Author's response to reviews

Title: Out-of-hours demand for GP care and emergency services: patients choices and referrals by general practitioners and ambulance services

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Author's response to reviews: see over
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02 July 2007

Dear Dr. Chrissie Kouremenou,

We have tried to address the remaining comments by two of the three reviewers with reference to the changes in the text where appropriate.

Following prof. Chris Salisbury suggestion, we have attached the text of the paper on ‘Self-referrals to the A&E Department during out-of-hours: patients’ motives and characteristics’ (currently being revised), so that you will be able to identify any overlap with the paper for BMC Family Practice (that, in our view, is only marginal).

We thank all reviewers for their supportive reactions and useful remarks.

We look forward to receiving your reply.

On behalf of my co-authors,
Yours sincerely,

Eric P. Moll van Charante, GP, PhD
Reviewer: David Dunt

General The authors acknowledge the point of their non-use of multivariate analysis but state that ‘we already used the results of such an analysis for another paper that is being revised elsewhere at this moment, making us feel somewhat reluctant to insert them in the current one. We hope that you can agree with this approach or else that you may have some suggestions to further tackle this issue.’ I am not sure this is entirely satisfactory. I understand the point that one may want to use the same dataset in two separate paper, one for descriptive and the other, explanatory (analytical) purposes and avoid overlap between the two. However it seems to me still that the section that is at issue under the heading AED: self-referrals,... starting at line 18 on p8, could be done better. I suggest that the 9 statistical tests (excluding 2 for describing the two populations) were reported as adjusted (for other relevant confounders) rather than remain as unadjusted ones. This would give confidence that test results reported in this section are not subject to invalidity. Doing this should not invalidate the submission of their other paper.

In the paragraph comparing the three groups of patients within the AED (Table 4) we have re-analysed all statistical tests as suggested using multivariate (regression) analysis. Dr. Gerben ter Riet, epidemiologist, was so kind to assist us during this process, and we have mentioned his contribution in the ‘acknowledgements’. Within the strata ‘injury’ and ‘non-injury’, the main confounders appeared to be age, distance and type of presenting problem (coded into one of the six most prevalent ICPC-chapters) as was also described in a separate paper (that we have attached following prof. Chris Salisbury suggestion). No effect on mode of care choice was found for sex, type of insurance (private/public), social deprivation (as indicated by the local council; yes/no), or time of the contact (day, evening, night). Overall, the p-values for the crude differences only slightly differed from the adjusted ones. Nevertheless, the latter ones were taken to the text, using a \( p_{\text{adj}} \) symbol to indicate that they represent the p-value of the reported differences after correction for confounders.

We hope that you will find this solution sufficiently satisfactory.

N.B. We have left out the first sentence of this paragraph (page 8, lines 20-21), as it may not be very relevant to this section after all.

Reviewer: Chris Salisbury

I think the editors should be aware of the content of the other paper mentioned in the response to the reviewers, so they are aware of any overlap.

To make sure that the editors are aware of the content of our other paper, we have attached it to our letter (‘Self-referrals to the A&E Department during out-of-hours: patients’ motives and characteristics’). This paper is currently under revision following the comments of the reviewers.

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct).

Page 7, line 20. change ‘....while more men contacted the AED’ to ‘while men accounted for a higher proportion of those patients who contacted the AED’

This was changed in the text (page 7, lines 20-21).

Please mention the AEDs in the ‘setting’ section at the beginning of the paper

This was also altered in the text (pag. 5, lines 16-17).
APPENDIX (COMPLEMENTARY PAPER; CURRENTLY UNDER REVISION)

Self-referrals to the A&E Department during out-of-hours: patients’ motives and characteristics

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Abstract

Objective: To determine self-referrals’ motives to visit the Accident & Emergency Departments (AED) and to compare their characteristics to patients contacting the GP cooperative.

Methods: Postal questionnaires were send to AED self-referrals and logistic regression analysis was used to contrast self-referrals to patients contacting the GP cooperative.

Results: For a study population of 62,000, during four months, 5547 contacts were registered with the GP cooperative, along with 808 AED contacts, 344 of whom (43%) were self-referrals. Main reasons to visit the AED were the perceived need for diagnostic facilities and the conviction that the hospital specialist was best qualified to handle the problem. Dissatisfaction with the GP cooperative among respondents was high. Self-referral to the AED was positively associated with injury, age between 15 and 64, musculoskeletal, cardiovascular and respiratory problems, and distance to the GP centre.

Conclusion: Self-referrals emerge as patients with a strong preference for the AED, mainly based on assumptions on quality of care and necessary facilities.

Practice implications: The current plans to redirect self-referrals to the GP by integrating AED and GP services should take into account that self-referrals may, in part, make motivated and appropriate choices to visit the AED.

Key words: after hours, primary health care, accident and emergency, satisfaction, health seeking behaviour
1. Introduction

Currently, Dutch health policy makers and many insurance companies are propagating the integration of GP cooperatives and Accident & Emergency Departments (AED) into one facility. They claim that such a close collaboration has become necessary as patients with an urgent out-of-hours problem feel indecisive whom they should contact: the GP cooperative, the AED or the ambulance service. Furthermore, this would offer a chance to prevent patients from bypassing the GP cooperative and self-referring to the AED, as many of them are believed to present with problems that can be treated equally well by the GP service and therefore cause unnecessary crowding in the AED [1-3]. Thus, integration would lead to a more efficient use of resources and at a lower overall cost.

Since the millennium change, Dutch provision of out-of-hours primary health care has shifted from practice-based services towards large-scale general practitioner (GP) cooperatives [4]. Many GP centres are known to lie in close proximity of the hospital, yet have a separate mode of operation. Most Dutch AEDs are facing substantial numbers of self-referrals ranging from 25 percent to as high as 70 percent of all their in and out-of-hours demand [5]. Recently, it was shown that integration of GP and AED services into one out-of-hours emergency centre can redirect many of these self-referrals to the GP [6].

In the current debate on the optimal role and position of the main out-of-hours health care providers very little attention is paid to patients’ motives to skip the GP cooperative and self-refer to the AED. A better understanding is necessary of patients’ incentives to attend to the AED and the extent to which their demand is complementary to the demand for GP care [7]. Most studies on AED self-referrals took place in the UK and were performed in the period preceding the GP cooperatives. In this out-of-hours study of a Dutch population of 62,000 people we explored self-referrals’ motives to visit the AED and compared their characteristics to patients contacting the GP cooperative.
2. Methods

Setting
The GP cooperative in the coastal city of IJmuiden participated in the study. It serves a population of around 62,000 people with a total of 25 GPs and 8 nurses. During out-of-hours, all staff members have access to the complete electronic medical records for all GP practices. The GP cooperative operates from 5.00 pm to 8.00 am from Monday to Friday and 24 hours during the weekends. Apart from 11 pm to 8 am when only one GP is on call, two GPs work alongside, one making home visits and one taking care of centre consultations or telephone calls after nurse telephone triage. The service is located in the former AED of a small district hospital that had to close in 1996. The population is served by three AEDs bordering on the region.

Postal questionnaire to AED self-referrals
We developed a short questionnaire to assess self-referrals’ motives to visit the AED, since the questionnaires that were found in the literature were either unvalidated or dated back to the time before the introduction of the GP cooperatives. To locate relevant aspects on this subject, in September 2002 a bibliographic search was carried out in the EMBASE and MEDLINE database using combinations of the MeSH-terms ‘after hours’, ‘primary (health) care’, ‘accident and emergency’/’emergency care’, ‘satisfaction’ and ‘health seeking behaviour’. Nine articles of interest were found and reviewed and their references checked, yielding a preliminary questionnaire of nineteen items. This was then piloted among twelve randomly chosen patients who had visited the AED without being referred by the GP or ambulance service. They were asked to comment on the items’ relevance and phrasing, and to indicate whether they had any additional items that could further clarify their motives to attend the AED. Items that were ambiguous, confusing or irrelevant were rephrased or removed, resulting in a 20-item questionnaire, leaving room for additional qualitative remarks (Appendix).

Between 1 November 2002 and 1 March 2003, all self-referrals from the population studied who visited one of the three AEDs received a postal questionnaire within one week of their contact and a reminder after 10 days. Of all 344 registered self-referrals, three patients had died and of two others no address was available. The remaining 339 patients were sent a postal questionnaire.
Out-of-hours activity data

In the same period, all incoming calls at the GP cooperative were registered by the nurses. Contact information was entered on a specially prepared data collection sheet. It was completed by the nurses (advice alone) or GPs (all other contacts) and was used to collect demographic data, presented problems, diagnosis and management (by nurse or GP). All contacts were classified into injury or non-injury and coded according to the International Classification of Primary Care (ICPC) [8]. Passers-by from other regions were excluded.

For the same period and population, a similar, retrospective data collection and coding took place using the hospital records for all patients who contacted one of the three AEDs. All AED charts were anonymised and coded. Using a national route & travel program, for all patients, the shortest distance was calculated from their home address to the GP cooperative [9]. Similarly, we obtained the shortest distance to the AED for all self-referrals. A more detailed description of the data collection and setting can be found elsewhere [10].

Analysis

In the non-response analysis, Pearson’s $\chi^2$ test was used to test for differences in two by two tables, using a level of significance of $p<0.05$.

We used random effects logistic regression analysis with self-referral to the AED (yes/no) as the dependent variable and patients as random intercept, since 22 percent of them had received more than one contact. To facilitate comparison with other studies, six age groups and five main ICPC chapters were modelled as dummy variables using 5-14 years and ‘general and unspecified’ as the respective reference categories. These nine dummies were kept in the model at all times. The initial set of determinants included sex, age-group, insurance (public or private), time of contact (day, evening, night), social deprivation (y/n, area defined by the local council), and distance to the GP cooperative (km). We made the model more parsimonious by removing non-significant variables, but only if their removal did not materially (>10%) alter the regression coefficients of significant associations and the likelihood ratio test [11] indicated a non-significant change in the model’s fit (at a two-sided $p>0.05$). Odds ratios were converted to relative risks (RR) to facilitate interpretation [12]. All analyses were carried out using Stata statistical software (Release 9.2, Stata Corporation, College Station, TX).
3. Results

For the population of Velsen, during four months, 5547 contacts were registered with the GP cooperative. In parallel, 808 contacts were registered with the AED: 344 (43%) self-referrals, 338 (42%) referrals by the GP cooperative, 115 (14%) patients brought in by the ambulance service and 11 (1%) other contacts. Overall, self-referrals constituted 5% (344/6355) of the total out-of-hours demand.

Patient questionnaire

Overall, 224 out of 339 AED self-referrals who received a postal questionnaire responded (66%). Between the response and non-response groups no differences were found for sex, insurance, time of the day (day versus evening and night), hospital admission (y/n), follow up care (referral back to the GP (y/n)), or distance to GP centre or AED (Table 1). However, respondents were younger and had more often presented with an injury.

Patient opinions

Over half of the respondents (59%) had made the decision to attend the AED themselves, while the partner or other family members also played an important role in this decision (26%)(Table 2). Only 18% of the respondents thought that the AED was better accessible than the GP centre. On average, respondents expected to wait longer in the AED than at the GP centre (1.3 versus 0.9 hrs; sign rank test z = -7.2, p<0.0001). Most respondents had presented with a problem of the musculoskeletal system (70%). The large majority of the respondents (90%) perceived the AED to be the most appropriate place for their problem, while many (66%) seemed convinced that the GP would not have been able to solve it. In general, patients indicated that they were satisfied with the care they had received from the AED (80%) and most respondents (69%) stated they would visit the hospital again under similar conditions. Interestingly, 28% of the respondents appeared to be dissatisfied with the care from the GP cooperative, compared to 8% dissatisfaction with their own GP (difference = -21%, 95% CI -28 to -13).

An important reason to visit the AED was the expectation that it would prove necessary to make use of diagnostic facilities (36%)(Table 3).

‘I had hit my finger with a hammer really hard and I was afraid that it was broken, so I visited the hospital for an x-ray to know for sure whether this was the case or not.’
Another reason that was mentioned frequently was the assumption that the hospital specialist or A&E doctor would be best qualified for the problem presented (30%).

‘When I woke up, I had such excruciating chest pain that I thought I was going to die from a heart attack, so my wife took me to the AED straight away. We anticipated that the GP cooperative would have referred us to the hospital too, so we decided not to waste any time by contacting the GP first.’

Reasons for not being satisfied with the care provided by the GP cooperative (n=62, 28%) were associated with unfriendliness by the nurses (19/62, 31%), long waiting times (18/62, 29%) and insufficient diagnostic facilities (16/62, 26%).

Comparing AED self-referrals with patients contacting the GP cooperative

Around 80% (271/339) of the AED self-referrals had injuries of some sort, compared to 18% (996/5547) of the GP sample. Table 4 shows which variables were associated with the patients’ choice for the AED rather than GP services. Patients with an injury were 3.6 times more likely to visit the AED than those without (CI 3.3-3.9). The ICPC-chapters for circulatory (RR 4.3, CI 2.0-8.0), musculoskeletal (RR 2.5, CI 1.8-3.2) and respiratory (RR 2.4, CI 1.2-4.7) complaints were most strongly associated with an AED self-referral. Compared to patients between 5 and 14 years, parents with children aged 0-4 and patients 65 years and older contacted the GP cooperative more often, while patients aged 15-64 were more likely to visit the AED. Compared to the daytime hours during the weekend, patients were more likely to self-refer to the AED during the night (RR 1.5, CI 1.0-2.1). Finally, a higher distance to the GP centre was associated with a higher RR of visiting the AED (1.2, CI 1.1-1.3). For socio-economic factors (deprived/non-deprived areas) no significant effect was found. There appeared to be no interaction between distance and time of the visit or deprivation.
4. Discussion and conclusion

4.1 Discussion
The large majority of self-referrals considered the AED to be the most appropriate place to present their problem to. Their motivation to seek help at the AED seems to be emphasized by the anticipation on a longer waiting time and travelling distance compared to the GP cooperative, while over two thirds would visit the AED again under similar circumstances. Main reasons to visit the AED were the perceived need for diagnostic facilities and the conviction that the hospital specialist was best qualified to handle the problem. Dissatisfaction with the GP cooperative was high in comparison with dissatisfaction with the own GP. Self-referral to the AED was positively associated with injury, age between 15 and 64, musculoskeletal, cardiovascular and respiratory problems, and distance to the GP centre.

In this study, no evaluation took place of the motives of patients contacting the GP cooperative, prohibiting a direct comparison with AED self-referrals. Nevertheless, we did perform a patient evaluation among patients contacting the GP cooperative in 2004 that was part of a larger study of patient satisfaction with out-of-hours primary care [13]. Satisfaction levels with the GP cooperative in Velsen were very high, with no more than 12 percent of the respondents being dissatisfied with the care received. The 28 percent dissatisfaction with the GP cooperative that was found among self-referrals therefore appears to be high, although the numbers are small and respondents may have 'justified' their choice for the AED by overstating their dissatisfaction with the GP cooperative. Another limitation is that there were more injuries among the respondents compared to the non-respondents. Perhaps patients who felt to have ‘legitimately’ used the AED without a referral from the GP felt more inclined to describe their incentives for visiting this service. Therefore, some caution should be taken in generalizing the results to all self-referrals.

The percentage of self-referrals within the AEDs studied was 43%. This is low compared to the AEDs in larger cities, that are facing up to 70% of self-referrals [5]. Indeed, if the self-referrals in this study represent a more ‘appropriate’ selection of problems for the AED, their motives may have been more focussed on specialist care or diagnostic facilities than would have been the case in the major cities.

Finally, the patient questionnaire was filled out after the AED visits, leaving room for recall bias on the expected waiting times or perceived appropriateness of choice.
Many of the study findings seem to be in accordance with the literature. Factors that have also been reported to influence the differential decision making by patients are: direct attention of specialist care [14-16], need to make use of advanced technology (e.g. x-ray) [15-18], better accessibility [14,15,19] and not wanting to disturb the GP out-of-hours [15]. We did not find the choice for AED to be associated with lack of knowledge of the range of available services [18], anticipation on shorter waiting times [20], or dissatisfaction with (daytime) GP care [18,19,21]. However, dissatisfaction with the out-of-hours GP cooperative appeared to be higher among AED self-referrals compared to patients contacting the GP cooperative [13]. Interestingly these dissatisfied patients, while having fewer fractures, received significantly more x-ray investigations than those who were generally satisfied with the care from the GP cooperative (data not shown). These self-referrals may therefore be a more apprehensive and demanding group of patients, requesting a higher level of specialised care with less urgent problems.

Patient characteristics that were found to be associated with the choice to visit the AED were also described previously. Young children (0-4 years) and elderly patients (>65 years) were found to contact the GP cooperative more often, while most self-referrals to the AED came from the remaining age groups [20,22,23]. Shipman et al. reported that during the nightly hours the percentage of contacts with the AED was higher than with the GP cooperative [18]. Closer proximity to the AED was found to be associated with a higher use of service [24,25]. In this study we found that an increasing distance to the GP centre was associated with a higher RR of visiting the AED, although the average distance to the AED was still significantly higher. In the logistic regression analysis we did not try to extrapolate the distance to the closest AED for patients contacting the GP centre, as we observed that a substantial minority of AED visitors did not go to the hospital that was closest to their home. This may be the result of the injury taking place elsewhere (e.g. sports injury, or traffic accident), or unknown preferences by patients for one or the other hospital. Overall, perhaps, a greater distance to the GP centre may be related to a lower affinity with the GP services and, hence, lower overall use. A problem of most previous studies is that they describe bivariate associations and were not able to control for confounding effects. For instance, while male sex was found to be associated with self-referring to the AED [18,19], it appears to be confounded by injury in our study (OR$_{sex}$ 1.37, OR$_{sex adjusted for injury}$ 1.07).

Compared to general and unspecified problems (e.g. fever) we found the AED not only to have a higher RR for handling musculoskeletal complaints [18,26], but also for circulatory
(mainly chest pain) and even respiratory (mainly shortness of breath) complaints. Interestingly, we observed that there were high referral rates for patients with chest pain (41%), shortness of breath (18%) or injury (12%), compared to the 7% overall referrals (results described elsewhere [10]). Therefore, for these types of problems it may not be unreasonable that patients decide to self-refer to the AED.

There has been much debate on (in)appropriateness of service use by self-referrals to the AED [27-30]. An important shortcoming in much of the research on this subject has been that ‘inappropriate’ attenders (sometimes even called ‘primary care patients’) have generally been labelled through retrospective comparison with ‘legitimate’ patients; this is, by using the final diagnosis to identify those whose problems did not need the AED services [19,29]. It is relatively easy after assessment and investigation to confidently classify a problem as ‘minor’ and not in need of the services of a hospital department, but from the patients’ point of view a rational response in the fact of unfamiliar symptoms is to be cautious and consider the worst possible scenario until this has been excluded.

4.2 Conclusion

AED self-referrals express the legitimacy of their choice with the need to use diagnostic facilities and most appropriately qualified medical care for the problem presented. They show relatively high levels of dissatisfaction with out-of-hours GP care. Compared to patients contacting the GP cooperative, they emerge as a self-selected group with mainly injuries and problems that have relatively high referral rates when presented to the GP cooperative.

4.3 Implications for practice and further research

Involving patients or citizens in the planning and development of health care is receiving increased attention [7,31,32]. From this study, it seems likely that many self-referrals would be opposed to integration of GP and AED services if the decision to visit the AED were left to a triage nurse. While health policy makers and insurance companies seem convinced that full integration of out-of-hours GP and AED services would lead to a more efficient use of resources and higher quality of care at a lower cost this has, as yet, not been substantiated. Importantly, a recent study indicated that redirecting these patients to the GP within an integrated out-of-hours service with the AED was not associated with a reduction in costs [33]. Furthermore, although the percentage of self-referrals to the AED dropped with a substantial 53%, this perceived effectiveness gain was diminished by a fifty percent decrease
in the number of patient calls to the GP cooperative (limiting the impact of telephone triage) and a forty-five percent increase in the number of AED referrals after an initial GP contact (resulting in unnecessary double contacts) [34]. Further, prospective studies should focus on the regional differences that may exist in the extent to which patients make appropriate, complementary use of out-of-hours services and their motivation to seek specialist care. Such information could lead to the conclusion that in some regions (e.g. with high percentages of AED self-referrals) full integration of out-of-hours care by GP cooperatives and AEDs can be beneficial in terms of costs and appropriate use of acute care, while in other regions (with fewer self-referrals) this may not be the case.

Acknowledgements

We thank all respondents, GPs, and staff members of the GP cooperative for participating in the study. The authors would also like to express their gratitude to Mildred Beeldman for her sustained help with the data collection and coding of the problems presented.

Funding

The Department of General Practice of the Academic Medical Centre covered the expenses made during data collection and analysis.

I confirm all patient/personal identifiers have been removed or disguised so the patient/person(s) described are not identifiable and cannot be identified through the details of the story.
References


<table>
<thead>
<tr>
<th></th>
<th>All Self-Referrals N=339</th>
<th>Respondents n=224 (66%)</th>
<th>Non-respondents n=115 (33%)</th>
<th>% difference (95% CI)</th>
<th>significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>175 (52)</td>
<td>109 (49)</td>
<td>66 (57)</td>
<td>-9 (-20 to 2)</td>
<td>0.128</td>
</tr>
<tr>
<td>Public insurance</td>
<td>228 (67)</td>
<td>150 (67)</td>
<td>78 (68)</td>
<td>-1 (-11 to 10)</td>
<td>0.873</td>
</tr>
<tr>
<td>Day contact</td>
<td>118 (35)</td>
<td>72 (32)</td>
<td>46 (40)</td>
<td>-8 (-19 to 3)</td>
<td>0.150</td>
</tr>
<tr>
<td>Injury</td>
<td>271 (80)</td>
<td>195 (87)</td>
<td>76 (66)</td>
<td>21 (11 to 31)</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>Hospital admission</td>
<td>34 (10)</td>
<td>22 (10)</td>
<td>12 (10)</td>
<td>-1 (-7 to 6)</td>
<td>0.859</td>
</tr>
<tr>
<td>No outpatient appointment</td>
<td>138 (41)</td>
<td>130 (58)</td>
<td>64 (59)</td>
<td>-1 (-13 to 10)</td>
<td>0.832</td>
</tr>
<tr>
<td>Age (IQR)</td>
<td>33 (30)</td>
<td>30 (30)</td>
<td>38 (25)</td>
<td>7</td>
<td>0.003</td>
</tr>
<tr>
<td>Distance* to GP centre (IQR)</td>
<td>4 (3)</td>
<td>4 (3)</td>
<td>4 (3)</td>
<td>0</td>
<td>0.505</td>
</tr>
<tr>
<td>Distance* to AED (IQR)</td>
<td>7 (2)</td>
<td>7 (2)</td>
<td>7 (3)</td>
<td>0</td>
<td>0.027</td>
</tr>
</tbody>
</table>

* in kilometres; IQR = inter quartile range

\(^{1}\) Mann-Whitney U
Table 2. Main results from postal questionnaire among self-referrals (n=224).

<table>
<thead>
<tr>
<th>Question</th>
<th>n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Q7. Visiting the AED: whose idea?</strong></td>
<td></td>
</tr>
<tr>
<td>Mine</td>
<td>133 (59)</td>
</tr>
<tr>
<td>My partner/family members</td>
<td>59 (26)</td>
</tr>
<tr>
<td>Others</td>
<td>24 (11)</td>
</tr>
<tr>
<td><strong>Q9. Best accessible service: GP centre or AED?</strong></td>
<td></td>
</tr>
<tr>
<td>AED</td>
<td>40 (18)</td>
</tr>
<tr>
<td>GP centre</td>
<td>85 (38)</td>
</tr>
<tr>
<td>No difference</td>
<td>83 (37)</td>
</tr>
<tr>
<td>Don’t know</td>
<td>16 (7)</td>
</tr>
<tr>
<td><strong>Q10. Have you visited the AED in the past?</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>103 (46)</td>
</tr>
<tr>
<td>No</td>
<td>119 (53)</td>
</tr>
<tr>
<td><strong>Q11. Have you visited the GP centre in the past?</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>158 (71)</td>
</tr>
<tr>
<td>No</td>
<td>60 (27)</td>
</tr>
<tr>
<td><strong>Q12. Expected waiting time (hrs (sd))</strong></td>
<td></td>
</tr>
<tr>
<td>AED</td>
<td>1.3 (0.6)</td>
</tr>
<tr>
<td>GP centre</td>
<td>0.9 (0.4)</td>
</tr>
<tr>
<td><strong>Q14. What was the best place for the problem: GP or AED?</strong></td>
<td></td>
</tr>
<tr>
<td>AED</td>
<td>202 (90)</td>
</tr>
<tr>
<td>GP centre</td>
<td>10 (4)</td>
</tr>
<tr>
<td>No difference</td>
<td>7 (3)</td>
</tr>
<tr>
<td>Don’t know</td>
<td>5 (2)</td>
</tr>
<tr>
<td><strong>Q15. Could the GP have solved the problem?</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>24 (11)</td>
</tr>
<tr>
<td>No</td>
<td>147 (66)</td>
</tr>
<tr>
<td>Don’t know</td>
<td>50 (22)</td>
</tr>
<tr>
<td><strong>Q17. Are you satisfied with the care from the AED?</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>179 (80)</td>
</tr>
<tr>
<td>No</td>
<td>19 (8)</td>
</tr>
<tr>
<td>Don’t know</td>
<td>17 (8)</td>
</tr>
<tr>
<td><strong>Q18. Would you visit the AED again in similar circumstances?</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>154 (69)</td>
</tr>
<tr>
<td>No</td>
<td>33 (15)</td>
</tr>
<tr>
<td>Don’t know</td>
<td>37 (17)</td>
</tr>
<tr>
<td><strong>Q19. Are you satisfied with the care from your own GP?</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>191 (85)</td>
</tr>
<tr>
<td>No</td>
<td>17 (8)</td>
</tr>
<tr>
<td>Don’t know</td>
<td>11 (5)</td>
</tr>
<tr>
<td><strong>Q20. Are you satisfied with the care from the GP centre?</strong></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>93 (42)</td>
</tr>
<tr>
<td>No</td>
<td>62 (28)</td>
</tr>
<tr>
<td>Don’t know</td>
<td>63 (28)</td>
</tr>
</tbody>
</table>

Due to missing numbers (up to 19 (8.5%)), totals do not always add up to 224 or 100%.
For all question items: see Appendix.
Table 3. Main reasons to visit the AED (Q16) (n=224).

<table>
<thead>
<tr>
<th>Reason</th>
<th>n</th>
<th>(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Further research (e.g. X-rays) was necessary</td>
<td>80</td>
<td>36</td>
</tr>
<tr>
<td>The doctor in the AED is best qualified for this problem</td>
<td>67</td>
<td>30</td>
</tr>
<tr>
<td>The AED is better accessible than the GP cooperative</td>
<td>36</td>
<td>16</td>
</tr>
<tr>
<td>It was related to a recent hospital contact or procedure</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>I didn’t want to disturb the GP/ no GP available</td>
<td>9</td>
<td>4</td>
</tr>
<tr>
<td>Other</td>
<td>12</td>
<td>5</td>
</tr>
<tr>
<td>Missing</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>224</td>
<td>100</td>
</tr>
</tbody>
</table>
Table 4. Relative risks (RR) for determinants of self-referral to the Accident & Emergency Department (AED)(n=5716; 175 missing cases).

<table>
<thead>
<tr>
<th></th>
<th>n</th>
<th>RR (95% CI)</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (yrs)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0-4</td>
<td>938</td>
<td>0.4 (0.2 - 0.9)</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>5-14</td>
<td>603</td>
<td>1.0 (ref)</td>
<td></td>
</tr>
<tr>
<td>15-24</td>
<td>594</td>
<td>1.9 (1.3 - 2.6)</td>
<td></td>
</tr>
<tr>
<td>25-44</td>
<td>1475</td>
<td>1.6 (1.1 - 2.4)</td>
<td></td>
</tr>
<tr>
<td>45-64</td>
<td>978</td>
<td>1.7 (1.1 - 2.6)</td>
<td></td>
</tr>
<tr>
<td>&gt;65</td>
<td>1265</td>
<td>0.7 (0.4 - 1.2)</td>
<td></td>
</tr>
<tr>
<td>Day</td>
<td>2329</td>
<td>1.0 (ref)</td>
<td>p=0.112</td>
</tr>
<tr>
<td>Evening</td>
<td>2666</td>
<td>1.2 (0.9 - 1.6)</td>
<td></td>
</tr>
<tr>
<td>Night</td>
<td>878</td>
<td>1.5 (1.0 - 2.1)</td>
<td></td>
</tr>
<tr>
<td>Non-deprived area</td>
<td>3189</td>
<td>1.0 (ref)</td>
<td>p=0.070</td>
</tr>
<tr>
<td>Deprived area</td>
<td>2702</td>
<td>0.7 (0.5 - 1.0)</td>
<td></td>
</tr>
<tr>
<td>Distance (km)</td>
<td>5774</td>
<td>1.2 (1.1 - 1.3)</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>No injury</td>
<td>4609</td>
<td>1.0 (ref)</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>Injury</td>
<td>1272</td>
<td>3.6 (3.3 - 3.9)</td>
<td></td>
</tr>
<tr>
<td>ICPC-chapter*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General &amp; unspecified</td>
<td>1228</td>
<td>1.0 (ref)</td>
<td>p&lt;0.001</td>
</tr>
<tr>
<td>Digestive</td>
<td>836</td>
<td>1.2 (0.5 - 2.8)</td>
<td></td>
</tr>
<tr>
<td>Circulatory</td>
<td>198</td>
<td>4.3 (2.0 - 8.0)</td>
<td></td>
</tr>
<tr>
<td>Musculoskeletal</td>
<td>1045</td>
<td>2.5 (1.8 - 3.2)</td>
<td></td>
</tr>
<tr>
<td>Respiratory</td>
<td>707</td>
<td>2.4 (1.2 - 4.7)</td>
<td></td>
</tr>
<tr>
<td>Skin</td>
<td>607</td>
<td>1.6 (0.9 - 2.6)</td>
<td></td>
</tr>
<tr>
<td>Other chapters</td>
<td>1260</td>
<td>0.9 (0.4 - 1.7)</td>
<td></td>
</tr>
</tbody>
</table>

* Six main chapters for both AED and GP cooperative; a higher RR indicates that patients are more likely to visit the AED
Appendix.

Postal questionnaire self-referrals to Accident & Emergency Department (AED)

1. Who is filling out the questionnaire?
   - I am (the patient)
   - Patient’s family member (partner, parent, child, sister, etc.)
   - Someone else, please specify:

2. Part of the day when you contacted the GP cooperative:
   - In the weekend during the day (8 am–5 pm)
   - In the evening (5 pm–11 pm)
   - During the night (11 pm–8 am)

3. Your age (of the patient): categories 0–4, 5–14, 15–24, 25–44, 45–64, 65–74, 75 or older

4. Your gender (of the patient): male/female

5. Your nationality (of the patient): Dutch/non-Dutch

6. Your highest level of education (of the patient):
   - None (yet)
   - Primary school
   - Lower Vocational Education
   - Advanced Primary or Elementary Education, Lower General Secondary Education
   - Intermediate Vocational Education
   - Higher General Secondary Education, Girls’ Secondary School, Pre-university Education
   - Higher vocational education
   - University / College
   - Other, please specify:

7. Whose idea was it to visit the A&E department of the hospital?
   - Mine (the patient)
   - Patient’s family member (partner, parent, child, sister, etc.)
   - Someone else’s, please specify: ............
8. How did you travel to the A&E department?
☐ With own transportation
☐ With transportation of family, friends or others
☐ Other (e.g. by bus), please specify: ............

9. Which service was best accessible: the GP centre or the A&E department?
☐ A&E department
☐ GP centre
☐ No difference
☐ Don’t know

10. Have you visited this A&E department in the past?*

11. Have you visited the GP cooperative in the past?*

12. How long did you expect to be waiting in the A&E department? And how long would you expect to have been at the GP centre? (please specify for both services)
☐ A&E department ..... hours/ ..... minutes
☐ GP centre ..... hours/ ..... minutes

13. What were the most important health complaint(s) and/or reason(s) for contacting the A&E department? (no more than 3)
(1) ........................................
(2) ........................................
(3) ........................................

14. What was the best place to present your problem to: the GP centre or the A&E department?
☐ A&E department
☐ GP centre
☐ No difference
☐ Don’t know

* Yes/no/don’t know
15. Could the GP (centre) have solved your problem?*

16a. What was the main reason to visit the A&E department?
(please tick the most important one)
☐ Further diagnostic investigation (e.g. X-rays) was necessary
☐ The doctor in the A&E department is best qualified for this problem
☐ The A&E department is better accessible than the GP centre
☐ My problem is taken more seriously in the A&E department than in the GP centre
☐ It was related to a recent hospital contact or procedure
☐ I didn't want to disturb the GP/ there was no GP available
☐ My own GP had advised me to visit the A&E department if things would get worse
☐ The problem was related to an accident on my work
☐ Other: (please specify) .................................

16b. Please describe briefly why you visited the AED:
........................................................................................................

17a. Are you satisfied with the care you received from the A&E department?*
17b. If ‘no’, please explain in a few words why you were not satisfied: ............

18a. Would you visit the A&E department again in similar circumstances?*
18b. If ‘no’, please explain in a few words why you would not visit the AED again:..........

19a. Are you satisfied with the care from your own GP?*
19b. If ‘no’, please explain in a few words why you were not satisfied:..........

20a. Are you satisfied with the care from the GP cooperative?*
20b. If ‘no’, please explain in a few words why you were not satisfied:..........

* Yes/no/don’t know