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A quantitative day in the life of a Saskatchewan rural physician

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Introduction: Rural family physicians are often required to meet a wide variety of medical service demands that are otherwise the responsibility of specialty physicians in urban centres. However, many rural physicians enjoy the practice variety and ability to meet patients' medical needs through this wider spectrum of care. We aimed to quantify and summarize the workload and clinical disorders seen by rural family physicians in Saskatchewan relative to urban family physicians.
Methods: We used Saskatchewan Ministry of Health billing data for 2015/16 to compare rural and urban care provision. The data were summarized in a graphic 1-month format to portray a typical month in the life of a rural physician in the province.
Results: In the office setting, rural family physicians saw 16.8% more cardiac presentations in adults over 65 years of age than did urban family physicians; otherwise, there were no significant differences in the top office diagnosis categories seen by the 2 groups. Differences were apparent, however, in the hospital setting: urban family physicians saw more patients presenting with pain and, reflective of centralization of obstetric delivery services, performed more deliveries than did rural physicians.
Conclusion: There are differences in the clinical presentations seen by rural and urban family physicians, and these need to be considered by new physicians considering rural practice. Our simple visual depiction of average workload, vacation and activity levels of rural physicians can further inform medical residents on the realities of working in rural Saskatchewan as a family physician. A more complete understanding of clinical workload expectations may promote recruitment of resident physicians.

Introduction : Les médecins de famille en milieu rural sont souvent appelés à fournir des services médicaux très variés qui sont par ailleurs la responsabilité des médecins spécialistes, en milieu urbain. Cela dit, beaucoup de médecins en milieu rural apprécient la variété et la capacité de répondre aux besoins médicaux des patients dans ce contexte de soins plus étendu. Nous avons tenté de quantifier et de résumer la charge de travail ainsi que les troubles cliniques des patients reçus par les médecins de famille en milieu rural en Saskatchewan par rapport aux médecins de famille en milieu urbain.
Méthodes : Nous avons utilisé les données de facturation du ministère de la Santé de la Saskatchewan pour 2015–2016 afin de comparer la prestation des soins en milieu rural et urbain. Les données ont été résumées sous forme de graphique représentant un mois typique dans la vie d'un médecin exerçant en milieu rural dans la province.
Résultats : En cabinet, les médecins de famille en milieu rural ont reçu 16,8 % plus de patients de 65 ans atteints d'une cardiopathie que les médecins de famille en milieu urbain. Par ailleurs, il n'y avait pas de différences significatives dans les principales catégories de diagnostics en cabinet entre les deux groupes. Toutefois, des différences étaient évidentes en milieu hospitalier : les médecins de famille en milieu urbain ont reçu plus de patients présentant une douleur et ont pratiqué un nombre plus élevé d'accouchements que les médecins en milieu rural, ce qui reflète la centralisation des services obstétriques.
Conclusion : Les troubles cliniques des patients reçus par les médecins de famille en milieu rural et urbain diffèrent et doivent être pris en compte par les nouveaux médecins qui envisagent la pratique en milieu rural. Notre représentation visuelle simple de la charge de travail, des vacances et du taux d'activité moyen des médecins en milieu rural peut éclairer les médecins résidents sur les réalités de la pratique du médecin de famille en région rurale en Saskatchewan. Une compréhension plus complète des attentes en matière de charge clinique pourrait favoriser le recrutement des médecins résidents.

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INTRODUCTION

The average physician in a rural environment is required to meet varied medical demands that are otherwise the responsibility of specialty physicians in urban centres.[1,2] To meet community demands, rural family physicians often use their skills as hospitalists in such areas as emergency care, anesthesia, obstetrics and minor surgery.[2] Although responsibility is generally greater in rural medicine than in urban centres, many rural family physicians enjoy the practice variety and ability to meet the diverse needs of their patients through a wider spectrum of care provision.[3,4] Promoting broad-scope family medicine and comprehensive patient care may be an effective tool for attracting physicians to rural areas facing physician shortages.[1,5,6]

We attempted to quantify and summarize the workload and clinical disorders seen by rural family physicians in Saskatchewan relative to urban family physicians and to present the data in a novel graphic 1-month format. Our aim was to further inform medical residents on the realities of working in rural Saskatchewan as a family physician. A more complete understanding of clinical workload expectations may promote recruitment of resident physicians who may have an incomplete understanding of the clinical workload in rural areas of the province.

METHODS

We performed a secondary review of family physician billing information for 2014/15 from the Saskatchewan Ministry of Health for annual workload and diseases observed. We separated the billing entries provided based on urban/metropolitan and rural family physicians. Billing was categorized by diagnosis, and procedures were ranked in a list of the 20 most common diagnostic categories. We then further subdivided the diagnoses by patient age group (birth to 11 yr, 12–18 yr, 19–35 yr, (36–65 yr and > 65 yr) and setting (office or hospital).

In the data analysis of emergency department visits, we used hospital classifications defined by the government of Saskatchewan[7] to determine "district" and "community" rural hospitals. The district classification includes hospitals as small as Tisdale Hospital in Tisdale (2011 population 3180) and as large as St. Joseph's Hospital in Estevan (population 11 054).[8] The community classification includes hospitals as small as the Arcola Health Centre in Arcola (population 649) to as large as Southeast Integrated Care Centre in Moosomin (population 2485).[8]

We condensed the 20 most common office and hospital diagnoses for both urban and rural family physicians in 2015/16 into discipline-specific categories and then compared these categories between urban and rural family physicians. Within the total sample population, as well as in the various age categories, we arbitrarily identified relative differences of 10% between diagnostic categories as significant.

Data sources

The Saskatchewan Ministry of Health provided unidentified family physician billing information submitted through their Medical Services Branch claims processing system by all fee-for-service physicians in 2015/16. Data are for in-province patients submitted by in-province physicians. Data are based on diagnosis. The International Classification of Diseases, 9th revision[9] is used for disease classification. We obtained information regarding transfer of patients from a rural hospital to a higher level of care in 2014/15, including emergency medical air transportation data, from the Saskatchewan Ministry of Health.

Statistical analysis

Data analysis was completed in Microsoft Excel 2013.

Ethics approval

The University of Saskatchewan Research Ethics Board gave ethics approval for this study.

RESULTS

There were 1652 active physicians (those licensed and billing more than $60 000 in the fiscal year) in Saskatchewan in March 2015: 251 rural general practitioners, 434 metropolitan-area (Regina and Saskatoon) general practitioners, 208 urban general practitioners and 759 specialists residing in urban, regional or metropolitan areas.

Of all 2015/16 fee-for-service billing claims for rural physicians, 65% were from the office and 35% were in hospital. The corresponding values for urban/metropolitan physicians were 79% and 21%.

In the office setting, rural family physicians saw 16.8% more cardiac presentations in adults over 65 years of age than did urban family physicians. Otherwise, there were no significant differences in the top office diagnosis categories seen by the 2 groups.

Table 1 displays inpatient rural hospital admissions with the major clinical categories of significant

Table 1: Average rural inpatient hospital admissions with a major clinical category of significant trauma, injury, poisoning or toxic effects of drugs, 2010/11 to 2015/16

	Year; mean no. of admissions ± SD*					
Variable	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16†
All rural hospitals						
No. of all-cause admissions	1604	1506	1329	1246	1202	1153
No. of hospitals	48	47	46	47	44	48
Annual	33.4 ± 0.6	32.0 ± 0.6	28.9 ± 0.6	26.5 ± 0.4	27.3 ± 0.5	24.0 ± 0.5
Monthly	2.8 ± 0.1	2.7 ± 0.1	2.4 ± 0.1	2.2 ± 0.1	2.3 ± 0.1	2.0 ± 0.1
Community hospitals	1009	930	778	827	783	738
No. of all-cause admissions						
No. of hospitals	39	38	37	38	35	39
Annual	25.9 ± 0.5	24.5 ± 0.5	21.0 ± 0.5	21.8 ± 0.5	22.4 ± 0.6	18.9 ± 0.5
Monthly	2.2 ± 0.1	2.0 ± 0.1	1.8 ± 0.1	1.8 ± 0.1	1.9 ± 0.1	1.6 ± 0.1
District hospitals	595	576	551	419	419	415
No. of all-cause admissions						
No. of hospitals	9	9	9	9	9	9
Annual	66.1 ± 4.1	64.0 ± 3.8	61.2 ± 3.1	46.6 ± 2.1	46.6 ± 2.2	46.1 ± 2.5
Monthly	5.5 ± 1.3	5.3 ± 0.3	5.1 ± 0.3	3.9 ± 0.2	3.9 ± 0.2	3.8 ± 0.2

SD = standard deviation.
*Except where noted otherwise.
†Data do not reflect a complete data cycle.

trauma, injury, poisoning and toxic effects of drugs. Average rural hospital inpatient admissions are shown in Table 2. We used these data to populate a graphic 1-month summary (Fig. 1).

In the hospital setting, urban family physicians saw 10.3% more presentations for pain management than did rural family physicians. Urban/metropolitan family physicians also had 34.8% more baby deliveries and 13.0% more pediatric pain management consultations than their rural counterparts. However, the latter had 19.3% more consultations for acute respiratory infections in pediatric patients than did urban family physicians. Compared to rural family physicians, urban family physicians had 12.6% more pain management consultations in adolescents, 15.4% more pain management consultations in adults aged 19–35 years, 15.4% more obstetrics/gynecology consultations and 11.6% more pain management consultations in adults aged 36–65 years (data not shown).

The average daily number of road ambulance trips for injury/trauma with a destination to a rural hospital in 2014/15 was 0.2; the patient care record count was 4437. The corresponding values for district and community hospitals were 0.4 (1432) and 0.2 (3005), respectively.

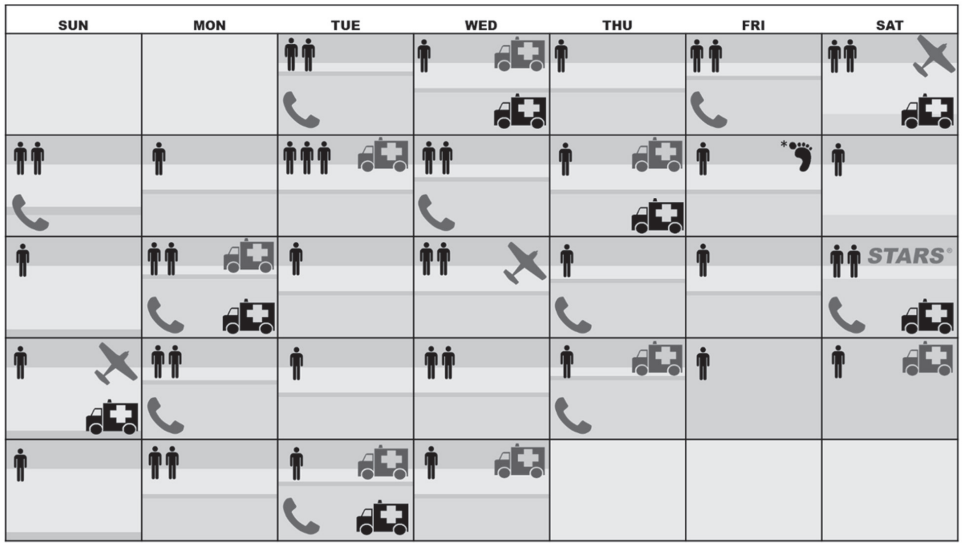
Table 3 shows the average number of transfers out of rural hospitals to a higher level of care in 2014/15, both annually and monthly, by acuity. These data were also used to populate the graphic summary (Fig. 1).

We compared the community and district hospital emergency department visits of 2014/15 with the population sizes of their respective community using 2011 census data. A total of 52 communities were included; 20 communities were omitted owing to lack of data. Their relation showed a linear trend of $R^2 = 0.574$. Communities outside of 2 standard deviations of the trend line were noted. The emergency departments of St. Joseph Hospital (Estevan) and Weyburn General Hospital (Weyburn) had comparatively fewer visits per capita, and the emergency departments of Kamsack District Hospital and Nursing Home (Kamsack), La Ronge Health Centre (La Ronge) and Rosthern Hospital (Rosthern) had comparatively more visits per capita.

Table 2: Average rural hospital inpatient admissions and hospital length of stay in Saskatchewan, 2013/14 and 2014/15

	Year; mean ± SD	
Variable	2013/14	2014/15
All rural hospitals		
No. of separations*	519.3 ± 401.4	510.7 ± 407.9
Daily census	8.9 ± 6.9	9.2 ± 7.2
Length of stay, d	6.7 ± 2.9	7.0 ± 2.4
Community hospitals		
No. of separations*	439.6 ± 283.0	409.4 ± 278.0
Daily census	7.3 ± 4.5	7.3 ± 4.8
Length of stay, d	7.4 ± 3.2	7.7 ± 3.2
District hospitals		
No. of separations*	1047.1 ± 331.7	1049.4 ± 361.8
Daily census	18.1 ± 6.5	19.1 ± 6.6
Length of stay, d	6.3 ± 1.5	6.8 ± 1.6

SD = standard deviation.
*Include death, discharge, sign-out and transfer.



Symbol	Monthly
On Call	10
Ambulance Delivery (Trauma)	9
Emergency Baby Delivery	*
Admission	43
Ambulance Transfer	8
STARS	1
Air Ambulance	3

Activity	Weekly (hrs)
Sleep	49
Personal Time	44
Paperwork	7
Seeing Patients	59
Holidays/CME	9

Fig. 1. Typical month for a rural family physician in Saskatchewan in 2015. The average length of stay per admission was 6.5 days. *Emergency baby delivery is infrequent and highly site specific. CME = continuing medical education, STARS = Shock Trauma Air Rescue Service.

Table 3: Average number of transfers out of rural hospitals in 2014/15

	Mode of transfer; mean ± SD		
Frequency	Road ambulance	Shock Trauma Air Rescue Service	Air ambulance
All rural hospitals			
Annual	116.0 ± 101.7	12.1 ± 6.8	33.4 ± 25.1
Monthly	9.7 ± 8.5	1.0 ± 0.6	2.8 ± 2.9
District hospitals			
Annual	213.0 ± 90.8	11.2 ± 5.9	41.3 ± 33.1
Monthly	17.7 ± 7.6	0.9 ± 0.5	3.4 ± 2.8
Community hospitals			
Annual	94.0 ± 91.7	12.5 ± 7.4	30.6 ± 36.3
Monthly	7.9 ± 7.6	1.0 ± 0.6	2.6 ± 3.0

SD = standard deviation.

We also compared the community and district hospital emergency department visits of 2011/12 with the population sizes of their respective community using 2011 census data. A total of 53 communities were included, and 19 communities were omitted owing to lack of data. This comparison serves as a control given that the population data are from 2011. Emergency departments operating outside 2 standard deviations of the trend line were identical to those in 2014/15 with the addition of Melfort Hospital (Melfort), which had comparatively fewer visits per capita, and Meadow Lake Hospital (Meadow Lake), which had comparatively more visits per capita.

DISCUSSION

We found that some anecdotal considerations about rural practice were reflected in the data and that others can be safely debunked. For example, billing data show that the chances in modern rural Saskatchewan

of having to do an emergency unplanned delivery are small. This should be reassuring to rural physicians in that, although they need to be prepared for this possibility, it should not be an overriding clinical concern.

Other than the higher proportion of cardiac presentations to the office in rural areas, the office diagnoses were similar between rural and urban family physicians. Differences were apparent, however, in the hospital environment. Urban physicians saw more patients presenting for pain and, reflective of centralization of obstetric delivery services, performed deliveries.

Physicians in rural centres must be able to stabilize the condition of sick patients and those with trauma so they can be transferred. This aspect of rural care is nicely illustrated in the graphic format (Fig. 1), which allows for easy understanding of the clinical workload that might be expected. Optimally, a graphic such as this would be available for any rural hospital in the province, and this could aid in resource planning and in allowing new physicians to the community to consider whether the community would be a good fit. We hope the graphic will allow medical students and residents to gain an accurate picture of the clinical workload that might be expected in rural Saskatchewan. This could aid in personal training efforts and decrease stress in relation to realistic expectations of clinical practice.

Limitations

There are a number of limitations to this study and the format of data presentation in the form of a graphic. First, billing data encompass only family physicians who operate by a fee-for-service payment schedule in Saskatchewan; they exclude any out-of-province or out-of-country billing and workers compensation board treatments. In certain communities near borders with adjoining provinces, this could affect the data submitted to the Saskatchewan Ministry of Health. Furthermore, limitations exist within the data set itself, as billing data are not audited by the government. Physicians may incorrectly categorize or summarize similar diseases, may choose to exploit billing codes that are more lucrative or may lump multiple presenting problems under a single billing code. Finally, the 20 most common diagnoses represent only 35%–78% of these fee-for-service billings, depending on the setting and patient age, which limits the generalizability of the findings. A limitation of the data analysis used to determine the trend between emergency department visits and community populations in 2014/15 is that we compared 2011 census figures to emergency department visits in 2014/15. Statistics from the government of Saskatchewan show that the population of the province was 1.06 million in January 2011, 1.11 million in January 2014 and 1.13 million in January 2015.[10] The 2011 population may underestimate the population of some communities, or migration may overestimate the population of others.

CONCLUSION

There are differences in the clinical presentations seen by rural and urban family physicians, and these need to be considered by new physicians considering rural practice or urban practice. A simple, easy to understand visual depiction of average workload, vacation and activity levels of rural physicians may be an avenue through which a clear picture of rural family medicine can be built and then disseminated to future rural physicians, even at an individual community level.

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