

# What determines frequent attendance at out-of-hours primary care services?

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**Background:** A detailed description of the characteristics of frequent attenders (FAs) at primary care services is needed to devise measures to contain the phenomenon. The aim of this population-registry-based research was to sketch an overall picture of the determinants of frequent attendance at out-of-hours (OOH) services, considering patients' clinical conditions and socio-demographic features, and whether the way patients' general practitioners (GPs) were organized influenced their likelihood of being FAs. **Methods:** This study was a retrospective cohort study on electronic population-based records. The dataset included all OOH primary care service contacts from 1 January to 31 December 2011, linked with the mortality registry and with patients' exemption from health care charges. A FA was defined as a patient who contacted the service three or more times in 12 months. A logistic regression model was constructed to identify independent variables associated with this outcome. **Results:** Multivariate analysis showed that not only frailty and clinical variables such as psychiatric disease are associated with FA status, but also socio-demographic variables such as sex, age and income level. Alongside other environmental factors, the GP's gender and mode of collaboration in the provision of health services were also associated with OOH FA. **Conclusion:** Our study demonstrates that the determinants of OOH FA include not only patients' clinical conditions, but also several socio-economic characteristics (including income level) and their GPs' organizational format.

## Background

It is estimated that ~80% of a general practitioner's clinical work is spent on 20% of his/her patients, and that between one in six and one in seven consultations are with the top 3% of attenders.<sup>1</sup> Smith even estimated that frequent attenders (FAs) account for 39% of all face-to-face consultations with their general practitioners (GPs).<sup>2</sup>

The analysis of FAs in general practice, with particular attention to GPs' daytime activity, has been the object of many studies, as summarized in a review,<sup>3</sup> which have shown that FAs have high rates of physical disease, psychiatric illness, social difficulties, emotional distress<sup>3–5</sup> or chronic somatic problems<sup>2</sup>, although Forster et al. found that FAs of primary care services do not have particular types of disease.<sup>6</sup>

Although numerous studies have investigated FAs in general practice during the daytime, few have considered FAs in out-of-hours (OOH) general practice. No unequivocal definition of FA exists in the literature, but the few publications on FAs at OOH services<sup>7,8</sup> usually define them as the 10% of patients most often attending OOH services in a given calendar year (12 months). These studies addressed only a very small number of potential determinants, demonstrating that women and elderly people were more prone to become FAs, and that chronic and psychiatric complaints were more prevalent among FAs.<sup>7–9</sup> Den Boer-Wolters et al.<sup>10</sup> judged that FAs put a severe pressure on OOH resources, concluding that a detailed description of these patients' background is needed to develop action to contain the phenomenon. In fact, to some degree, exceptionally frequent attendance can be seen as an indicator of inappropriate consulting behavior and health care use, increasing the workload and costs for primary health care (PHC) systems.<sup>11,12</sup> Clarifying the characteristics and conditions of FAs contacting OOH services could therefore prompt measures to

facilitate an appropriate use of OOH medical care, optimizing the scarce resources available for primary care in general.

This study involved a Local Health Agency (LHA) in the Veneto Region of north-eastern Italy, a country with a unique OOH care model: OOH services are provided by more than 20 000 GPs [known as physicians for continuity of care (*Medici di Continuità Assistenziale*)], who deliver urgent primary care during the night and on Saturday afternoons and Sundays, and public holidays.

The aim of this population-registry-based study was to identify the determinants of frequent access to OOH services, in terms of patients' clinical and socio-demographic conditions, and also aspects relating to the organizational format of their GP's daytime practice.

## Methods

### *The organization of Italian OOH general practice*

The OOH general practice service in Italy came into being in 1978 with the institution of the National Health Service (Law 833 of 23 December 1978)<sup>13</sup> to respond to a growing demand for continuity of the care provided by the primary care services during the day. In 2010, the number of OOH service providers was 4.8/100 000 population and the density of OOH physicians was 20/100 000 population.<sup>14</sup> The OOH service is organized by physicians working as independent contractors for the LHAs and they are remunerated on a fixed hourly rate. They provide patient care from 8 pm to 8 am Monday to Friday, and round the clock on Saturday afternoons, Sundays and public holidays. The OOH services are regulated by National Collective Agreements signed by the Government, the Regional Authorities, the National Association of Italian municipalities and the most representative national trade unions for the GPs. The LHAs are responsible to some extent for organizing the OOH activities in their respective

territories; however, so their organizational models may differ slightly from one LHA to another.

Traditionally, Italian daytime GPs run their practices alone, without any staff or formal links with other GPs.<sup>15</sup> The first national agreement mentioning the idea that organizational formats involving some form of cooperation among GPs could be negotiated at a local level was signed in 1996, but it was only when the agreement was renewed in 2000 that the rules governing GP networks were laid out. In the national agreement in place at the time of this study, GPs willing to engage in some form of collaboration in the provision of health services to their patients can choose one of three formats, named association ('*medicina in associazione*'), network ('*medicina in rete*') and group ('*medicina di gruppo*'), each of which implies a different level of cooperation between GPs. In any of these three formats, GPs have to coordinate their office hours to remain open till 7 pm on weekdays and they commit to sharing guidelines and meeting to discuss and improve their service. In the case of networks (or nets), which involve an intermediate level of cooperation, GPs also have to share an electronic patient database. Although GPs in associations or nets can continue to work at their own offices, the group format (with the highest level of cooperation) requires that GPs share the same clinic, so they can also jointly invest in medical equipment and employ nursing or administrative staff. In the LHA analyzed in this study, some GPs work within a more advanced primary care organization called unit for primary care (UTAP), like a House of Health,<sup>16</sup> which works through structured practices, protocols and procedures.

## Setting

This study was conducted at the LHA 'ULSS 4—Alto Vicentino', which extends in the north-western part of the Veneto Region. The LHA 'ULSS 4' serves a population of about 190 000 with a mean density of 111 people per square mile (290/km<sup>2</sup>). In 2011, foreign residents accounted for ~10.3% of the Region's total population, ~2% more than the national average. The LHA 'ULSS 4' has three OOH service points with a total of 25 physicians working on a rota system for 24 h a week each. When the service is operating, patients have to make a telephone call to a single call center that records their personal details using an electronic call management system, before they can talk to a doctor. The OOH physician decides whether the patient needs a home visit, a consultation at the local OOH office, or just advice over the phone (and all three types of service are provided by the OOH physician taking the call). If a patient's condition is judged to be life-threatening, an ambulance is sent. In 2006 the LHA 'ULSS 4' implemented an IT system that enables OOH doctors to establish a link with GPs working at a PHC center, or with the hospital emergency department, and to consult a patient's personal health records.

## Materials

This retrospective cohort study used data collected by the LHA 'ULSS 4' in a population-based dataset of OOH service contacts recorded from 1 January to 31 December 2011. An OOH care contact (a unit in the statistical analysis) was defined as: (i) any visit to the walk-in center; (ii) any home visit; (iii) any retirement home visit; and (iv) any telephone consultation with no further contact in the 12 hours thereafter (so OOH contacts were only recorded as phone consultations if the physician gave the necessary advice by phone and did not see the patient afterwards at the walk-in center or the patient's home).

The computer database of OOH contacts recorded the following variables: the patient's demographic details such as sex, age, nationality and home address (which enabled us to calculate their distance from the nearest OOH points using Google Maps). Additional information concerned the primary care services being provided for

each patient (non-cancer integrated homecare, cancer-related integrated homecare, terminal illness integrated homecare, home nursing services) and the characteristics of each patient's GP (form of collaboration in the provision of health services, and GP's gender). The database was also linked to the mortality records for 2011–2012, and data on patients' exemption from health care charges as at January 2011. Exemptions are awarded to people who declare very low incomes, patients with specific disabilities (e.g., the blind or deaf, disabled ex-servicemen, or the victims of industrial accidents), and people who have certain chronic diseases.

## Statistical methods

For the purposes of our study, all attenders were ranked by number of contacts in a year. Starting from the highest-ranking, individuals were included consecutively until the group consisted of 10% of all patients. To avoid attenders with the same number of contacts being placed in two different groups, the cutoff was rounded off to the nearest integer to define the FA group. Thus, we defined FAs as patients with three or more contacts within 12 months. The model for predicting the outcome, that is, the identification of a FA (a patient contacting the OOH services  $\geq 3$  times in 12 months), was derived in two steps. First, bivariate analyses were performed to identify the predictors associated with FA status, applying the chi-square test or Fisher's exact test, as appropriate. All dependent variables with a *P*-value of  $<0.05$  in the bivariate analyses were included in a multilevel logistic regression analysis with the second-level variable, that is, the number identifying the daytime GP. In fact patients nested within a daytime GP physician form a natural hierarchical structure suitable for analyses that model each level simultaneously. In our example, for instance, attributes of the GP such as his characteristics and managerial performance may have distinct effects on the FA condition of his/her patients. The likelihood ratio test ( $P < 0.0006$ ) indicated that the ordinal logistic regression model in which only one intercept was estimated was strongly rejected in respect to a multilevel logistic regression model. The Hosmer and Lemeshow goodness of fit test was used to check the fitness of the model, clustering observations with similar covariates into 10 groups. The model fitted well ( $P = 0.17$ ). Finally, to test the model for multicollinearity, we calculated the variance inflation factor, which amounted to 2.32, demonstrating that there was no collinearity among the variables.

## Results

In 2011, there were 17 367 residents served by the LHA—ULSS 4 who accessed the OOH primary care services; they made 23 504 calls, resulting in a contact rate of 12.4% of the population served, and 9.2% accessing the OOH primary care services only once. The 7.3% of patients who were FAs (contacting the OOH services  $\geq 3$  times in the index year) accounted for 20.1% of all the contacts. The detailed distribution of the number of OOH service contacts made by residents is given in Table 1.

The patients' socio-demographic characteristics and their GP's organizational model are shown in Table 2, by FA status. Very young and very old age, and female sex were more frequently associated with FA status, and exemptions from health care charges due to a low income increased the probability of being a FA. All the primary home care pathways (involving nurses, physicians and physiotherapists providing services at home) seemed to be associated with a higher likelihood of patients being FAs (see Table 3). The exemptions for chronic diseases associated with FA status related to patients with cardiovascular diseases, psychiatric disorders, hypertension, neoplasms and diabetes (see Table 3).

Multivariate logistic regression analysis showed that FA status was associated not only with frailty (death recorded within a year;

OR: 2.30, CI 95% 1.80–2.92), exemption for disability (OR: 1.91, CI 95% 1.56–2.30), being the object of nursing care at home (OR: 2.22, CI 95% 1.74–2.84), or medical care at home (OR: 1.47, CI 95% 1.11–1.96) and certain clinical variables such as psychiatric disease (OR: 2.78, CI 95% 1.73–4.49), but also with socio-demographic variables such as female sex (OR: 1.15, CI 95% 1.02–1.30) and income low enough to warrant exemption (OR: 1.30, CI 95% 1.15–1.49). Other environmental factors were also involved, such as the GP being female (OR: 1.18, CI 95% 1.02–1.37), and the GP's form of collaboration in the provision of health services (taking no association or a simple association for reference, OR: 0.76, CI 95% 0.59–0.99 for those in integrated practices; see Table 4).

## Discussion

This study demonstrated that not only clinical variables (such as proximity to death, frailty requiring home care provided by nurses or GPs and certain clinical conditions such as psychiatric disorders)

are associated with FA status, but also environmental factors and patients' socio-demographic variables (sex, age and income levels).

In our sample, FA patients accounted for 20.1% of all OOH service contacts. Other studies on this issue had found that FAs were involved in 30–42%<sup>7,8</sup> of all consultations within a period of 12 months. The impact of FAs on workload would therefore seem to be lower in our scenario, but it is impossible to say for sure because this difference might be attributable to a different distribution of risk factors among the different populations investigated in the various studies, or to primary care systems being organized differently.

### Socio-demographic determinants

Age showed a U-shaped curve associated with FA status, in both the bivariate and the multivariate analyses, that is, infants and the very elderly are more likely to be FAs than other age groups. This age-related phenomenon has been observed in other studies too<sup>17,18</sup> and is consistent with the age-related U-shaped distribution of the demand for (and cost of) health services generally.<sup>19</sup>

Our study demonstrated that FAs at OOH services were more likely to have a low income. Only one other study on general practice demonstrated that FAs were more often unemployed than controls.<sup>20</sup> Other researchers found that other conditions of social deprivation, such as family dysfunction<sup>21</sup> or social problems, also raised the chances of becoming a FA.<sup>22</sup> Social deprivation is not only more often associated with chronic disease<sup>23</sup> and psychiatric disorders,<sup>24</sup> but also with a poor perceived health,<sup>25</sup> which is associated with FA status<sup>26</sup> and a lower likelihood of patients being able to manage their health condition themselves,<sup>27</sup> so they cannot postpone or avoid asking for a physician to intervene.

### Clinical determinants

Our data also show that FAs of OOH services are more frequently frail, requiring home medical care, or dying within a year. Another study on OOH services<sup>10</sup> found an association between FAs and the prevalence of chronic diseases. As expected, our data indicate that

**Table 1** Univariate distribution of number of accesses to OOH primary care services in a year

Number of accesses	Absolute frequencies	Relative frequencies	Cumulative frequencies
1	13 690	77.53	77.53
2	2675	15.15	92.68
3	793	4.49	97.17
4	258	1.46	98.64
5	118	0.67	99.30
6	49	0.28	99.58
7	30	0.17	99.75
8	18	0.10	99.85
9	9	0.05	99.90
10	8	0.05	99.95
>10	9	0.05	100

**Table 2** Socio-demographic, organizational and environmental variables by FA status

	Variables	N	FA N (%)	P	
Socio-demographic characteristics	Sex	Male	8041	564 (6.9)	0.043
		Female	9276	717 (7.7)	
	Nationality	Italian	15 424	1144 (7.4)	0.270
		Not Italian	1891	127 (6.7)	
	Age group	0–1 y	805	105 (13.0)	<0.001
		2–14 y	3618	281 (7.8)	
		15–18 y	526	20 (3.8)	
		19–44 y	5076	248 (4.9)	
		45–64 y	3164	183 (5.8)	
		65–74 y	1434	99 (6.9)	
15–84 y		1490	158 (10.6)		
Number of exemptions for low income	0	7593	554 (7.3)	0.007	
	1	8492	600 (7.1)		
	2	873	77 (8.8)		
	3	272	27 (9.9)		
	4	80	11 (13.8)		
	5	7	2 (28.6)		
GP's form of organization and environmental characteristics	Distance from OOH	≤5 km	8438	658 (7.8)	0.013
		>5 km	8639	588 (6.8)	
	GP's shift	Only morning	3920	301 (7.7)	0.130
		Afternoon	1943	171 (8.8)	
		Evening	468	46 (9.8)	
	GP's organizational format	Base association	5941	499 (8.4)	0.002
		GP group	4016	260 (6.5)	
		GP Network	4098	292 (7.1)	
		No association	1207	88 (7.3)	
	GP's sex	Male	10 776	744 (6.9)	0.003
Female		6183	503 (8.1)		

**Table 3** Clinical characteristics by FA status

	Variables		N	FA N (%)	P
<b>Primary care services received</b>	Death within a year	No	16 033	1016 (6.3)	<0.001
		Yes	1 284	255 (19.9)	
	Physiotherapist at home	No	17 273	1260 (7.3)	<0.001
		Yes	44	11 (25.0)	
Nurse at home	No	16 133	1012 (6.3)	<0.001	
	Yes	1 184	259 (21.9)		
Physician at home	No	16 838	1146 (6.8)	<0.001	
	Yes	480	125 (26.1)		
<b>Exemptions from health care charges</b>	for disability	No	14 387	852 (5.9)	<0.001
		Yes	2 930	419 (14.3)	
	for visual or hearing impairment	No	17 249	1265 (7.3)	0.638
		Yes	68	6 (8.8)	
	for cerebrovascular disease	No	17 284	1269 (7.3)	0.778
		Yes	33	2 (6.1)	
	for cardiovascular disease	No	16 361	1185 (7.2)	0.043
		Yes	956	86 (9.0)	
	for respiratory disease	No	17 293	1267 (7.3)	0.080
		Yes	24	4 (16.7)	
	for diabetes mellitus	No	16 251	1154 (7.1)	<0.001
		Yes	1 066	117 (11.0)	
	for asthma	No	17 089	1252 (7.3)	0.562
		Yes	228	19 (8.3)	
	for chronic hepatitis	No	17 239	1265 (7.3)	0.905
		Yes	78	6 (7.7)	
	for multiple sclerosis	No	17 285	1266 (7.3)	0.072
		Yes	32	5 (15.6)	
	for psychiatric conditions	No	17 194	1249 (7.3)	<0.001
		Yes	123	22 (18.0)	
	for alcohol dependence	No	17 251	1266 (7.3)	0.941
		Yes	66	5 (7.6)	
	for liver or biliary cirrhosis	No	17 290	1268 (7.3)	0.452
		Yes	27	3 (11.1)	
	for ulcerative colitis or Crohn's disease (009)	No	17 273	1266 (7.3)	0.305
		Yes	44	5 (11.4)	
	for epilepsy	No	17 213	1261 (7.3)	0.372
		Yes	104	10 (9.6)	
	for chronic kidney disease	No	17 257	1266 (7.3)	0.767
		Yes	60	5 (8.3)	
	for hypercholesterolemia	No	17 133	1257 (7.3)	0.888
		Yes	184	14 (7.6)	
for hypertension	No	16 423	1169 (7.1)	<0.001	
	Yes	894	102 (11.4)		
for Basedow, other hyperthyroidism	No	17 257	1263 (7.3)	0.075	
	Yes	60	8 (13.3)		
for Parkinsonism	No	17 261	1269 (7.3)	0.279	
	Yes	56	2 (3.6)		
for neoplastic disease	No	16 161	1138 (7.0)	<0.001	
	Yes	1 156	133 (11.5)		
for Hashimoto's disease	No	17 129	1258 (7.3)	0.822	
	Yes	188	13 (6.9)		
for hypertension without damage	No	14 867	1065 (7.2)	0.029	
	Yes	2 450	206 (8.4)		
for arterial disease	No	17 237	1267 (7.3)	0.421	
	Yes	80	4 (5.0)		
for rare diseases	No	17 251	1264 (7.3)	0.308	
	Yes	66	7 (10.6)		

frail patients receiving medical care at home also need to access the OOH primary care system more frequently, whatever their single chronic condition. That is why we believe that OOH physicians should be involved in defining and implementing clinical pathways for such patients, and should be able to access their clinical data so that their OOH visits can be an integral part of a person-centered approach.<sup>28</sup>

Regarding the other clinical variables found associated with FA status, psychiatric conditions have been the most frequently analyzed in the literature. A number of articles have shown that, in general practice, 10% of FAs have emotional complaints<sup>20</sup> and 13% are registered as having a mental disorder.<sup>29</sup> When analyzing FAs of OOH services, den Boer-Wolters<sup>10</sup> also found a higher attendance

associated with a higher prevalence of psychiatric problems; the author showed that patients in the very FA group more often called the OOH service due to agitation, and they were more frequently referred to the acute mental health service. Psychological problems were also diagnosed more often in the FA group than in patients who were not FAs. In fact, psychological distress often prompts patients to contact health services.<sup>30</sup>

### *Determinants relating to how daytime primary care is organized*

Our study demonstrated that some aspects of how patients' daytime GPs operated were associated with OOH service FA status. This

**Table 4** Multilevel logistic regression results analyzing associations between predictor variables and FA status: estimated ORs and 95% CIs

		OR	[95% CI]	
Socio-demographic variables	Women (ref Men)	1.15	1.02	1.30
	Exemption due to low income	1.31	1.15	1.49
	Age	0.99	0.99	0.99
Process variables	Distance from nearest OOH (km)	0.91	0.80	1.04
Clinical variables	Patient on home physiotherapy program	1.28	0.62	2.66
	Patient on home nursing care program	2.22	1.74	2.84
	Patient on home medical care program	1.47	1.11	1.96
	Death registered within a year	2.30	1.80	2.92
	Exemption due to disability	1.91	1.56	2.32
	Exemption due to psychiatric conditions	2.78	1.73	4.49
	Exemption due to diabetes	1.14	0.90	1.44
	Exemption due to cardiovascular disease	0.91	0.70	1.19
	Exemption due to hypertension	1.07	0.82	1.41
	Exemption due to hypertension without damage	1.08	0.89	1.31
	Exemption due to neoplastic disease	0.93	0.74	1.17
	GP's organizational format	Female GP (ref male GP)	1.18	1.02
GP practice group (ref. No association or Base association)		0.92	0.77	1.11
Networking GP group (ref. No association or Base association)		0.84	0.69	1.02
Integrated GP practice group UTAP (ref. No association or simple association)		0.76	0.59	0.99
Random-effect parameter				
		<b>SD</b>		
Day-time GP_id		0.20	0.12	0.34

could be tested in our data because Italian GPs working in a group normally have their own list of patients, so each patient is assigned to a particular GP. We found that having a female GP was associated with patients having  $\approx 20\%$  higher odds of being FAs. This is not easy to explain, but it has been suggested that physicians who are women may attract the more challenging patients (who seek healthcare more often) because of their different attitude to their patients.<sup>31</sup> Some researchers have reported that female physicians engage significantly more in what can be considered a patient-centered form of communication.

Finally, our findings demonstrate, for the first time in the published literature, that forms of collaboration amongst GPs that involve different levels of continuity and availability of care being offered to patients during the day are associated with OOH service attendance. Group practices, and particularly integrated GP practice groups, would offer an advantage over single-handed practices in this sense [in addition to other advantages discussed in recent publications, such as a better-quality process and higher productivity, a greater appreciation of the doctors, a greater use of innovation and information and communication technology, and quality assurance].<sup>32</sup>

This study has several limitations. First of all, we did not consider diagnoses, but only disease-specific exemptions. The use of disease-specific exemptions from health care charges (awarded to patients subject to a specialist certifying to their diagnosis) could lead to an underestimation of patients with ongoing disease, tracking those with a longer history of disease instead. Our results should also be interpreted correctly since we compared FAs with other OOH service attenders, not with the general population. If the general population were chosen as the counterfactual group, the strength of the associations measured would be different, probably tending more away from the null hypothesis.

In conclusion, our study demonstrated that OOH service FA status is associated not only with patients' clinical conditions, but also with some of their socio-economic characteristics (including income level), and with the organizational format adopted by their GPs.

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## Key points

- Frequent attender (FA) status is associated with several socio-demographic features, including female gender and lower income.
- The clinical and functional picture of FA status is characterized by people with disabilities, frailty, or health issues that demand integrated home care services, patients who die within a year, and patients with mental disorders.
- FA status is more likely to be associated with patients whose GP is female and less likely if GP works in an UTAP.
- Such evidence of predictors of FA status may be useful in planning out-of-hours services according to a community-oriented primary care approach.

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