Emergency overcrowding and access block: A smaller problem than we think

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CLINICIAN'S CAPSULE

What is known about the topic?
Emergency access block is the number one emergency department (ED) safety concern; many believe it cannot be solved without increased hospital capacity.

What did this study ask?
The objective was to measure emergency access blocks (problem) as a fraction of inpatient capacity (potential solution).

What did this study find?
Delays to care space averaged 46,000 hours per ED per year – large, but only 1% of inpatient capacity.

Why does this study matter to clinicians?
Emergency access gaps are small relative to hospital capacity; if viewed as a hospital problem, small improvements could eliminate them.

ABSTRACT

Objectives: Emergency department (ED) access block, the inability to provide timely care for high acuity patients, is the leading safety concern in First World EDs. The main cause of ED access block is *hospital access block* with prolonged boarding of inpatients in emergency stretchers. Cumulative emergency access gap, the product of the number of arriving high acuity patients and their average delay to reach a care space, is a novel access measure that provides a facility-level estimate of total emergency care delays. Many health leaders believe these delays are too large to be solved without substantial increases in hospital capacity. Our objective was to quantify cumulative emergency access blocks (the problem) as a fraction of inpatient capacity (the potential solution) at a large sample of Canadian hospitals.

Methods: In this cross-sectional study, we collated 2015 administrative data from 25 Canadian hospitals summarizing patient inflow and delays to ED care space. Cumulative access gap for high acuity patients was calculated by multiplying the number of Canadian Triage Acuity Scale (CTAS) 1-3 patients by their average delay to reach a care space. We compared cumulative ED access gap to available inpatient bed hours to estimate fractional access gap.

Results: Study sites included 16 tertiary and 9 community EDs in 12 cities, representing 1.79 million patient visits. Median ED census (interquartile range) was 66,300 visits per year (58,700-80,600). High acuity patients accounted for 70.7% of visits (60.9%-79.0%). The mean (SD) cumulative ED access gap was 46,000 stretcher hours per site per year (± 19,900), which was 1.14% (± 0.45%) of inpatient capacity.

Conclusion: ED access gaps are large and jeopardize care for high acuity patients, but they are small relative to hospital operating capacity. If access block were viewed as a "whole hospital" problem, capacity or efficiency improvements in the range of 1% to 3% could profoundly mitigate emergency care delays.

RÉSUMÉ

Contexte: Le blocage de l'accès aux services des urgences (SU), soit l'impossibilité de fournir des soins appropriés en temps opportun aux patients en état grave, est la préoccupation première des SU quant à la sûreté des patients, dans les pays industrialisés. La principale cause du blocage de l'accès au

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SU est le *blocage de l'accès à l'hôpital*, qui conduit au séjour prolongé des malades hospitalisés, sur civière, au SU. L'écart cumulé d'accès au SU, soit le produit du nombre de patients en état grave à l'arrivée par le délai d'attente moyen avant l'arrivée dans une salle d'examen, constitue une nouvelle mesure d'accès qui fournit une approximation des délais d'attente totaux, au niveau des établissements, avant la prestation de soins d'urgence. Bon nombre de dirigeants sont d'avis que les délais d'attente sont trop importants pour être résolus sans une augmentation importante de la capacité d'hospitalisation des malades. L'étude visait donc à quantifier les blocages cumulés de l'accès au SU (le problème) sous forme de fraction de la capacité d'hospitalisation des malades (la solution possible), dans un large échantillon d'hôpitaux au Canada.

Méthode: Il s'agit d'une étude transversale, dans laquelle ont été recueillies des données administratives de 2015, provenant de 25 hôpitaux et fournissant un résumé de l'afflux des patients et des délais d'attente avant l'arrivée dans une salle d'examen au SU. L'écart cumulé d'accès chez les patients en état grave a été calculé en multipliant le nombre de patients dont l'état était de niveau I à III selon l'Échelle canadienne de triage et de gravité par les délais d'attente moyens avant l'arrivée dans une salle d'examen. Il y a eu, par la suite, comparaison entre l'écart cumulé d'accès au SU et le nombre d'heures-lits disponibles pour les malades hospitalisés, afin d'estimer la fraction de l'écart d'accès.

Résultats: L'étude comptait 16 SU tertiaires et 9 SU communautaires, répartis dans 12 villes, qui totalisaient 1,79 million de consultations. La valeur médiane (écart interquartile) du dénombrement des visites au SU s'élevait à 66 300 consultations par année [58 700 – 80 600]. Les patients en état grave pesaient pour 70,7 % des consultations [60,9 % – 79,0 %]. L'écart cumulé moyen (écart type) d'accès au SU était de 46 000 heures-civières, par SU, par année (± 19 900), soit 1,14 % (± 0,45 %) de la capacité d'hospitalisation des malades.

Conclusion: Les écarts d'accès au SU sont importants et ils mettent en péril la prestation de soins aux patients en état grave, mais ils sont minimes comparativement à la capacité de fonctionnement des hôpitaux. Si les blocages d'accès étaient considérés comme un problème « global » touchant l'ensemble de l'établissement, des améliorations apportées à la capacité ou à l'efficacité, de l'ordre de 1 à 3 %, pourraient atténuer considérablement les délais d'attente avant la prestation de soins d'urgence.

Keywords: access, emergency, overcrowding, patient flow

INTRODUCTION

Emergency department (ED) care delays are a widespread problem and common media focus. Emergency access block, often referred to as *overcrowding*, is the number one safety concern in First World EDs.[1–6] It is associated with delayed care for seriously ill patients,[7–10] prolonged hospital length of stay (LOS),[11–13] patient dissatisfaction,[3,14] and patient mortality.[11, 15–20] The main cause of ED access block is *hospital access block* with prolonged *boarding* of inpatients in EDs.[2–4,6,16,21–33]

When inpatients accrue in ED stretchers, ED and hospital access shortfalls are concentrated in a single area, magnifying the apparent size of the problem and reinforcing the belief that it cannot be solved without large increases in system capacity. ED leaders view boarding as a threat to emergency care and advocate for its elimination, whereas inpatient leaders often believe doing so would disrupt important hospital operations.[24,26,34] Determining the disruptive potential of future access solutions requires understanding the size of the care shortfall. If emergency access gaps are small relative to hospital capacity, emergency access can be improved without compromising inpatient operations.

Overcrowding research has focused on metrics like wait times and ED LOS for admitted patients. These measures describe waiting periods for individuals but do not reflect delays caused by care space unavailability, and do not quantify demand-capacity shortfalls at a facility level. Cumulative emergency access gap, a facility-level measure of emergency access delays, has not been studied. At any hospital, this value can be estimated by measuring the cumulative time that high acuity patients are blocked in waiting areas. Expressed in stretcher hours, cumulative emergency access gap approximates the capacity required to eliminate emergency access block. Our objective was to estimate cumulative emergency access gaps within a large sample of Canadian hospitals. Our hypothesis was that these gaps represent a small and manageable proportion of total hospital care capacity.

METHODS

Design and setting

We invited a convenience sample of 40 urban ED directors to provide administrative data summarizing patient characteristics and delays to care space. Data provision was considered implied consent. The University of Calgary Research Ethics Board approved this research.

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Patients

ED directors provided calendar 2015 data for high acuity patients – those in Canadian Triage Acuity Scale (CTAS) triage categories 1 (*resuscitation*), 2 (*emergent*) or 3 (*urgent*).[35] Our population therefore included patients with potentially serious illness/injury, severe pain, or a life and limb threat. Less urgent CTAS 4-5 patients and those triaged to minor treatment areas were excluded because they are less likely to suffer delay-related morbidity.[18]

Outcomes

We estimated the *cumulative emergency access gap* for each site by multiplying the number of arriving high-acuity patients by their mean delay to an ED care space. We determined the *fractional access gap* (primary outcome) by expressing the cumulative emergency access gap as a fraction of available inpatient bed hours (i.e., cumulative access gap/inpatient bed count × 24 × 365). The *fractional access gap* is therefore an estimate of the emergency access gap relative to inpatient capacity – the size of the problem relative to the size of the potential solution. The value for each hospital has implications regarding the feasibility of non–capacity-based access strategies.

Care processes

EDs historically place high-acuity patients in nurse-staffed stretchers with ~ 1:4 nursing ratios. Inpatient boarding has reduced stretcher availability, so many EDs have developed *rapid assessment zones* or *intake* (RAZ-INT) areas that permit limited patient assessment on chairs or examining tables. Intended for patients with no life or limb threat, RAZ-INT areas have internal waiting zones to which patients return after a physician assessment (Figure 1). This minimizes stretcher dwell time and allows high turnover through a small number of exam spaces, analogous to a medical office. RAZ-INT patients are not monitored, may not undergo a post-triage nursing assessment, and typically do not have a primary nurse. ED physicians are often the first and sometimes the only provider caring for these patients.

Data capture

Most large Canadian EDs electronically capture triage time, time to a physician assessment, and time to an ED stretcher or RAZ-INT area. For patients triaged to traditional nurse-staffed stretchers, we defined time to care space as the electronically captured interval from triage to stretcher. Because "care space" connotes the ability to examine a patient, time to care space for RAZ-INT patients was defined by the arrival to an examination space – not to a RAZ-INT waiting chair. For sites that did not electronically capture this, we used the time from triage to first physician or bedside nurse assessment as a proxy for time to examination space. Sites also provided their triage acuity distribution and inpatient bed count, excluding maternity and neonatal units.

Analysis

We provided descriptive analyses summarizing ED census, acuity distribution, patients triaged to stretchers v. RAZ-INT areas, inpatient bed count, and cumulative emergency access gap. Continuous data were reported as means (± SD) or medians (interquartile ranges), as appropriate. Because we chose an estimation approach for our main outcome, no tests of statistical significance were contemplated. Given concerns about the precision of administrative data, we performed a sensitivity analysis on the primary outcome measure in which delay to care space was adjusted by ± 50% and inpatient bed count by ± 10%.

RESULTS

Thirty-six of 40 ED directors agreed to participate and 34 submitted data; however, nine sites were excluded

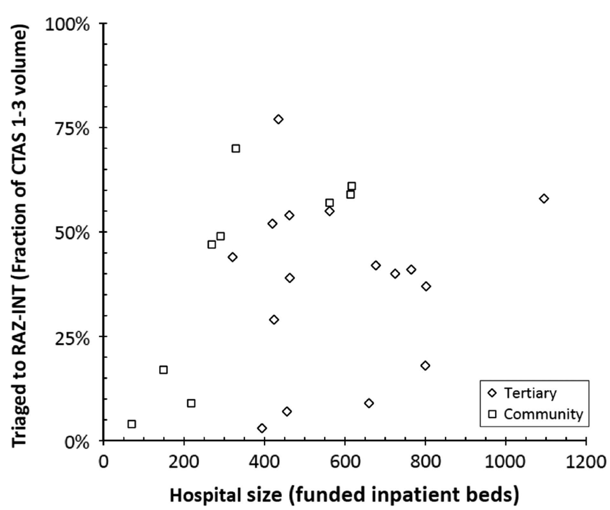

Figure 1. Use of innovative intake areas by hospital size and type.

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because of unreliable time capture. The remaining 25 sites included 16 tertiary and 9 community EDs in 12 cities, representing 1.79 million ED visits in 2015. Study sites included four hospitals in Edmonton, Calgary, and Toronto; two in Ottawa, London, Regina, and Vancouver; and one in Kingston, Winnipeg, Surrey (BC), St. Albert, and Leduc (AB).

The median ED patient census was 66,272 visits per year, with 71% in high acuity CTAS 1-3 categories (Table 1). Overall, 42% of high-acuity patients (range 4%-77%) were triaged to RAZ-INT areas rather than to nurse-staffed stretchers. The median inpatient bed base was 462, corresponding to over 4 million bed hours per hospital per year. Table 2 shows that the median delay from triage to care space was 0.72 hours for stretcher patients and 1.15 hours for RAZ-INT patients. Delays were similar at tertiary and community sites but shorter for patients triaged to nurse-staffed stretchers, reflecting the selection of sicker patients with possible life-limb threats. The mean cumulative access gap for high-acuity patients was 46,000 (± 19,900) stretcher hours per site, equivalent to 1.14% (± 0.45%) of corresponding inpatient capacity.

Table 3 summarizes the sensitivity analysis in which key determinants – delay to care space and inpatient bed count – were adjusted across a credible range of error. If reported times to care space were inaccurate by ± 50% and bed base estimates by ± 10%, our estimate for the fractional ED access gap could range from 0.52% to 1.9%.

DISCUSSION

This study quantifies emergency access delays and estimates the capacity or improvement required to address them. Cumulative access gaps reported here, measured in hours that arriving high-acuity patients were blocked from care spaces, averaged 46,000 hours

Table 1. Site characteristics

Site	Type	ED census	CTAS 1-3	To stretcher	To RAZ-INT	Inpatient beds	Inpatient hours
A	T	78,705	75%	46%	54%	462	4,047,120
B	T	83,781	77%	45%	55%	562	4,923,120
C	T	49,824	80%	97%	3%	394	3,451,440
D[a]	T	66,272	80%	91%	9%	660	5,781,600
E	T	78,348	80%	42%	58%	1095	9,592,200
F	T	60,851	89%	56%	44%	321	2,811,960
G[b]	T	92,000	61%	59%	41%	765	6,701,400
H	T	84,000	54%	23%	77%	435	3,810,600
I	T	74,966	79%	61%	39%	463	4,055,880
J[c]	T	62,932	71%	48%	52%	420	3,679,200
K	T	112,191	80%	60%	40%	725	6,351,000
L	T	53,000	80%	93%	7%	456	3,994,560
M	T	82,000	71%	63%	37%	802	7,025,520
N	T	78,000	64%	58%	42%	677	5,930,520
O[d]	T	55,700	56%	82%	18%	800	7,008,000
P	T	58,715	65%	71%	29%	424	3,714,240
Q	C	80,618	79%	43%	57%	562	4,923,120
R	C	76,543	78%	39%	61%	617	5,404,920
S	C	65,231	71%	53%	47%	269	2,356,440
T[e]	C	63,000	70%	30%	70%	329	2,882,040
U	C	61,200	56%	51%	49%	291	2,549,160
V	C	57,987	56%	83%	17%	149	1,305,240
W	C	24,567	47%	96%	4%	70	613,200
X	C	41,648	64%	91%	9%	218	1,909,680
Y	C	146,435	58%	41%	59%	614	5,378,640
	Median	66,272	71%	58%	42%	462	4,047,120
	IQR	59-81,000	61-79%	45-82%	18-55%	329-660	2.9-5.8M

Notes: C = community; T = tertiary.
[a]4.7%, [b]2.6%, [c]21.7%, [d]9.3%, and [e]3.9% (Proportions of patients for which first location after triage was missing; they were presumed to be RAZ-INT patients.)

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Table 2. Access delays and cumulative access gap as a fraction of hospital capacity

		Stretcher patients			RAZ-INT patients				
Site	Type	N	*Delay (hours)	†Access gap hours	N	*Delay (hours)	†Access gap hours	Cumulative access gap (total hours)	Fractional access gap (%)
A	T	27,096	0.42	11,272	31,752	0.78	24,767	36,039	0.89%
B	T	28,952	0.48	13,897	35,961	1.24	44,592	58,489	1.19%
C	T	38,540	0.72	27,749	1,178	1.43	1,685	29,434	0.85%
D	T	48,211	1.03	49,657	4,941	1.59	7,856	57,513	0.99%
E	T	26,233	0.78	20,462	36,383	1.2	43,660	64,122	0.67%
F	T	30,696	0.9	27,626	23,740	0.81	19,229	46,855	1.67%
G	T	32,995	0.09	2,970	23,036	1.53	35,245	38,215	0.57%
H	T	10,669	0.2	2,134	34,768	0.67	23,295	25,429	0.67%
I	T	35,827	0.6	21,496	23,088	0.8	18,470	39,966	0.99%
J	T	21,524	0.72	15,497	22,987	0.68	15,631	31,128	0.85%
K	T	54,000	0.63	34,020	36,000	0.5	18,000	52,020	0.82%
L	T	39,327	0.77	30,282	2,921	0.64	1,869	32,151	0.80%
M	T	36,740	1.5	55,110	21,173	1.5	31,760	86,870	1.24%
N	T	28,987	1.1	31,886	21,294	2.04	43,440	75,326	1.27%
O	T	25,644	1.75	44,877	5,696	1.62	9,228	54,105	0.77%
P	T	27,189	0.73	19,848	10,915	1.02	11,133	30,981	0.83%
Q	C	27,219	0.7	19,053	36,509	1.18	43,081	62,134	1.26%
R	C	23,439	0.63	14,767	36,142	1.15	41,563	56,330	1.04%
S	C	24,430	0.72	17,590	21,753	1.31	28,496	46,086	1.96%
T	C	13,441	0.96	12,903	30,935	1.02	31,554	44,457	1.54%
U	C	17,598	1.0	17,598	16,886	1.2	20,263	37,861	1.49%
V	C	26,692	1.0	26,692	5,495	1.0	5,495	32,187	2.47%
W	C	11,096	0.7	7,767	443	0.7	310	8,077	1.32%
X	C	24,436	0.47	11,485	2,293	0.73	1,674	13,159	0.69%
Y	C	34,740	0.29	10,075	50,758	1.6	81,213	91,288	1.70%
	Median	*27,189*	*0.72*	19,053	*22,987*	*1.15*	20,263		
	IQR	24-35000	0.6-1.0	13-28000	6-35000	0.8-1.4	9-35000		
	Mean	28,629	0.76	*21,869*	21,482	1.12	*24,140*	*46,009*	*1.14%*
	SD	10,075	0.36	13,277	13,861	0.39	18,554	19,976	0.45%

Notes: C = community; T = tertiary.
Cumulative access gap (total hours) is the sum of access delays for all CTAS 1-3 patients. Fractional access gap is the cumulative access gap expressed as a percentage of available inpatient hours for a site. Preferred measures are in bold text. Medians are used to express central tendency for site volume and typical care delays. Means are used to calculate total access gap hours (patient N × mean delay = total access gap hours).
*Delay is the average time to care space at each site.
†Access gap hours (the product of average delay and patient N) are the sum of all access delays for patients in the relevant subgroup.

per site in 2015. This value seems compatible with the common belief that existing care gaps cannot be closed without substantial increases in capacity, and that solutions based on operational improvement will necessarily be large enough to disrupt hospital operations. However, although 46,000 hours is a sizable gap during which many patients will suffer adverse events,[8,10,15–20] it represents only 1% of inpatient capacity – a gap that would be eliminated by a 90-minute reduction in average inpatient LOS for a hospital with 30,000 separations per year. This suggests that if access block were viewed as a "whole hospital" problem rather than concentrated in the ED, it could be substantially mitigated by modest efficiency improvements with or without new capacity.

Our approach to quantifying ED access gap is intuitive but not previously described. Prior research has focused on time-to-physician and ED LOS for admitted patients.[2,7,15] The former is an access measure that incorporates physician-related delays, whereas the latter reflects inpatient boarding, not emergency access. Both describe waiting periods for individual patients but offer no insight into the overall size of demand-capacity

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Table 3. Size of ED access block as a proportion of inpatient capacity (sensitivity analysis)

If inpatient capacity is:	If actual delay to care space is: 50% Shorter than reported	Accurate	50% Longer than reported
10% Higher than reported	0.52%	1.04%	1.56%
Accurate	0.57%	**1.14%**	1.71%
10% Lower than reported	0.63%	1.27%	1.90%

mismatches. In contrast, *cumulative emergency access gap* provides a facility-level estimate of emergency care delays, while *fractional access gap* places these in the context of hospital capacity, enabling conceptual demand-capacity analyses. These novel measures are easily captured and provide an estimate of the capacity or operational improvement required to assure timely emergency care, as well as a sense of the feasibility and disruptive potential of non–capacity-based strategies.

Inpatient boarding is the primary cause of emergency access block.[2–4,6,16,21–33] Boarding inpatients occupy ED stretchers and displace high acuity arrivals to waiting areas, compromising their outcomes.[7–10,21,24–26] Boarded inpatients themselves experience delays to definitive treatment and have worse outcomes than patients transferred promptly to appropriate units.[11–20] They suffer prolonged periods on stretchers (not beds) in noisy environments where the lights never go out, and endure sleep-deprivation without privacy, dignity, or toilet facilities. For these reasons, the Institute of Medicine has recommended hospitals discontinue boarding except in extreme circumstances.[24] Boarding is a priority improvement target, but its consequence, emergency access block, is a larger safety concern that reflects acutely ill people held in locations where they cannot be assessed or treated. Our data show that emergency access block is small relative to hospital capacity, therefore that mitigating its detrimental effects will require reduction but not elimination of inpatient boarding.

A root cause of boarding is the decoupling of queue management accountability from operational expectations: Programs are not expected to be accountable for their waiting patients.[15,36] When a hospital program determines they are unable to manage their queue, the default process is to stop inflow and board inpatients in the ED.[2,21,24,26] If hospital programs close beds for budgetary reasons, to allow staff vacations (seasonal closures) or because of sick calls, they do so expecting that the ED will simply hold more patients. If an inpatient discharge is delayed from 0900 until 1600 hours, one more ED stretcher will be blocked for the day.

Without queue management accountability, the consequences of capacity or efficiency shortfalls manifest not within a program, but upstream. Separation of consequence from cause reduces the need and the motivation for programs to solve internal capacity, efficiency, and access shortfalls.[36] If ED boarding is an acceptable response to demand-capacity challenges, there is little need to develop real or innovative flow solutions. Therefore, although new capacity is necessary in some areas, capacity alone is unlikely to mitigate emergency access block. Meaningful solutions will involve clarifying program accountability to their populations, mandating proactive demand-capacity planning, queue management contingencies, and limiting the ED's role as a capacity buffer for other programs.[26,36]

During the last two decades, health leaders have addressed ED overcrowding by adding hospital and residential beds, introducing flow initiatives, urgent care centres, and community diversion strategies. None have had a meaningful or sustained effect, and shifting accountability for inpatient care back to strained inpatient programs has proven difficult. A 2017 Canadian Institute for Health Information (CIHI) report shows that 90th percentile ED LOS for admitted patients has now risen above 30 hours in urban hospitals.[37] The obvious question is, why have multiple system initiatives not eliminated emergency access gaps if these represent only 1% of inpatient capacity? There are several possible explanations. The rising population, age, and patient complexity have created demand unmatched by new capacity. Alternate level of care patients with no viable discharge destination have increased, compromising inpatient capacity, just as boarding inpatients compromise ED capacity. When bed expansion or efficiency gains create capacity within a program, this tends to be allocated to program priorities or to mitigate internal operational pressures, with only trickle-down impact on boarding delays, which are still viewed as primarily an ED problem.[38] Many administrators have come to view boarding as inevitable – a form of normalized deviance.[39]

The failure to address system variability is a significant cause for ongoing access block. Natural variability (e.g., influenza outbreaks) and scheduled

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variability (e.g., surgical admissions clustered early in the week) generate large fluctuations in bed demand, aggravated by variable hospital lengths of stay by service and provider.[40,41] Seasonal bed closures and staffing crises, plummeting discharge rates on weekends, diminished consultant availability, and lack of palliative or long-term care intake outside of bankers hours mean that system capacity is also highly variable and unmatched to patient demand.[41–43] Uncontrolled variability in demand and capacity create more severe and prolonged overcapacity situations during which hospital access block and ED boarding become extreme.[42] High levels of variability require that hospitals target lower occupancy levels to accommodate demand fluctuation,[43] but budgetary implications make this approach unpalatable to administrators and funders, who often feel that hospitals should not operate with unused capacity. Litvak and others have shown that smoothing variability and matching demand to capacity are essential, effective, and underutilized strategies that would more than address the care gaps identified in this study.[44]

Our data also show that the need to manage more patients with fewer available stretchers has driven profound changes in emergency care models, with EDs now triaging almost half of high-acuity patients to alternative RAZ-INT locations. These areas are typically crowded and offer less nursing care, little or no monitoring, limited privacy, and often-compromised patient examination – features that some feel may reflect suboptimal care. Despite this, they are efficient and allow many patients who would otherwise face prolonged delays in hallways or waiting rooms to see a physician more quickly. Sadly, the authors' collective experience is that ED stretchers made available through process innovation are frequently occupied by even more boarding inpatients, thus exacerbating the problem they were designed to solve.[37,45] In a corollary to Parkinson's law, patients expand to fill the space available, and the queuing continues.

LIMITATIONS

This study's main limitation is its convenience sampling approach, which could generate selection bias. However, we studied community and tertiary centres in 12 cities, ranging from 24,000 to 112,000 visits per year, and found that all 25 sites exhibited the same high cumulative access gaps and very low fractional access gaps. Essentially, identical outcomes at every study site imply external validity and suggest that selection bias is an unlikely explanation for our findings. Readers should understand that we estimated the improvement required to eliminate ED access gaps, not to eliminate inpatient boarding. The study is based on administrative data, which may differ in quality across sites. Data quality threats are mitigated by the fact that our key variables – ED volume and acuity – are standard validated performance measures, audited and regularly reported to governments and the public. Delay to care space is less reliably captured; therefore, we provided explicit definitions of what constitutes a care space and how to measure the associated time interval. When this interval was unclear for RAZ-INT patients, we used time-to-bedside nurse or physician, which could cause an overestimation of the fractional access gap. Hospital bed estimates are also a potential source of error, given the inconsistent use of overcapacity beds, special purpose beds, seasonal bed closures, and unscheduled staffing-related closures. To address possible errors in these variables that determined the primary outcome, we performed a sensitivity analysis demonstrating that our findings were robust. Finally, that 25 hospitals with diverse operational models and data management processes generated almost identical estimates for the primary outcome is evidence that "bad" data were not an important study limitation.

We did not stratify access block by the time of day or day of the week; therefore, the critical importance of system variability was not addressed. Access delays are generally greater during weekday and evening periods, and less severe during weekends and nights, implying that solutions need to be deployed preferentially during these times. The authors acknowledge that hospital efficiency gains may not translate on a one-to-one basis to access block reduction; therefore, operational improvements of more than 1% may be necessary. Our focus may suggest to readers that ED access block is entirely due to inpatient boarding, which is incorrect. Boarding is the main cause[2–4,6,16,21–33]; however, if EDs can improve internal processes, they can reduce fractional access gaps to levels below those estimated here. We focused on urban hospitals where access block is most severe, so our findings cannot be generalized to rural settings. Further, because we excluded less urgent patients, we did not describe the full impact of ED access block. Readers should not presume that lower-acuity patients do not suffer as a result of access block, or that they do not merit a timely evaluation.

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CONCLUSION

ED access gaps are large and jeopardize care for high-acuity patients, but these gaps are small relative to hospital operating capacity. If access block is viewed as a whole hospital problem, capacity or efficiency improvements in the range of 1% to 3% could profoundly mitigate emergency care delays.

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