



# Pathways to rural family practice at Memorial University of Newfoundland

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## Abstract

**Objective** To assess Memorial University of Newfoundland's (MUN's) commitment to a comprehensive pathways approach to rural family practice, and to determine the national and provincial effects of applying this approach.

**Design** Analysis of anonymized secondary data.

**Setting** Canada.

**Participants** Memorial's medical degree (MD) graduates practising family medicine in Newfoundland and Labrador as of January 2015 (N=305), MUN's 2011 and 2012 MD graduates (N=120), and physicians who completed family medicine training programs in Canada between 2004 and 2013 and who were practising in Canada 2 years after completion of their postgraduate training (N=8091).

**Main outcome measures** National effect was measured by the proportion of MUN's family medicine program graduates practising in rural Canada compared with those from other Canadian family medicine training programs. Provincial effect was measured by the location of MUN's MD graduates practising family medicine in Newfoundland and Labrador as of January 2015. Commitment to a comprehensive pathways approach to rural family practice was measured by anonymized geographic data on admissions, educational placements, and practice locations of MUN's 2011 and 2012 MD graduates, including those who completed family medicine residencies at MUN.

**Results** Memorial's comprehensive pathways approach to training physicians for rural practice was successful on both national and provincial levels: 26.9% of MUN family medicine program graduates were in a rural practice location 2 years after exiting their post-MD training from 2004 to 2013 compared with the national rate of 13.3% (national effect); 305 of MUN's MD graduates were practising family medicine in Newfoundland and Labrador as of 2015, with 36% practising in rural areas (provincial effect). Of 114 MD students with known background who graduated in 2011 and 2012, 32% had rural backgrounds. Memorial's 2011 and 2012 MD graduates spent 20% of all clinical placement weeks in rural areas; of note, 90% of all first-year placements and 95% of third-year family medicine clerkship placements were rural. For the 25 MUN 2011 and 2012 MD graduates who also completed family medicine residencies at MUN, 38% of family medicine placement weeks were spent in rural communities or rural towns. Of the 30 MUN 2011 and 2012 MD graduates practising family medicine in Canada as of January 2015, 42% were practising in rural communities or rural towns; 73% were practising in Newfoundland and Labrador and half of those were in rural communities and rural towns.

**Conclusion** A comprehensive rural pathways approach that includes recruiting rural students and exposing all medical students to extensive rural placements and all family medicine residents to rural family practice training has resulted in more rural generalist physicians in family practice in Newfoundland and Labrador and across Canada.

## Editor's key points

► Memorial University of Newfoundland (MUN) is committed to training family medicine physicians for the special challenges and opportunities of rural generalist practice. To train these physicians, MUN has implemented a comprehensive "pathways" approach that focuses on recruiting students through a targeted admissions process and subsequently exposing all undergraduate medical students to extensive rural placements and all family medicine residents to rural family practice training.

► As demonstrated by the high proportion of students with rural backgrounds, the high proportion of clinical learning that takes place in rural locations within the medical doctor and postgraduate family medicine programs, and the high proportion of recent family medicine graduates establishing rural practice in Newfoundland and Labrador, MUN remains fully committed to a comprehensive rural pathways approach that emphasizes the rural experience and contextual learning. This study shows that many MUN medical doctor graduates are continuing the strong tradition of establishing rural practice in Newfoundland and Labrador and thus contributing to addressing a critical need in the province and fulfilling MUN's social accountability mandate.



## Points de repère du rédacteur

► À l'Université Memorial de Terre-neuve (UMT), on est déterminé à former des médecins de famille qui pourront répondre aux problèmes particuliers de la pratique généraliste en milieu rural et à accepter d'y travailler. Afin de former de tels médecins, l'UMT a instauré une voie d'accès particulière qui comprend un recrutement ciblé des étudiants suivi d'une exposition de tous les étudiants du premier cycle de médecine à des stages en région rurale et de tous les résidents en médecine familiale à une formation en médecine rurale.

► Comme l'indiquent le grand nombre d'étudiants avec un passé rural, la forte proportion de l'enseignement clinique qui se donne en milieu rural et le nombre élevé des récents diplômés en médecine familiale qui choisissent de pratiquer en milieu rural à Terre-Neuve et au Labrador, l'UMT demeure entièrement déterminée à utiliser une voie d'accès privilégiée à la médecine rurale, qui met l'accent sur un passé rural et sur une formation appropriée. Cette étude montre qu'un grand nombre de diplômés en médecine à l'UMT poursuivent la tradition provinciale d'adopter une pratique rurale, contribuant ainsi à corriger une situation provinciale critique, tout en aidant l'UMT à remplir son mandat de responsabilité sociale.

# La voie qui mène à pratiquer la médecine familiale en milieu rural à l'Université Memorial de Terre-Neuve

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## Résumé

**Objectif** Évaluer la façon particulière choisie par l'Université Memorial de Terre-Neuve (UMT) pour amener les étudiants en médecine à choisir une pratique rurale et déterminer les effets d'une telle méthode aux niveaux national et provincial.

**Type d'étude** Une analyse anonymisée de données secondaires.

**Contexte** Le Canada.

**Participants** Des médecins (MD) diplômés qui pratiquaient la médecine familiale à Terre-Neuve et au Labrador en janvier 2015 (N=305), les diplômés en médecine de 2011 et 2012 à l'UMT (N=120), et les résidents qui avaient complété leur programme de formation en médecine familiale au Canada entre 2004 et 2013 et qui pratiquaient toujours au Canada 2 ans après la fin de leur formation de deuxième cycle (N=8091).

**Principaux paramètres à l'étude** L'effet national a été mesuré en comparant la proportion des diplômés en médecine familiale de l'UMT qui pratiquaient en région rurale au Canada avec la proportion des diplômés des autres programmes canadiens de médecine familiale. L'effet provincial a été mesuré par le lieu de pratique des diplômés en médecine de l'UMT qui pratiquaient la médecine familiale à Terre-Neuve et au Labrador en janvier 2015. L'engagement à utiliser une méthode particulière pour favoriser une pratique rurale a été mesuré par les données géographiques anonymisées portant sur les admissions, les stages de formation et les lieux de pratique des diplômés de 2011 et 2012 à l'UMT, incluant ceux qui ont complété leur résidence en médecine familiale à l'UMT.

**Résultats** La méthode instaurée par l'UMT pour former des médecins qui pourront pratiquer en zone rurale s'est avérée un succès au niveau tant national que provincial : 26,9% des diplômés du programme de médecine familiale de l'UMT pratiquaient en région rurale 2 ans après avoir complété leur formation de deuxième cycle entre 2004 et 2013, alors que le taux national était de 13,3% (l'effet national); 305 des diplômés en médecine de l'UMT pratiquaient en médecine familiale à Terre-Neuve et au Labrador en 2015, dont 36% en région rurale (l'effet provincial). Sur 114 étudiants dont les antécédents étaient connus et qui ont obtenu leur diplôme en 2011, 32% avaient un passé rural. Les diplômés en médecine de 2011 et 2012 à l'UMT passaient 20% de toutes leurs semaines de stage clinique en région rurale; à noter que 90% de tous les stages de première année et 95% des stages de troisième année de résidence en médecine familiale étaient ruraux. Sur les 25 étudiants qui ont complété leur résidence en médecine familiale à l'UMT en 2011 et en 2012, 38% de leurs semaines de stage en médecine familiale se déroulaient dans des communautés ou des municipalités rurales. Sur les 30 diplômés en médecine de 2011 et 2012 à l'UMT qui pratiquaient au Canada en janvier 2015, 42% pratiquaient dans des communautés ou des municipalités rurales; 73% pratiquaient à Terre-Neuve et au Labrador, et la moitié d'entre eux se déroulaient dans des communautés ou des municipalités rurales.

**Conclusion** L'adoption d'une méthode particulière favorisant une pratique en région rurale comportant un recrutement qui favorise les étudiants d'origine rurale et qui expose tous les étudiants en médecine à des stages en milieu rural et tous les résidents en médecine familiale à une formation en médecine rurale a fait en sorte qu'il y a maintenant plus de médecins généralistes qui pratiquent la médecine familiale rurale à Terre-Neuve, au Labrador et au Canada.

Memorial University of Newfoundland's (MUN's) Faculty of Medicine has had a social accountability mandate since it was founded in 1967, focusing its attention specifically on training physicians for practice in a province that features a widely distributed population across an expansive geographic area. This mandate includes a focus on training physicians with the interest, knowledge, and skills to practise in rural areas. Its rural-focused, experiential-learning-based curriculum forms the backbone of what MUN considers its "pathways" to rural family practice. Memorial's comprehensive pathways approach augments the conventional pipeline approach to develop and support medical students, residents, and physicians by recognizing the different paths that people take through their lives to get to rural practice. This study assesses MUN's commitment to a comprehensive rural pathways approach to education for rural family practice, as well as the national and provincial effects of using this approach.

Canadian studies demonstrate the importance of rural admissions and rural medical education at both the undergraduate medical student and the postgraduate family medicine vocational training levels, resulting in a higher percentage of doctors who practise in rural areas. These studies include influences on the supply of rural physicians,<sup>1-3</sup> rural background as an element of diversity recruitment to medical school,<sup>4-6</sup> distributed learning and integrated and rural-focused family medicine residencies,<sup>7</sup> and duration of residency training.<sup>8</sup>

A recent study of medical doctor (MD) graduates from MUN's Faculty of Medicine confirmed that those with rural backgrounds were more likely to practise in rural locations.<sup>9</sup> A study of 2011 to 2013 Northern Ontario School of Medicine family medicine graduates also found that those with rural backgrounds were more likely to practise in rural locations.<sup>10</sup> Similar to MUN, the Northern Ontario School of Medicine provides distributed, community-based learning with an emphasis on rural and remote areas.<sup>11</sup>

Across Canada, and in Newfoundland and Labrador specifically, there continues to be a shortage of rural family physicians. Memorial's comprehensive pathways approach addresses this shortage with interventions that begin before an individual enters medical school and follows the student throughout their medical education and subsequent medical career. Memorial's Learners and Locations (L&L) ongoing study explores the result of increased recruitment of rural students into medical school, along with extensive exposure to rural medicine through undergraduate placement weeks and a rural-focused family medicine postgraduate training program.

To assess MUN's commitment to a comprehensive pathways approach to rural family practice, this study examined the following questions: What are the national geographic effects of MUN's comprehensive pathways

approach to rural family practice, as measured by the proportion of MUN family medicine program graduates practising in rural Canada compared with other Canadian family medicine training programs? What are the provincial geographic effects of MUN's comprehensive pathways approach to rural family practice, as measured by the location of MUN MD graduates practising family medicine in Newfoundland and Labrador? What are the indications that MUN has an ongoing commitment to a rural pathways approach, as measured by the proportion and distribution of students with rural backgrounds, rural clinical learning opportunities in MD and postgraduate programs, and rural family medicine practice locations of 2011 and 2012 MUN MD graduates?

## — Methods —

### Measurement approaches

The following methods were used to measure the national and provincial effects of MUN's comprehensive pathways approach to rural practice, as well as the university's ongoing commitment to the approach.

**National effect.** National effect was measured by the proportion of MUN family medicine program graduates practising in rural Canada compared with those from other Canadian family medicine training programs. The study population for this portion of the analysis comprised physicians who completed family medicine training programs between 2004 and 2013 and who were practising in Canada 2 years after completion of their postgraduate training (N=8091).<sup>12</sup> This study component analyzed this practice-entry cohort and determined the proportion practising in rural locations.

The Canadian Post-MD Education Registry (CAPER) gathers post-MD training data and practice locations for all residency programs at all Canadian medical schools. Practice location is reported for graduates 2 years after exiting their post-MD training. *Rural locations* are defined by CAPER as those locations outside census metropolitan areas and census agglomerations, as well as the territories. This means communities with a population of less than 10000 outside the commuting zone of large urban centres.

**Provincial effect.** Provincial effect was measured by the location of MUN MD graduates practising family medicine in Newfoundland and Labrador. The study population for this portion of the analysis comprised MUN MD graduates practising family medicine in Newfoundland and Labrador as of January 2015 (N=305).

This study component analyzed the location of MUN MD graduates practising family medicine in Newfoundland and Labrador based on data for physicians licensed by the College of Physicians and Surgeons of Newfoundland and Labrador. These data

were georeferenced and analyzed using the definitions of *rural* developed for the L&L project described below. ArcGIS Online was used to create the map.

**Memorial's ongoing commitment to a comprehensive pathways approach.** This was measured by the proportion and distribution of students with rural backgrounds, rural clinical learning opportunities within the MD and postgraduate programs, and rural family medicine practice locations of recent MUN graduates. The study population for this portion of the analysis was MUN's 2011 and 2012 MD graduates (N=120). To gather information for this section (eg, students' backgrounds, clinical placements), the L&L database was used.

### The L&L database

The L&L database was developed in 2008 as the basis for a longitudinal study that links students' backgrounds and educational placement locations with their eventual practice locations in Newfoundland and Labrador and further afield.

The L&L database includes admissions information and education placement administrative information (One45 software) on educational placements and Canadian Medical Directory data on practice locations. This study included anonymized data from the L&L database on MUN 2011 and 2012 MD graduates (N=120), including those who completed family medicine residencies at MUN (N=25), those who practised family medicine in Canada as of January 2015 (N=30), and those who practised family medicine in Newfoundland and Labrador as of January 2015 (N=22). To analyze statistics, SPSS software was used, and ArcGIS Online was used to create maps.

A key aspect of the L&L project is the definition of *rural*, for which L&L has adapted standard Statistics Canada categorizations in order to reflect what are commonly accepted operational differences in practice locations throughout the province. Statistics Canada defines *rural* and *small town* as follows:

municipalities outside the commuting zone of larger urban centres (with a population of 10000 or more). These individuals might be disaggregated into zones according to the degree of influence of a larger urban centre (called *census metropolitan area* and *census agglomeration* influenced zones).<sup>13</sup>

This study used the following classifications: rural community (population of less than 10000), rural town (population of 10000 to 29999), small city (population of 30000 to 99999), mid-sized city (population of 100000 to 499999), large city (population of 500000 to 999999), and metropolis (population of more than 1 000 000). In accordance with this categorization system, this study used Statistics Canada 2011 population data to classify background, placement, and practice locations. (The 2011 census data were used to best correspond with the

cohort being studied.) Smaller centres with less than 50% commuting flows to larger centres were categorized in accordance with the larger centre. We have included rural towns as "rural," as from a practice perspective, family physicians in these towns often play a rural generalist role that includes a considerable portion of hospital work such as emergency services and obstetrics, as well as substantial responsibilities in caring for hospital patients. When classifying student backgrounds, educational placements, and practice locations, rural communities and rural towns were both categorized as "rural." Students who spent most of their time in rural locations before their 18th birthday, according to data reported in medical school applications, were considered students with rural backgrounds.

## — Results —

### National effect

National comparative data provided by CAPER (Table 1) found that 26.9% of MUN's family medicine program graduates were practising in a rural location

**Table 1. Practice entry cohort, 2004 to 2013, completing family medicine programs who are located in Canada in 2 years after exiting post-MD training, by practice location**

LOCATION OF POST-MD TRAINING	RESIDENTS PRACTISING IN A RURAL LOCATION* 2 Y AFTER POST-MD TRAINING, %
Memorial University	26.9
Dalhousie University	17.8
Laval University	27.2
University of Sherbrooke	19.7
University of Montreal	12.4
McGill University	6.3
University of Ottawa	14.7
Queen's University	13.9
University of Toronto	3.7
McMaster University	9.1
University of Western Ontario	10.0
Northern Ontario School of Medicine	19.2
University of Manitoba	17.0
University of Saskatchewan	14.1
University of Alberta	10.4
University of Calgary	9.8
University of British Columbia	14.4
National total	13.3

MD—medical doctor.

\*Rural locations are metro-influenced zones outside of census metropolitan areas and census agglomerations, as well as the territories. Custom tables provided by CAPER 2016 from the Canadian Post-MD Education Registry.<sup>12</sup>



2 years after exiting their post-MD training from 2004 to 2013 compared with the national rate of 13.3%.<sup>12</sup>

### Provincial effect

**Figure 1** shows the locations of all MUN MD graduates practising family medicine in Newfoundland and Labrador as of January 2015 (N=305). As **Figure 1** shows, 22% of these graduates are practising in rural communities and 14% are practising in rural towns.

### Commitment to a comprehensive pathways approach

Data on MUN's 2011 and 2012 MD graduating classes demonstrate that of 114 students with known backgrounds, 32% had rural backgrounds. Memorial 2011 and 2012 MD graduates spent 20% of all clinical placement weeks in rural areas; of note, 90% of all first-year placements and 95% of third-year family medicine clerkship placements were rural. While the proportion was lower in second year, it still remained fairly high, with 57% of all second-year placements being rural. **Figures 2, 3, and 4** show total placement weeks in all location types for MUN's 2011 and 2012 MD graduates. For the 25 MUN 2011 and 2012 MD graduates who also completed family medicine residencies at MUN, 38% of family medicine residency placement weeks were spent in rural communities or rural towns. Of the 30 MUN 2011 and 2012 MD graduates practising family medicine in Canada as of January 2015, 42% were practising in rural communities or rural towns; 73% were practising in Newfoundland and Labrador and half of those were in rural communities and rural towns. **Figure 5** shows practice locations of these graduates practising family medicine in Newfoundland and Labrador as of January 2015.

## — Discussion —

Both external and internal measures indicate continuing success from MUN's commitment to a comprehensive pathways approach to developing family physicians for rural generalist practice.

Compared with other Canadian medical schools, MUN is very successful at producing rural family physicians. With data from CAPER, this study found that the MUN family medicine program consistently produces doctors who establish rural practice locations; 26.9% of MUN family medicine program graduates were in a rural practice location 2 years after exiting their post-MD training from 2004 to 2013 compared with national rate of 13.3% (**Table 1**).<sup>12</sup>

This study finding is consistent with other external measures, most notably research compiled by the Society of Rural Physicians of Canada (SRPC). The SRPC uses CAPER and Canadian Medical Association data files to determine the percentage of physicians in rural practice 10 years after completing their postgraduate

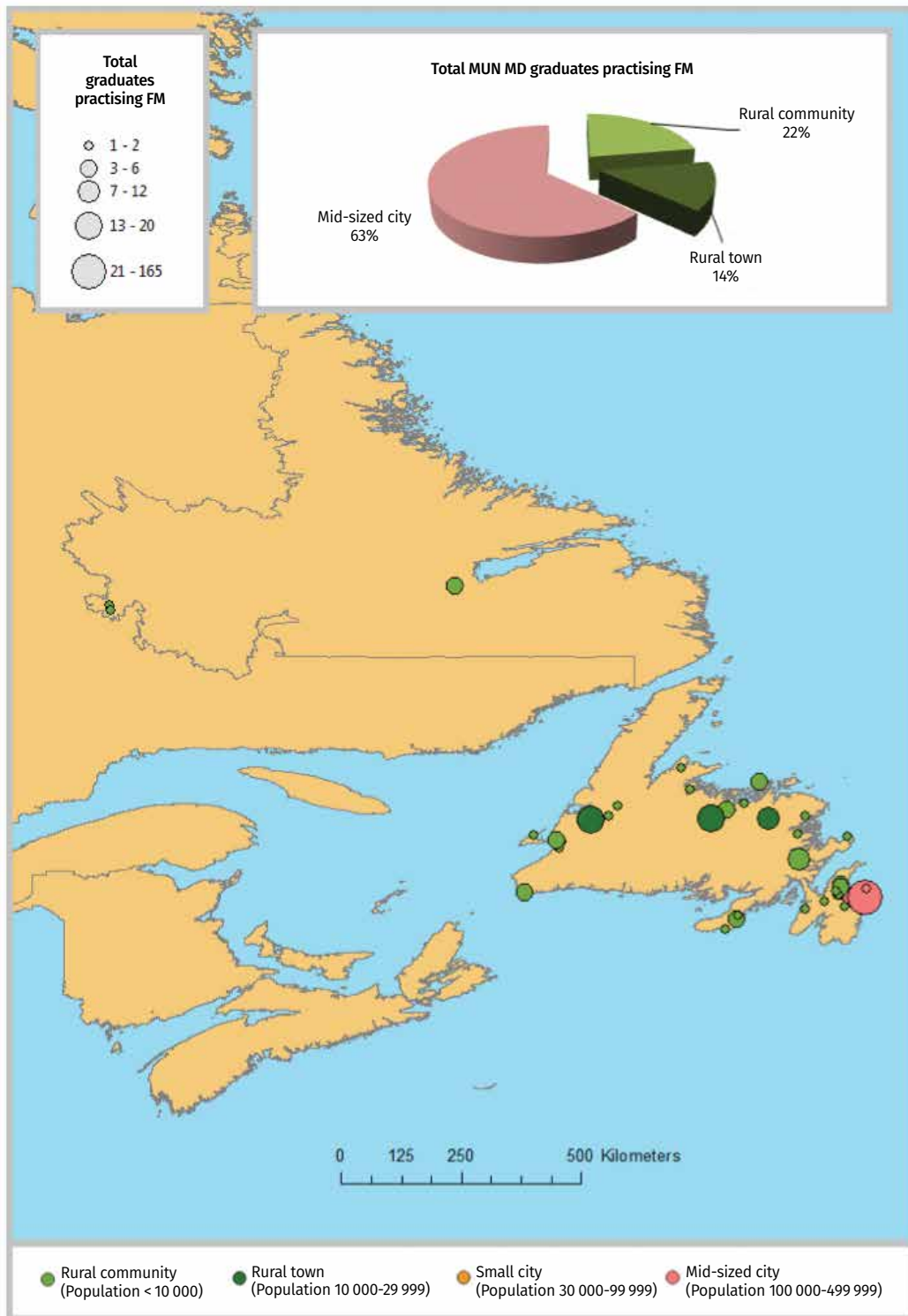
family medicine training to determine its annual Keith Award recipient, which is awarded to the university with the highest percentage of such physicians. Memorial received the Keith Award in 2016 (38.9% compared with the national average of 18.8%), in 2013 (43.8% vs 20%), and in 2010 (52% vs 20.9%) (SRPC, unpublished data).

Memorial's social accountability mandate was developed in response to its location in Newfoundland and Labrador. This mandate includes a focus on training family medicine physicians for the special challenges and opportunities of rural generalist practice. Memorial has demonstrated success in fulfilling its provincial social accountability mandate.<sup>9,14,15</sup> By 2014, 78% (approximately 638 of approximately 818) of the fully licensed physicians in Newfoundland and Labrador were MUN MD graduates. In addition, most of the remaining fully licensed physicians who were graduates of other medical schools had completed their postgraduate vocational residency training at MUN. Between 2004 and 2014, the number of MUN MD graduates with a full license to practise in Newfoundland and Labrador increased from about 406 to about 638, an increase of 60% over the decade.

Memorial is very successful in training family physicians for Newfoundland and Labrador, including rural family physicians, in response to its social accountability mandate. This study found that 305 of MUN MD graduates were practising family medicine in Newfoundland and Labrador, with 36% practising in rural areas (22% in rural communities and 14% in rural towns). In comparison, in 2013 to 2014, 14% of all family medicine physicians in Canada were practising in rural or remote areas.<sup>16</sup>

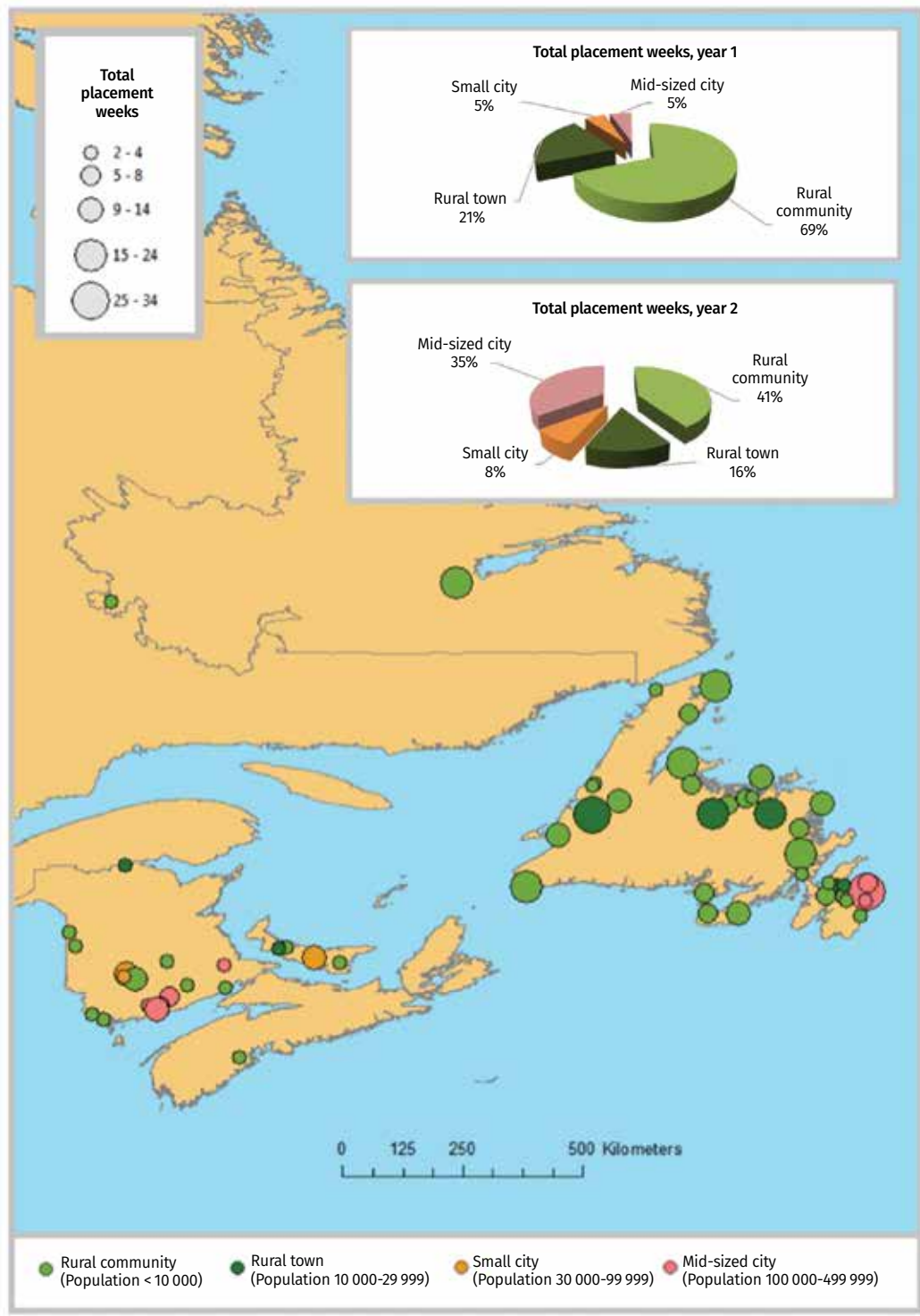
As demonstrated by the high proportion of students with rural backgrounds, the high proportion of clinical learning that takes place in rural locations within the MD and postgraduate family medicine programs, and the proportion of recent family medicine graduates establishing rural practice in Newfoundland and Labrador, MUN remains fully committed to a comprehensive rural pathways approach to rural family practice that emphasizes rural experience and contextual learning. This study examined 2 full cohorts of medical students and found that 32% of MUN 2011 and 2012 MD graduates came from rural areas, 90% completed their first-year medical student clinical placement in a rural location, 57% completed their second-year medical student family medicine placement in a rural location, and 95% completed their third-year medical student family medicine placement in a rural location. Additionally, for those MUN 2011 and 2012 MD graduates who completed their family medicine residencies at MUN, 38% of their residency placement weeks took place in rural locations. Since this study, the MUN family medicine residency program has increased the proportion of rural placements with an emphasis on longitudinal community placements within geographic streams.

Figure 1. Map showing locations of all MUN MD graduates practising FM in Newfoundland and Labrador as of January 2015: N = 305.



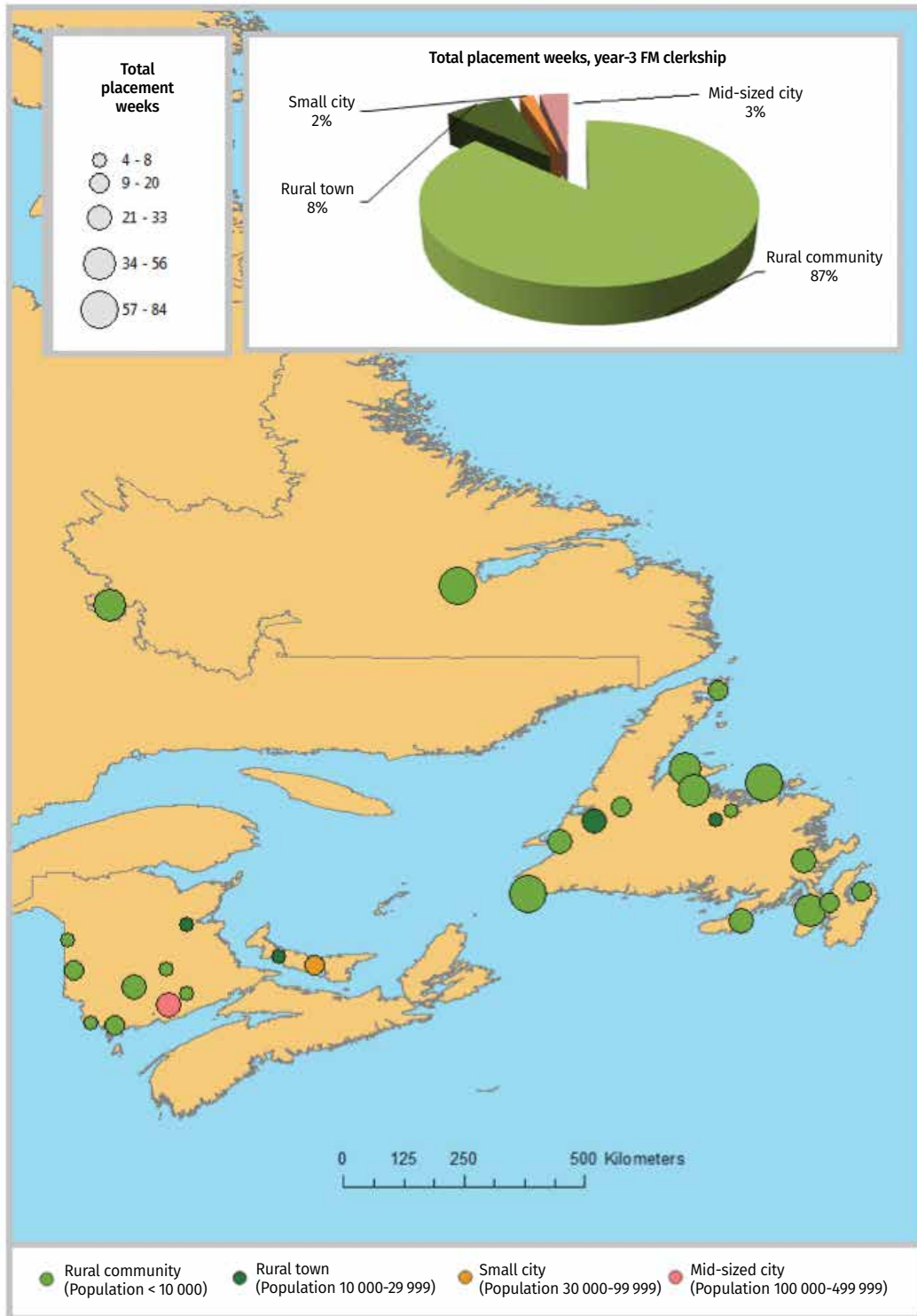
FM—family medicine, MD—medical doctor, MUN—Memorial University of Newfoundland.

**Figure 2.** Map showing total year-1 and year-2 medical student clinical placement weeks spent in all location types for MUN MD in 2011 and 2012 graduating classes



MD—medical doctor, MUN—Memorial University of Newfoundland.

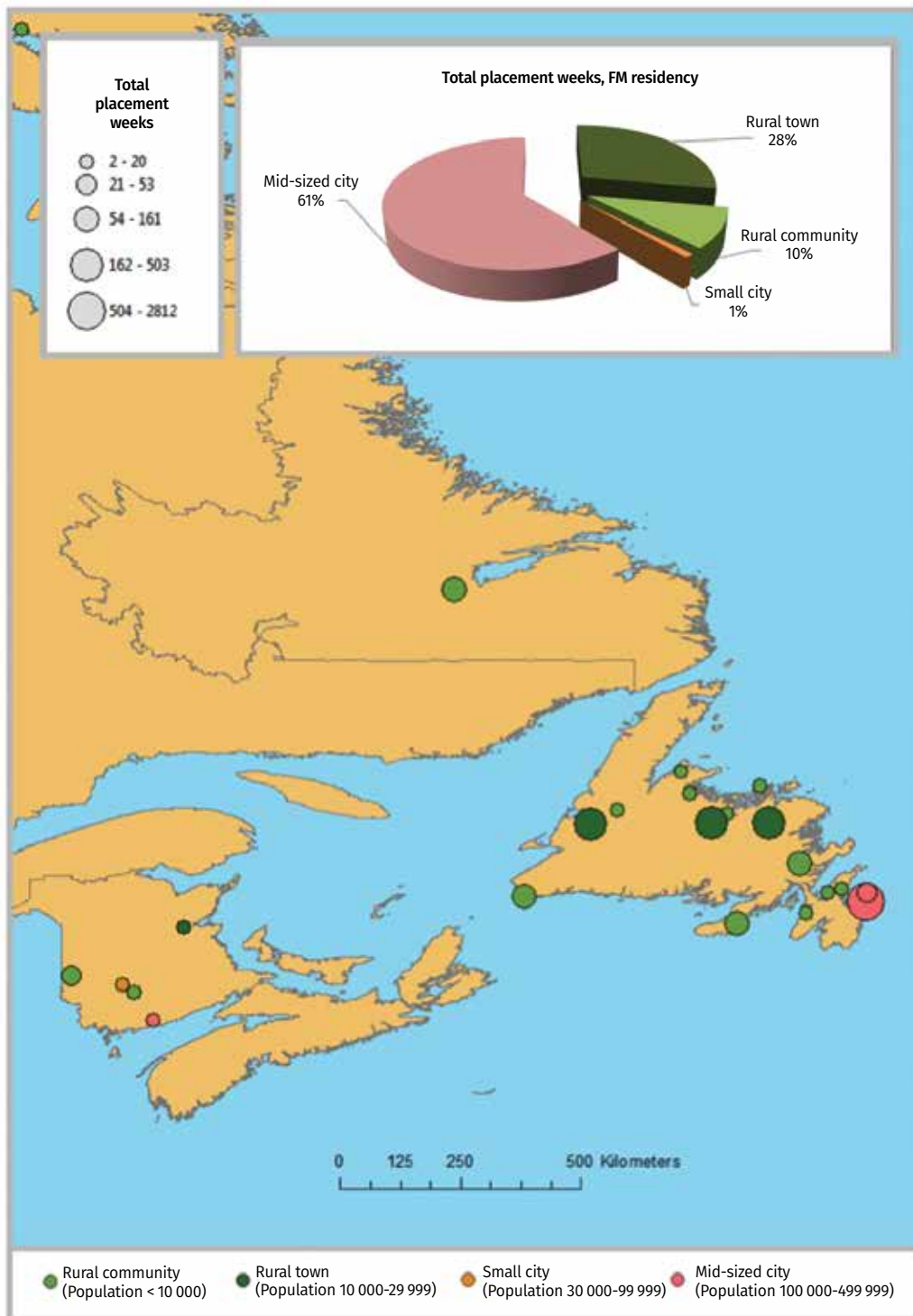
Figure 3. Map showing total year-3 clerkship placement weeks spent in all location types for MUN 2011 and 2012 MD graduates



FM—family medicine, MD—medical doctor, MUN—Memorial University of Newfoundland.

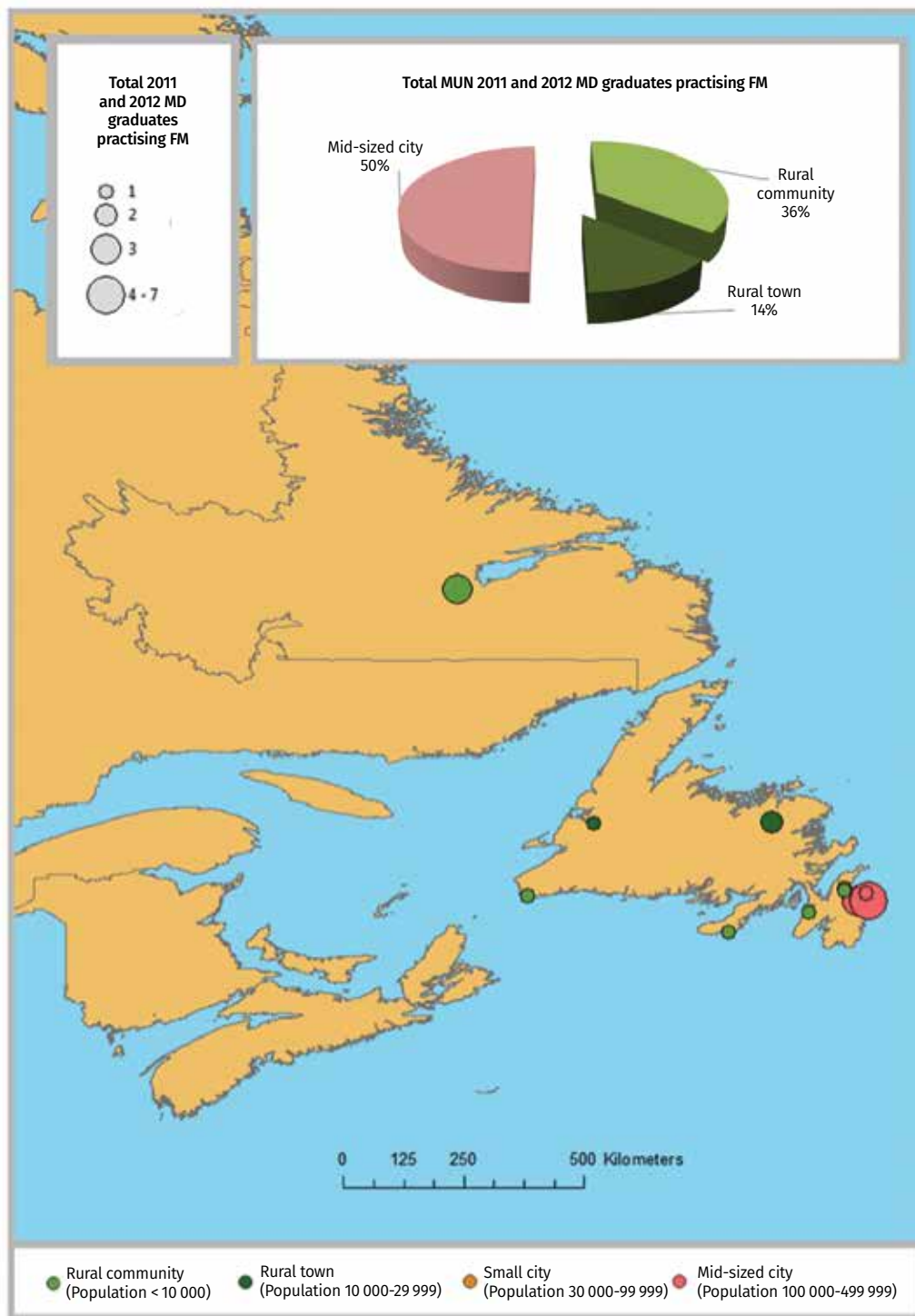


**Figure 4.** Map showing total postgraduate placement weeks spent in all location types for MUN FM residents from its 2011 and 2012 MD graduating classes



FM—family medicine, MD—medical doctor, MUN—Memorial University of Newfoundland.

**Figure 5.** Map showing practice locations for MUN 2011 and 2012 MD graduates practising FM in Newfoundland and Labrador as of January 2015



FM—family medicine, MD—medical doctor, MUN—Memorial University of Newfoundland.

Fifty percent of MUN 2011 and 2012 MD graduates practising family medicine in Newfoundland and Labrador are practising in rural locations. This study thus shows that MUN's most recent graduates are continuing the strong tradition of establishing rural practice in Newfoundland and Labrador and thus contributing to addressing a critical need in the province and fulfilling the medical school's social accountability mandate.


As MUN's L&L database is still growing, the numbers examined in the current study are small, yet they indicate continued success in training physicians for practice in rural areas across the country. Within a few years, the numbers will allow MUN to study the interplay and relative importance of the different component factors along the MUN pathways to rural practice.

## Limitations

This study is limited in that it focuses on one university's medical school in a province with unique demographic and geographic characteristics, which means that the data might not be generalizable to other provinces in Canada or locations outside the country. Also, it does not address the qualitative factors that might affect the choice to enter rural practice: supports during the transition, issues related to workload, and spousal or family considerations. While a medical school might not be able to control or influence such lifestyle or practice factors, their importance might be notable when considering how a medical school supports the transition from residency to practice.

## Conclusion

This study clearly demonstrates that MUN is committed to an integrated pathways approach to training physicians for rural practice. The cumulative effect of focusing on recruiting rural students through admissions and subsequently exposing all undergraduate medical students to extensive rural placements and all family medicine residents to rural family practice training results in an increased number of generalist physicians in rural family practice in Newfoundland and Labrador and across Canada.

Newfoundland and Labrador, like other Canadian provinces and territories, continues to recruit family doctors from underresourced countries. One important implication of the results of this study is that this dependence can be reduced over time through the recruitment of rural students and the implementation of a strong rural curriculum in medical schools followed by rural family medicine residency programs. To accelerate this effect, the province funded an MD class size expansion and corresponding family medicine residency program capacity emphasizing long rural learning experiences. This study—and the rural-focused approach at MUN—provides a positive example for other jurisdictions seeking to increase capacity to produce rural physicians. 

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### Contributors

All authors contributed to the concept and design of the study; data gathering, analysis, and interpretation; and preparing the manuscript for submission.

### Competing interests

None declared.

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