usually 4-year campuses, where both pre-clinical and clinical curriculum is delivered.

Results
Fifty (50) articles were selected for inclusion in the final review. Thirty-six (36) of the reviewed articles (72%) specifically stated that the development of RMCs was in response to the physician shortage and limited access to healthcare in rural areas. Twenty-five (25) articles discussed program models that spanned both basic science and clinical curricula. Of the 50 articles that were included in the final review, 15 (30%) utilized descriptive methodology, and 35 (70%) involved quantitative, qualitative or mixed methods research, with some being considered "program evaluations." Four major themes emerged from the reviewed articles: workforce, social accountability, distributed medical education, and regional versus main campus settings.

Conclusion
This study is the first systematic review of published literature on RMCs and providing a benchmark and direction for future research on RMC development and impact.

Introduction

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The creation of Regional Medical Campuses (RMCs) has become an international phenomenon, with RMCs sprouting up in many countries, such as the United Kingdom, Australia, the United States and Canada.[1] RMCs have existed as far back as the 1960s, but it was not until the publication of *Mini-Med: the role of regional campuses in U.S. medical education* and the 2006 call by the Association of American Medical Colleges (AAMC) for increasing the number of physicians, that any true national attention was focused on RMCs.[1,2]

Medical schools have traditionally been located in urban centers and associated with large universities. The creation of new medical schools and the development of new or expanded RMCs has been prompted by the need to respond to physician shortages and limited access to healthcare in underserved and rural areas. The exapansions of schools and campuses has led to increased enrollment and medical school admissions.

It is important to ensure that training more students would not perpetuate the maldistribution of physicians, with the majority concentrated in large urban areas. One of the most efficient ways to attract and retain physicians in an area is to train them locally. Thus, being socially accountable to the underserved and rural areas and training medical students locally has proven to be of paramount importance.[1]

RMCs, by definition, extend undergraduate medical education beyond the main (usually urban) campus. RMCs are deemed more efficient than implementing new self-standing medical schools, since curriculum can be delivered across campuses via technology, at a distance. The number of RMCs in Canada and the US has increased significantly since the 1970s.[3,4] Medical schools that created new or expanded existing RMCs did it independently, without national coordination, and there was a lack of agreement on the vernacular surrounding regional campuses. Therefore, for many decades the impact of RMCs on medical education, workforce sustainability and local economies remained unclear.

With the continued development of RMCs in Canada and the US, it is imperative to synthesize the literature on RMC impact, such as, but not limited to: medical education outside of the traditional medical school and/or the big University-based teaching hospital can be as good as the traditional approach, and if students graduating from regional programs resolve the maldistribution of physicians and provide medical care to all communities. The purpose of this review is to identify and categorize themes from the existing body of literature on the development and evaluation of undergraduate RMCs in Canadian and US medical schools.

Methods

We completed a systematic review of the published literature on RMCs in Canada and the US. A librarian performed a comprehensive search of the following databases: Medline OVIDSP, Evidence-Based Medicine Reviews OVIDSP, CINAHL EBSCO, ERIC EBSCO, PsycInfo EBSCO, and Web of Science ISI. In an initial pilot review, the search included the Campbell Collaboration; this initial search yielded zero results and therefore was excluded from the search process. To ensure the literature search was comprehensive and effective, it was peer-reviewed by an independent medical education librarian. In addition, three of the leading medical education journals were hand-searched: Academic Medicine (including the special collection on Regional Medical Education, Rural Medical Education, and Care for the Underserved), Medical Education and Medical Teacher. This review did not involve human subjects and ethics approval was not sought.

The following search terms were used: medical education, undergraduate; schools, medical, regional campus, site, center or program; distributed campus or site or center or program; satellite campus, site, center or program; dispersed campus, site, center or program; branch campus, site, center or program; basic science model; clinical model; longitudinal model; distributed model; combined model; integrated clerkship; longitudinal clerkship; and geographically isolated

campus. Searches were limited to English-language, Canada and US articles only. As an example of our systematic approach, Table 1 presents the search strategy for the Medline OVIDSP search. The selected key words used to search the databases appeared to be sensitive enough to provide for a broad, yet targeted, set of results. It must be noted that the language used to describe RMCs varies considerably in the literature.[4]

A large variation and subjectivity in RMC classification exists. What constitutes a RMC has been judged and redefined over time by different authors and agencies. For example, the Liaison Committee on Medical Education (LCME) considers as a regional campus any location separated from the main campus, where a minimum of one student spends 6 or more months of their training.[5] Terms have been used interchangeably for community-based or rural-based continuous medical education, postgraduate medical education, nursing education and other health-allied education. According to the GRMC, an RMC involves "a significant portion of the medical educational program (e.g., all of the required pre-clinical and/or clinical clerkships) at a site geographically distant from the medical school".[6] The GRMC has defined RMCs to be of four distinct types: basic science campuses, where students study pre-clinical (basic sciences) courses; clinical campuses, where clerkship training is completed; longitudinal model (for example, Longitudinal Integrated Clerkships) and, usually 4-year campuses, where both pre-clinical and clinical curriculum is delivered (integrated, mixed model).[4] This categorical system provided the common denominator for RMCs across the US and Canada and for the purposes of our review, we adopted the GRMC classification system for RMCs in undergraduate medical education. Articles were included if they met one of the four criteria outlined by the GRMC.

Each database search concluded with developing a data set to be reviewed for inclusion. After combining the final search sets from each database and the hand-searching process, and after removal of duplications, 950 potential articles remained, of which a set of 289 articles was selected for further review. Articles about allopathic undergraduate medical education in Canada and US medical schools that could be aligned with the categories of the GRMC's definition of RMCs were included. After the review process iterations were complete, the researchers identified 50 articles meeting all inclusion criteria. Two researchers independently reviewed each of the 289 articles. If discrepancy between the reviewers regarding inclusion or exclusion existed, a third reviewer read the article and weighed for a final decision. Twenty-two articles had to be reviewed by a third reviewer. The inclusion and exclusion criteria used in the determination of the final article review set are presented in Figure 1.

A qualitative thematic analysis of the included articles was conducted. The intent of the systematic review was to identify and categorize the results, and not to critically appraise the quality of the study design of the included articles. Therefore, the articles were analyzed using open and axial coding. This process involved coding the articles for major categories (open coding) and then focusing on each category specifically to identify further relationships (axial coding) and thread themes.[7]

Results

Thirty-six (36) of the reviewed articles (72%) specifically stated that the development of RMCs was in response to physician shortage and limited access to healthcare in underserved and rural areas. Twenty-five (25) articles (50%) discussed program models that spanned both basic science and clinical curricula. Of the 50 articles that were included in the final review, 15 (30%) utilized descriptive methodology, describing program implementation, challenges and successes. Thirty-five (70%) articles involved quantitative, qualitative or mixed methods research, with some being labeled "program evaluations."

The articles included in the review fit the definition and categories provided by the GRMC. Table 2 presents the types of RMCs according to the GRMC

classification system as found in the literature. Table 3 presents the study methodology utilized in the included articles.

Thirty-four (34) of the 50 articles (68%) were published in medical education journals. The remaining 16 articles (32%) were published in general education, medical specialty, rural health, and other journals.

Discussion

Four major themes emerged from the included articles: workforce, social accountability, rural medical education, and rural versus urban setting.[1,8-56] Table 4 presents the codes within each of the four major topic categories, and Table 5 presents the complete bibliographic information for the fifty articles included in our analysis.

Workforce: Twenty-two of the articles stated that RMCs were developed as a response to physician shortage and maldistribution, often with a specific focus on underserved areas and rural geographies. Medical schools were challenged to increase enrollment and admissions to their undergraduate medical programs without funding for developing new schools. The existing medical schools were tasked with producing more physicians to meet the shortage and maldistribution issues plaguing both Canada and the US.[2,57] Physician workforce distribution across underserved and rural areas in Canada and the US has been problematic, leaving these populations without adequate or equitable access to health care.

The earliest articles on the topic came out of the Washington, Wyoming, Alaska, Montana and Idaho (WWAMI) program, which began in 1970.[8] Multiple articles about WWAMI focused on the workforce and provided historical background, benchmarking for RMCs that have since developed as well as evidence that RMCs do have an impact on the physician workforce.

The National Residency Matching Program (NRMP) data do not identify graduates of RMCs separately, thus making it more difficult to assess the association between training students in RMCs and acceptance to primary care residency programs. Individual campuses or medical schools track and report on the career choices of their RMC graduates. Small RMCs are disadvantaged in reporting numbers because of smaller enrollments and limited resources devoted to graduate tracking and impact research.[4] The WWAMI program is one of the longest existing regional programs and provides longitudinal data about the effectiveness of regional programs in retaining physicians. For example, after completing the WWAMI program, many students have returned to their areas of training to practice medicine, even though the students may not have been originally from that specific area; in Idaho, 71% of the students returned to the state to practice medicine.[48]

Social Accountability:

Medical schools have a social responsibility to produce graduates that will serve all patient populations, including underserved and rural areas.[1] The literature described the roles of physicians in community partnerships and community leadership. Few studies focused on the evaluation of the RMCs at the community level, and only a few articles explored RMC's effects on community stakeholders. Three studies originating from the University of British Columbia (UBC) program described the community influences of RMCs. In 2004, UBC's undergraduate medical program created two campuses at considerable distances from the main campus in Vancouver; one campus was located in a small urban city, Victoria, and the other in a northern rural area, Prince George. The Prince George Northern Medical Program collaborated with the University of Northern British Columbia to conduct a study with local community stakeholders. Hanlon, et al. conducted interviews with local physicians about their involvement and perception of the medical program in regards to their practice and the community in general.[30] Another publication focused on the RMC's impact on its community stakeholders: local business, economy, education, health and political sectors in the community. That qualitative study found that community stakeholders felt pride and an increased sense of status, developed new partnerships, a new found

sense of community self-efficacy, and perceived positive change at the local community level.[37] Another study also found that the RMC benefited the community education, health services, and the local economy, with major impact on health services and improving healthcare access in a medically underserved community.[54]

Distributed Medical Education:

The development of RMCs brought about educational innovation and renewed pedagogy. New curriculum delivery strategies were developed in order to provide medical education to RMCs at distant locations, such as use of technology and videoconferencing. One of the earliest innovation articles regarding RMCs described the use of satellite in the WWAMI program as a tool to communicate between the various RMC locations.[22] Since the early days of the RMCs, the use of technology has evolved and increased in the delivery of curriculum. Lectures can be distributed using videoconference technology, students can interact with each other online and curriculum is becoming more flexible because of advances in technology. An example is the use of technology to deliver pathology curriculum within a distributed program; to evaluate the effectiveness of the technology in the delivery of the curriculum, a study compared student examination scores across multiple RMCs and surveyed student opinions about the material delivery.[28] Based on the geographically distributed nature of the regional campuses, it is critical that educational innovation is encouraged and fostered, to ensure the success of the RMCs.

An integral part of the successful implementation of RMCs is successful faculty recruitment, and this is most evident in the implementation of Longitudinal Integrated Clerkships (LICs), where students participate in the continuous care of patient panels across disciplines and healthcare settings.[24] A great deal of research has been done to evaluate the value of LICs on student performance, future career selection and learning perception. LICs implemented in the RMC setting have proven to be academically successful and have had positive impacts on relieving the shortage of physicians in rural communities.

Regional versus Main Campus:

To evaluate RMCs, medical education researchers study RMCs from the aspect of comparable national examination scores, various student outcomes (e.g., grades distribution), and perceptions focused on equitable experiences (e.g., student satisfaction with curriculum and services). Program evaluation is an important component of RMC implementation and sustainability. Twenty-three articles described and compared programs by analysis of exam scores, student and faculty surveys, and data from focus groups. The program evaluations customarily compared the regional campus to the main campus in regards to student success and satisfaction. The comparative studies proved that students at regional campuses score comparably with students at main campuses. These types of studies continue to be critical for the sustainability and continued development of RMCs across Canada and the US and are of the utmost importance for regional programs, validating the quality of medical education in distributed regions.

Another way of evaluating the RMCs' impact has been through an economic lens. Articles discussed the financial benefits of developing RMCs over implementing new stand-alone medical schools. For example, an article from the 1960s, was the first to discuss the local economic impact of regional campuses stating that developing regional sites would be less expensive than creating new medical programs.[15]

Study Limitations

This review provides categorization of articles qualified by inclusion criteria and critical analysis of the study design of the included articles was not intended. Deployment of conclusions is limited to institutions with existing RMCs, as defined by GRMC. Translating the findings of this study to new and developing RMCs need to be done with caution.

Future Direction

Although RMCs have been in place for over 50 years, the majority of RMCs have been established recently, making it difficult to obtain longitudinal data. However, there has been program evaluation and descriptive work that provides potential new RMCs with initial benchmarking and implementation data. RMC programs need to consider establishing research agendas, as early as the planning phases for creating new campuses, to ensure that this is part of the RMC's mandate and can be reasonably done with available resources. Comparative studies remain an integral part of RMC research, in establishing evidence that the educational outcomes of students at the regional campuses are comparable to those at the main campus. Without strict language, searching for RMC articles in a database will continue to be challenging. We recommend that future RMC publications should consider utilizing GRMC language and categorization of their programs. There are opportunities for RMCs to research social accountability. Existing research demonstrates that value exists outside of increasing the physician workforce to address physician shortage and maldistribution, with boosts in local economy and improved healthcare access and delivery. One important aspect of the RMC literature discussed financial accountability. Based on the articles included in this study, RMCs are thought to provide an economically viable alternative to producing more MD graduates and responding to the need to offset the predicted physician shortage.[8,15,20,47,49] More research needs to be done on the financial and local economic aspects of RMC impact.

The paucity of research on RMCs, and the continued increase in the number of RMCs, suggest that future studies on the impact of RMCs – educationally and within the local community – are critical. Anecdotally, RMC regional deans, faculty, and senior leadership share success across institutions. In addition, until recently, there was a lack of a systematic way to categorize RMC campuses, thus research and publication about such findings proved quite difficult. Since the number of medical students per campus are traditionally low, it might be difficult to draw statistically significant conclusions by using individual, isolated campuses as basis for research. Such approach would translate in unacceptable delays before reaching conclusions. We recommend that future RMC studies involve multi-institutional, multi-campus research, where results could be widely deployable.

Conclusion

This study is the first systematic review of the published literature on RMCs. This review provides a benchmark and direction for future research in this area of RMC development and impact. This systematic review suggests it would be beneficial to explore the impacts of RMCs on workforce, social accountability, distributed medical education and regional versus main campus settings.

Abbreviations:

AAMC – Association of American Medical Colleges
GRMC – Group on Regional Medical Campuses
NRMP – National Resident Matching Program
RMC - Regional Medical Campuses
US – United States

Competing interests:

The authors declare that they have no competing interests.

Authors' contributions:

GP conceived of the review. TF carried out the searches, coordinated the review process, and wrote the draft manuscript. RA, PG, SP, GP, and TF participated in the development of the design of the review, reviewed articles, and helped to draft the manuscript. CC helped to draft the manuscript. All authors read and approved the final manuscript.

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Table 1 Medline OVID search strategy

Database(s): **Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R)** 1946 to Present

Search Strategy:

#	Searches
1	Education, Medical, Undergraduate/
2	Schools, Medical/
3	Students, Medical/
4	Clinical Clerkship/
5	(undergraduate adj3 medical adj3 (school* or education or student*)).tw.
6	1 or 2 or 3 or 4 or 5
7	(regional adj3 (campus* or site* or center or centre or program*)).tw.
8	(distribut* adj3 (campus* or site* or center or centre or program*)).tw.
9	(satellite adj3 (campus* or site* or center or centre or program*)).tw.
10	(dispersed adj3 (campus* or site* or center or centre or program*)).tw.
11	(branch adj3 (campus* or site* or centre or centre or program*)).tw.
12	((basic science or clinical or longitudinal or distribut* or combined) adj3 model).tw.
13	((integrated or longitudinal) adj3 clerkship*).tw.
14	(geographically adj3 campus*).tw.
15	7 or 8 or 9 or 10 or 11 or 12 or 13 or 14
16	6 and 15
17	exp Canada/
18	exp United States/
19	17 or 18
20	16 and 19
21	limit 20 to english language

Fig. 1 Inclusion and exclusion criteria and literature review flow chart

Inclusion Criteria

- Undergraduate medical education programs
- English literature
- Setting fits into one of the GRMC's categories:
  - Basic science model
  - Clinical Model
  - Longitudinal/Distributed model
  - Combined model

Exclusion Criteria

- Graduate medical education, continuing medical education, nursing or other health professional programs
- Commentaries, opinion pieces, letters
- Reports, books, theses/dissertations
- Programs located outside Canada and the US

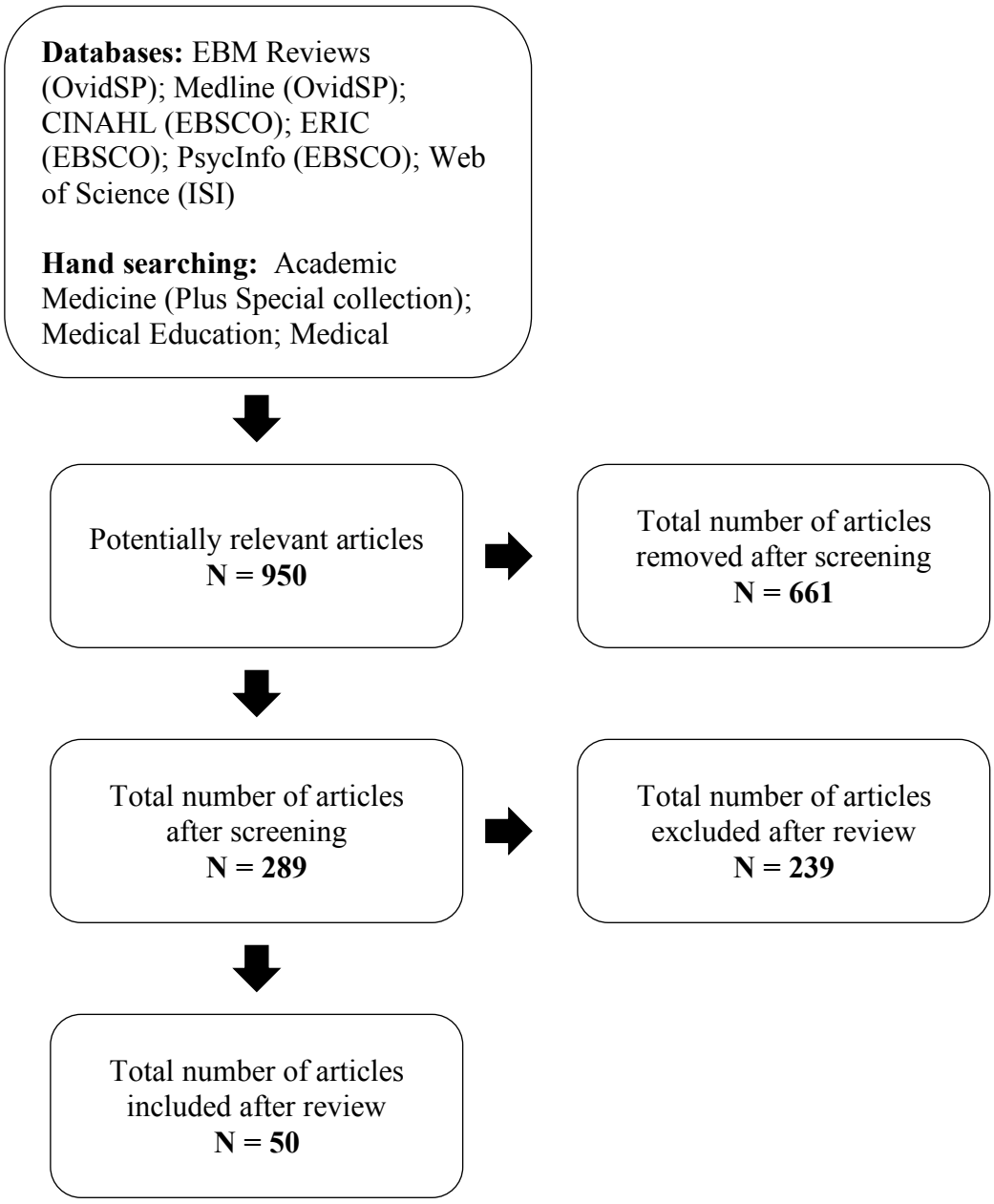

Table 2. Type of RMCs

Type of RMC	Number
Basic science model	1
Clinical model	8
Combined model	25
Distributed model	10
Clinical & Distributed model	2
All models	4
Total	**50**

Table 3. Research approaches utilized in the included articles

Approach	Number	Percentage
Descriptive	15	30%
Mixed Methods	1	2%
Qualitative	6	12%
Quantitative	23	46%
Review	5	10%
Total	**50**	**100%**

Table 4. Emergent Themes and Codes

Theme	Code	Sub-code
Regional versus Main Campus The comparison amongst RMCs within an undergraduate medical school regarding grades and other outcome measures (i.e. - research).	Equity Program Evaluation Satisfaction	Examination scores
Social Accountability The role of the community in the development of RMCs and/or the RMCs impact on community for which it is situated outside (of workforce).	Partnership Community	Physicians
Distributed Medical Education Educational approach is changed/renewed as an impetus of, or result of, the development of RMCs.	Cost Technology Accreditation	Faculty recruitment
Workforce Addresses physician shortage or mal distribution of physicians in specific geographic areas.	Admissions Enrollment increase Distribution of physicians Shortage of Physicians	Academic qualifications Site selection

Table 5. Fifty articles included after review

Author & Year	School	Type of RMC	Approach	Methodology	Themes
Atkin et al. 1987	WWAMI	Combined Model	Quantitative	Longitudinal Study	Distributed Medical Education Regional versus Main Campus
Bianchi et al. 2008	McMaster	Distributed Model	Quantitative	Comparative Study	Regional versus Main Campus
Bing-You et al. 2010	Tufts	Combined Model	Descriptive	Descriptive Study	Workforce Distributed Medical Education Social Accountability
Bland et al. 1995	N/A	N/A	Review	Synthesis	Workforce
Bradley et al. 2012	Florida State University College of Medicine	Combined Model	Quantitative	Comparative Study	Regional versus Main Campus
Carney et al. 1999		Clinical Model	Quantitative	Comparative Study	Distributed Medical Education
Cigarroa 2008	University of Texas Health Science Center at San Antonio	Clinical Model	Descriptive	Descriptive Study	Workforce Regional versus Main Campus
Clark 1966	N/A	N/A	Qualitative	Interviews	Distributed Medical Education Social Accountability
Couper et al. 2011	Northern Ontario School of Medicine	Clinical Model	Qualitative	Cross-sectional descriptive	Regional versus Main Campus
Crump et al. 2004	University of Louisville School of Medicine	Clinical Model	Quantitative	Survey	Workforce
Crump et al. 2010	University of Louisville School of Medicine	Clinical Model	Quantitative	Survey	Workforce Distributed Medical Education
Crump et al. 2013	University of Louisville School of Medicine	Clinical Model	Quantitative	Comparative Study	Regional versus Main Campus Workforce
Cullen et al. 1976	WWAMI	Combined Model	Quantitative	Comparative Study	Workforce Social Accountability

					Regional versus Main Campus
Cullen et al. 1981	WWAMI	Combined Model	Quantitative	Comparative Study	Workforce Regional versus Main Campus
Dohner 1985	WWAMI	Combined Model	Quantitative	Survey	Distributed Medical Education
Donnon et al. 2009	University of Calgary	Clinical Model	Quantitative	Survey	Workforce Distributed Medical Education
Ellaway et al. 2013	Northern Ontario School of Medicine; University of Calgary; McGill University	Clinical Model	Review	Synthesis	Distributed Medical Education Regional versus Main Campus
Essex and Sorlie 1982	University of Illinois	Basic Science Model	Quantitative	Comparative Study	Regional versus Main Campus
Farnsworth et al. 2012	N/A	N/A	Review	Synthesis	Workforce Distributed Medical Education
Fogarty et al. 2012	Florida State University	Clinical Model	Descriptive	Descriptive	Distributed Medical Education Regional versus Main Campus
Ford et al. 2008	University of British Columbia	Combined Model	Quantitative	Comparative Study	Regional versus Main Campus Distributed Medical Education
Fyfe et al. 2009	University of British Columbia	Combined Model	Descriptive	Descriptive	Distributed Medical Education
Hanlon et al. 2010	Northern Medical Program (NMP) – UBC	Combined Model	Qualitative	Interviews	Social Accountability
Heck et al. 2014	University of North Carolina	Clinical Model	Descriptive	Descriptive	Distributed Medical Education Regional versus Main Campus
Hirsh et al. 2012	Harvard Medical School – Cambridge	Clinical Model	Quantitative	Comparative Study	Distributed Medical Education

	Integrated Clerkship				Regional versus Main Campus
Hoag et al. 2013	University of British Columbia	Combined Model	Quantitative	Survey	Distributed Medical Education
					Regional versus Main Campus
Hurt and Harris 2005	Florida State University	Clinical Model	Descriptive	Descriptive	Workforce
					Distributed Medical Education
Lau and Bates 2004	University of British Columbia	Combined Model	Review	Synthesis	Distributed Medical Education
Lorenzetti et al. 2011	West Virginia University School of Medicine	Clinical Model	Descriptive	Descriptive	Distributed Medical Education
Lovato et al. 2009	UBC	Combined Model	Qualitative	Interviews	Social Accountability
Mazotti et al. 2011	University of California, San Francisco	Clinical Model	Quantitative	Survey	Regional versus Main Campus
McLaughlin et al. 2011	Universities of Alberta, British Columbia and Calgary	Clinical Model	Quantitative	Comparative Study	Regional versus Main Campus Distributed Medical Education
Mihalynuk et al. 2008	UBC	Combined Model	Qualitative	Interviews	Workforce
Norris et al. 2006	WWAMI	Combined Model	Descriptive	Descriptive	Workforce
					Distributed Medical Education
Norris et al. 2009	16 schools in Australia, Canada, South Africa and US	Clinical Model	Quantitative	Survey	Distributed Medical Education
Penn 2007	University of Arkansas Medical School	Clinical Model	Descriptive	Descriptive	Workforce
Phillips et al. 1982	WWAMI	Combined Model	Quantitative	Comparative Study	Regional versus Main Campus Distributed Medical Education
Pinder et al. 2008	UBC	Combined Model	Quantitative	Survey	Distributed Medical Education

					Regional versus Main Campus
Poncelet et al. 2011	University of California, San Francisco	Clinical Model	Mixed Methods	Surveys; Focus Groups	Distributed Medical Education Regional versus Main Campus
Rackleff et al. 2007	Florida Atlantic University-University of Miami Miller School of Medicine	Combined Model	Descriptive	Descriptive	Workforce Social Accountability Distributed Medical Education
Ramsey et al. 2001	WWAMI	Combined Model	Descriptive	Descriptive	Workforce Social Accountability Distributed Medical Education
Robertson et al. 2007	Oregon Health & Science University School of Medicine	Combined Model	Descriptive	Descriptive	Workforce Social Accountability Distributed Medical Education
Sadoski and Colenda 2010	Texas A&M Health Science Center College of Medicine	Combined Model	Quantitative	Survey, Comparative Study	Workforce Regional versus Main Campus
Smego et al. 2010	The Commonwealth Medical College	Combined Model	Descriptive	Descriptive	Workforce Distributed Medical Education
Snadden and Bates 2005	UBC	Combined Model	Descriptive	Descriptive	Workforce Distributed Medical Education
Snadden et al. 2011	N/A	N/A	Review	Synthesis	Distributed Medical Education Workforce Social Accountability
Spencer et al. 1983	University of Illinois	Combined Model	Descriptive	Descriptive	Workforce
Toomey et al. 2013	University of British Columbia	Combined Model	Qualitative	Interviews	Social Accountability
Veerapen et al. 2010	University of British Columbia	Combined Model	Quantitative	Survey	Regional versus Main Campus

Woloschuk et al. 2014	University of Calgary	Clinical Model	Quantitative	Comparative Study	Regional versus Main Campus