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Emergency department visits for non-life-threatening conditions: evolution over 13 years in a Swiss urban teaching hospital

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Summary

INTRODUCTION: A large proportion of visits to our Emergency Department (ED) are for non-life-threatening conditions. We investigated whether patients' characteristics and reasons for consultation had changed over 13 years.

METHODS: Consecutive adult patients with non-life-threatening conditions at triage were included in the spring of 2000 and in the summer of 2013. In both years patients completed a similar questionnaire, which addressed their reasons for consultation and any previous consultation with a general practitioner (GP).

RESULTS: We included 581 patients in 2013 vs 516 in 2000, with a mean age of 44.5 years vs 46.4 years (p = 0.128). Of these patients, 54.0% vs 57.0% were male (p = 0.329), 55.5% vs 58.7% were Swiss (p = 0.282), 76.4% were registered with a GP in both periods, but self-referral increased from 52.0% to 68.8% (p <0.001); 57.7% vs., 58.3% consulted during out-of- hours (p = 0.821). Trauma-related visits decreased from 34.2% to 23.7% (p <0.001). Consultations within 12 hours of onset of symptoms dropped from 54.5% to 30.9%, and delays of ≥1 week increased from 14.3% to 26.9% (p <0.001). The primary motive for self-referral remained unawareness of an alternative, followed in 2013 by dissatisfaction with the GP's treatment or appointment. Patients who believed that their health problem would not require hospitalisation increased from 52.8% to 74.2% and those who were actually hospitalised decreased from 24.9% to 13.9% (all p <0.001).

CONCLUSION: The number of visits for non-life-threatening consultations continue to increase. Our ED is used by a large proportion of patients as a convenient alternative source of primary care.

Key words: *emergency department; emergency care; non-urgent; primary care; questionnaire*

Introduction

Timely access to care for acute medical conditions is an essential feature of developed healthcare systems. Historically, general practitioners (GPs) have provided acute unscheduled care for non-life-threatening conditions. The delivery of acute care has, however, gradually shifted from GPs to emergency departments (EDs) [1]. In the USA, patients obtain only 42% of their acute care at their doctor's office, and EDs are now the single largest provider of acute care consultations [2]. In Switzerland, a country with universal health insurance coverage and devoid of a gatekeeping system, EDs are faced with a steadily increasing flow of patients consulting for non-urgent or non-life-threatening conditions [3]. The number of ambulatory visits in all Swiss EDs increased by 32% between 2007 and 2011, and the number of consultations resulting in hospitalisation increased by 16% [4]. This growth is not a result of demographic changes, as the Swiss population increased by only 4.8% over the same period. Other reasons are population ageing, perceived severity of symptoms, unavailability of other physicians, or changes in the pattern of healthcare utilisation related to society and migration changes [5–9]. This growing demand for ED consultations may be associated with a marked increase in healthcare costs, as mean costs per ED visit are 1.5–1.7 times higher than care provided by GPs working in hospital-associated primary care units [10]; it has also resulted in ED overcrowding. In 2006 in Switzerland, 84% of EDs with >20,000 visits/year reported being overcrowded [11]. Overcrowding is associated with reduced quality of care and with worse short-term outcome [12, 13]. The workload generated specifically by patients with non-life-threatening conditions is one of many factors that contribute to ED overcrowding [14]. According to a survey conducted in the year 2000 at the ED of the University Hospital of Lausanne, the increasing number of consultations was in part due to a growing attendance by patients with non-life-threatening conditions, by elderly patients and by a growing number of migrants

[15]. The majority of non-urgent patients were self-referred patients, who chose our ED on the basis of accessibility, perception of excellence and previous consultations at our location [15, 16]. Since this report in 2000, the attendance at our ED has continued to increase, and we decided to investigate if the characteristics of our patients with non-life-threatening conditions or their motives to consult had changed significantly over the last 13 years.

Methods

Our study was cross-sectional, single centre, and conducted from the 29th of July to the 12th of August 2013, and from the 10th to 17th of April 2000 at the ED of the University Hospital of Lausanne. The university hospital serves as the primary care hospital for Lausanne and surrounding area, and as a tertiary-care centre for the Canton of Vaud and neighbouring cantons. In 2013, the investigators, two medical students not involved in the care of the patients, screened all consecutive patients arriving between 8 a.m. and 8 p.m. during the first week, and between 8 p.m. and 8 a.m. during the second week. In 2000, six investigators covered 24 hours a day over one week. The goal was to have a representative sample of patients visiting our ED during a whole week, similar to the design of the study conducted in 2000. Consecutive patients attending the ED during the period of the survey period were screened for eligibility, and were included if they were ≥16 years old, had a non-life-threatening condition defined as triage level of 3 or 4 on the Swiss emergency triage scale (SETS; appendix 1) in 2013 (to be seen by a physician within 2 hours or when a physician is available) [17]. In 2000, the National Advisory Committee for Aeronautics (NACA) score was utilised instead [18]: a score <4 defined non-life-threatening conditions [15]. Patients were excluded if they had an acute life-threatening problem, were transferred from another department within our hospital or from another acute care hospital, were unable to provide informed consent, did not understand the questionnaire, or had detainee status. Eligible patients were approached to participate in the study. A short questionnaire, similar to the one used in 2000, was given to them in the waiting room prior to consultation. Patients were invited to complete the questionnaire on their own. In addition, investigators completed each questionnaire with the purpose of visit, and the final diagnosis from the physician in charge. Only the index visit was included in the analysis for patients who returned to the ED during the study period.

The variable "No personal GP identified" was created with two different questions of the questionnaire. Patients who answered "I have no GP" to both questions were counted as being without a GP. Discordant answers between both questions were counted as invalid and were excluded from our analyses (tables 1 and 2). Office hours were defined as weekday hours between 8 a.m. and 6 p.m. Admissions that occurred out of this period and on weekends were considered as out-of-hours visits. We also assessed the changes in the number of non-life-threatening emergencies over the years. Triage was instituted in our ED during the year 2004, so that data for complete years was only available from 2005.

Descriptive statistics (frequencies, mean and standard deviation) were calculated in order to describe patients' characteristics and motivations for coming to the ED. Comparisons were made using Pearson's chi-squared, Fischer exact test or Student's t-test as appropriate. A p-value <0.05 was considered as indicative of a significant difference. All analyses were performed using Stata 13.1 (StataCorp LP, College Station, TX, USA).

Our study was approved by the Human Research Ethics Committee of Canton of Vaud. An Information form was given to each patient and written informed consent was obtained from each patient.

Results

The number of ED consultations increased from 41,225 in 2005 to 54,882 in 2013 (+33.1% point), a mean increase of 3.7% point / year. For non-life-threatening consultations, the figures were 31,382 and 41,991 (+33.8% point), a mean increase of 3.8% point / year. The proportion of non-life-threatening conditions remained stable over the years (p = 0.439): 76.1% and 76.5% of the total number of ED visits in 2005 and in 2013, respectively.

In 2013, 990 patients visited the ED during the presence of the study investigators; 680 who had not visited before were eligible, of whom 581 (85.4%) were included. Among the 99 patients (14.6%) who did not complete the questionnaire, the two major reasons were leaving without being seen by the investigators (n = 37) and refusal to respond (n = 23) (see appendix 2).

Patients' mean age was 44.5 years, and slightly less than half were women, unchanged since 2000 (all p >0.05) (table 1). Nevertheless the proportion of elderly patients ≥75 years was lower in 2013: 10.7 vs 16.5% (p = 0.005). The proportion of Swiss and non-Swiss citizens was stable (p = 0.282). Non-Swiss patients came mainly from European countries, but their proportion decreased slightly, while those of non-European countries increased. The diversity of countries of origin also increased from 41 to 54. The majority of non-Swiss citizens were in Switzerland for

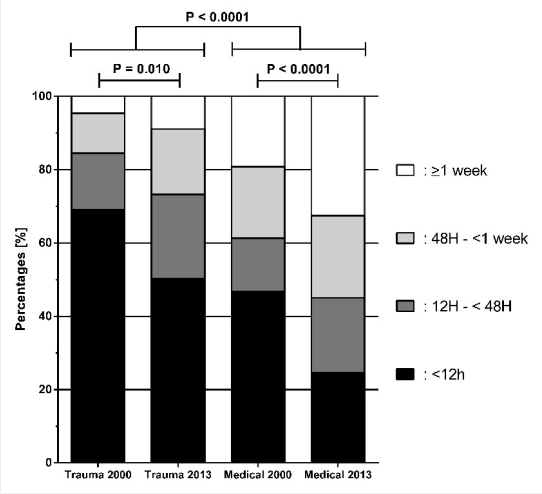

Figure 1

Time elapsed before Emergency Department consultation in 2000 and 2013, according to the type of condition.

>5 years, but the proportion of those in Switzerland for ≤5 years had increased in 2013. Most patients had a professional activity or were retired. About two-thirds lived with a parent, a partner or relative who could offer social support, a proportion unchanged since 2000 (p >0.05).

The referral pattern to the ED changed significantly over time: two-thirds of patients were self-referred or came on the advice of a relative (+16% point), and only 7.4% were sent by their GP, a 10% point drop over the same period (p <0.001). The majority of patients still came to ED during out-of-hours (p = 0.821). After the ED consultation, 86.1% were discharged to home, an 11% point increase (p <0.001).

Most patients reported having a GP: 76.4% in 2000 and 2013 (tables 1 and 2); this proportion was even higher in patients ≥75 years: 91.8% and 96.8%, respectively (p = 0.491). Patients with a GP were significantly older: 48.5 ± 21.4 years vs 33.5 ± 13.3 years (p <0.001), without change between 2000 and 2013 (all p >0.05). The majority of patients with a GP were Swiss, unchanged over time (p >0.05), followed by those from European countries. Among non-Swiss patients who reported having a GP, more than 70% had lived in Switzerland for more than 5 years. Patients without a GP were mostly non-Swiss; they were more commonly living in Switzerland for ≤5 years, a significant change since 2000 (p = 0.006). Among patients with a GP, a third tried to contact their GP before coming to ED in both periods (p = 0.656), but the percentage of patients who found it difficult to get a timely appointment nearly doubled since 2000 (p = 0.002). However, in 2013nearly one in three patients reporting having a GP tried to contact another physician prior to their ED visit, whereas only one in five did so in 2000 (p <0.001). Most patients had consulted a physician during the year prior to their index visit, but in a larger proportion for those who had a GP, both in 2000 and 2013 (p <0.001). Finally, a reported personal GP had no impact on the proportion of out-of-hours consultations, unchanged since 2000.

The main reason for self-referral was still the lack of known alternatives to the ED, although this proportion decreased (table 3). Excellence of the institution and access to specialists, the second most frequent reason in 2000, was

Table 1: Patients' characteristics in 2000 and 2013.

	2000 (n = 516)	**2013 (n = 581)**	**p-value**
Patients: (n)	516	581	
– Mean age, years (SD)	46.4 (22.0)	44.5 (20.0)	*0.128*
– Women, n (%)	222 (43.0)	267 (46.0)	*0.329*
Nationality: (n)	516	566	
– Swiss, n (%)	303 (58.7)	314 (55.5)	
– Non-Swiss:			*0.282**
– Citizen of European country, n (%)	157 (30.4)	146 (25.8)	
– Citizen of non-European country, n (%)	56 (10.9)	98 (17.3)	
– Unknown, n (%)	–	8 (1.4)	
Non-Swiss resident in Switzerland for: (n)	196	249	*0.002*
– <1 year, n (%)	34 (17.4)	29 (11.7)	
– 1–5 years, n (%)	29 (14.8)	59 (23.7)	
– >5 years, n (%)	129 (65.8)	142 (57.0)	
– Unknown duration, n (%)	4 (2.0)	19 (7.6)	
Professional activity: (n)	502	566	*0.279*
– Working, n (%)	237 (47.2)	294 (51.9)	
– Retired, n (%)	135 (26.9)	119 (21.0)	
– Student/apprentice	52 (10.4)	62 (11.0)	
– Homemaker, n (%)	23 (4.6)	22 (3.9)	
– Unemployed, n (%)	17 (3.4)	26 (4.6)	
– Beneficiary of social allowance, n (%)	38 (7.6)	42 (7.4)	
– Other, n (%)	0 (0.0)	1 (0.2)	
Social support: (n)	504	573	*0.479*
– Living with other person who can provide social support, n (%)	341 (67.7)	376 (65.6)	
Reported having a general practitioner (GP): (n)	516	581	*<0.001*
– GP, n (%)	394 (76.4)	444 (76.4)	
– No GP, n (%)	70 (13.6)	112 (19.3)	
– Invalid answer, n (%)	52 (10.1)	25 (4.3)	
Referred to the ED: (n)	510	571	*<0.001*
– Self-referred or on the advice of a relative, n (%)	265 (52.0)	393 (68.8)	
– GP or GP's staff, n (%)	90 (17.7)	42 (7.4)	
– Another physician, n (%)	85 (16.7)	98 (17.2)	
– Other, n (%)	70 (13.7)	38 (6.7)	
Time of consultation: (n)	516	581	*0.821*
–Out of hours, n (%)	301 (58.3)	335 (57.7)	
Reason for consultation: (n)	514	569	*<0.001*
– Trauma, n (%)	176 (34.2)	135 (23.7)	
– Medical, n (%)	338 (65.8)	434 (76.3)	
Discharge status: (n)	514	581	*<0.001*
– Home, n (%)	386 (75.1)	500 (86.1)	
– Hospital admission, n (%)	128 (24.9	81 (13.9	

SD = standard deviation
* p-value for Swiss vs non-Swiss

replaced in 2013 by dissatisfaction with treatment or timing of appointments provided by GPs. The possibility of consulting without appointment or a paramedic's decision increased by 5% point each, a marked change since 2000.

In general, the delay before the index ED visit increased significantly (p <0.001): the percentage of patients who consulted within 12 hours of their perceived symptoms dropped from 54.5% to 30.9% while those waiting more than a week increased from 14.3% to 26.9% (fig. 1). Medical patients waited longer than trauma patients in both study periods (p <0.001) (fig. 1), and the time delay for both increased significantly.

The proportion of patients who believed that their health problem would not require hospitalisation increased from 52.8% to 74.2% in 2013 (p <0.001). This augmentation was found for both trauma and medically related visits *(*data not shown*)*. Based on the subjective assessment of the ED physician, the percentage of patients who required the technical capabilities of our ED, and therefore needed to come to our hospital-based ED decreased from 44.7% to 36.0% (p = 0.004).

Discussion

Our study is the first to investigate changes over the last decade in patients' reasons for consultation for non-life-threatening conditions at a hospital-based ED in Switzerland. Our results confirm the continuous rise in the total number of consultations since 1993 in Lausanne [16], and in the growing number of visits for non-life-threatening conditions reported in Switzerland since 2007 [4], and in other developed countries [19]. It occurred despite the inauguration since 2000 of two urgent-care clinics in Lausanne, providing new alternative opportunities for medical consultations, in particular out-of-hours. The lack of impact on ED attendances by raising the number of alternative sites has been found in other countries, and may be due to the new demand that they create [20, 21].

In 2013, patients attending our ED were typically young active males consulting for a trauma, a description fitting previous reports [3, 22, 23]. A lower proportion of patients were elderly, an unexpected change because of the ageing population [16]. Elderly patients might be less likely to be triaged as low urgency patients, given their greater number of comorbidities [16]. Also, nearly all elderly patients were registered with a GP, whom they might have consulted instead of the ED. However, nearly 70% of patients

Table 2: Evolution between 2000 and 2013 of the characteristics of patients with and without a general practitioner (GP).

	GP			**No GP**		
	2000 (n = 394)	2013 (n = 444)	p-value	2000 n = 70	2013 n = 112	p-value
Age, years, (n) Mean age (SD)	393 49.4 (22.2)	444 47.7 (20.6)	*0.245*	70 34.1 (15.5)	112 33.0 (11.9)	*0.587*
Nationality: (n) – Swiss, n (%) – Non-Swiss: – Citizen of European country, n (%) – Citizen of non-European country, n (%) – Unknown, n (%)	394 255 (64.7) 106 (26.9) 33 (8.4) –	435 273 (62.8) 101 (23.2) 54 (12.4) 7 (1.6)	*0.557*¶	70 25 (35.7) 31 (44.3) 14 (20.0) –	109 33 (30.3) 38(34.9) 38 (34.9) –	*0.448*¶
Non-Swiss in Switzerland for: (n) – <1 year, n (%) – 1–5 years, n (%) – >5 years, n (%) – Unknown, n (%)	130 10 (7.7) 16 (12.3) 100 (76.9) 4 (3.1)	159 8 (5.0) 24 (15.1) 115 (72.3) 12 (7.6)	*0.262*	41 15 (36.6) 8 (19.5) 18 (43.9) 0 (0.0)	76 16 (21.1) 33 (43.4) 21 (27.6) 6 (7.9)	*0.006*
Contacts with physicians prior to ED consultations: – Tried to contact their GP, n (%) – Difficulty in getting an urgent appointment with their GP, n (%) – Tried to contact another physician (excluding their GP), n (%) – Contact with a physician during the previous year, n (%)	123 (31.2) 43 (10.9) 76 (19.4) 348 (88.8)	145 (32.7) 83 (18.7) 139 (31.7) 378 (85.7)	*0.656* *0.002* *<0.001* *0.187*	NA NA 19 (27.1) 42 (64.6)*	NA NA 25 (22.7) 61 (54.5)**	 *0.502* *0.187*
Time of consult: (n) – out of hours, n (%)	394 226 (57.4)	444 262 (59.0)	*0.674*	70 41 (58.6)	112 64 (57.1)	*0.878*

ED = emergency department; GP = general practitioner; NA = not applicable; SD = standard deviation
* p <0.0001 for GP vs no GP in 2000 ** p <0.0001 for GP vs no GP in 2013; ¶ p-value for Swiss vs non-Swiss

Table 3: Evolution between 2000 and 2013 of reasons for self-referral to the Emergency Department.

	2000 (n = 242)	**2013 (n = 379)**	**p-value**
Unaware of alternative for emergencies (%)	30.2	20.3	*<0.001*
Excellence of the institution and access to specialists (%)	23.6	14.5	
Usual place of consultation (%)	17.4	15.6	
Easy access (%)	16.1	11.9	
Dissatisfaction with treatment or appointment with general practitioner (%)	8.3	19.8	
Convenience of unscheduled appointment (%)	1.7	6.3	
Paramedics' choice (%)	1.2	6.6	
Other (%)	1.7	5.0	

were self-referred, a rate similar to that in other studies [22, 24–27]. Reasons for self-referral changed over 13 years. Unawareness of an alternative treatment site was still the first reason to attend our ED, providing an opportunity for an educational intervention: better knowledge of alternative treatment sites for non-urgent conditions has been shown to reduce ED use [28]. Dissatisfaction with the primary care provider became the second most frequent reason to consult our ED, reported by one in five patients. Dissatisfaction usually pertains more to the difficulty to get a timely appointment [29], than to the quality of care [25, 27]. Regardless, both unmet medical needs and poor primary care access drive up ED attendance [30]. The convenience of an unscheduled appointment became a more common reason, which supports the new trend in patients' preferences for accessing urgent care [31]. The perceived urgency of the medical condition is a frequently cited motive for self-referral [9]. However, our patients waited longer before consulting, considered their acute health problem to be unlikely to require hospital admission, and ultimately were hospitalised less often. This convergent evidence suggests that the perceived emergency or severity was less of a drive to attend our ED. Another reason for self-referral is patients' belief that their acute condition requires immediate diagnostic capabilities supposedly only available in the ED [23, 30]. However, physicians assessed that fewer patients in 2013 needed the technical capabilities of our ED, and that patients could have been seen at their GP's office, as long as the GP had access to standard x-ray or blood tests *(*data not shown*)*. These observations, taken together, suggest that our ED is now used more often as an accessible and convenient source of primary care than a GP's office.

Since 2000, the proportion of non-European patients was larger, reflecting the changes of migration patterns over the last 20 years [32]. Non-Swiss patients resided in Switzerland for a shorter time than in 2000. According to the Federal Statistical Office, non-Swiss residents represented 32.8% of the population of the Canton of Vaud [33], but they accounted for 44.5% of our patients. Their disproportionate use of the ED for non-urgent conditions has been reported in an earlier study in Lausanne [16], and more recently in the hospital-based ED of two large Swiss cities [24, 34]. Non-European patients and those in Switzerland for less than 5 years less frequently had a GP, suggesting that they were less integrated in our healthcare system. They may also have been in poorer health, as they tend to be hospitalised more frequently than Swiss patients after their ED consultation [4]. International reports of ED use by migrants compared with native patients are somewhat conflicting: from lower use (the healthy migrant effect) [35–37] to higher use [38, 39]. The comparison between native patients and migrants is subject to several confounders: variable international ED visit rates for native patients, origin of migrants, their gender, age, baseline health, income, insurance coverage, length of residency and type of medical conditions [40]. Many of these factors were not collected in our study, and our results must be interpreted with caution.

The strength of our study relies on the prospective collection of data in a large group of consecutive patients, providing a unique perspective of our ED attendance at two time points 13 years apart. But our study has also potential limitations. First, the definition of a non-life-threatening case was based on the assessment at triage, which changed from NACA in 2000 to SETS in 2013. Different severity criteria may have led to the selection of a different population. Nevertheless the proportion of non-life-threatening cases remained stable over time, and the magnitude of their absolute increase was in the range published by the Swiss Health Observatory [4]. Second, our 2013 survey took place during a vacation period at the end of July and beginning of August, but was outside a vacation period in April of 2000. The different timeframe could have increased the proportion of patients registered with a GP or consulting during office hours. However, we found similar proportions. Third, changes observed in our ED population must be interpreted as changes from the perspective of our ED, and not from a societal perspective. The local healthcare system has evolved and been reorganised since 2000. The Department of Ambulatory Care and Community Medicine was relocated to a new building adjacent to the university hospital, and the relocation was associated with a near doubling of its urgent consultations. As urgent consultations are triaged either to the ambulatory clinic or to the hospital-based ED, we sampled patients in both locations. On the other hand, new urgent-care clinics have opened in Lausanne. The net impact of these changes for urgent consultations is therefore difficult to assess. Fourth, our study was single-centre, which may limit its external validity. Nevertheless our results are in agreement with those of others [5, 7, 8, 25, 27, 41, 42]. Fifth, our rate of participation was 84% in 2013, 11% point lower than in 2000. However, our rate remains high, and the lower participation can be partly explained by the new requirement by our ethics committee of a signed informed consent in 2013. Sixth, there was one more public holiday during the investigation period in 2013, generating more out-of-hours admissions. However, this proportion remained greater than 50% even when admissions from this additional holiday are removed. Finally, data was collected over a short period of time. The observed changes may be therefore due to random variations, and not related to an actual evolution of ED use. However, our data are in accordance with other studies conducted in Switzerland [1, 3, 4, 16, 22, 24, 34].

Conclusion

Our study confirms the absolute increased use of ED by patients with non-life-threatening conditions, for which patients wait longer before seeking care. Even if lack of known alternative sites for consultation is still the leading cause for self-referral, growing dissatisfaction with GPs' care or accessibility drives some of the increased ED use. Our study thus highlights new challenges that our healthcare system needs to face to address unscheduled care in order to curb the unnecessary use of ED resources.

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Authors' contribution: LD and LE contributed equally.

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References

1 Guntensperger U, Pinzello-Hurlimann R, Martina B, Ciurea A, Muff B, Gutzwiller JP. Primary care emergency services utilization in German-speaking Switzerland: a population-based cross-sectional study. Swiss Med Wkly. 2010;140:w13111.

2 Pitts SR, Carrier ER, Rich EC, Kellermann AL. Where Americans get acute care: increasingly, it's not at their doctor's office. Health Aff (Millwood). 2010;29:1620–9.

3 Chmiel C, Huber CA, Rosemann T, Zoller M, Eichler K, Sidler P, et al. Walk-ins seeking treatment at an emergency department or general practitioner out-of-hours service: a cross-sectional comparison. BMC Health Serv Res. 2011;11:94.

4 Vilpert S. Consultations dans un service d'urgence en Suisse. Neuchâtel: Observatoire suisse de la santé, 2013 Report No. 3/2013. French/German.

5 Bonvicini L, Broccoli S, D'Angelo S, Candela S. Emergency room services utilization in the province of Reggio Emilia: a comparison between immigrants and Italians. Epidemiol Prev. 2011;35:259–66.

6 George G, Jell C, Todd BS. Effect of population ageing on emergency department speed and efficiency: a historical perspective from a district general hospital in the UK. Emerg Med J. 2006;23:379–83.

7 Gindi RM, Cohen RA, Kirzinger WK. Emergency Room Use Among Adults Aged 18–64: Early Release of Estimates From the National Health Interview Survey, January–June 2011. National Center for Health Statistics May 2012. Available from: http://www.cdc.gov/nchs/nhis/releases.htm.

8 Hargreaves S, Friedland JS, Gothard P, Saxena S, Millington H, Eliahoo J, et al. Impact on and use of health services by international migrants: questionnaire survey of inner city London A&E attenders. BMC Health Serv Res. 2006;6:153.

9 Uscher-Pines L, Pines J, Kellermann A, Gillen E, Mehrotra A. Emergency department visits for nonurgent conditions: systematic literature review. Am J Manag Care. 2013;19:47–59.

10 Eichler K, Hess S, Chmiel C, Bogli K, Sidler P, Senn O, et al. Sustained health-economic effects after reorganisation of a Swiss hospital emergency centre: a cost comparison study. Emerg Med J. 2014;31:818–23.

11 Sanchez B, Hirzel AH, Bingisser R, Ciurea A, Exadaktylos A, Lehmann B, et al. State of Emergency Medicine in Switzerland: a national profile of emergency departments in 2006. Int J Emerg Med. 2013;6:23.

12 Hoot NR, Aronsky D. Systematic review of emergency department crowding: causes, effects, and solutions. Ann Emerg Med. 2008;52:126–36.

13 McCusker J, Vadeboncoeur A, Levesque JF, Ciampi A, Belzile E. Increases in Emergency Department Occupancy Are Associated With Adverse 30–day Outcomes. Acad Emerg Med. 2014;21:1092–100.

14 Rathlev NK, Chessare J, Olshaker J, Obendorfer D, Mehta SD, Rothenhaus T, et al. Time series analysis of variables associated with daily mean emergency department length of stay. Ann Emerg Med. 2007;49:265–71.

15 Santos-Eggimann B, Halfon P. Analyse du recours au service des urgences du Centre Hospitalier Universitaire Vaudois. Lausanne: Centre Hospitalier Universitaire Vaudois, Insitut de Médecine Sociale et Préventive; 2000.

16 Santos-Eggimann B. Increasing use of the emergency department in a Swiss hospital: observational study based on measures of the severity of cases. BMJ. 2002;324:1186–7.

17 Rutschmann OT, Kossovsky M, Geissbuhler A, Perneger TV, Vermeulen B, Simon J, et al. Interactive triage simulator revealed important variability in both process and outcome of emergency triage. J Clin Epidemiol. 2006;59:615–21.

18 Weiss M, Bernoulli L, Zollinger A. The NACA scale. Construct and predictive validity of the NACA scale for prehospital severity rating in trauma patients. Anaesthesist. 2001;50:150–4. German.

19 FitzGerald G, Toloo S, Rego J, Ting J, Aitken P, Tippett V. Demand for public hospital emergency department services in Australia: 2000–2001 to 2009–2010. Emerg Med Australas. 2012;24:72–8.

20 Chan CL, Lin W, Yang NP, Huang HT. The association between the availability of ambulatory care and non-emergency treatment in emergency medicine departments: a comprehensive and nationwide validation. Health Policy. 2013;110:271–9.

21 Mason S, Mountain G, Turner J, Arain M, Revue E, Weber EJ. Innovations to reduce demand and crowding in emergency care; a review study. Scand J Trauma Resusc Emerg Med. 2014;22:55.

22 Müller U, Winterhalder R, Businger A, Zimmermann H, Exadaktylos AK. Why do walk-in patients prefer a busy urban emergency department during office hours? A pilot survey of 200 consecutive patients from Switzerland. Swiss Med Wkly. 2012;142:w13565.

23 Durand A-C, Palazzolo S, Tanti-Hardouin N, Gerbeaux P, Sambuc R, Gentile S. Nonurgent patients in emergency departments: rational or irresponsible consumers? Perceptions of professionals and patients. BMC Research Notes. 2012;5:525.

24 Bardelli P, Kaplan V. Non-urgent encounters in a Swiss medical emergency unit. Swiss Med Wkly. 2013;143:w13760.

25 de Valk J, Taal EM, Nijhoff MS, Harms MH, Lieshout EM, Patka P, et al. Self-referred patients at the Emergency Department: patient characteristics, motivations, and willingness to make a copayment. Int J Emerg Med. 2014;7:30.

26 Moll van Charante EP, ter Riet G, Bindels P. Self-referrals to the A&E department during out-of-hours: patients' motives and characteristics. Patient Educ Couns. 2008;70:256–65.

27 van der Linden MC, Lindeboom R, van der Linden N, van den Brand CL, Lam RC, Lucas C, et al. Self-referring patients at the emergency department: appropriateness of ED use and motives for self-referral. Int J Emerg Med. 2014;7:28.

28 DeVries A, Li CH, Oza M. Strategies to reduce nonurgent emergency department use: experience of a Northern Virginia Employer Group. Med Care. 2013;51:224–30.

29 Sarver JH, Cydulka RK, Baker DW. Usual source of care and nonurgent emergency department use. Acad Emerg Med. 2002;9:916–23.

30 Huntley A, Lasserson D, Wye L, Morris R, Checkland K, England H, et al. Which features of primary care affect unscheduled secondary care use? A systematic review. BMJ Open. 2014;4:e004746.

31 Kocher KE, Asplin BR. What is our plan for acute unscheduled care? Ann Intern Med. 2013;158:907–9.

32 La population de la Suisse 2012. Neuchâtel: Federal Statistical Office, 2013. Available from: http://www.bfs.admin.ch/bfs/portal/en/index/themen/01/22/publ.html?publicationID=5748

33 Federal Statistical Office. Interactive Statistical Atlas of Switzerland [cited 30.10.2014]. Available from: http://www.atlas.bfs.admin.ch/maps/13/map/mapIdOnly/0_fr.html.

34 Clément N, Businger A, Martinolli L, Zimmermann H, Exadaktylos AK. Referral practice among Swiss and non-Swiss walk-in patients in an urban surgical emergency department. Swiss Med Wkly. 2010;140:w13089.

35 Buron A, Cots F, Garcia O, Vall O, Castells X. Hospital emergency department utilisation rates among the immigrant population in Barcelona, Spain. BMC Health Serv Res. 2008;8:51.

36 Davidovitch N, Filc D, Novack L, Balicer RD. Immigrating to a universal health care system: utilization of hospital services by immigrants in Israel. Health Place. 2013;20:13–8.

37 Tarraf W, Vega W, Gonzalez HM. Emergency department services use among immigrant and non-immigrant groups in the United States. J Immigr Minor Health. 2014;16:595–606.

38 Rue M, Cabre X, Soler-Gonzalez J, Bosch A, Almirall M, Serna MC. Emergency hospital services utilization in Lleida (Spain): A cross-sectional study of immigrant and Spanish-born populations. BMC Health Serv Res. 2008;8:81.

39 Zinelli M, Musetti V, Comelli I, Lippi G, Cervellin G. Emergency department utilization rates among immigrant population. A 5–year survey in a large Italian urban emergency department. Emerg Care J. 2014;10:1896.

40 Jimenez-Rubio D, Hernandez-Quevedo C. Inequalities in the use of health services between immigrants and the native population in Spain: what is driving the differences? Eur J Health Econ. 2011;12:17–28.

41 Alyasin A, Douglas C. Reasons for non-urgent presentations to the emergency department in Saudi Arabia. Int Emerg Nurs. 2014;22:220–5.

42 Rouzier S, Vardon D, Joly M, Latrie TDM, Boyeau-Desmarres C, Six P, et al. Analyse des déterminants du recours et des caractéristiques sociodémographiques des patients se présentant spontanément aux urgences sans avis médical préalable. Ann Fr Med Urg. 2014;4:143–52.

Appendix 1

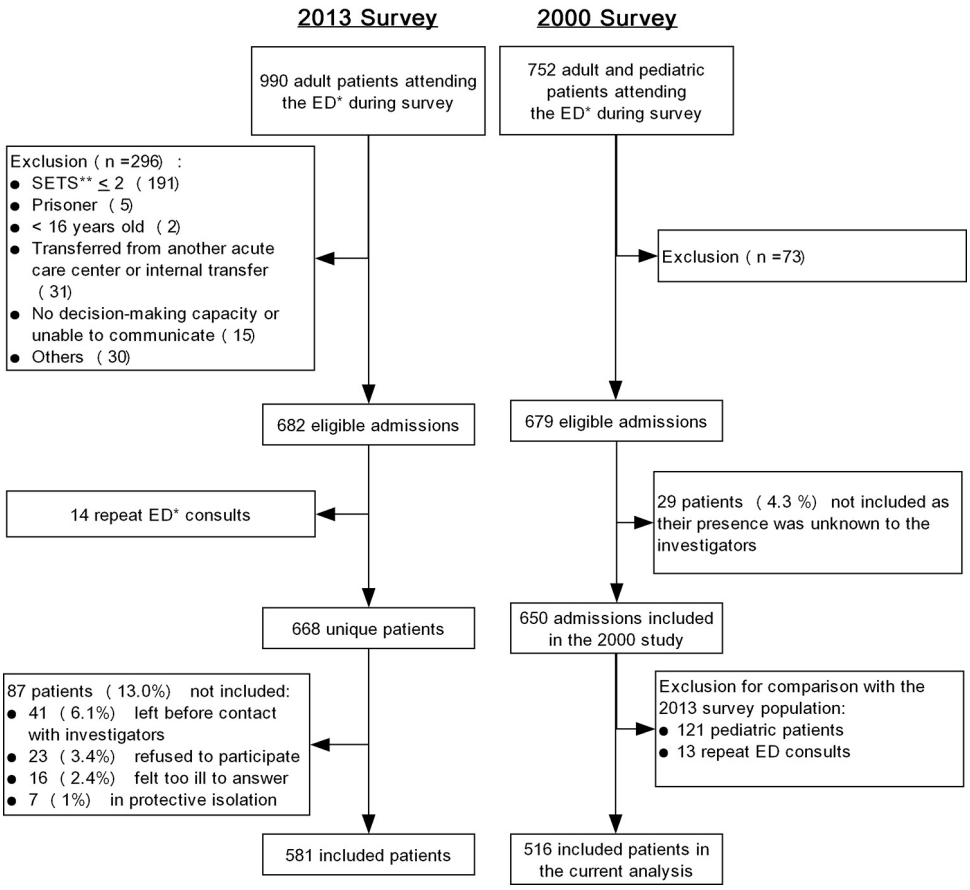
Swiss Emergency Triage Scale (SETS) and orientation for triage level 3 and 4.

Cardiovascular/respiratory systems:	**Triage level**	**Orientation**
Tachycardia, dysrhythmia	1-2-3	ED – Amb
Hypertension	1-2-3	ED – Amb
Extremity pain or oedema	2-3	ED – Amb
Dyspnoea, tachypnoea, bradypnoea	1-2-3	ED
Cough, dry or productive	3-4	Amb
Neurology – psychiatry:		
Paralysis, paresis, paraesthesia, aphasia, dysphasia, amnesia, imbalance, vertigo, diplopia, visual field loss	1-2-3*	ED
Mild or chronic headache	3-4	ED – Amb
Malaise with/without loss of consciousness	2-3	ED – Amb
Anxiety, depression	3-4	ED – Amb
Drug abuse / overdose	2-3	ED
Alcohol abuse or intoxication	2-3	ED
Alcohol withdrawal or request for weaning off alcohol	2-3-4	ED – Amb
Hallucinations	1-2-3	ED
Fatigue, insomnia	4	Amb
Trauma:		
Spinal injury without neurological deficit	2-3	ED
Chest injury	1-2-3	ED
Head injury without loss of consciousness and/or amnesia	2-3	ED
Pelvic injury	1-2-3	ED
Extremity injury	2-3-4	ED
Maxillofacial injury	1-2-3	ED
Superficial wound	3-4	ED
Burn	1-2-3	ED
Frostbite	2-3	ED
Bite	2-3	ED
Gastroenterology – gynaecology:		
Haematemesis, melaena	1-2-3	ED
Rectal bleeding	1-2-3	ED
Abdominal pain	2-3	ED – Amb
Nausea, vomiting	2-3-4	Amb
Epigastric pain	3-4	Amb
Constipation	3-4	Amb
Diarrhoea	2-3-4	Amb
Anal pain or disorder	3-4	ED – Amb
Pelvic pain, inguinal pain	2-3	ED
Foetal delivery, labour, uterine contractions	1-2-3	ED
Vaginal haemorrhage	1-2-3	ED
Urology – nephrology:		
Renal angle pain or tenderness	3-4	ED – Amb
Macroscopic haematuria	2-3	ED – Amb
Anuria, urinary retention	2-3	ED
Dysuria, pollakiuria	3-4	Amb
Testicular or penile pain / dysfunction	2-3	ED – Amb
Polyuria, polydypsia, hyper- or hypoglycaemia	2-3	ED
Urinary incontinence	3-4	Amb
Infectious disease:		
Fever, fever in returned travellers	1-2-3-4	ED – Amb
Influenza-like illness	3-4	Amb

Ear-Nose-Throat (ENT):		
Vertigo (of peripheral origin)	3	Amb
ENT disorder	2-3-4	Amb
Dermatology:		
Allergic reaction	1-2-3	ED – Amb
Genital/sexual dysfunction	3-4	Amb
Skin or soft tissue disorder, infection	2-3-4	ED – Amb
Rheumatology:		
Neck, back or low-back pain	3-4	ED – Amb
Arthralgia, myalgia, neuralgia	2-3-4	ED – Amb
Others:		
Inhalation of, ingestion of, exposure to toxic substance	1-2-3	ED
Inhalation, ingestion, insertion of foreign body	1-2-3	ED
Body packing or stuffing	3	ED
Social admission	4	ED
Readmission following recent previous admission	2-3-4	ED
Abnormal laboratory tests	2-3-4	ED – Amb
Decline in general health	3-4	ED – Amb
Recurrent falls in the elderly	3-4	ED
Organ transplant	2-3	ED
Advice, certificate, prescription	4	ED – Amb
Sexual assault / rape	2-3-4	ED
Assault report	4	ED
Hiccup	3-4	Amb
Request for a medical procedure / examination	3-4	ED – Amb
Scheduled appointment	4	ED – Amb
Amb = ambulatory care and community medicine clinic; ED = emergency department		

Appendix 2

Study flow chart for the surveys conducted in 2013 and 2000.



Figures (large format)

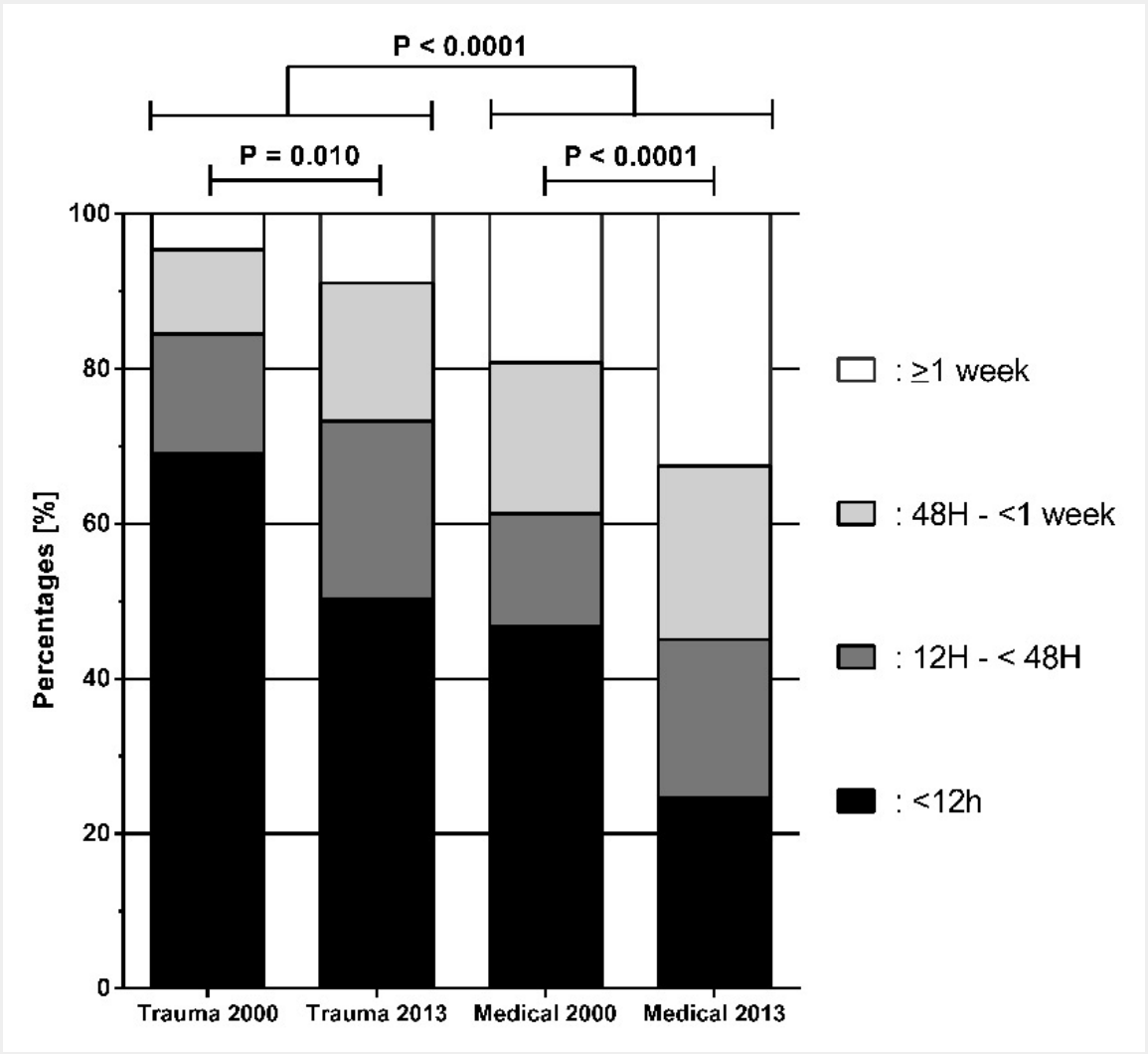


Figure 1

Time elapsed before Emergency Department consultation in 2000 and 2013, according to the type of condition.