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COVID-19 and the appointment system in general practice in Belgium: results from the cross-sectional PRICOV-19 study

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Abstract

For infection prevention and control (IPC), the patient flow management in general practices during the COVID-19 pandemic asked for an important change. This study examined how Belgian general practices organised their appointment system during COVID-19 and its association with practice characteristics. Using the online PRICOV-19 survey, data collection took place in 2020-2021 in 481 practices. Five survey items were selected as outcome variables in the chi-square and logistic regression analyses. The results showed that group practices, compared to single handed and duo practices, were more likely to inform patients on their website about the symptoms with which not to come to the practice (Odds Ratio 3.742) and were less likely to have walk-in consultations (OR 0.253). As opposed to rural-, big city- and suburb practices, practices in mixed urban-rural areas were less likely to ask for a reason for encounter when patients made an online appointment (OR 0.532) or an appointment by phone (OR 0.448). Also rural practices were less likely to ask for a reason for encounter when patients made an online appointment (OR 0.323) in opposition to practices in bigger areas. If the infection risk was unclear, both practices in mixed urban-rural areas (OR 0.594) and rural areas (OR 0.197) were less likely to always call patients beforehand to verify this compared to practices in urban areas. Practices with a secretary more often asked for a reason when making an appointment by phone (OR 1.982). Further research on barriers to withholding general practices from implementing IPC adjustments to their appointment system is essential to inform future policy interventions.

Keywords: COVID-19; general practice; primary care; infection prevention and control; quality of care; patient safety; appointment system; PRICOV-19

Introduction

The scale of the COVID-19 pandemic put much pressure on medical care, with a shift in focus to acute care for COVID-19. Hereby, general practitioners (GPs) played a key role in being the first point of access to healthcare (1). In Belgium, GPs supported case finding for COVID-19 patients who did not need acute care. GPs co-operated to coordinate local first-line triage centres to provide diagnosis, care, and hospital referral for the right patients. The centres were accessible following a telephone triage. It was then possible to first create a safe environment for GPs to examine patients with suspected COVID-19 pathology, to optimise the use of scarce protective equipment and, also, to prevent emergency room overflow (2).

The overwhelming amount of information and rapidly changing policy guidelines led to much stress for GPs as they had to adapt their working methods quickly (3). In addition to the rapid organizational shift for COVID-19-related acute care, chronic care and other regular care concerns persisted. Apart from organising the local triage centres, GPs had to adjust their own practice organisation to prevent the spreading of COVID-19 and to protect themselves and their patients (4). Adapting to the new situation was even more difficult for GPs as throughout the first weeks of the pandemic, GPs faced a shortage in personal protective equipment (PPE) (3).

Several European countries and also in Belgium, GPs experienced a decrease in face-to-face appointments, mainly a decrease in chronic and preventive care and an increase in remote consultations (i.e., video, telephone, or e-mail) (1, 4-12). In Belgium, there was a decrease of 45% in physical consultations during the first weekend of the initial COVID-19 outbreak (4). Patients were advised to contact their GP by phone, which made it more difficult for the GPs to evaluate their patients (12). More than 70% of consultations in March 2020 were telephone consultations (3). Due to the reduced

consultation numbers, some studies report a reduced income, as most practices in Belgium work with a fee-for-service payment system (10, 12). They also had to update their website regularly with health advice concerning COVID-19 and read the news and papers to stay informed. Besides, they had more administrative work than in the pre-COVID era (11).

Several authors have studied the impact of COVID-19 on the GP practice organisation, focusing on the use of remote consultations, number of consultations, reasons for encounter, …(1, 3-5, 9, 11-15). However, there is a lack of research concerning adapting the appointment system of GPs during COVID-19 in relation to practice characteristics. Also, studies on the appointment system in GP practices during other pandemics or epidemics were scarce. With this information, further research can be done into the relationship between adjusting the appointment system and infection rate among GPs, their staff and their patient population.

Against this background, this paper aims to examine (i) the appointment system in Belgian GP practices during COVID-19, including (ii) its association with practice characteristics. Using a cross-sectional design, we can analyse which types of practices might need better support in adapting to a safe appointment system. This makes it possible to make proactive adjustments in times of high incidence of other infectious diseases, epidemics or pandemics.

Methods

Study design and setting

In this study, the Belgian data of the PRICOV-19 study is used. The PRICOV-19 study aimed to research how GP practices were organized during the COVID-19 pandemic, how the practices aimed to ensure high-quality care, how the pandemic affected the well-being of GPs, how their tasks shifted and whether differences between different types of practices and healthcare systems are visible (16).

During the summer of 2020, an international consortium was formed to set up the PRICOV-19 - a multi-country, cross-sectional - study. The consortium consisted of more than 45 European research institutes, and the research unit 'Equity in Healthcare' at Ghent University (Belgium) coordinated the study. Data collection took place in 37 European countries plus Israel. The Belgian data collection took place in the three regions (Flemish Region, the Brussels-Capital Region and the Walloon Region).

Measurement

Data collection took place using an online survey conducted in GP practices using the REDCap platform (17). The development of the survey took place at Ghent University in multiple phases with, among others, a pilot study among 159 Flemish GP practices (Belgium). The study protocol details are published elsewhere (16). The 53 survey items focused on six topics: patient flow; infection prevention; information processing; communication; collaboration and wellbeing; and practice and participant characteristics. For the variable on the practice location, the division was made based on population density in the relevant municipality based on the postal code (18).

Sampling and recruitment

The GP practices were selected through a pre-defined recruitment process. Only one survey was completed per practice, mostly by a GP. The sample was recruited between December 2020 and August 2021. Therefore, a list of the 'National Institute for the Sickness and Invalidity Insurance' was used to take a random sample of 1477 practices. There was an exclusion of GPs that were qualified as GP before 1980, eliminating retired GPs or GPs with limited patient contact. The selected practices were asked to participate in the study through a standardized procedure. This included contact attempted via telephone and e-mail leading to the participation of 370 practices (response rate of 25,1%). There was an additional sample of 134 GP practices recruited through professional and personal contacts of the research teams involved, so another 109 practices filled in the survey (response rate of 81,3%). Consequently, the total response rate was 29.8% (n = 481).

Data cleaning and analysis

Data cleaning and statistical analysis were performed on the Belgian PRICOV-19 database using SPSS Statistics for Windows, version 28.0 (IBM Corp., Armonk, N.Y., USA). The five survey items that contain the appointment system and that do not relate to remote consultations have been selected as outcome variables: patients stating a reason when making an online appointment or appointment by phone, calling patients beforehand if infection risk is unclear when making an online appointment, patients get to see a message about which complaints they may (not) bring to the practice, and finally, whether there were walk-in hours. The considered explanatory characteristics of the practices are: the number of GPs (independent of employment rate) (i.e., solo, duo, group (at least three GPs)), mono- or multidisciplinary practice, practice location (referring to big (inner)city, suburbs, mixed urban-rural, or rural), the

availability of a GP trainee (yes or no) and finally, the availability of secretary or administrative assistant (yes or no).

To define the multidisciplinarity of the practice team, a new variable was constructed to distinguish between mono- and multidisciplinary practices. Therefore, all different disciplines apart from GP and GP trainee were summed per practice, including dietician or nutritionist, health promotor, physiotherapist, manual therapist, osteopath, social worker, podiatrist, psychologist, and nurse or nurse assistant. If a practice included one or more of these paramedical disciplines, and thus if the sum was one or more, they were labelled as multidisciplinary. Monodisciplinary practices refer to practices where this sum was zero. During the data cleaning, the answer options of 'I do not know' or 'not applicable' were considered invalid. Regarding the outcome variable on patients who made an appointment and where it is unclear whether they pose a risk of infection are called beforehand to verify this, the original answer options were recoded into always and not always (i.e., never, rarely, sometimes, and usually).

Since all variables are categorical, a description of practice characteristics and the outcome variables was done using absolute numbers and valid percentages (Table 1, 2). In addition, chi-squared analysis was performed to investigate the relationship between variables with $p < 0.05$ considered statistically significant. Logistic regression models were also used with $p < 0.05$ to determine the associations between the appointment system measures and practice characteristics (Table 3).

Ethical considerations

The study was conducted according to the guidelines of the Declaration of Helsinki. The Research Ethics Committee of Ghent University Hospital approved the protocol

of the PRICOV-19 study and Belgian data collection (BC-07617). All participants gave informed consent.

Results

Descriptive statistics

The analysis included 481 Belgian practices whose profiles are described in Table 1. Almost half of the respondents were organized in group practices (43.2%) and one-third in solo practices (37.3%). Almost three-quarters (70.9%) worked in monodisciplinary practices, implying that no paramedical was associated. Almost equal proportions were located in big (inner) city (42.8%) and mixed urban-rural (39.6%) areas. Two-fifth of the practices had a GP in training (39.1%), and almost half had a secretary or administrative assistant (45.7%).

Table 1: a description of the sample based on practice characteristics (n = 481)

	n	%
Number of GPs		
Solo	178	37.3
Duo	93	19.5
Group (>2 GPs)	206	43.2
Number of disciplines		
Monodisciplinary	341	70.9
Multidisciplinary	140	29.1
Practice location		
Big (inner-)city	204	42.8
Suburbs	44	9.2
Mixed urban-rural	189	39.6
Rural	40	8.4
Availability of a GP trainee		

Yes	188	39.1
No	293	60.9
Availability of secretary, administrative assistant		
Yes	220	45.7
No	261	54.3

GP = general practitioner

Multidisciplinary = practices with one of following extra disciplines apart from GP: dietician or nutritionist, health promotor, physiotherapist, manual therapist, osteopath, social worker, podiatrist, psychologist, and nurse or nurse assistant

Patients must state a reason when making an appointment at the practice (online or by telephone)

A description of the outcome variables is shown in Table 2. When making an online appointment, 68.2% of the patients must state a reason when they wanted to come to the practice. Using logistic regression, the practice location was a predictor for having to state a reason when making an online appointment. Mixed urban-rural (OR 0.532) and rural (OR 0.323) practices opposed to big (inner) city and suburb practices were less likely to have to state a reason when making an online appointment ($p < 0.05$).

When patients wanted to make an appointment by phone, 85.4% had to state a reason. There is a correlation between the location of the practice and having to state a reason when making an appointment by phone: $\chi 2 = 9.586$ ($p < 0.05$). Practices in rural areas had to state a reason in 94.4% of the practices, whereas in mixed urban-rural areas, this is only 79.4%. In logistic regression models, having a secretary and the place of the practice were significant predictors. Having to state a reason was more likely in practices with a secretary than in practices without (OR 1.982, $p < 0.05$). Practices in mixed urban-rural areas were less likely to ask for a reason when making an appointment by phone than practices in big (inner)cities, suburbs, or rural areas (OR 0.448, $p < 0.01$).

When patients want to make an online appointment for this practice, they are shown a message informing them about which complaints they may (not) bring to the practice

The vast majority of the practices (81.5%) showed a message informing patients about which complaint they may (not) bring to the practice. There was a correlation between the presence of a secretary, administrative assistant and getting a message: $\chi 2 = 6.935$ ($p < 0.01$). Most of the practices (87.9%) that have a secretary showed a message, where only 75.5% of the practices without a secretary showed the message. There was also a correlation between the number of GPs and showing an informative message: $\chi 2 = 16.021$ ($p < 0.001$). In group practices, 89.0% of the practices showed a message where only 66.7% of solo practices showed the message. Using logistic regression, the number of GPs working in practice was a positive predictor for showing a message when making an online appointment. Group practices were more likely to show the message than solo- or duo practices (OR 3.742, $p < 0.01$).

Patients who made an appointment and where it is unclear whether they pose a risk of infection are called beforehand to verify this

When infection risk was unclear, 28% of the practices always call the patients to verify this beforehand. There was a correlation between multidisciplinarity and calling patients beforehand: $\chi 2 = 16.406$ ($p < 0.01$). Of the multidisciplinary practices, 37% always called, compared to monodisciplinary practices, of which only 24.2% always called. There was also a correlation between the presence of a secretary/administrative assistant and calling patients beforehand to verify the infection risk: $\chi 2 = 32.319$ ($p <0.001$). In practices without a secretary, 22.3% of the practices always called as opposed to when there is a secretary, 34.3% of practices always called. Third, there was a correlation between the number of GPs and calling patients beforehand when infection risk is unclear: $\chi 2 = 33.151$ ($p <0.001$). In solo practices, 23.3% of the

practices always called as opposed to in group practices 31.6% always called. Using logistic regression the place of the practice was an explanatory variable. Mixed urban-rural (OR 0.594, $p < 0.05$) and rural (OR 0.197, $p < 0.01$) practices were both less likely to always call a patient beforehand if infection risk is unclear as opposed to big (inner)city and suburb practices.

In this practice, do you currently have walk-in hours where patients can walk in for a consultation without an appointment?

Only 6.4% of the practices still had walk-in consultations. Using logistic regression, group practices were less likely to have walk-in consultations than solo- or duo practices ($p < 0.05$) (OR 0.253).

Table 2: a description of the outcome variables on the appointment system in general practice during COVID-19

	n	Valid percent %
Patients must state a reason when making an online appointment at the practice		
Yes	191	68.2
No	89	31.6
Patients must state a reason when making an appointment by phone		
Yes	387	85.4
No	66	14.6
When patients want to make an online appointment for this practice, they are shown a message informing them about which complaints they may (not) bring to the practice		
Yes	224	81.5
No	51	18.5

Patients who made an appointment and where it is unclear whether they pose a risk of infection are called beforehand to verify this.		
Always	119	28.0
Not always	306	72.0
In this practice, do you currently have walk-in hours when patients can come in for a consultation without making an appointment?		
Yes	30	6.4
No	437	93.6

Table 3: Logistic regression: significant values, including Wald value, significance and odds ratio (OR)

	Wald	Sig.	OR
Patients must state a reason when making an online appointment at the practice			
Practice location			
Mixed urban-rural area	4.409	0.036	0.532
Rural area	5.138	0.023	0.323
Patients must state a reason when making an appointment by phone			
Availability of secretary, administrative assistant			
Receptionist/administrative assistant present	3.925	0.048	1.982
Practice location			
Mixed urban-rural area	7.135	0.008	0.448
When patients want to make an online appointment for this practice, they are shown a message informing them about which complaints they may (not) bring to the practice			
Number of GPs			
Group practices	8.480	0.004	3.742

Patients who made an appointment and where it is unclear whether they pose a risk of infection are called beforehand to verify this.			
Practice location			
Mixed urban-rural area	4.535	0.033	0.594
Rural area	8.408	0.004	0.197
In this practice, do you currently have walk-in hours when patients can come in for a consultation without making an appointment?			
Number of GPs			
Group practices	4.455	0.035	0.253

Discussion

Summary of the findings

This paper aimed to examine the appointment system in Belgian GP practices during COVID-19 and its association with practice characteristics. Group practices, in contrast to solo and duo practices, were more likely to inform patients on their website about the symptoms that should prohibit them from coming to the practice when making an online appointment. They were also less likely to have walk-in consultation hours. Using logistic regression analyses, multidisciplinary practices were not significantly more likely to perform infection prevention measures than monodisciplinary practices. As opposed to practices in big (inner)cities and suburbs, practices in mixed urban-rural areas were less likely to ask for a reason when patients are making an online appointment, they were also less likely to ask for a reason when patients made an appointment by phone. Practices in rural areas were less likely to ask for a reason when patients made an online appointment than urban practices. If the infection risk was unclear, practices in mixed urban-rural areas were less likely to always call a patient beforehand and practices in rural areas were less likely to always

call beforehand as opposed to practices in big (inner)cities and suburbs. Having a GP trainee was not related to IPC measures. Practices with a secretary were more likely to ask for a reason when making an appointment by phone and there was also a correlation between a secretary and showing a message informing patients about which complaint they may (not) bring to the practice.

The more frequent adoption of safe practice measures by group practices versus solo or duo practices was also seen in Gaal's research. Gaal et al. researched safety features in general practice in pre-COVID era in multiple European countries in relation to practice characteristics, where they reported that larger practices were more likely to take safe practice measures. However, the measures did not concern the appointment system and were not during a pandemic (19). It is a possibility that smaller practices with less colleagues within the practice, practices with no administrative help and practices in areas with GP shortage have more difficulties during periods of high infection rate to take the time to make safe practice adjustments. Eisele et al. examined lessons to be learned from the swine flu (H1N1) and EHEC outbreak. Their main suggestion in practice/consultation organisation is to split patient flows and perform telephone triage, but further specifications concerning the appointment system are lacking (20). According to Saint-Lary et al. one in four GPs offered unscheduled appointments before the pandemic. During the pandemic, one-third chose to cancel them and one-third adapted them to the epidemic wave, implying that the last-third continued with these unscheduled appointments (11), there was no research on the correlation with practice characteristics. Verhoeven et al. who conducted qualitative interviews with Flemish GPs during the initial phase of the pandemic showed that primary contact was by telephone and online agendas were either closed or restructured to discriminate between respiratory and other complaints (12). This paper

demonstrated that only 6.4% of the practices still had walk-in consultations, a comparison can still be made between before the pandemic and after the pandemic to evaluate. In the context of implementing these adjustments, protocols can be written by professional or governmental associations and be distributed to and implemented in the daily organization of general practices. When communicating these protocols, it is important that there is one clear, easily accessible, government-driven guideline. GP associations can discuss the theme during their continuing education programmes and encourage each other to make adjustments (following the - mentioned above - protocol) and share good practice.

With the spreading of these results, GP practices can be made aware of the adaptations that are needed for IPC during a period of high infection rate. More qualitative research is needed to investigate which barriers prevent GPs from implementing these IPC adjustments in their appointment system and to investigate which practices need to be guided in taking measures and how they can be supported in doing so. Further research is also crucial to investigate adaptations that can be made within the appointment system to improve separating consultations with possible infectious diseases from others. The effect of adjusting the appointment system on the infection rate among GPs, their staff and patient population can also be researched. In this way, there may be evidence to support the need to adapt the appointment system. Further research can also be done into the relationship between quality of care indicators, practice characteristics and the willingness of practices to adjust their appointment system or take other IPC measures. A comparison over time can also be made post-pandemic or during other pandemics.

Strengths and limitations

The five-stage development of the PRICOV-19 questionnaire and its validation are strengths of the study. There is also a large sample size and a broad scope of respondents with a high response rate of overall 29.8%. Furthermore, the composition of the sample across the three regions is very similar to the distribution of the number of practices across Belgium, implying that the sample is representative for this criterion. Data collection took place over a period of nine months, including the second and third wave of the pandemic (21), but no distinction was made between the different waves of the pandemic. Several IPC measures could have been initiated in different moments during the pandemic. 109 practices were selected through personal and professional contacts, this creates a self-selection bias. The cross-sectional study design prohibits examining causal relationships between COVID-19 and the adjustments in the appointment system. There is no information of using the IPC measures concerning the appointment system before the COVID-19 pandemic.

Conclusion

In this paper, we investigated the appointment system during COVID-19 in relation to practice characteristics. Group practices versus solo- and duo practices, practices in big (inner)cities and suburbs versus practices in mixed urban-rural and rural areas and practices with a secretary versus practices without a secretary were more likely to initiate IPC measures. In future pandemics, adequate governmental support with providing IPC protocols or adequate identification and guiding of practices who are less likely to take measures to adjust their appointment system might improve the overall implementation of IPC measures and might decrease GP-, staff- and patient infection rate.

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