

## PREHOSPITAL CARE

# Use of out of hours services: a comparison between two organisations

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**Objectives:** To investigate differences in numbers and characteristics of patients using primary or emergency care because of differences in organisation of out of hours care.

**Background:** Increasing numbers of self referrals at the accident and emergency (A&E) department cause overcrowding, while a substantial number of these patients exhibit minor injuries that can be treated by a general practitioner (GP).

**Methods:** Two different organisations of out of hours care in two Dutch cities (Heerlen and Maastricht) were investigated. Important differences between the two organisations are the accessibility and the location of primary care facility (GP cooperative). The Heerlen GP cooperative is situated in the centre of the city and is respectively 5 km and 9 km away from the two A&E departments situated in the area of Heerlen. This GP cooperative can only be visited by appointment. The Maastricht GP cooperative has free access and is located within the local A&E department. During a three week period all registration forms of patient contacts with out of hours care (GP cooperative and A&E department) were collected and with respect to the primary care patients a random sample of one third was analysed.

**Results:** For the Heerlen and Maastricht GP cooperative the annual contact rate, as extrapolated from our data, per 1000 inhabitants per year is 238 and 279 respectively ( $\chi^2_{(1df)}=4.385$ ,  $p=0.036$ ). The contact rate at the A&E departments of Heerlen ( $n=66$ ) and Maastricht ( $n=52$ ) is not different ( $\chi^2_{(1df)}=1.765$ ,  $p=0.184$ ). Some 51.7% of the patients attending the A&E department in Heerlen during out of hours were self referred, compared with 15.9% in Maastricht ( $\chi^2_{(1df)}=203.13$ ,  $p<0.001$ ).

**Conclusions:** The organisation of out of hours care in Maastricht has optimised the GP's gatekeeper function and thereby led to fewer self referrals at the A&E department, compared with Heerlen.

Increased utilisation of emergency care has been reported by several authors.<sup>1-4</sup> It has been argued that this leads to overcrowding of the accident and emergency (A&E) departments, which can be seen as the biggest impediment of timely and adequate emergency care.<sup>2,3,5</sup> A substantial number of patients using emergency care exhibit minor problems that can be treated by a general practitioner (GP).<sup>5,6</sup> There have been several initiatives reported dealing with this problem, like employing GPs in A&E departments or by establishing a separate stream for minor injuries.<sup>7-11</sup> All these initiatives mainly focused on reducing the number of primary care patients utilising emergency medicine.

In the Dutch healthcare system the GP acts as a gatekeeper to secondary care. As a rule, patients need a referral from their GP to use hospital services.<sup>12</sup> However, to attend an A&E department a referral is recommended but not strictly needed. Many patients skip the GP and attend the emergency department without referral.<sup>12</sup>

In the past few years GPs out of hours care has been reorganised substantially, motivated by increased dissatisfaction of GPs with former out of hours care. Like in other countries GPs in the Netherlands used to organise their out of hours services in locum groups, in which they joined a rota system.<sup>13</sup> In recent years, large GP cooperatives have been set up following British and Danish examples.<sup>14,15</sup> Generally 40 to 120 full time GPs participate in these services, providing care for populations ranging from 80 000 to 300 000. There are however, differences in the way these GP cooperatives are organised, such as differences in location (located next to the A&E department of a hospital or in a separate distant building at the centre of a city or a rural area) or differences in accessibility (free access compared with appointment only).

There are no publications on the effect of different organisation structures of out of hours services by GPs on patient

flow. Therefore it is not known to what extent these differences influence attendance of patients at emergency departments and GP cooperatives, or the way care is provided outside normal working hours.

In this study we compared two types of GPs out of hours services. One is located at the A&E department of a hospital and has free access (Maastricht), and another that is located in the centre of a city where patients can only present themselves by telephone (Heerlen). We envisage that especially the location of these cooperatives influences the number of patients attending the local emergency department (see fig 1). In the first situation the GP's gatekeeper function during out of hours seems fully established, because all patients seeking care during out of hours, including those patients attending the A&E department without referral are first seen by a GP. In other words, skipping the GP and directly attending the A&E department is not possible. The GP decides which treatment is most appropriate and whether referral is needed.

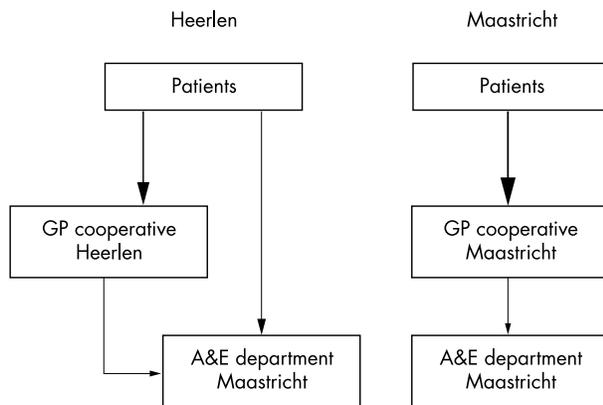
The objective of this study is to evaluate the effects of differences in the organisation of GP's out of hours services on the number and the characteristics of patients using out of hours primary and emergency care.

## METHODS

### Setting

This study compares the use of out of hours services (A&E departments and GP cooperatives) in two Dutch cities and their surrounding areas; Heerlen and Maastricht. The distance between both cities is about 20 km.

In Heerlen the GP cooperative is located in the centre of the city of Heerlen and serves a population of 278 000 patients, with 120 participating GPs. During this study the area of Heerlen had two A&E departments operational during out of



**Figure 1** Out of hours service organisation.

hours, together serving a population of 300 000 patients. These A&E departments are about 5 km and 9 km away from the GP cooperative, and are located in the suburbs of Heerlen and the centre of a nearby city (Kerkrade), respectively.

The GP cooperative Maastricht is situated at the A&E department of the university hospital Maastricht and serves a population of 190 000 patients, with 83 participating GPs. The university hospital Maastricht is located in the suburbs of Maastricht. Both regions consist of rural and urban areas.

#### Data collection

During a three week period in June 2001 in Heerlen and from 22 September to 15 October 2001 in Maastricht, all data of patient contacts with both GP cooperatives and A&E departments in the corresponding areas were collected. We used standard registration forms completed for every patient contact. Every third consecutive patient contact with the GP cooperative was entered into a database and was analysed. With respect to the A&E departments all data were analysed.

We had no reason to believe that the differences in registration periods may account for relevant differences between the datasets. Neither of these periods included bank holidays or the summer vacation period, which might influence contact rates. Also Salisbury *et al*<sup>16</sup> showed only little seasonal variation. We assume that the distribution of patient contacts characteristics remains comparatively stable over various periods, and therefore differences in characteristics are not likely to be caused by differences in these data collection periods. In August 2001 the patient population of the GP cooperative of Maastricht expanded from 120 000 to 190 000 patients, with the inclusion of 24 GPs from the Maastricht area. With this expansion the comparability between both regions (distribution of rural and urban areas) increased,

which is one of the reasons we choose to perform data collection in September and October in Maastricht.

#### Outcome measures

Main outcome measures involved number of patient contacts, diagnostic information, type of consultation with the GP cooperative, and referrals to the A&E department. Because of lack of detail of telephone consultations, we only analysed patient contact characteristics with respect to consultations at the GP cooperative and home visits. With respect to total number of patient contacts all data were used. The diagnostic information was coded according to the chapters of the International Classification of Primary Care (ICPC).<sup>17</sup>

#### Statistics

Pearson's  $\chi^2$  tests were carried out to test for differences and the level of significance was set at 0.05.

#### RESULTS

Over the three week periods that were monitored, in total 3825 contacts were registered in the Heerlen GP cooperative, and 3054 contacts in the Maastricht GP cooperative. In the A&E departments, 1152 contacts and 567 contacts were recorded in Heerlen and Maastricht respectively. We extrapolated the data to an annual contact rate per 1000 inhabitants per year. For the Heerlen and Maastricht GP cooperative the annual contact rate per 1000 inhabitants per year is 238 and 279 respectively ( $p=0.036$ ). The contact rate at the A&E departments of Heerlen and Maastricht is not different ( $p=0.184$ ) (see table 1).

In Heerlen, comparatively more patients receive telephone advice, fewer patients attend the GP cooperative for a consultation, and more patients are paid a home visit compared with Maastricht. These differences were statistically significant ( $p<0.001$ ).

Some 51.7% of the patients attending the A&E department in Heerlen were coded as self referred, compared with 15.9% in Maastricht ( $p<0.001$ ).

GPs in Maastricht saw comparatively more patients with musculoskeletal problems, and less circulatory problems compared with GPs in Heerlen ( $p<0.001$  and  $p=0.002$  respectively) (see table 2).

#### DISCUSSION

We found no difference in the total number of patient contacts with out of hours emergency care, between Heerlen and Maastricht. However, in Maastricht significantly more patients were seen by a GP, with fewer self referrals to the A&E department.

The contact rate per 1000 patients per year in Heerlen is comparable to another Dutch study by Van Duijn *et al*.<sup>18</sup> However, other studies, mainly in the UK, report lower contact

**Table 1** Characteristics of patient contacts with out of hours care

	Heerlen	Maastricht	$\chi^2$ Value	p Value
Population				
GP cooperative	278000	190000	–	–
A&E department	300000	190000		
Contacts/1000/year				
GP cooperative	238	279	4.385 <sub>df=1</sub>	0.036
A&E department	66	52	1.765 <sub>df=1</sub>	0.184
Self referrals at A&E department	51.7% (n=592)	15.9% (n=90)	203.13 <sub>df=1</sub>	<0.001
GP cooperative				
Consultation	47.6%	62.8%	169.11 <sub>df=2</sub>	<0.001
Telephone consultation	39.0%	29.8%		
Home visit	13.4%	7.4%		

**Table 2** Patient's complaints subdivided according to the chapters of the International Classification of Primary Practice (ICPC). These data concerns only consultations at the cooperative and home visits

Code	ICPC chapter*	GP cooperative Heerlen		GP cooperative Maastricht		$\chi^2$ Value	p Value
		N	%	N	%		
A	General and unspecified	76	9.5	108	10.0	0.124 (1df)	0.725
B	Blood, blood forming organs†	5	0.6	4	0.4	–	–
D	Digestive	108	13.6	117	10.9	3.141 (1df)	0.076
F	Eye	35	4.4	42	3.9	0.283 (1df)	0.595
H	Ear	32	4.0	40	3.7	0.113 (1df)	0.736
K	Circulatory	69	8.7	55	5.1	9.358 (1df)	0.002
L	Musculoskeletal	102	12.8	212	19.7	15.552 (1df)	<0.001
N	Neurological	31	3.9	43	4.0	0.012 (1df)	0.911
P	Psychological	25	3.1	19	1.8	3.768 (1df)	0.052
R	Respiratory	100	12.6	123	11.4	0.558 (1df)	0.455
S	Skin	133	16.7	216	20.1	3.417 (1df)	0.065
T	Endocrine, metabolic and nutritional†	7	0.9	4	0.4	–	–
U	Urology	44	5.5	65	6.0	0.220 (1df)	0.639
W	Pregnancy, childbirth, family planning	12	1.5	7	0.7	3.345 (1df)	0.067
X	Female genital system and breast	11	1.4	6	0.6	3.455 (1df)	0.063
Y	Male genital system	4	0.5	8	0.7	0.417 (1df)	0.518
Z	Social problems †	2	0.3	1	0.1	–	–
Total		796	100	1075	100		

\*The overall Pearson  $\chi^2$  test showed a significantly distribution of complaints between both cooperatives ( $\chi^2_{(16df)}$ ,  $p < 0.001$ ). †One of the cells has an expected count less than 5, and therefore no  $\chi^2$  test is performed.

rates<sup>13 16 19</sup> (130 to 176 per 1000 patients per year). Also higher contact rates have been reported (423 to 514 per 1000 patients).<sup>15 20</sup> Different aspects of the national health care system and definition of out of hours may account for these differences.

The number of self referrals to the A&E department in Maastricht is much lower than in Heerlen. This is caused by the fact that in Maastricht the GP's gatekeeper function is fully established. The GP decides with respect to all patients attending the GP cooperative and A&E department whether a patient is suitable for primary care or if the patient should be referred to the A&E department. Patients entering the hospital with obviously very severe injuries are immediately directed to the A&E department and are registered as self referred, while in fact they are not. This completely explains the 15.9% self referrals in Maastricht.

Assuming that minor injuries mainly relate to musculoskeletal problems and skin or subcutaneous wounds, it is obvious that the Maastricht GP cooperative sees more of these patients at the GP cooperative or during home visits. These two chapters of the ICPC together account for 40% of all disorders as presented at the GP cooperative in Maastricht, compared with 30% in Heerlen (see table 2). The finding that GPs in Maastricht seem to handle fewer patients with circulatory problems, lays probably in the fact that in Maastricht patients with clear cardiac complaints are directly referred to the cardiologist, and thereby bypassing the GP cooperative.

Despite the selection function of the GP in Maastricht, there was no statistical difference in the number of patients using emergency care between Heerlen and Maastricht. As reported in the literature a lot of patients using emergency care exhibit minor injuries that can be taken care of by a GP.<sup>5 6</sup> Therefore we expected less attendees at the Maastricht A&E department in comparison with Heerlen. There may be two explanations for not finding a difference between these two A&E departments. Firstly, the A&E department in Heerlen advises patients with minor injuries, in case of crowdedness at the A&E department, to contact the GP cooperative. This causes a reduction of the number of patients using emergency care. However, it is unclear how many patients are advised to do so, and eventually attend the GP cooperative. Secondly, there used to be three A&E departments serving the Heerlen region population. A couple of months before this study, one A&E department was closed during out of hours. This may also have caused a

number of patients with minor injuries to decide not to attend one of the other two A&E departments, as their travel distance to the nearest A&E department had increased. This assumption is supported by a study of O'Reilly *et al.*<sup>21</sup>

This study also showed that GPs in Maastricht performed more consultations at the GP cooperative than their colleagues in Heerlen. There are two predominant explanations for this difference. Firstly, the former self referrals in Maastricht used to enter the A&E department without an appointment, and now enter the GP cooperative also without an appointment. Secondly, because the GP cooperative in Heerlen uses telephone triage, patients are seen by appointment, which enables the GP cooperative to handle a substantial number of patient contacts by telephone. In Maastricht, annual reports showed that only about 25% of all consultations at the GP cooperative were preceded by a telephone consultation.

As suggested by others, there is need for primary care at the A&E department.<sup>5 6</sup> Supplying primary care outside a hospital will only partially fulfil these needs, as numerous patients believe that they should be treated in the A&E department.<sup>11</sup> The organisation of out of hours care in Maastricht ensures that all primary care patients are treated by GPs in contrast with Heerlen. Overcrowding at the A&E department as caused by patients with minor problems is likely to be reduced more in Maastricht than in Heerlen. However, this is not supported by the results of this study. The most important benefit of the way out of hours care as organised in Maastricht, is that health care is optimally geared to the symptoms of the patient, which implies efficient and appropriate care. The role of the GP as gatekeeper to secondary care is fully established. Patients needing emergency care are directly referred to the A&E department and primary care patients are seen by a GP. In addition, patients no longer need choose between attending a GP cooperative or the A&E department. They are always in the right place.

The organisation of out of hours care in Maastricht supports close collaboration between primary and emergency care. This offers possibilities for exchanging expertise and clinical knowledge. We hope to investigate this aspect in future research.

In summary, the organisation of out of hours care in Maastricht has optimised the GP's gatekeepers function and led to fewer self referrals at the A&E department, compared with Heerlen.

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