

Original Article
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Rural–urban differences in emergency department wait times

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Introduction: I sought to determine whether emergency department (ED) volume is associated with differing ED wait times.
Methods: I conducted a retrospective analysis of the Emergency Department Reporting System database of the Ontario Ministry of Health. I abstracted ED length of stay for patient visits to 117 hospital EDs during the second quarter of 2008, representing 89% of ED visits in the province during that period. Annual volume of ED visits, lengths of stay in the ED and acuity levels of patients were measured.
Results: All EDs were more efficient in managing the treatment of low-acuity patients compared with high-acuity patients. Small rural EDs in Ontario had the shortest wait times for both high- and low-acuity patients (medians 2.35 h for high-acuity and 1.46 h for low-acuity patients in small rural EDs v. 4.98 h for high-acuity and 2.85 h for low-acuity patients in teaching hospitals).
Conclusion: Among the hospitals studied, rural EDs had the shortest wait times for both low- and high-acuity patients.

Introduction : J'ai cherché à déterminer s'il y a un lien entre le volume de patients reçus à l'urgence et la variabilité des temps d'attente.
Méthodes : J'ai procédé à une analyse rétrospective de la base de données du Système de production de rapports sur les services d'urgence du ministère de la Santé de l'Ontario. J'ai résumé la durée du séjour à l'urgence pour les patients qui se sont présentés à l'urgence de 117 hôpitaux au cours du deuxième trimestre de 2008, ce qui représentait 89 % des visites à l'urgence enregistrées dans la province au cours de la période en cause. Le volume annuel des visites à l'urgence, la durée du séjour à l'urgence et la gravité des cas ont été mesurés.
Résultats : Les urgences ont réussi à gérer avec plus d'efficacité le traitement des patients dont le cas était moins grave que ceux dont le cas était plus lourd. Les petites urgences rurales de l'Ontario affichaient les temps d'attente les plus courts à la fois pour les patients dont le cas était lourd et pour ceux dont le cas était léger (médiane de 2,35 h pour les cas lourds et de 1,46 h pour les cas légers dans les petites urgences rurales c. 4,98 h pour les cas lourds et 2,85 h pour les cas légers dans les hôpitaux universitaires).
Conclusion : Parmi les hôpitaux étudiés, les urgences rurales affichaient les temps d'attente les plus courts à la fois pour les cas légers et les cas lourds.

INTRODUCTION

According to one study,[1] 38% of Canadian respondents visited an emergency department (ED) for care during a 2-year period (2002–2004), a third more than respondents from most other countries studied (Australia, New Zealand, the United Kingdom and the United States). Emergency department wait times in Canada were found to be significantly higher than in the 4 other countries studied, with 48% of respondents waiting longer than 2 hours for care.

Anecdotally, there are increasing numbers of people from the city who travel to rural EDs because they feel that they receive better, or at least faster, service there. On the other hand, as acuity has previously been found to directly affect ED length of stay,[2] it could be that if high-volume EDs in

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Canada have longer wait times, this is a reflection of a higher percentage of severely ill patients presenting to these centres.[3]

In some Ontario regions, ED efficiency has been cited as the rationale for proposals to close small EDs. The question arises, does size really matter when it comes to the efficiency of ED wait times?

METHODS

Emergency department length of stay includes time spent by the patient waiting to see the doctor, and time spent conducting laboratory tests, radiography and so on. I abstracted ED length of stay for the second quarter of 2008 from the Emergency Department Reporting System of the Ontario Ministry of Health. Of Ontario hospitals, 117 are mandated by the province to report ED length of stay, representing 89% of ED visits in the province. There is no time data available for the 38 other Ontario hospitals for which mandatory reporting is not in effect. Of these hospitals, 31 are small community hospitals with a median community population of 4298 and a median volume of 9996 annual visits.

Emergency departments were stratified according to the annual volume of visits. Patient data from university teaching hospitals formed a category of its own. For other hospitals, low volume was defined by fewer than 20 000 annual ED visits, medium volume was 20 000–30 000 visits, high volume was 30 000–50 000 visits and very high volume was more than 50 000 visits.

Visits to the ED were also stratified by acuity level using the Canadian Emergency Department Triage and Acuity Scale (CTAS).[4] High-acuity patients were admitted or were classified as CTAS I–III. Low-acuity patients were classified as CTAS IV and V.

The ED length of stay was calculated by finding the difference between the "time patient left ED" from the registration time or triage time (whichever came first, depending on the hospital's process) resulting in a time spent in the ED that is measured in hours. The following measures were obtained:

- Median length of stay: the length of time in which 50% of patients had completed their ED visit.
- Mean length of stay: the total time spent in the ED for all ED visits divided by the total number of visits.
- 90th percentile: the maximum length of time in which 90% of patients had completed their ED visit.

Statistical significance was tested using SPSS version 12.

RESULTS

Table 1 indicates ED length of stay in hours for 117 Ontario hospitals for the second quarter of 2008. All EDs were more timely in dealing with low-acuity patients. The length of stay for high-acuity patients in low-volume EDs approaches that of teaching hospital EDs for low-acuity patients.

DISCUSSION

Limitations of this study include the absence of data for the very smallest EDs, and potential variations in acuity and time coding. The smallest EDs are not required to report time data and so the "low volume" category includes only 25 of a potential 63 EDs (the vast majority, 26, of the nonreporting EDs are in northern Ontario). The data from EDs with very high, high and medium volumes are based on nearly complete data and show a continous trend that continues into the low volume category. This does not preclude a methodologic bias, but it reassures that the statistically significant results in the smallest category are real. For the hospitals studied, the 25 small rural EDs in Ontario that reported

Table 1. Emergency department lengths of stay for patients who presented to 117 Ontario hospitals in the second quarter of 2008, by acuity level

ED volume/ category	No. of hospitals	Median community population in 2006	Acuity level; length of stay, h					
			90th percentiles		Means		Medians	
			High	Low	High	Low	High	Low
Low	25	10 295	7.81	3.30	3.66	1.83	2.35	1.46
Medium	26	19 288	9.73	4.25	4.64	2.31	2.84	1.85
High	27	82 184	12.09	4.94	5.89	2.72	3.77	2.24
Very high	23	323 342	13.31	4.80	6.49	2.69	4.14	2.20
Teaching	16	1 130 761	17.72	6.16	7.86	3.46	4.98	2.84

ED = emergency department.

data had the lowest wait times for both high- and low-acuity patients. The absolute time differences are even greater for high-acuity patients. One has to wonder if it may be the greater availability of diagnostic testing and consultants in larger hospitals (and thus their use) that contributes to this difference in efficiency.

Other factors may be at work at the rural ED that improve efficiency. One potential factor is that the doctor in the rural ED is usually a community physician who knows his or her patients, and is passingly familiar with the sickest patients of his or her colleagues.

The most significant wait time differences for small hospitals are the times for high-acuity patients, despite the fact that most times of the day many support services (e.g., radiography) need to be called in to a rural hospital. The time required to have the technician wake up, drive to the hospital and warm up the machine will reduce rural efficiency outside of regular work hours. The rural doctor may be better able to direct his or her limited resources to high-acuity patients, which in turn improves wait time outcomes.

CONCLUSION

Small hospital size appears to be an advantage for efficiency in ED wait times.

Competing interests: None declared.

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LES MÉDECINS S'EXPRIMENT

La parole aux médecins — Lettres à la rédaction — Éditoriaux

Nous invitons les médecins à commenter les questions qui les intéressent. Faites parvenir vos textes à Suzanne Kingsmill, rédactrice administrative, *JCMR*, 45, boul. Overlea, C. P. 22015, Toronto (Ontario) M4H 1N9; cjrm@cjrm.net