ORIGINAL ARTICLE

Northern Ontario's Rural Physician Teams: Who, why and for how long

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Abstract

Introduction: This study examines the state of Rural and Northern Physician Group Agreement (RNPGA) physician teams in rural Northern Ontario in terms of demographics, intent to stay, length of stay, number of physicians relative to the RNPGA-designated complement and perceptions of various workplace and community factors.

Materials and Methods: Data were based on a survey mailed, in 2018, to Ontario physicians in RNPGA communities having a designated complement of 2 or more physicians. Physicians reported on aspects of the work environment, community and intentions to stay.

Results: Sixty-five percent of all practices and 91.7% of those with a designated complement of 2 physicians were at or above their government-designated complement. Intent to stay was higher in groups below complement. The mean length of stay was 11.3 years. More physicians were male (58.7%). Older physicians were more represented in smaller practice groups. Physicians reported positive ratings on several aspects of their work environment, community and intentions to stay. Length of stay in the community was related to strong family ties and was a predictor of intent to stay. Many physicians had neither strong family ties (65.3%) nor a rural upbringing (57.3%).

Conclusion: The results show positive outcomes in terms of: high intentions to stay, satisfaction with workplace and community factors, and full recruitment into RNPGA groups designated for a complement of two physicians. Further research is needed to understand the role of family ties to length of stay, and the role of level of physician complement and group size in retention and recruitment.

Keywords: Physician retention, primary care, quantitative research, rural health services

Résumé

Introduction: Cette étude examine l'état des équipes de médecins de l'Entente relative au groupe de médecins en milieu rural et dans le Nord (EGMMRN) dans les régions rurales du Nord de l'Ontario en termes de données démographiques, d'intention de rester, de durée, de nombre de médecins par rapport à l'effectif désigné par l'EGMMRN, ainsi que de perceptions de divers facteurs liés au milieu de travail et à la communauté.

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Méthodes: Les données sont fondées sur un sondage envoyé par courrier en 2018 aux médecins de l'Ontario dans les communautés associées à l'EGMMRN ayant un effectif désigné de 2 médecins ou plus. Les médecins ont fait état des aspects du milieu de travail, de la communauté et de leurs intentions de rester.
Résultats: Soixante-cinq pour cent de tous les cabinets et 91,7% de ceux dont l'effectif désigné est de 2 médecins se situaient au niveau ou au-dessus de leur effectif désigné par le gouvernement. L'intention de rester était plus élevée dans les groupes en dessous de l'effectif. La durée moyenne de présence était de 11,3 ans. Plus de médecins étaient des hommes (58,7%). Les médecins plus âgés étaient plus représentés dans les petits groupes de pratique. Les médecins ont attribué des notes positives à plusieurs aspects de leur environnement de travail, de leur communauté et de leur intention de rester. La durée de présence dans la communauté était liée à des liens familiaux forts et constituait un facteur prédictif de l'intention de rester. De nombreux médecins n'avaient ni des liens familiaux forts (65,3%) ni une éducation en milieu rural (57,3%).
Conclusion: Les conclusions montrent des résultats positifs en termes d'intentions élevées de rester, de satisfaction à l'égard du lieu de travail et des facteurs communautaires, ainsi qu'un recrutement complet dans les groupes désignés de l'EGMMRN pour un effectif de 2 médecins. D'autres recherches sont nécessaires pour mieux comprendre le rôle des liens familiaux sur la durée de présence, ainsi que le rôle du niveau d'effectif de médecins et de la taille du groupe en matière de rétention et de recrutement.

Mots-clés: Recrutement, rétention, rural

INTRODUCTION

Northern Ontario refers to an area of Ontario occupying over 860,000 km^2 and yet containing only approximately 6% of the provincial population.[1-3] The health of those living in Northern Ontario has historically been shaped by this remoteness and relative rurality. In general, people living in the north tend to die earlier, have more chronic diseases, and report fewer healthy behaviours than people in southern Ontario.[1,2] These health challenges are compounded by chronic physician shortages.[4]

While recent studies show that more physicians are staying in the north, northern physician distribution remains clustered in urban areas, with rural areas remaining underserved.[5,6] Current literature indicates that multiple factors influence physician recruitment and retention.[7-11] Financial incentives have a strong correlation with recruitment but are less effective at long-term, same placement retention.[8,9,12] Selection of applicants to medical education programmes with a focus on rural context and experience correlates with improved outcomes for both rural recruitment and retention.[8,9,12-14] Other proposed factors influencing retention of physicians who already work in the north include partner/spouse satisfaction, community integration, personal attributes and quality of life in a rural community.[7,8]

In Ontario, financial incentives[13] – establishing the Northern Ontario School of Medicine (NOSM)[12] and the introduction of the Rural and Northern Physician Group Agreement (RNPGA)[14] – are strategies that have been used to address the issue of physician recruitment and retention in the north. The RNPGA was introduced in 1996 to improve support, increase the financial feasibility of working in the north, and reduce dissatisfying factors,[14] in part by encouraging the creation of formal physician groups. Each group is funded by the Ministry of Health (MOH) for a specific number of physicians (complement) using a blended capitation model to provide core health care services, including hospital and emergency services in those communities having hospitals, for the population in the group's catchment area. The RNPGA complements range from 1 to 7 physicians, with the majority having more than 1 physician.[15] As of 2017, there were 38 RNPGA physician groups serving over 65,000 patients in small rural northern communities.[14] These road-accessible communities are spread across Northern Ontario from Haileybury, 155 km east of North Bay, to Vermillion Bay, 395 km west of Thunder Bay, as well as on Manitoulin Island in the south and north to Red Lake and Pickle Lake. Very little is known about whether the RNPGA intra-professional teams have resulted in improved support and satisfaction.

In 2018, a survey was conducted in Northern Ontario of physicians from RNPGA communities assigned a complement of 2 or more physicians to assess the role of physician team efficacy in

predicting intent to stay when controlling for other factors related to retention.[16] Variations that might exist between these rural communities in Nurse Practitioner and Physician Assistant numbers, and the influence that may have on the outcomes measured, was not accounted for in this study.

The present secondary analysis of the 2018 survey data looks at the current state of the RNGPA teams in terms of demographics, length of stay, intent to stay and other factors related to retention. The analyses also look at associations between these factors.[7]

MATERIALS AND METHODS

Selection of participants and survey methods

All RNPGA groups with a designated complement of two or more physicians were identified through the database of RNPGA physician groups, published by Health Force Ontario. Individual community clinics and hospitals were contacted to create a list of physicians to whom to send the survey. All physicians actively funded by the RNPGA at the time of the study were sent a paper copy of the survey with postage-paid return envelopes. To encourage participation physicians were offered monetary incentives from project grant funds: an initial $20 incentive for the time to review the survey, followed by an additional $100 upon survey completion. After a month, non-respondents were sent a second survey package.

Survey measures

Physician surveys included demographic items for gender, age group and length of time in the community. The remainder of the survey items were selected to assess constructs of retention factors previously cited in the extant literature, including rural practice preparedness, career opportunities, working conditions, community integration, partner support and intent to stay along with aspects of team functioning. Specific questions to investigate these constructs were formulated based on a review of the previous literature [7,17-23]

Survey items to evaluate the constructs were worded positively and had 5-point Likert-type scale responses ranging from strongly disagree to strongly agree and construct scores based on the items could range from 0 to 5. Intent to stay, was measured using a 5-item measure which included items such as 'I will probably look for a new job in the near future' and 'I am thinking of quitting my job at the present time.' All items for this measure were reverse-coded such that higher scores on the measure indicated a greater intent to stay with the organisation.

For cross-tabulations, length of stay was stratified into three groups based on response (0–<5 years, 5–<15 years and 15 + years) and the lowest and highest 2 age groups were combined. Information on physician complement and the actual number of physicians was gathered from the RNPGA database and community clinics and hospitals. Hospital commitment information for the communities was obtained through the Ontario Medical Association. Physician groups were classified as being either below, at, or above their government-designated complement (level of complement attained) and as having, or not having, hospital commitments.

Statistics

Descriptive analyses were completed including frequency tables for nominal and categorical data and means/standard deviations for continuous data. Comparisons between groups were completed using one-way ANOVAs and *t*-tests to determine between which groups differences were significant. Chi-square tests with *z* values for between column comparisons in proportions were used for cross-tabulations while Pearson correlations were used to test for associations between factors. Regression analysis was used to control for potentially confounding factors and assess factors associated with intent to stay, including age, gender, length of time in the community, complement, hospital commitment and level of complement attained and interactions between complement and age, level of complement attained and hospital commitment. All analyses were conducted using SPSS with statistical significance (IBM Corp. Released 2017. IBM SPSS Statistics for Windows, Version 25.0. Armonk, NY, USA) assumed at $P < 0.05$ and a minimum difference of 0.5 in the mean scores was considered to be relevant.

Ethics

Approval for this study was obtained from the Lakehead University Research Ethics Board (ID No. 1466559) before the distribution of the survey material.

RESULTS

Eighty-nine physicians actively funded by RNPGA were sent the survey. Seventy-five physicians returned completed surveys for an 84.3% response rate, with 3 nonresponders for the length-of-stay question.

Rural and Northern Physician Group Agreement physician complement and hospital commitment

Of the 38 RNPGA communities, 26 (68.4%) had designated complements of two or more physicians, ranging from 2 to 7, with the most frequent complement being two physicians (12 or 46.2% of the groups), followed by a complement of 6 for 23% of the groups. At the time of the survey, 17 (65.4%) of these 26 groups were either at or above complement and the actual number of physicians in the groups ranged from 1 to 9, with 10 (38.5%) having two physicians. The proportion of physician groups at or above their MOH-designated complement was significantly higher for those groups with a designated complement of two physicians (91.7%) compared to those groups with a designated complement of 3–5 (40.0%) or 6–7 (44.4%) ($P < 0.05$). Eighteen (69.2%) of the communities had hospital commitments as part of their agreement. Half of the communities with a designated complement of two had hospital commitments, compared to 80% and 89% of those with designated complements of 3–5 and 6+ respectively (not significant).

Physician demographics and team size

Just over 40% of the survey respondents were female and physicians ranged from under 30 to 70 + years of age with 50% younger than 50 [Table 1]. The time that the physicians had been in their current community ranged from 1 month to 40 years, with 47.2% having practised in the community for more than 10 years.

There were no significant differences by gender for team size groupings, age of physicians or length of stay in the community. There was a weak negative correlation between the age group of physicians and the actual number of physicians in the practice (Pearson –0.295, $P < 0.05$). Only 5.3% of those under 40 were in a team of two physicians, compared to 47.1% of those aged 60 or older ($P < 0.05$) while 47.4% of the under 40-year-olds were in a practice of six or more physicians, compared to only 11.8% of those aged 60 or older ($P < 0.05$). As would be expected, the length of time in the community was positively correlated with the age group (Pearson correlation 0.639, $P < 0.001$).

Physician intent to stay and perceptions of related variables

Overall, the physicians had a positive perception of all the team and workplace-related variables as well as community integration; mean scores were above 3/5 for all the variables [Table 2]. Rural preparedness had the lowest mean score with particularly low means for the single items of strong family ties and raised in a rural setting. The proportion of respondents with scores reflecting a negative perception (score <3) was <34% for all, but these same 2 items. Only 14.7% of physicians scored intent to stay as <3. While many of the team-related factors and intent to stay were rated at or above 4 by more than half of the respondents, working conditions, organisational commitment,

Table 1: Demographics

Factor	Frequency (%)
Gender (*n*=75)	
Female	31 (41.3)
Male	44 (58.7)
Age group (*n*=74)	
Under 30	4 (5.4)
30-39	15 (20.3)
40-49	18 (24.3)
50-59	20 (27.0)
60-69	15 (20.3)
70+	2 (2.7)
Length of stay in community (*n*=72), Mean±SD (years)	11.3±10.3
0-<5	23 (31.9)
5-<15	26 (36.1)
16+	23 (31.9)

SD: Standard deviation

Table 2: Physician rural practice preparedness and perceptions of team and workplace

Variable	Mean±SD	Percentage with score <3/5 (5 point Likert Scale for individual items)	Percentage with score ≥4/5
Rural practice preparedness overall score	3.21±0.84	33.3	18.6
Individual items			
Strong family ties	2.35±1.52	65.3	17.3
Raised rural	2.67±1.60	57.3	21.3
Prepared for rural leadership	3.18±1.16	17.3	70.6
Adequate rural medicine training	3.60±1.05	13.3	61.3
Community meets personal interest	3.66±1.19	33.3	46.6
Prepared for rural living	3.83±1.05	20.0	65.3
Perception of team performance	3.57±0.53	10.7	31.9
Working conditions	3.59±0.63	14.7	28.0
Organisational commitment	3.63±0.77	17.3	32.0
Community integration	3.65±0.71	16.0	37.2
Career opportunities	3.67±0.86	12.0	51.9
Communication	3.96±0.86	12.0	69.3
Team climate	4.01±0.74	10.7	63.4
Conflict resolution	4.01±0.73	10.7	70.5
Partner support (single item)	4.03±1.00	6.3	78.1
Team efficacy	4.04±0.69	8.0	62.5
Decision making	4.06±0.73	10.7	66.7
Intent to stay	3.89±1.04	14.7	63.9

SD: Standard deviation

perception of team performance and community integration were viewed more neutrally.

Factors related to intention to stay and length of stay

No significant correlation was found between age and respondent's stated intent to stay, nor did the intent to stay differ by gender (males mean 3.89 ± 1.1, females 3.91 ± 1.0) or age group [Table 3]. Mean intent to stay was found to be significantly higher for physicians in practices that were below the designated complement compared to communities at or above the designated complement [Table 3]. In regression analysis for intent to stay, length of stay in the community (P = 0.012) and level of complement attained (P = 0.009) were found to be significant factors (model R^2 = 0.22, P = 0.011) [Table 4]. None of the interaction terms were significant and did not significantly contribute to the model. Significant Pearson correlations were found between intent to stay and factors previously studied in the literature [Table 5]. Finally, a significantly higher proportion (40.4%) of physicians with a length of stay of <5 years had family ties score <3 compared to those with longer lengths of stay (28.6% and 11.1% for 5 to <15 years and 15 + years, respectively).

Table 3: Intent to stay by age group and level of complement attained

Factor	Frequency	Mean intent to stay (score range: Low 0 to high 5)	SD
Age group			
Under 40	19	3.85	0.95
40-49	18	4.14	0.88
50-59	20	3.77	1.30
60+	17	3.8	1.04
Level of complement			
Below complement	25	4.34[a,b]	0.630
At complement	33	3.62[a]	1.30
Above complement	17	3.74[b]	0.764

[a,b]Values with same superscript are significantly different (P<0.05).
SD: Standard deviation

DISCUSSION

While close to two-thirds of RNPGA practices in Northern Ontario with a MOH-designated physician complement of two or more physicians have, at the time of the study, succeeded in reaching or surpassing the government-established

Table 4: Regression analysis for intent to stay

Model	Unstandardised coefficients		Standardised coefficients	t	Significant
1	B	SE	Beta		
Constant	4.014	0.590		6.798	0.000
Hospital commitment	−0.320	0.312	−0.126	−1.027	0.308
Complement	0.091	0.070	0.170	1.297	0.199
Age	−0.263	0.136	−0.308	−1.932	0.058
Gender	0.114	0.240	0.053	0.474	0.637
Length of stay in community	0.041	0.016	0.395	2.570	0.012
Level of complement	−0.449	0.168	−0.312	−2.678	0.009

SE: Standard error

Table 5: Intent-to-stay Pearson correlations with retention variable

Retention variable	Mean response to factor-specific questions (*n*=75)	SD	Pearson correlation with intent to stay
Career opportunities	3.67	0.859	0.458*
Community integration	3.65	0.713	0.609*
Rural practice preparedness	3.21	0.843	0.450*
Working conditions	3.59	0.627	0.517*

**P*<0.01. SD: Standard deviation

target number of physicians, there has much been greater success in achieving the target in practices designated as two physicians. These smaller-sized teams were also more likely to be served by physicians aged 60 and over. More research is needed to determine what the recruiting challenges are for groups with higher designated complements and why more younger physicians are in these groups. Do physicians prefer to work in groups only up to a certain size and if so, why? Do physicians move to smaller practices as they get older, is there a more recent trend towards preferring groups larger than two or have small groups had no recent vacancies for newer physicians to fill? The role of the presence of allied health professionals as part of teams also needs to be considered. Given the relatively high percentage of older physicians in the practices of two physicians, more of these groups may be underserviced in the nearer future as physicians retire.

As has been previously reported in the literature, the current study results indicate a lower proportion of females than males working in the north. While the proportion of females (41.3%), lags slightly behind the 2017 national average of practising female family physicians (45.5%),[24] it is considerably higher than the 25.5% for northern practices reported in 2011.[5] The fact that 50% of the physicians in the study were under 50 is consistent with the national average in 2016 of 50.2 years of age.[24] The age and gender distribution for RNPGA communities with a designated complement of one and physicians working in rural Northern Ontario settings under other funding models would need to be included for a more accurate picture of physicians by gender and age in the north as a whole. The interpretation of age data is also limited by the use of age ranges in the survey rather than reporting exact age.

With close to half (47%) of respondents having been in the community for over 10 years and a mean length of stay of 11.3 years, it is evident that a number of physicians working in the RNPGA teams have stayed for significant periods. While it is difficult to say what the ideal term of retention is for physicians within a given community, it is well known that having a long-term physician relationship is correlated with better patient outcomes, increased community health and better preventative care.[25,26]

The results of this study also suggest that the goal of the RNPGA programme to improve support and reduce dissatisfaction through the promotion of group practice is coming to fruition as physicians responding to the survey scored positively all variables addressed in the survey related to the team, workplace and community, although this outcome may not be related to the RNPGA programme *per se*. The lower proportions of physicians with high scores

for working conditions, perceptions of team performance and organisational commitment indicate that there is room for improvement in these areas. More detailed analysis of individual aspects of working conditions in the future could help determine which aspects seem to be of greatest concern. The lack of association between hospital commitments and intent to stay suggests that other working conditions may be influencing recruitment and retention. There have been concerns that the RNPGA contract has not kept up with other funding models in areas such as remuneration for emergency and inpatient services as well as locum coverage.[27] As over half of those surveyed did not have strong family connections to the community or a background of growing up in a rural setting, these factors may not be as important in rural retention and recruitment as previously thought. However, the proportion of physicians raised in a rural setting may still be higher in the physicians studied than among the general family physician population. The rural upbringing may only impact initial recruitment, and not long-term retention, as has been suggested in the literature.[28] The high proportion of physicians feeling that they were prepared for rural living and had adequate rural medicine training suggests that the NOSM and other rural track training programmes are increasing exposure, interest and preparedness for rural northern medicine.

The finding of higher intent to stay for physicians in practices that are below complement compared to those at or above complement challenges the long-held belief that having adequate physicians would lead to greater intent to stay. Perhaps there is a decreased feeling of obligation or worry that patients would suffer if the physician were to leave in well-serviced practices. This would be coherent with the finding that rural physicians tend to have service-oriented personality traits.[7] Physicians who are in deficit communities may simply feel more of a duty to stay. Alternatively, the RNGPA funding model may be more lucrative when there are fewer than the designated complement of physicians. For example, in cases where there are hospital commitments, the remaining physicians would benefit financially from the increased number of on-call ER shifts. Further study would be needed to better understand the relationship between intentions to stay and the level of complement attained.

Length of stay was also found to be a predictor of intent to stay and was associated with the single item of strong family ties within the rural preparedness construct. The level of strong family ties was lower for physicians who had been in the community for a shorter period. More research will need to be done to clarify whether 'strong family ties' developed over prolonged time in the community for the 15+ years physicians, or whether family ties were a significant factor in facilitating long-term practice.

Limitations

True retention '… the length of time between commencement and termination of employment'.[29] could not be measured with the present cross-sectional survey, although intent to stay has historically been a strong predictor of retention.[30,31] Similarly, the current length of stay is a function of age along with factors related to retention factors. To determine the true length of stay, and the contributing factors, future studies should consider using a prospective design to follow rural physicians over time and collect data as they leave the practice, or alternatively, identify a group of former RNPGA physicians to gain insight into the actual length of stay and reasons for departure from rural communities. This study is also not able to answer questions as to the evolution of the factors throughout an individual's practice over time. The sample size of this survey was relatively small which limited some of the analysis and it is unknown whether the non-responders differed significantly from responders in age or gender. Finally, within a small and cooperative setting in the north, it is possible that physicians might have felt pressured to answer the questions positively.

CONCLUSION

Retention of physicians in rural Northern Ontario remains a complex and multifaceted issue. This study, representing responses from over 80% of physicians practising in RNGPA communities with a designated complement of two or more physicians, indicates physicians largely have high intentions to stay and positive perceptions of

aspects of the workplace, team and community integration as they relate to physician retention.

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