

Impact of health care system interventions on emergency department utilization and overcrowding in Singapore

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Abstract

Background Public emergency departments (EDs) in Singapore were facing increasing attendances (visits) with frequent overcrowding in the 10 years from 1975 to 1985. Over the next 12 years a series of social interventions were carried out to minimize “unnecessary” attendances at these EDs.

Aims This paper reviews the various interventions carried out on ED utilization to determine their impact and usefulness.

Methods Emergency and non-emergency attendances at the six main public EDs were analysed over the 32 years of the review and especially just before and soon after the application of four major interventions relating to use of EDs, including: (1) public education campaigns, (2) financial disincentives, (3) redirection to primary health care centres and (4) use of alternative clinics.

Results The 12-year period of social interventions resulted in a fall in the proportion of non-emergency patients using the EDs from 57% to 18%. Public education campaigns each resulted in a fall in inappropriate attendances of 27% to 67%. Financial disincentives were able to demonstrate an impact if they were significant and resulted in a heavier fiscal cost to the patient than if available primary health clinics were used. Redirection of non-emergencies away from EDs resulted in significant public relations issues with only mild decreases in non-emergency attendances. Alter-

native clinics may provide some respite if actively promoted by ED staff, but are able to generate their own separate patient clientele.

Conclusions Public education and financial measures that seek to change the pattern of ED utilization in a community must go hand in hand with an easily accessible primary health care system for best effect. Co-ordination of such efforts requires active support from all levels of the health service and political leadership. An active feedback loop is needed for better outcomes management.

Keywords Emergency department utilization · Public health education · Financial disincentives · Inappropriate · Redirection · Primary health clinics

Introduction

Emergency departments (EDs), by their very name, conjure impressions of high acuity, intense action and fast pace of patient care. Most persons would presume that such units are meant for the management of the acutely sick and injured [1]. Worldwide, most such departments are generally known to be open to members of the public 24 h a day. EDs also generally have the potential availability of access to all the resources of the parent hospital at their disposal, such as radiological services and other investigative modalities, in addition to an almost unlimited array of pharmaceuticals. For most communities, there is hardly any other more easily accessible facility.

General practitioner (GP) clinics and community primary health care centres, on the other hand, tend to be open for only specific hours, usually ranging from 6 to 12 h a day, and often are hardly available on weekends and public

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holidays. In many communities, attendances at primary health clinics would be by appointment only, and as is present in all appointment-only systems of medical practice, waiting times are inevitable, often in terms of days. It is, therefore, hardly surprising that large numbers of the public tend to use EDs for a whole variety of common medical ailments.

From a hospital and health services perspective, emergency patients arriving in hospitals should be cared for in a timely manner. Unfortunately, the presence of large numbers of relatively non-emergency patients in EDs is a distraction. Being fully alert and able to verbally demand the attention of medical and nursing staff, they compete for the limited resources of such departments. This leads to delayed action and less time to attend to the very sick and injured, compromising the care given to them [2, 3].

In an attempt to ensure that the EDs of the large public hospitals in Singapore are able to handle emergency patients without hindrance, the Ministry of Health of this country had, since 1985, attempted a variety of measures, including public health education campaigns to educate community citizens on the correct use of such units, redirecting non-emergency patients away from these departments, setting up separate facilities for such non-emergencies and even implementing a system of financial disincentives for unwarranted use of EDs.

The objective of this paper is to review the effects of these various social interventions on ED utilization with a view to determine those measures that have the greatest potential for success.

Methods

This is a retrospective study conducted on the effects of such social interventions since the first major intervention in 1985. The combined emergency and non-emergency [4] attendance statistics of the EDs of the six public general hospitals in Singapore were reviewed for a 12-year period from 1 November 1985 until 31 October 1997. In the latter half of 1997, the state opened a large children's hospital with its own paediatric ED and also closed one of the large hospitals and moved this to another location approximately 15 km away. These would potentially have a major impact on the emergency department seeking characteristics of populations in the areas of the country affected by the shifts, especially in the immediate period. The review was, therefore, confined to the period mentioned above, though statistics of the last few years are introduced for the readers' information only to better appreciate the continued effect of earlier interventions.

The attendances of the private emergency departments in Singapore were not included in this review for the following reasons:

- (a) Policies applied to public hospitals in Singapore over the period 1976–2007 have not included the private sector.
- (b) There are no clear attendance statistics on ED attendances in the private sector in this country to date. However, it is generally believed that more than 90% of ED attendances in this country occur in public sector hospitals.

The review included all the social interventions made to the ED utilization system during the period under review. Such social interventions were carried out during a 12-year period from 1985 to 1997. These interventions were as follows:

(a) *Public education campaigns on the proper use of EDs*

Three major public education campaigns on the proper use of EDs were conducted during the period reviewed. These campaigns were:

1. November 1985 to February 1986. This consisted of the following:
 - (i) Clear definitions of what constituted an emergency/non-emergency with long explanatory lists and examples were provided to the public over the print and broadcast media in all four official languages of the country repeatedly almost daily during the 4-month campaign period.
 - (ii) The results of public surveys on why people used EDs for common, non-emergency ailments were publicized to increase awareness of reasons for what was perceived as inappropriate use of such departments.
 - (iii) Lists of government polyclinics, regional general practice clinics and available private sector 24-h clinics were made available to the media and also displayed at all emergency departments and the 16 government polyclinics located around the island.
 - (iv) Regular messages in the media, during campaign talks and media bytes encouraging members of the community to have their own family physicians and use them as often as possible were broadcasted.
 - (v) Large numbers of educational pamphlets on the proper use of emergency departments were produced and distributed to clinics, EDs and general offices and even residential homes.
 - (vi) Large lighted poster boards were installed in EDs. These displayed prominently educational messages on the proper use of EDs and definitions and examples of emergencies and non-emergencies.

2. Two weeks in September 1991: an intensive 2-week campaign highlighted the following:
 - (i) Reinforcing the messages of the 1985 campaign especially on the consequences of misuse of EDs, such as prolonged waiting times and adverse impact on the severely sick and injured.
 - (ii) Moving to the community to get the message across even better, such as organizing talks to junior college students, large employer organizations, including multinational corporations.
3. One month long effort in February 1993 which included work done in the following areas:
 - (i) Reinforcing the consequences of misusing EDs to the public.
 - (ii) Production of pamphlets on how the public could deal with the ten most common non-emergency ailments encountered at EDs, namely fevers, cough, colds, diarrhoeal illnesses, minor injuries, headaches, rashes, nose bleeds and chronic backaches.
 - (iii) Campaign promotion messages printed on letters handled by the nation's postal services.
 - (iv) Poster exhibitions and talks at community centres, workplaces and schools.
 - (v) Emphasizing the importance of having a family physician as the primary care giver.
- (b) *Financial disincentives directed at patients attending EDs*

Four instances of financial adjustments to the fees paid at EDs were made during the 12-year review period in an attempt to discourage non-emergency attendances. These were at:

1. April 1987—when an increase in the overall ED fees from Singapore \$4 to Singapore \$8 was implemented. This was by implementing a separate Singapore \$4 charge for services provided at EDs such as investigations, procedures and medications.
2. September 1989—a separate Singapore \$3 increase in the attendance fee resulted in a net fee of Singapore \$15 for an ED attendance. Fees for investigations, procedures and medications remained unchanged.
3. June to December 1992—when the attendance fee for emergency patients was increased to Singapore \$28 and a differential fee for non-emergencies at Singapore \$32 was introduced. In addition, itemized charging was introduced for services performed, but capped at Singapore \$25 for investigations and procedures and Singapore \$4 for prescriptions. This resulted in an average net fee of about Singapore \$57 per attendance. The average fee charged for a primary care visit in Singapore at that time generally ranged from Singapore \$15 to \$20 at GP clinics and was Singapore \$7 at government polyclinics.
4. October 1997—a single standard fee of Singapore \$70 was introduced per ED attendance.

For all these changes, publicity on fee increases was conducted in the print and broadcast media during the week prior to each of the change implementation dates.

(c) *Redirection of non-emergency patients from public EDs*

Redirection refers to a system of requesting patients arriving at EDs to go to alternate health facilities outside of the hospital for their problems to be attended to. The redirection of patients from the front door of EDs after initial triage to other primary care facilities such as government polyclinics and general practitioner clinics was implemented from 1 November 1985 to 31 October 1988. Such redirection was enforced from 0800 hours to 1700 hours on weekdays and Saturdays. No redirection was carried out on Sundays and public holidays, when such primary care facilities were closed.

(d) *Provision of alternative clinics for re-directed patients and those with minor complaints*

Two types of alternative clinics were tried:

1. Evening clinics: these were set up at all public hospitals from November 1985 till October 1988 at locations fairly close to but not within the EDs. These operated from 1700 hours to 2300 hours on weekdays when many polyclinics and some general practitioner clinics would be expected to be closed. The evening clinics would be manned by doctors and nurses borrowed from the various EDs. Patients would be redirected from the EDs if they were triaged by trained nurses as non-emergencies. At these evening clinics mandatory waiting times of up to 60 min were enforced to discourage non-urgent patients from coming to public hospitals in the first place.
2. Walk-in clinics: from August 1995, the two largest public hospitals in the country (Singapore General Hospital and the Tan Tock Seng Hospital) set up walk-in clinics operating from 0800 hours to 2300 hours located within the hospital campus, but some distance from the respective EDs. These clinics were intentionally priced at rates lower than at the EDs so as to provide an incentive for non-emergencies to present at the clinics rather than the EDs. The clinics were also tasked to provide speedier service than was then available at the EDs. However, they were priced at rates higher than would be chargeable at private general practitioner clinics. Patients seen there were either those redirected from EDs or those who would have walked

Table 1 Public emergency department average monthly attendances in Singapore, 1975–2006

Year	Average monthly attendance	Emergencies	Non-emergencies
1975	17,895	10,735	7,160
1976	20,073	10,792	9,281
1977	23,571	11,302	12,269
1978	24,840	14,167	10,673
1979	27,012	15,125	11,887
1980	31,035	16,652	14,383
1981	33,611	17,242	16,369
1982	36,644	17,000	19,644
1983	38,235	19,366	18,869
1984	39,127	16,816	22,311
1985	36,526	20,275	16,251
1986	31,512	24,845	6,667
1987	36,388	26,248	10,140
1988	40,480	26,749	13,731
1989	42,869	26,554	16,315
1990	44,464	26,801	17,663
1991	43,075	26,276	16,799
1992	43,091	28,009	15,062
1993	39,928	27,151	12,777
1994	39,172	29,575	9,597
1995	43,649	34,166	9,483
1996	44,892	37,709	7,183
1997	45,598	37,310	8,288
1998	43,235	35,644	7,591
1999	44,410	38,322	6,088
2000	44,779	39,577	5,202
2001	47,382	43,935	3,447
2002	49,749	49,016	713
2003	46,019	45,589	430
2004	51,541	51,318	223
2005	54,859	54,615	244
2006	56,397	56,271	126

in directly from the street. Though under the administrative control of EDs, they were staffed by separate teams of doctors and nurses.

For each initiative, the average monthly emergency and non-emergency attendances were calculated for the 3 months immediately before and after the intervention.

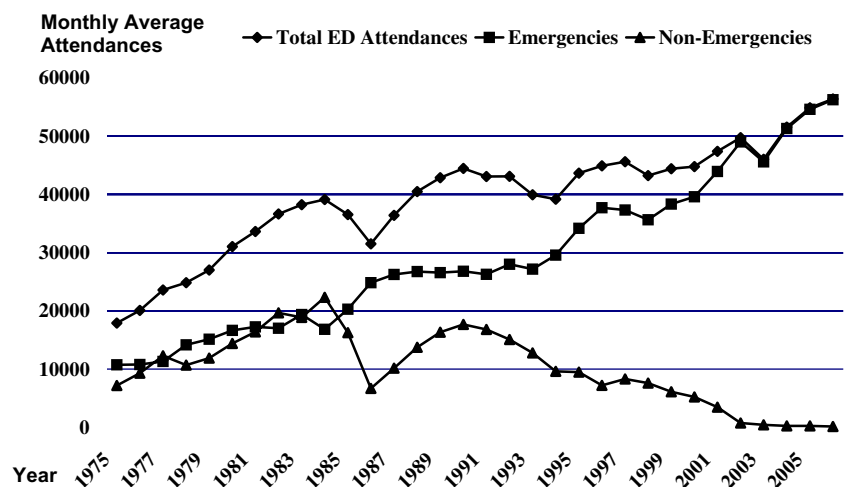
In addition, the attendance statistics from as far back as 1976 and up until 2006 have been documented to demonstrate trends in ED attendances over the years.

Results

(a) Overall ED attendances 1975–2006

During the 22-year period 1975–2006 public EDs in Singapore saw a total of 15,144,696 patients of whom 6,379,728 were seen during the 12-year review period 1985–1997. The annual attendance figures with numbers of emergency and non-emergency patients are given in Table 1. Figure 1 demonstrates the trends for overall attendances and for emergencies and non-emergencies. Non-emergency attendances peaked during the years 1982–1984, during which time they constituted 49.4–57.0% of all ED attendances. During the period 1975–1984, the following changes had occurred in the pattern of ED attendances at public hospitals:

1. The numbers of emergencies had increased over the 10 years from 1975 to 1984 inclusive by 56.6%, constituting an average annual growth rate of 5.5%.
2. Non-emergencies, on the other hand, increased by 211.6% during this period, an annual growth rate of 14.1%.
3. The net growth in patient attendance during this period was 218.6%

Fig. 1 Monthly average attendances at public emergency departments, Singapore (1975–2006)

After a series of active interventions (which will be described in more detail), during the period 1985–1992, the proportion of non-emergencies fell to 32.0% in 1993 and has been steadily falling ever since. During this period of active interventions, the average annual growth rate for emergencies was 5.8%, very similar to the pre-intervention period, while non-emergencies declined by 42.0%. During this 9-year time period, overall patient attendance only grew marginally by 2.1%.

In the immediate post-intervention 4-year period, overall patient attendances grew by 14.3%. Most of these were accounted for by an average annual growth in emergency attendances of 8.5%. These 4 years also saw a further fall in the non-emergency attendances at public EDs by 55.1%.

In 1997, 12 years after the start of the interventions to be discussed in further detail, non-emergencies constituted 18.0% of all ED attendances.

Since then, these numbers have continued to fall, in spite of the increasing pattern of emergency attendances at public EDs in the country. Emergency attendances at public EDs have increased at an average rate of 4.9% per annum over the last 10 years. Overall the total attendance at public EDs has increased by about 23.6% over the last 10 years.

(b) *Impact of public education campaigns* (Table 2)

All three campaigns (Table 2) produced substantial reductions in overall ED attendances. Yet, some time after the intensity of the campaigns had subsided, the numbers of patients had gradually increased. The factors contributing to such an increase could not be determined in this review. The data demonstrated the following:

1. Average non-emergency attendances after each public education campaign decreased by a factor of 67.3% to 27.2%. Though it appears that the proportion of fall was less with each succeeding campaign, this cannot be
2. Except for the first campaign which saw an increase in emergency numbers, the other two were associated with a fall in total numbers of emergencies, though the magnitude of the fall was less than for non-emergencies. Though figures are not available for all public hospitals, the figures of the largest centre (Singapore General Hospital) revealed that while non-emergencies there decreased by 34.4% for the second campaign and 27.9% for the third campaign, the numbers of priority 1 emergencies (resuscitations) increased by 1.2% and 1.4%, respectively, for the second and third campaigns, and 0.7% and 3.1%, respectively, for priority 2 (non-resuscitation, but critical) patients. For minor ambulant priority 3 patients, however, attendances fell by 27.5% during the second campaign and 25.1% for the third. These two campaigns were associated with greater emphasis on the role of the family physician and on management of common ailments, some of which were grouped as priority 3.
3. The figures also demonstrate how the numbers of non-emergencies gradually reverted to the pre-campaign levels many months after the end of the campaigns. The reasons for this reversion to pre-campaign levels could not be ascertained from the data.
4. During the 8 years of the public education campaigns, the net annual growth of emergency attendances remained similar at 5.8% (5.5% annual growth before the 1985 period). However, total patient attendances at public EDs grew only by 2.1% over the period, the minimal increase in total attendances being due primarily to a steep fall in non-emergency and some minor emergency attendances. This contrasted sharply with an average annual increase in annual attendance

Table 2 Impact of public education on public ED attendances in Singapore, 1985–1997

Period of public education campaign	Monitoring periods	Average monthly attendances	Average monthly emergency attendances	Average monthly non-emergency attendances
Nov 1985 to Feb 1986	Before campaign (10 months from Jan to Oct 1985)	36,014	19,267	16,747
	After campaign (10 months from Mar to Dec 1986)	28,836	23,357	5,479
	% Change	-19.9%	+21.2%	-67.3%
Sep 1991	Before campaign (Jun to Aug 1991)	45,176	26,859	18,317
	After campaign (Oct to Dec 1991)	34,749	23,185	11,564
	% Change	-23.1%	-13.7%	-36.9%
Feb 1993	Before campaign (Nov 1992 to Jan 1993)	47,512	28,527	18,985
	After campaign (Mar to May 1993)	39,506	25,679	13,827
	% Change	-16.9%	-10.0%	-27.2%

prior to 1985 of about 20%, which was contributed significantly by marked annual increases in non-emergency attendances.

(c) *Impact of financial disincentives* (Table 3)

1. The initial fee increases implemented in April 1987 and September 1989 had, by themselves, no impact on ED attendances.
2. Financial measures began to have an effect on attendances only after ED fees exceeded the charges levied by the nation's primary health care services, as in 1992 and 1997. Especially in 1992, the fall in non-emergency attendances far exceeded the increase in emergencies. The gradual fall in non-emergency attendances continued over the years between 1992 and 1997 and the further fall after the fee increase would be most likely owing to the continuing decrease in non-emergency attendances that had been occurring for some years.
3. The fall in emergency attendances, however, was predominantly an effect of the minor emergencies (priority 3 patients). Though figures on such patients managed by the primary health care services are not available, the general impression then was that more such patients were beginning to look towards their primary health care doctor for minor emergencies.

(d) *Impact of redirection of non-emergencies* (Table 4)

1. The numbers of non-emergencies redirected from ED triage rooms to primary health care centres was highest in the first 2 months of the effort. Gradually, the numbers of patients who were redirected to primary health care centres decreased.
2. The efforts at redirection of patients from the EDs met with a fair amount of resistance from members of the public. There were frequent instances of such redirected members creating scenes just outside the EDs and sometimes resorting to verbal abuse and threats to triage staff. Patients frequently insisted on being seen at the EDs because they were already there. Frequently ED doctors had to be called out to triage stations to arbitrate over disputes that occurred during the redirection process.
3. With all these the numbers of patients triage nurses were able to redirect after triaging them as non-emergencies constituted only between 7.9% and 17.6% of all such patients presenting to the EDs.
4. With the decreasing redirections over the 3 years, the frequent adverse public relations incidents at the front doors of the various EDs and the decreasing contribution of such redirections to non-emergency attendances at hospitals, this scheme was discontinued after completion of its third year.

Table 3 Impact of financial disincentives on public ED attendances in Singapore, 1985–1997

Period of financial disincentive	Monitoring periods	Average monthly attendances	Average monthly emergency attendances	Average monthly non-emergency attendances
1 April 1987 (fee increased from Singapore \$8 to \$2)	Before increase (Jan to Mar 1987)	28,836	23,357	5,479
	After increase (Apr to May 1987)	31,365	25,092	6,273
	% Change	+8.8%	+7.4%	+14.5%
1 September 1989 (fee increased from Singapore \$2 to \$5)	Before increase (Jun to Aug 1989)	40,255	26,568	13,687
	After increase (Sep to Nov 1989)	40,982	27,458	13,524
	% Change	+1.8%	+3.3%	-1.2%
June to December 1992 (attendance fee increased from Singapore \$5 to \$28 for emergencies and \$32 for non-emergencies). Additional itemized fees for services up to \$5) and prescription (up to \$4)	Before increase (1991)	43,075	26,276	16,799
	After increase (1993)	39,928	27,151	12,772
	% Change	-7.3%	+3.3%	-23.9%
1 October 1997 (single fee of Singapore \$70)	Before increase (Jul to Sep 1997)	45,740	37,460	8,280
	After increase (Oct to Dec 1997)	40,325	32,759	7,566
	% Change	-11.8%	-12.5%	-8.6%

Table 4 Impact of redirection of non-emergencies on public ED attendances in Singapore (redirection carried out from November 1985 to October 1988)

Period of monitoring	Average monthly emergency attendances	Average monthly non-emergency attendances	Numbers redirected per month	% Contribution to decrease in non-emergency attendance
1984	16,816	22,311	NA	NA
1985 (Jan to Oct)	19,267	16,747	NA	NA
1985 (Nov to Dec)	17,953	11,003	1,685	13.3%
1986	24,845	6,667	1,512	17.6%
1987	26,248	10,140	1,329	11.6%
1988 (Jan to Oct)	27,932	12,548	1,088	7.9%

5. During the 3 years of redirection there was not a single documented instance of any patient suffering adverse medical consequences as a result of not being treated at the ED and instead being routed to a primary care clinic.

(e) *Impact of alternative clinics* (Table 5)

1. These clinics were also not very popular with patients classified as non-emergencies after initial triage at the EDs. They contributed another decrease of 9.8% to 20.8% to the decrease in non-emergency attendances at the various public EDs.
2. For each patient routed to an evening clinic, time was consumed by staff having to provide detailed instructions on how to walk to the evening clinics, provide the appropriate directional pamphlets and also a note to the effect that they have been so routed.
3. With a combination of both procedures, that is routing to an evening clinic and redirecting to an out-of-hospital primary health care clinic, the impact on non-emergencies who could be finally turned away from the ED decreased from a promising 39.3% in the first year to a dismal 17.7% in the third year of operation. The inability to sustain substantial benefit from this exercise and the generally low workload led to the closing of the evening clinics in late 1988. These clinics were also drawing upon the resources of their parent EDs (doctors and nurses). That such

resources could be better utilized to manage the existing non-emergencies within the EDs also contributed to the final decision to terminate the rerouting and redirection exercise.

4. Some years later, in the last quarter of 1995, the setting up of independent walk-in clinics offering speedier service has not appeared to have made any significant impact on ED non-emergency attendances. Instead the walk-in clinics attracted their own clientele, as seen by the increasing attendances there.
5. Such walk-in clinics were also generally seen as competing with private GPs even though they were priced higher. Patients frequenting these clinics often saw the back-up resources within a major hospital as a major convenience that could not be matched by stand-alone primary care clinics.

Discussion

The whole saga of using social interventions to limit perceived inappropriate use of emergency departments begs the question whether there is any need at all to control the case mix of EDs in a community.

In today's world of increasing health care costs, insurers of health care often see non-urgent care as one that can be low-cost, if provided in a low-cost facility, owing to less

Table 5 Impact of alternative clinics on public ED attendances in Singapore, 1985–1997

Type of alternative clinic	Monitoring periods	Average monthly non-emergency attendances	Alternative clinic attendances	Percentage non-emergency savings at ED
Evening clinic	1986	6,667	1,752	20.8%
	1987	10,140	1,342	11.7%
	1988	12,548	1,361	9.8%
Evening clinic + redirections	1986	6,667	3,264	39.3%
	1987	10,140	2,671	23.3%
	1988	12,548	2,449	17.7%
Walk-in clinic	Last quarter 1995	2,285	3,764	NA
	1996	1,877	4,738	NA
	1997	2,287	5,769	NA

need for expensive manpower and equipment resources that often form a significant portion of the fixed cost of health care establishments [5–7]. Such payers of the health care dollar would tend to view more favourably care being provided in low-resource environments such as primary health care units. In socialized medicine communities [8], governments would think along similar lines, as the health care dollar is precious, politically a hot topic and allows better use of scarce funds. Modern EDs are increasingly being staffed by highly trained specialists and use progressively higher-technology equipment that all contribute to an increasing fixed cost of facility care.

ED leaders and managers have two major conflicting perspectives on this. Those with low high-acuity workloads, fearing closure and wanting to survive would welcome managing a larger proportion of non-emergency and minor emergency patients owing to the ease of care for these, a generally shorter time to manage most such patients, and potentially substantial financial reimbursement that will help to make their business units fiscally viable [5, 9]. Those with crowded EDs needing to handle constant complaints of waiting times and the like with little incentive to see more patients would wish such non-urgent attendees would not come to them, so that their limited resources can be better managed for what they perceive as their *raison d'être*.

Rather than being judgemental on this issue, this paper attempts to address the need of communities that hope to maximize care potential with their limited resources and ensure that waiting times are significantly shortened to the general satisfaction of their stakeholders [10]. Patients have a different perspective and perception of urgency. The issue of emergency department crowding in Singapore, as in most communities, has to do with concerns on standards of care and optimizing allocation of limited resources. When emergency department overcrowding became a source of irritation to the health authorities because of frequent complaints and airing of concerns in the local media, the Health Services took a long-term perspective and began to consider multiple approaches that will provide the basis for solutions that would be acceptable to the community. Taking this approach meant that the civil authority needed to provide some form of overarching oversight of the “problem” as it was perceived [11], hospital boards needed to provide the support to their emergency departments to make solutions work, and emergency medicine leaders had to operationalize the solutions, monitor their impact and follow through on agreed actions. Fortunately, there was ample room for feedback and adjustments and comfort margins of front-line emergency departments were given due consideration. Such a community approach to the problem helped in the realization of some of the benefits that accrued from this long-term collaboration within the public health care services of the country.

Internationally, there is a lack of validated standards to guide health services in measuring the appropriateness of emergency department visits [1, 12, 13]. We have used the Patient Acuity Categorization Scale (PACS) drawn up and periodically revised by the Emergency Medicine Services Committee, Singapore [14] as a guide for emergency departments to make decisions on acuity and disposition. Singapore uses a four-category system with the first three referring to a range of emergency acuities (priority 1 for resuscitative care, priority 2 for rapid care, priority 3 for urgent care in an ambulatory setting), and the fourth category referring to non-urgent care. Throughout the whole of the review period, the basic definitions differentiating the emergency categorizations from the non-urgent categorization remained unchanged. These categorizations were formulated and disseminated via the members of the Emergency Medicine Services Committee, who were all Heads of their various public hospital EDs. Occasional random audits of the practice of these categorizations were also conducted to ensure that consistency variations did not exceed 5%. Where such variations were encountered, the proportions established during the audit sessions were applied for the period of review. The Emergency Medicine Services Committee also provided the mechanism for regular and frequent reminders to all public emergency departments for consistent use of these definitions. In such a setting, defining priority 4 patients as inappropriate ED use was acceptable and is used in this review.

This review indicates that single or short-term public education efforts tend to have a short-term impact in reducing apparent inappropriate ED attendances. Greater effect was noted with repetitive public education efforts that allowed messages to sink in. These efforts need to be channeled through multiple media, such as radio, newspapers, television, pamphlets, talks, messages at multiple levels and even mass distribution of flyers and educational pamphlets that may be distributed to residential homes. Such an effort requires funding and support from the civil authority and the political leadership. For success there has to be active support from the emergency medicine community and consistency in the messages delivered. The availability of a committee of community emergency medicine leaders that came together frequently to share notes and evaluate outcomes of measures carried out in this effort is another crucial factor. All these indicate commitment of the civil, political and professional leadership in wanting to make this happen. It is such unity that gives strength to the campaign.

Mention needs to be made of the rebound effect with increasing attendances when the public education messages ceased. Such rebound effects were noted to be dampened with repeated education campaigns, especially when followed by education on how members of the public could

manage common ailments better and about availability of alternative primary health clinics in the community and their opening hours. The emphasis on the non-misuse of EDs for the greater good was also noted to help win many friends to the cause and blunted opposition to the campaign in general.

Financial interventions need to be significant if they are to have any impact. Even then, financial measures to discourage inappropriate use of EDs need to provide enough fiscal discomfort to those with minor ailments. There is always concern that financial disincentives may also deter the less well off in society with critical illnesses from seeking early medical help. This concern has to be addressed in the publicity on these measures. The rationale for the fee increases must be clearly explained to an increasingly literate populace, if such moves are to gather general acceptance from the community. The concept of individual responsibility in minimizing risk of injury and illness also needs to be emphasized for members of the public to more easily accept the financial disincentives as a “penalty” for previous slack in measures to stay healthy. However, the message that no patient will be denied care on account of being unable to pay must be strong as a form of public safety assurance.

Our experience has been that redirection of non-emergencies can be an exercise fraught with potential public relations issues. There was always potential for legal action from an aggrieved member of the public who had been redirected. Therefore, the guidelines on redirection were carefully considered and discussed before implementation. Pre-redirection publicity was carried out and back-up intervention by senior ED doctors on duty was agreed to each time a dispute arose. As a result there were no cases of legal action taken against any ED during the period of redirection or thereafter for the redirection carried out. There is a common general impression that Singapore is a far less litigious country than some others, such as the USA, and especially so in the 1980s. The willingness of patients arriving at EDs to willingly move to alternate clinics is usually low. In addition, communities wishing to implement redirection to alternative clinics would need to ensure that such alternative sites are easily accessible with minimal waiting, at least from a public safety perspective. Unless staff of EDs have the time and resources to discuss preferences for referral out of their department in cases of inappropriate attendances, the community would need to look at punitive measures to discourage such inappropriate use.

The review did not look at a single intervention. This could not have been possible since some of these interventions were instituted within relatively short intervals after others. This illustrates that overcrowding at public emergency departments needs a multi-pronged approach that may even go beyond the measures discussed above and include others such as augmentation of ED resources [3] and of the capacity of the primary health care system to

absorb the non-emergency and selected minor emergency patients who today frequent EDs, but may not require any form of hospitalization or prolonged observation.

The various measures that were intended to decrease non-emergency visits to EDs also resulted in decreases of minor emergency visits. Such visits, while usually seen as appropriate, may also be regarded as discretionary since other alternatives exist that allow earlier care to be delivered for an emerging condition and potentially prevent the need to visit an ED.

ED overcrowding is an international problem. In a number of communities, ED overcrowding has reportedly reached crisis proportions [15–17]. Though there are various causes of overcrowding, patient arrivals have been one aspect [17] that has been looked at in different communities. Since EDs have a crucial role in the public health status of the population, threats to their ability to ensure quality emergency care can be seen as contributing to this crisis [18]. While non-urgent patients may not be the main cause of ED overcrowding in certain countries [19–21], other communities which have limited medical and nursing manpower resources and that are held accountable for waiting times, commit significant resources to attend to the relatively non-urgent group of patients presenting to an emergency department [22].

Limitations

For many years there was no requirement for documentation of the emergency-type categorization of the patient. All that was required during the first 22 of the 32 years covered by this review was that every attendance had to be categorized as either emergency or non-emergency. Documentation of the patient into one of the three categories of emergency (priority 1, 2 and 3) was an option and not implemented in all the EDs of the local public hospital system. The data on the numbers of priority 3 patients who presented to the health service is thus incomplete and could not be presented fully in this paper.

This, being a retrospective review of the service over a 32-year period, is heavily dependent on the accuracy of the available records. A critical assumption made in this review is that the basic definition of emergency and non-emergency for all patients presenting to the various emergency departments in the public health service was followed. Separate verification of the accuracy of these designations for the individual patients could not be made especially during the first 10 years of the period of review.

For the period of the social interventions from 1985 to 1997, there is no documented feedback of patients redirected from EDs having suffered adverse medical consequences. There are no statistics available to indicate

how many redirected patients, if any, were sent back to the EDs, either on the day of redirection or the few days thereafter, for the same medical complaint. Neither were records kept of the actual individual instances when disputes arose between members of the public and ED triage staff during the redirection process. As a result there was no documentation of the degree of agreement or disagreement between doctors and nurses whenever such disputes arose.

This review was confined to the patients who attended only the public health care system in Singapore. It does not cover the patients seen in the private health care system in the country. Since the EDs in the private sector in Singapore are generally considered to manage less than 10% of the overall emergency workload in the country (again this is only an estimate owing to the lack of accurate data on ED attendances in private sector hospitals), the unavailability of those data is not expected to significantly alter the results of the review. At the same time, the pressures that private sector hospitals have to bear may be very different from those faced by those in the public sector. Such pressures can, potentially, alter the approach they may take on the issue of non-urgent ED attendances.

Conclusion

Public education measures and financial measures that seek to change the pattern of ED utilization must go hand in hand with an easily accessible primary health care system in the community for best effect. All such efforts need to be sustained and co-ordinated at the level of the community with active support from all levels of the health service and the political leadership. An active mechanism for feedback is essential for good outcomes management of such programmes.

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