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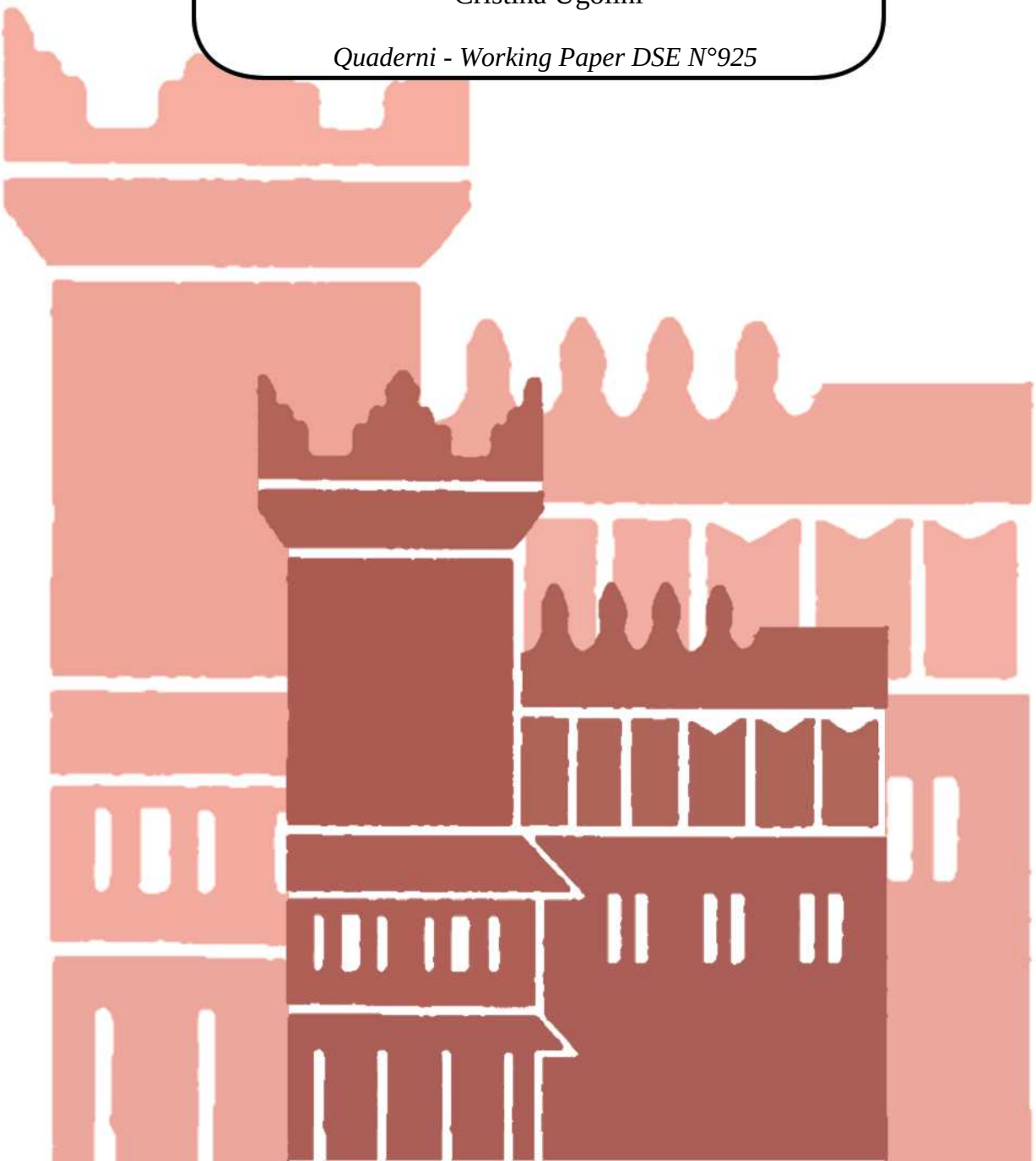

Dealing with minor illnesses: the link between primary care characteristics and First Aid Clinics' attendances

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ABSTRACT

The reformulation of existing boundaries between primary and secondary care, in order to shift selected services traditionally provided by Emergency Departments to community-based alternatives has determined a variety of organisational solutions aimed at reducing the ED overcrowding. One innovative change has been the introduction of fast-track systems for minor injuries or illnesses, whereby community care providers are involved in order to divert patients away from EDs. These facilities offer an open-access service for patients not requiring hospital treatments, and may be staffed by nurses and/or primary care general practitioners operating within, or alongside, the ED. To date little research has been undertaken on such experiences. To fill this gap, we analyse a First-aid clinic (FaC) in the Italian city of Parma, consisting of a minor injury unit located alongside the teaching hospital's ED. We examine the link between the utilisation rates of the FaC and primary care characteristics, focusing on the main organisational features of the practices and estimating panel count data models for 2007-2010. Our main findings indicate that the younger cohorts are heavy users of the FaC and that the extension of practice opening hours significantly lowers the number of attendances, after controlling for GP's and practice's characteristics.

Key words: Minor illness units, Emergency Departments, avoidable attendance, primary care, panel count data models.

JEL classification: I11, I18, C31

1. Introduction

A reorganisation of the boundaries between primary and secondary care in order to shift selected services traditionally supplied by hospitals to community-based providers, has attracted increasing interest from policymakers. This is of particular relevance for Emergency Departments (EDs), which are frequently required to treat conditions that could be effectively dealt with in less intensive settings. These concerns have led to a variety of measures designed to reduce ED overcrowding caused by such departments having to treat minor injuries and illnesses placing inappropriate demand on hospital services.

Patients seeking such inappropriate care are sometimes referred to as "primary care attenders" (Cooke et al., 2004), since they frequently use hospital ED services instead of ambulatory care centres, despite the fact that the latter would represent the more natural setting for treating non-severe conditions. Empirical studies (Roberts and Mays, 1998; Carson et al., 2010) suggest that increasing the continuity of primary care (for example, through the extension of practices' opening hours and the organisation of out-of-hours work), and expanding primary care-based emergency services, can reduce the number of primary care attenders. To this end, various initiatives have been introduced aimed at developing organisational innovations in order to reduce ED attendances for minor conditions. Such measures either involve community care, or are organized and financed by the hospitals themselves (e.g. the creation of special areas within ED wards for the treatment of minor injuries).

For the purposes of the present study, we focus on the introduction of fast-track systems for minor injuries or illnesses that employ primary care physicians and nurses rather than hospital staff. Although set up in differing institutional settings, these experiences arise from the common purpose to curb the rising number of primary care attenders. In general, such facilities offer an open access service to those patients who are deemed not to require specialist treatment within an acute general hospital setting.

Several countries have established primary care-based emergency services of this kind at various moments in time, and have adopted heterogeneous organisational and operational arrangements for such purpose. For instance, in the UK they have been operating for many years, but the recent removal of restrictions on nurses' scope of practice has resulted in the reorganization of the so-called "type 3" emergency services in two alternative organisational arrangements: Walk-in-Centres (WiCs) or Minor Injuries Units (MIUs). They are both staffed by emergency nurse practitioners working 24 hours a day, 365 days a year, but given that the MIUs

are located alongside, or next to, the emergency department, they also have potential access to the hospital's X-ray facilities (Carson et al., 2010). Similar experiences are well established in other countries as well, such as Australia, Canada and the USA, where WiCs have operated since the early 1970s, although they are usually run by doctors rather than by nurses (Jones, 2000).

For the purposes of the present work, henceforth we shall refer to these different arrangements for treating minor injuries and illnesses, either organised as separate centres or located within a hospital, as First aid Clinics (FaCs). There have been very few empirical studies of such experiences. From the scant evidence available, it would seem that such facilities are greatly appreciated by patients, while their effectiveness to date appears mixed (Cooke et al. 2004; Fisher et al. 2010; Martin et al. 2011; Chan et al. 2013), especially in terms of the threat to the continuity of primary care that such facilities could pose (Belle Brown et al. 2002), and in terms of the increasing duplication of services if patients use them during their GP's office hours (Szafran and Bell 2000; Dalum et al. 2013). Moreover, the few available empirical analyses concerning the impact of FaCs in government-funded health care systems, cover the UK and Canada only, and to the best of our knowledge very little is known about ongoing experiences elsewhere. However, due to the aforementioned limited nature of existing findings, these heterogeneous experiences are not easily generalizable so as to draw clear-cut policy recommendations based on best practices. A further limitation in the existing literature is the lack of attention to the link between the patterns of FaC utilisation and the organisation of GP services.

In this study we analyse the determinants of patients' utilisation of a primary care-based emergency service located in the Italian city of Parma: it is a FaC located alongside the University Hospital's ED, financed by the Local Health Authority (LHA) in order to absorb primary care attenders and allow the ED to concentrate on more severe cases.

This line of investigation is especially relevant from a policy perspective, since the design and organisation of primary care in the Italian NHS is aimed at ensuring an effective response to cases of minor injury within the GP system. The setting up of a FaC is seen as means of limiting the excessive (and costly) utilisation of ED wards in a context where patients may self refer to either source of care, but where ideally policymakers would prefer that minor conditions be treated by GPs. In this context, by identifying the main factors accounting for the high utilisation of FaCs, we can evaluate which characteristics of the practice contribute more to increasing/decreasing the number of visits to the FaC, and which types of patient group avail

themselves of the FaC's services more than others. A better understanding of these empirical patterns will help attempts to improve the organisation of the practice based system in order to ensure a comprehensive and effective response to patients' demand and to target any specific groups identified as primary care attenders.

Our contribution to the literature is threefold. Firstly, we examine a pilot experience in the Italian NHS, an institutional setting characterised by a composite form of governance where different levels of care interact to ensure access to public services, and where their multifaceted financing mechanisms affect providers' incentives and patients' utilisation patterns. Within this framework, the design of a balanced organisation of first aid services through the integration of primary, community and secondary care, has represented a key measure capable of improving the appropriateness of treatment settings. This is seen as an important step towards reconciling the strict public budget constraints, with the need to ensure universal access to healthcare services that are (almost) free at the point of demand. Secondly, we fill a gap in the literature by examining the link between the utilisation rates of FaCs and primary care, considering GPs and patients' characteristics jointly with the main organisational features of the practices. This allows us to establish which features contribute the most towards diverting demand away from GPs and in the direction of more intensive settings such as first aid clinics. This information may support policymakers in the design of effective policies for achieving the more appropriate utilisation of primary care. Thirdly, in the final section we extend our analysis by taking into account the influence on the determinants of FaC attendance rates, of the utilisation of ED wards which, as such, represent the natural alternative to the FaC when patients choose not to seek care from GPs. By doing so, we assess whether a more intensive use of first aid clinics is also correlated to a high degree of utilisation of hospital EDs, and to what extent the two alternative sources act as substitutes for patients registered with the same practice.

2. A primary care-based emergency service in Italy: the First-aid Clinic in Parma

Italy's health care system is represented by a regionally-based National Health Service (NHS) where central government establishes a national statutory benefits package to be offered to all citizens, and where regions are responsible for the organization and delivery of health services through the LHAs (Tediosi et al., 2009; De Belvis et al., 2012). Primary care services are delivered by independent contractors with the NHS and they are free of charge at the point of

need. Registration with a family physician is compulsory, and each physician has a maximum of 1500 registered patients.

Over the last ten years there has been increasing interest in improving the organisation of primary care, by addressing several aspects of its quality (Fiorentini et al., 2011) and through a specific emphasis, among other policy objectives, on a reduction in the numbers of referrals to EDs for non-severe conditions (Lega and Mengoni, 2008). The reasons for this interest can be found in the steady increase in ED visits throughout Italy, a relevant share of which are of the inappropriate kind. In accordance with these policy guidelines, wide-ranging organizational changes have been implemented in the field of primary care. These include ongoing initiatives designed to promote the extension of opening hours and out-of-hours care by GP groups and physicians' co-operatives, or to establish primary care centres able to provide a more comprehensive range of acute and chronic medical care, and minor injury units inside or near to hospitals. However, there is still little evidence of the impact that such interventions have had so far.

The present case-study focuses on an experience in the Italian city of Parma, situated in the centre-north of Italy. Parma LHA is subdivided into four Health Districts, each responsible for coordinating and providing primary care, non-hospital-based specialist medicine, residential and semi-residential care, within their respective geographical area. The largest Health District (District of Parma) covers the entire municipality of Parma, and delivers primary care to approximately 217,000 people through around 150 GPs, most of whom work in associated practices where GPs coordinate their work to some extent, for example by replacing one another in cases of absence. GPs working in such practices may also share the same premise, and if present, the same nursing staff (Fattore et al. 2009; Visca et al., 2013). Moreover, the Parma LHA provides those GPs already working in associated practices with additional remuneration if they arrange their opening hours in such a way as to ensure an overall daily coverage exceeding the minimum contractual standard of 6 hours and up to a maximum of 12 hours. This policy is designed to ensure that patients can access primary care services conveniently, thus reducing the likelihood of (inappropriate) ED attendances determined by the absence of primary care services right throughout the day. Besides these associated practices that focus on pooling resources to improve care provision, the LHA has created larger groups for better institutional coordination, insofar as all GPs operating in the same geographical sub-area are required to come together to form what are known as Primary Care Units (PCUs). The purpose of this is to ensure the mutual sharing of planning strategies and guidelines. One GP is

elected, from among those constituting the PCU, to be that unit's local coordinator, and as such the elected GP is responsible for providing information and data to the LHA, for briefing GPs on critical issues, and for generally acting as an interface between the LHA and primary care physicians. Furthermore, in order to favour the alignment of GPs' incentives to regional and local goals, the LHA may also introduce specific local programmes aimed, for instance, at increasing prescription rates of generic drugs, but also at the assumption of responsibility for chronic patients, such as diabetics or high-blood pressure sufferers (Iezzi et al. 2014).

In order to address the problems of the increasing number of inappropriate visits to the local University Hospital's ED, in 2003 Parma LHA also set up a FaC nearby the hospital, which is staffed by primary care or deputised physicians, who are employed by the LHA. The FaC is open daily from 8 a.m. to 8 p.m., for the treatment of non-severe conditions that cannot be deferred for a further 24/48 hours. Health care is provided by a team of eight clinicians supported by a nurse. The opening of the clinic was duly promoted among the local population and among GPs, by means of information leaflets sent to all GPs and to all LHA premises. Patients can access the FaC free of charge directly, either as an alternative to a visit to their GP, or outside of surgery hours, or they can be redirected there by the ED's front desk that has triaged the patient as non-urgent ("triage out"). Admission to Parma University Hospital for further specialist examination is always allowed, should the clinician diagnose an acute, urgent condition. As the FaC's catchment area is the municipal district, and all GP's premises are located within the same municipal area, geographical distance does not constitute a real barrier to accessibility to the different premises.

Table 1 summarises the FaC's workload for the period 2007-2010: the yearly number of visits is constantly around 24,000; 43% of patients used the clinic from 8am to 12am, 28% between 12am and 4 pm, and 29% after 4 pm. Children and elderly people were less likely to attend the clinic, while students and workers accounted for 76% - 80% of total attendances.

INSERT TABLE 1

The most common diagnosis was HEENT (head, eye, ear, nose, throat), 35%-39% of cases being accounted for by eye problems, and 13% - 17% of cases for ear, nose and throat problems. The remaining diagnoses included skin problems (9-12%) and insects bites and injuries (3-4%), whereas chronic conditions were infrequent (hypertension accounted for 0.36% of total visits, while no visits for diabetes were registered).

3. Identifying the main drivers of utilization

For the purposes of our empirical analysis, we exploit administrative datasets provided by the regional Department of Health. In particular, we merge data on annual FaC and ED attendances, with information regarding the characteristics of GPs and their practices, by means of a GP identifier. As the data for FaC attendance are aggregated at the level of the GP list, and we observe the number of FaC accesses by patients registered on each list, the unit of observation is the GP rather than the individual patient. The estimating sample includes observations for all the GPs operating in the Parma Health District over the 4-year period 2007-2010 (around 150 physicians). The main objective of our study is to investigate the determinants of the patterns of utilization, by residents, of the Parma District FaC , with a specific focus on the importance of the organisational features of primary care practices, once the individual characteristics of GPs and their registered patients have been accounted for.

Given the purposes of our analysis, we estimate an exponential conditional mean model for the count of FaC visits per GP list. Due to the evidence of over-dispersion in the data (the variance of the dependent variable is about 17 times the mean), we choose a Negative Binomial model rather than a Poisson model to get consistent estimates of the parameters of interest.

Count models for panel data allow for time-invariant, individual-specific effects that enter the conditional mean equation multiplicatively (Cameron and Trivedi, 2013). The individual effects can be assumed to be either independent of the regressors, or correlated with them.

In the random effect (RE) Negative Binomial model, the individual effects η_i are assumed to be uncorrelated with the covariates; the parameters of interest can be consistently estimated by Conditional Maximum Likelihood under specific distributional assumptions on the η_i (Hausman, Hall and Griliches, 1984).

The estimating RE NegBin model for FaC attendances is the following:

$$FaC_{it}=\exp(\ln(\text{list size})+ x'_{it}\beta+\ln(v_i)+e_{it}) \qquad (1)$$

where FaC_{it} is the number of visits to the First-aid Clinic by patients registered with GP *i* in year t; x is a vector of control variables, v_i is the time invariant GP-specific effect that is assumed to be i.i.d, such that it is treated as a stochastic error term, and e_{it} is an idiosyncratic error term; list size is the exposure variable in the model, such that the coefficient of ln(list size) is constrained to be equal to 1.

The RE estimator is efficient and enables the effect of time invariant regressors to be estimated; however, the estimates of the βs of the model in (1) are only consistent under the

strict assumption that there is no correlation between the individual-effect and the regressors in x.

The fixed effect (FE) model relaxes this assumption, and allows for a correlation between the individual effect and the regressors in the model. The empirical FE specification is the following:

$$FaC_{it}=\exp(\ln(\text{list size})+ \ln(\eta_i)+ x'_{it}\beta +\varepsilon_{it}) \quad (2)$$

where η_i is the individual effect potentially correlated with the variables in x, while list size is again an offset variable, and e_{it} is the idiosyncratic error.

We estimate the model in (2) as a conditional fixed-effect Negative Binomial model by Maximum Likelihood, as proposed in Hausman, Hall and Griliches (1984): this approach is the one most commonly followed in the empirical literature for NB FE estimation (e.g. Dusheiko and Gravelle, 2011).

It has been shown that the Conditional FE NegBin is not a true FE estimator, as it only removes time-invariant regressors under a very specific functional form for the η_i (Guimaraes, 2008). Therefore, differently from the standard FE estimators, in general it permits estimation of the parameters of the time-invariant regressors (Allison and Waterman, 2002). Furthermore, it does not suffer the incidental parameter problem in short panels (Cameron and Trivedi, 2013), and may be implemented in modern econometric softwares.

A Hausman test (1978) between random and fixed effects can be run in order to choose the preferred specification.

The regressors included in vector **x** are listed in Table 2, which also provides a definition of each variable and descriptive statistics for such. The control variables can be grouped into: (a) GP characteristics (GP male, GP seniority), (b) practice characteristics (GP coordinator, associated GP, Nursing staff, Extended opening, adherence to local programs), (c) list characteristics (Age groups in the list; Male patients, Foreign patients), (d) utilisation of emergency healthcare services (ED visits). As regards practice's characteristics, we take into account whether the GP acts as coordinator of his local PCU, whether the practice avails itself of nursing staff, and whether the GP belongs to a group practice, thus distinguishing between individual and associated practices. We add also two control dummies: one for GPs who coordinate the extension of surgery opening hours in order to provide daily coverage of up to 10-12 hours, and one for GPs' participation in local disease-management programmes promoting cooperative measures and compliance with clinical guidelines.

4. Empirical results

Table 3 presents estimates for equations (1) and (2), where the number of admissions to the FaC is regressed against the set of control variables illustrated in table 2, and the size of the list is included as an offset variable. Initially, our analysis abstracts from the alternative channels potentially capable of providing a response to patients' needs, namely the local Emergency Department or the GP, so that we do not include ED visits among the regressors. Overall, the IRRs indicate that even when statistically significant, the magnitude of the estimated impact of our covariates is, in general, of a modest entity. The signs of the coefficients are fairly robust between the FE and RE specifications, whilst some differences emerge in terms of the statistical significance of the estimated effects. Since with small sample it is not always possible to get results for the Hausman test, in our analysis we only obtain the test statistic for the model in Table 3. Given that in this case we fail to reject the null hypothesis of no significant difference between FE and RE estimates, preference should be given to the FE specification shown in equation (1).

In the FE model, GP seniority and the GP's position as coordinator, significantly affect the probability of visits to the FaC by registered patients, whereas these variables have no impact on the RE estimates. As for list characteristics, we observe that while the share of foreign patients significantly reduces the utilisation of the FaC in the FE model, and not in the RE one, the opposite holds true for the share of male patients. In the latter case, we observe a negative impact on the dependent variable in the RE specification but not in the FE specification. To evaluate the influence of age composition, we take patients aged 75 or over as the reference category. The only robust statistical difference emerges when we consider the youngest class (patients aged between 15 and 44) which positively affects the utilisation of FaC services in both specifications. As for the other age groups, we get a positive sign for the coefficient, which is weakly significant, in the FE model but not in the RE one. Such evidence is consistent with the widely-held belief that, other things equal, people of a younger age are keener to use fast-track channels for receiving treatment for non-serious conditions, than are older individuals. This is probably due to the higher opportunity cost of time to the former group, which discourages them from visiting their GP practice, with the longer waiting times this often entails.

The year dummies are in general not significant either, with the exception of year 2008 in the RE specification and of year 2010 in the FE specification, although in this latter case such

significance is only at the 10% level. These results indicate the lack of any marked time trend in utilisation patterns.

For an evaluation of the influence of primary care policies on the use of the FaC, it is particularly important to consider the impact of practices' organisational features. In the FE model we record a significant impact –albeit only at 10 % level- of the presence of a nurse, which reduces FaC attendance rates by 7%. Although working in association per se does not affect the use of FaC, patients registered with GPs whose association has agreed to coordinate opening hours to ensure daily coverage of up to 10-12 hours, record a significantly lower utilisation of the FaC. Our findings confirm that for non-severe conditions, an increased accessibility to GP services during the daytime helps significantly reduce the demand for alternative sources of assistance such as FaCs.

As patients may seek care for minor conditions not only from their GP or from the FaC, but also by attending the ED, it is also interesting to examine to what extent substitution patterns across these alternative sources of treatments affect FaC utilisation. Unfortunately, we have no data on the actual utilisation of GP services by patients; however, by matching information from hospital registers with databases on primary care, it is possible to include information on ED utilisation rates by patients registered with each GP operating within the Parma Health District. Table 3 provides estimates for the same equations (1) and (2) illustrated above, where the number of visits to the local ED not followed by hospitalisation is now included as an additional control variable. The new specification allows to evaluate the substitutability/complementarity between FaCs and EDs, and this represents a crucial issue from a policy perspective. Moreover, as regards the robustness of the other estimated effects, EDs utilisation may capture (part of) the unobserved heterogeneity associated with health care demand for non-severe conditions that bypasses the general practitioner. Such heterogeneity may stem from the different practice styles of GPs, or the idiosyncratic behaviour of patients, characterized by a diverse propensity towards using hospital or community-based services. From this perspective, it is important to evaluate whether the estimated impact of our set of controls is robust to the inclusion of ED attendances, as this allows us to assess whether, and to what extent, these unobserved factors may have influenced previous results.

We find that ED visits are negatively associated with FaC attendance in both the FE and RE specifications. Although the impact is significant, the magnitude of the estimated effect is extremely modest, and suggests that the degree of substitution between ED and FaC centres is limited, at least when measured at list, rather than individual, level.

As for the other variables, the results closely reflect the findings previously discussed. They confirm that the organisational features of the practice are more important than the GP's characteristics in determining FaC utilisation. In particular, patients enrolled with GPs who act as coordinators, and who belong to groups extending surgery opening hours, display lower FaC utilisation rates even after controlling for access to emergency wards. The estimated reduction in the probability of FaC visits for practices that extend their opening hours amounts to around 8%. The results are in line with previous estimates also for age groups and for the share of foreign patients. Significant differences from the reference category (patients over 75) are only found in the case of the 15-44 age category: a high proportion of patients belonging to this group in the GP list are associated with a significantly higher use of the FaC, while the opposite holds for the share of foreigners, a result which is consistent with the healthy immigrant hypothesis (Razum et a., 2000).

5. Conclusions

We have examined the link between attendance of a First aid Clinic for the treatment of minor illnesses located in the district of Parma (Italy), and the main characteristics of the local primary care system. We considered the case of a medium-sized Italian city where a FaC financed by the Local Health Authority was opened near to the local University Hospital, in order to treat patients affected by minor conditions. The targeted users are individuals who, suffering from minor conditions, do not seek care from their GP, and would otherwise self-refer to the hospital's Emergency Department, an event which would increase the cost of treatment and contribute towards hospital overcrowding.

The purpose of our study was to identify the main determinants of the FaC's utilisation in relation to the organisation of primary care. We have taken the GP as our unit of observation, and we have estimated both FE and RE count data models considering the number of visits to the local FaC by patients registered with each GP operating in the District, as our dependent variable. Our main findings suggest that the GP's individual characteristics do not seem to significantly affect attendance rates. From a policy perspective, the most relevant finding concerns the extension of practice opening hours: GPs working in a group practice offering longer opening hours, record a significantly lower number of visits compared to the FaC in each specification. This finding would seem to imply that extended accessibility to primary care services actually reduces self-referrals to the FaC, with an estimated reduction in attendance probability of around 8%. Other organisational features, such as the presence of nursing staff in

the practice or the GP acting as group coordinator, only affect attendances rates in certain specifications, and often only to a weakly significant effect. Furthermore, we have shown that the results are robust to the introduction of ED attendance rates as a control variable. We find evidence of a statistically significant substitution effect between the FaC and the ED, although its magnitude is modest when measured at list level list.

As for patients' socio-demographic characteristics, we consistently identify those aged less than 44 as relatively heavy users of the FaC, thus suggesting the need for targeted policies to improve their utilisation of primary care.

Overall, our findings confirm the importance for policymakers of identifying those features of the organisation of primary care that make the greatest contribution to ensuring the effectiveness of primary care physicians' gatekeeping role. This highlights the need for greater access to GP services during the day time, as an important means to ensure that patients – in particular the younger cohorts - affected by minor conditions, seek responses in low-intensity settings such as primary-care practices.

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Table 1- FaC's Workload: distribution of visits across times of the day and age composition of patients.

TOTAL VISITS First-aid Clinic	**2007**	**2008**	**2009**	**2010**	**Total**
Total	**23637**	**24850**	**23914**	**23583**	**95984**
TIME OF THE DAY	**2007**	**2008**	**2009**	**2010**	**Total**
8am-12am	43%	44%	43%	43%	41.347
12am-4pm	28%	28%	28%	28%	27.024
4pm-8pm	29%	27%	29%	30%	2.713
Total	100%	100%	100%	100%	95.984
AGE CLASS	**2007**	**2008**	**2009**	**2010**	**Total**
Not available	0%	0%	0%	0%	120
<15	2%	2%	3%	4%	2.817
15-44	57%	55%	52%	51%	51.264
45-64	23%	24%	25%	25%	23.241
65-74	10%	10%	11%	11%	9.953
Over 75	8%	8%	9%	9%	8.229
Total	100%	100%	100%	100%	95.984

Table 2 - Descriptive statistics

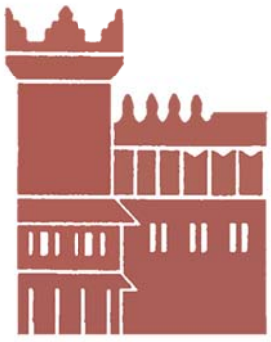
VARIABLE	**DEFINITION**	**Mean**	**SD**
FaC visits	Number of visits to the FaC per GP	101.886	43.19
ED'visits	Number of visits to the ED per GP	214.67	72.88
GP Male	= 1 if GP is male	0.79	0.41
GP seniority	Years of activity within the NHS	21.12	8.41
GP Coordinator	= 1 if GP has a coordination role	0.83	0.38
Associated GP	= 1 if GP works in a network or in a group	0.81	0.39
Nursing staff	= 1 if the practice avails of a nurse	0.27	0.44
Extended opening hours 10-12	= 1 if the practice extends opening hours > 9 hours per day	0.26	0.44
Adherence to local programs	= 1 if GP participates in local programs	0.75	0.43
List size	= no. of patients enrolled in the GP list	1240.49	355.98
Age group 15-44 (% list)	% of patients aged 15-44 in the GP list	43.9	8.43
Age group 45-64 (% list)	% of patients aged 45-64 in the GP list	29.88	4.18
Age group 65-74 (% list)	% of patients aged 65-74 in the GP list	12.52	3.13
Age group over 75 (% list)	% of patients aged over 75 in the GP list	0.14	0.05
Male patients (% list)	% of male patients in the GP list	46.85	4.21
Foreign patients (% list)	% of foreign patients in the list	8.07	6.83
Observations		589	

Table 3 – FE and RE estimates for the model not including ED visits

No. of visits to the First-aid Clinic for GP	*Fixed effects*			*Random effects*		
	Coefficient (SD)	***p value***	***IRR***	***Coefficient (SD)***	***p value***	***IRR***
GP Male	0.36430 (0.327)	0.265	1.43951	0.10565 (0.117)	0.365	1.11143
GP seniority	0.07050 (0.022)	0.001	1.07305	0.00566 (0.006)	0.304	1.00568
GP Coordinator	-0.04706 (0.025)	0.055	0.95403	-0.03543 (0.024)	0.148	0.96519
Associated GP	-0.02950 (0.047)	0.528	0.97093	-0.05780 (0.042)	0.164	0.94384
Nursing staff	-0.07142 (0.043)	0.093	0.93107	-0.05680 (0.040)	0.157	0.94478
Extended opening hours 10-12	-0.08563 (0.026)	0.001	0.91794	-0.09108 (0.026)	0.000	0.91294
Adherence to local programs	0.02227 (0.041)	0.583	1.02252	0.00235 (0.037)	0.950	1.00235
Age group 15-44 (% list)	0.04530 (0.012)	0.000	1.04634	0.02737 (0.008)	0.001	1.02774
Age group 45-64 (% list)	0.02090 (0.012)	0.085	1.02112	0.00354 (0.010)	0.722	1.00354
Age group 65-74 (% list)	0.02369 (0.014)	0.092	1.02398	0.00651 (0.013)	0.610	1.00653
Male patients (% list)	0.00585 (0.013)	0.663	1.00587	-0.02088 (0.009)	0.023	0.97934
Foreign patients (% list)	-0.01716 (0.008)	0.028	0.98298	-0.00839 (0.006)	0.147	0.99165
Year 2008	0.03192 (0.032)	0.314	1.03244	0.07654 (0.021)	0.000	1.07955
Year 2009	-0.06347 (0.054)	0.242	0.93851	0.04067 (0.027)	0.127	1.04151
Year 2010	-0.13861 (0.078)	0.074	0.87056	0.01577 (0.035)	0.649	1.01590
Constant	-6.86083 (1.078)	0.000	0.00105	-2.69750 (0.779)	0.001	0.06737
Ln List size (exposure)	1		1	1		1
/ln_r				2.24107 (0.156)		
/ln_s				1.90651 (0.136)		
r				9.40340 (1.468)		
s				6.72955 (0.918)		

Table 4 – FE and RE estimates for the model including ED visits

No. of visits to the First-aid Clinic for GP	*Fixed effects*			*Random effects*		
	Coefficient (SD)	***p value***	***IRR***	***Coefficient (SD)***	***p value***	***IRR***
ED'visits	-0.00078 (0.000)	0.017	0.99922	-0.00068 (0.000)	0.012	0.99932
GP Male	0.22534 (0.348)	0.517	1.25275	0.05962 (0.120)	0.620	1.06143
GP seniority	0.05492 (0.023)	0.016	1.05645	0.00537 (0.006)	0.339	1.00538
GP Coordinator	-0.05208 (0.025)	0.035	0.94925	-0.03949 (0.024)	0.102	0.96128
Associated GP	-0.02502 (0.046)	0.589	0.97529	-0.04947 (0.041)	0.231	0.95173
Nursing staff	-0.06633 (0.043)	0.124	0.93582	-0.05181 (0.040)	0.194	0.94951
Extended opening hours 10-12	-0.08600 (0.026)	0.001	0.91760	-0.08758 (0.025)	0.001	0.91614
Adherence to local programs	0.02567 (0.041)	0.527	1.02600	0.01026 (0.037)	0.782	1.01032
Age group 15-44 (% list)	0.04801 (0.012)	0.000	1.04918	0.02904 (0.008)	0.000	1.02946
Age group 45-64 (% list)	0.02012 (0.012)	0.099	1.02032	0.00351 (0.010)	0.721	1.00352
Age group 65-74 (% list)	0.02200 (0.013)	0.121	1.02224	0.00791 (0.013)	0.532	1.00794
Male patients (% list)	0.00396 (0.014)	0.760	1.00397	-0.01707 (0.009)	0.063	0.98307
Foreign patients (% list)	-0.01973 (0.008)	0.012	0.98046	-0.00961 (0.006)	0.096	0.99043
Year 2008	0.06295 (0.034)	0.066	1.06497	0.08958 (0.022)	0.000	1.09372
Year 2009	-0.00162 (0.060)	0.978	0.99838	0.06546 (0.028)	0.021	1.06765
Year 2010	-0.07556 (0.032)	0.356	0.92722	0.02804 (0.035)	0.424	1.02844
Constant	-6.26937 (1.110)	0.000	0.00189	-2.69537 (0.775)	0.001	0.06752
Ln List size (exposure)	1		1	1		1
/ln_r				2.24511 (0.160)		
/ln_s				1.82318 (0.138)		
r				9.44148 (1.511)		
s				6.19149 (0.852)		



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