

The implementation of remote consulting in UK primary care following the COVID-19 pandemic: a mixed-methods longitudinal study

Mairead Murphy (✉ mairead.murphy@bristol.ac.uk)

University of Bristol <https://orcid.org/0000-0002-3550-2727>

Lauren Scott

National Institute for Health Research Applied Research Collaboration West <https://orcid.org/0000-0003-3129-5123>

Chris Salisbury

University of Bristol <https://orcid.org/0000-0002-4378-3960>

Andrew Turner

National Institute for Health Research Applied Research Collaboration West

Anne Scott

University of Bristol

Rachel Denholm

NIHR Bristol Biomedical Research Centre, University of Bristol <https://orcid.org/0000-0002-8067-5440>

Rhys Lewis

One Care

Geeta Iyer

Bristol North Somerset and South Gloucestershire CCG

John Macleod

University of Bristol <https://orcid.org/0000-0001-8202-1144>

Jeremy Horwood

National Institute for Health Research Applied Research Collaboration West <https://orcid.org/0000-0001-7092-4960>

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Abstract

Background: To reduce contagion of COVID-19, in March 2020 UK general practices implemented predominantly remote consulting via telephone, video or online consultation platforms.

Aim: To investigate the rapid implementation of remote consulting and explore impact over the initial months of the COVID-19 pandemic.

Design and Setting: Mixed-methods study in 21 general practices in Bristol, North Somerset and South Gloucestershire.

Methods: *Quantitative:* Longitudinal observational analysis comparing volume and type of consultations in April-July 2020 with April-July 2019. Negative binomial models were used to identify if changes differed amongst different groups of patients. *Qualitative:* 87 practice staff longitudinal interviews in four rounds investigated practices experience of the move to remote consulting, challenges faced and solutions. A thematic analysis utilised Normalisation Process Theory.

Results: There was universal consensus that remote consulting was necessary. This drove a rapid change to 90% remote GP consulting (46% for nurses) by April 2020. Consultation rates reduced in April-July 2020 compared to 2019; GPs/nurses maintained a focus on older patients, shielding patients and patients with poor mental health. Telephone consulting was sufficient for many patient problems, video consulting was used more rarely, and was less essential as lockdown eased. SMS-messaging increased more than three-fold. GPs were concerned about increased clinical risk and some had difficulties setting thresholds for seeing patients face-to-face as lockdown eased.

Conclusions: The shift to remote consulting was successful and a focus maintained on vulnerable patients. It was driven by the imperative to reduce contagion and may have risks; post-pandemic, the model may need adjustment.

How This Fits In

The COVID-19 pandemic has rapidly accelerated a move to remote consulting (telephone, video and online) in general practice. In this longitudinal, mixed-methods, study we found that this shift to remote consulting had some benefits but was driven by necessity and helped by low consultation volumes in March/April 2020. Despite a drop in consultations overall, contact rates increased for patients who were older, shielding or had poor mental health. As consultation rates returned to normal by July 2020 and patients began to consult with more complex problems, GPs found remote management can be more time-consuming, clinically challenging and less satisfying. The appropriate role of remote consulting in future primary care service delivery remains unclear.

Introduction

The covid-19 pandemic required unprecedented change to general practice service delivery.¹ In March 2020, to reduce contagion, the UK government instructed general practice to conduct all consultations remotely unless there was urgent need otherwise.² Online or telephone triage models were introduced,³ with most triaged consultations done via telephone or video.⁴

This change was possible because much of the infrastructure was already established. The UK is a global leader in alternatives to face-to-face primary care consultations, and the NHS long-term plan committed practices to offer online consultations (e-consultations) from April 2020 and video from April 2021.⁵ Companies which offer online and video-consultations have been expanding since 2018⁶ and AccuRx SMS Chain, which enables GPs to send SMS messages direct from the patient record, was operational in 50% of GP practices in England by March 2018.⁷ In March 2020, technology companies offered remote consulting technologies at low or zero cost.^{8 9}

UK “lockdown” was announced on 23rd March and the public were instructed to “Stay at home, protect the NHS and save lives”.¹⁰ In response to this, substantially fewer people requested consultations with their GP.¹¹

Many have seen the move to remote consulting as a success.^{12 13} Although concerns about collateral effects have been raised,¹⁴ there has been little empirical study on the impact. The aim of this study was to investigate the impact of the rapid implementation of remote consultations in March 2020 on the delivery of patient care and explore how this changed during the first four months of the COVID-19 pandemic.

Methods

A mixed-methods study in 21 general practices in Bristol, North Somerset and South Gloucestershire Clinical Commissioning Group (BNSSG CCG). These cover 25% of this CCG’s practices, selected to be representative of the population (see supplementary file 1).

Research questions:

1. How did the volume and type of consultations and communications with patients change over the period April 2020-July 2020 and how did this differ from the same period in 2019?
2. Did changes in consulting rates or types of consultation provided differ across patient groups?
3. How did primary care clinicians and managers deal with the rapid implementation of remote consulting?

Quantitative methods

A longitudinal analysis of primary care consultations in the 21 practices was conducted to address research questions 1 and 2. One Care¹⁵, the GP practice federation in BNSSG CCG, extracted data on: demographic and clinical characteristics of patients registered in July 2020 (age, ethnicity, deprivation, gender, shielding status, mental health status, all as of July 2020); consultations these patients had with clinical staff from January 2019 – July 2020; and clinical codes entered in February – July 2019 and February – July 2020.

We defined consultations as two-way interactions between patients and GPs or nurse/paramedics. We excluded consultations added by administrators. This meant that, if an e-consultation added by an administrator was managed by the GP through (e.g.) a phone call, this is registered as a telephone consultation, but the e-consultation is not within our data. We also excluded administrative tasks performed by clinicians. A combination of consultation details and clinical codes were used to identify consultation types (Face-to-face, home visit, telephone, video, e-consultations) and staff type (GP, Nurse/Paramedic). We separately identified SMS messages sent from clinicians to patients. (see supplementary file 2)

Descriptive statistics: We report consultations and SMS message rates per 1000 patients. We used the patient characteristic data extracted in July 2020, adjusted by historic practice list sizes¹⁶ to calculate monthly list sizes.

Multilevel Model: Changes in consultation rates between April-July 2019 and April-July 2020 were investigated using negative binomial models. The model outcomes were: all consultations, remote consultations and in-person consultations. We defined “remote” consultations as telephone, video or e-consultation, and “in-person” as face-to-face or visit. We included only consultations in the models, not SMS messages. Incidence rate ratios (IRRs) and 95% confidence intervals (CIs) are reported for consulting rates in 2020 compared to 2019. Individual models were developed for each outcome and staff type (GP and nurse/paramedic). Consultation year was fitted as a fixed effect, GP practice as a random effect, and adjusted practice list size as the offset. Fixed effects for each of the covariates (age, gender, ethnicity, IMD quintile, shielding status, and mental health status), along with an interaction term between each covariate and consultation year, were fitted separately to each model to explore differences in the outcomes across patient characteristics. Interaction p-values are presented; consultation changes are only presented separately for each level of a patient characteristic if the interaction p-value < 0.05. Model validity was checked using standard methods; outliers which disrupted model fit were removed.

Qualitative Methods:

Longitudinal interviews were conducted with practice staff at 21 practices, using a flexible topic guide (See supplementary file 3) to investigate how practices dealt with the implementation of remote consulting, challenges faced, and solutions developed.

Interviews were audio-recorded, transcribed, anonymised, imported to NVivo and thematically analysed.¹⁷ MM/AT/AS/JH established an initial coding framework and MM/AT/AS double-coded six interviews (two each) to ensure a coding consensus and maximise rigour.¹⁸

The four Normalisation Process Theory (NPT)¹⁹ constructs were used to further develop themes. NPT provides a structured way to explore the implementation of a complex intervention. It proposes that implementation of an intervention is dependent on staff fulfilling four criteria (1) *coherence* (making sense of the reasons for remote consulting); (2) *cognitive participation* (buy-in to remote consulting); (3) *collective action* (putting remote consulting into action); (4) *reflexive monitoring* (appraising the consequences of the move to remote consulting).

Results

Change in consultation numbers

The quantitative findings are based on 350,966 registered patients across the 21 practices (see Table 1). In April 2019 there were 218 GP consultations per 1000 registered patients, of which 31% were by telephone, and no video-consultations were recorded (see Figure 1). In April 2020, this had reduced to 180 GP consultations per 1000 registered patients; 89% were telephone and just over 1% were coded as video, increasing to 3% for patients over 85 (although GP coding practices may mean that some videos were coded as telephone). Less than 1% were e-consultations added by GPs. Consultation volumes increased by June/July 2020 to similar levels to June/July 2019.

SMS messages sent to patients by GPs increased 3.1-fold, and by nurses 4.8-fold in Apr-Jul 2020 compared to 2019. In Apr-Jul 2019, 33% of SMS were sent on the same day that the patient had a consultation. By Apr-Jul 2020 this had increased to 65%. (See Supplementary File 4)

Table 2 shows changes from Apr-Jul 2019 to Apr-Jul 2020. There was an 11% reduction in consulting overall for GPs (IRR 0.89) and a 17% reduction for nurses (IRR = 0.83). GPs did almost 3 times more remote consultations compared with the previous year (IRR = 2.76), while GP in-person consultations dropped to 16% of the previous year (IRR = 0.16). Nurses did over five times more remote consultations (IRR = 5.51) and in-person consultations dropped to just over 50% of the previous year (IRR = 0.54).

These changes were consistent across different gender, IMD and ethnicity groups (interaction p-values >0.05 for all three outcome models for both GPs and nurses), but differed by patient age, mental health status, and shielding status, for both GPs and nurses (Table 2). For patients aged 85+, those shielding, or with poor mental health, consultation rates were higher in April-July 2020 than in April-July 2019.

Age: There was an increase in total GP consultation rates in 85+ year-olds (IRR = 1.08, p = 0.03), no significant change in patients from 70-84 (IRR=0.95, p=0.20), and a decrease in all other age groups, in particular 5-17 years (IRR=0.65, p<0.001). The reduction in GP in-person consultations was less for patients who were 85+ (IRR = 0.24, p<0.001) or pre-schoolers (IRR = 0.23, p<0.001) than ages 5-84 (IRR=0.12 to 0.19, all p<0.001). Nurses maintained more of an in-person focus on pre-school children (IRR = 0.83, p=0.01) with a larger drop in in-person nurse consultations for all other age groups (IRR=0.29 to 0.56, all p<0.001). The biggest drop in overall nurse consulting was in children aged 5-17 years (IRR=0.62, p<0.001).

Mental Health: Consultation rates in patients with poor baseline mental health increased from April-July 2019 for GPs (IRR=1.07, p<0.001) and stayed constant for nurses (IRR=0.98, p=0.69). GP and nurse consultation rates in patients with good mental health decreased (IRR=0.84, p<0.001 and IRR=0.79, p<0.001, respectively). People with good mental health had a greater reduction in nurse in-person consultations (IRR=0.54, p<0.001) than people with poor mental health (IRR=0.64, p<0.001; interaction p=0.02).

Shielding: Consultation rates in shielding patients increased in April-July 2020 compared with April-July 2019 for both GPs (IRR=1.11, p<0.001) and for nurses (IRR=1.14, p=0.03). Consultation rates for non-shielding patients decreased (IRR=0.87, p<0.001 and 0.83, p=0.002, respectively). Patients not shielding had a greater reduction in in-person consultations than patients who were shielding (GP IRR 0.16 vs 0.20, interaction p=0.02; nurse IRR 0.53 vs 0.72, interaction p=0.001).

Qualitative Findings

We conducted 87 interviews in four interview rounds between 13th May - 29th July 2020, with 41 participants: 21 GPs, 11 practice managers and 9 senior nurses/ advanced nurse practitioners (see supplementary file 1). Findings are presented for each of the NPT constructs.

Coherence : Making sense of the reasons for remote consulting

Mirroring NHS England advice in March 2020 that face-to-face patient contact should be minimised, round 1 interviews showed a strong consensus that remote consulting was imperative to protect patients and staff. In later interviews, as UK lockdown eased, this strong coherence reduced, due to lack of clear guidance:

when we started [March 2020] it was very clear that your primary goal was to not have people enter this building [...] whereas now, [July 2020] there isn't any clear NHS England message to guide on your threshold for bringing people in, so I think it's hard for us to know what we should be doing. (GP, HC20, Round 4)

Cognitive participation: Buy-in to remote consulting

Round 1 interviews demonstrated universal staff buy-in for rapidly implementing remote consulting:

Part of that is also us not having to persuade our reluctant staff to do it because actually we've had to by necessity so again that's taken out a lot of the onboarding, selling process and they just sort of got on with it like GPs do. (GP, HC20, Round 2)

Telephone, video and SMS were seen as necessary to implement social distancing and what patients wanted. However, this wholesale buy-in did not apply to e-consultations, which staff perceived as driven by a pre-existing national agenda.

We were told we had to do it [provide e-consultations]. There was no motivation at all, apart from the stick [national policy]. (GP, HC19, Round 4)

Buy-in to remote consulting was strongly tied to the sense of coherence of remote consulting as a current necessity. Clinicians varied as to the extent to which they wanted to continue consulting remotely after the pandemic.

We're doing it [move to remote consulting] because we have to do it, not because it's how we choose to work. (GP, HC13, Round 1)

So certainly, I think the triage by phone and video consulting will be two areas that we will keep but tempered. (Practice Manager, HC1, Round 1)

Collective action: Putting remote consulting into action

Infrastructure: The drop in consultation volumes released capacity in March/April 2020 to rapidly implement changes. Remote access technologies (e.g. virtual network computing, virtual private networks, re-routing of telephone calls) were used to allow shielding/self-isolating staff to work from home or in branch surgeries closed to patients (see Table 3). AccuRx functionality was upgraded to allow unlimited video links and photo transfer. As pandemic- blockages in international supply chains were cleared, GPs were provided with laptops, headsets and webcams.

Access Pathways: Practices closed online or walk-in consultation booking, leaving telephone (or e-consultations where implemented) as the only access pathway. Same-day telephone triage services were implemented and most practices adjusted appointment systems so that GPs worked off single patient lists, without fixed appointment times. Single lists worked for some GPs, but others found it relentless. Shielding and vulnerable patients were proactively followed up by GPs, nurses or social prescribers.

Changes made: In response to an increase in (non-COVID-19) demand some practices opened pre-bookable telephone appointments and moved back to individual GP lists. Total telephone triage, which meant that

every patient received a GP callback, became less manageable, and many practices reintroduced elements of receptionist triage. Fixed time-slots were often reintroduced. Identifying a distinction between telephone consulting and telephone triage, practices introduced differing duration telephone appointment slots for different types of telephone consultation. (see Table 3)

E-consultation systems were “soft-launched” in study practices during the 4-month period of this project. Practices did not advertise the service widely to ensure practices could set-up and embed them properly.

Reflexive monitoring: appraising the consequences of the move to remote consulting

Positive appraisals of remote consulting:

Imposing 90% remote consulting created wide recognition that many patients previously seen face-to-face could be safely consulted by telephone. Furthermore, information gathered through triage, meant necessary face-to face time was more “focused and productive.”

Some clinicians, who had been previously resistant to telephone consulting, recognised that it was a skill which could improve with practice. Nurses found that telephone consulting worked well for chronic conditions reviews, prioritising poorly controlled patients and seeing patients face-to-face for physical aspects only. Telephone consulting gave GPs greater control of their working day and meant they could type and check information without the patient feeling that they were not listening. GPs noted that patients “come to the point” more quickly and raise fewer problems by phone.

I hope we'll never go back to just whole mornings of patients booking by themselves, quite often when they don't need to see a doctor, when it could have been dealt with in another way or by another person. (GP, HC9, Round 2)

Video-consultation proved useful for dynamic assessment (e.g. gait, respiratory monitoring) and were particularly useful with children, to assess them visually and reassure the parent.

The [verbal] description doesn't always match up with the clinical picture and being able to actually have a look, that's very helpful. (GP, HC3, Round 1)

Nurses used video-consultations to train patients and/or carers, for example on wound care or administration of injectable long-acting reversible contraception. GPs used video-consultations to connect with elderly or vulnerable patients in nursing homes or when they were with an allied health professional.

Clinicians used AccuRx to send information to patients via SMS before and after a consultation.

I'll write quite detailed texts to patients who I've just spoken to, saying, 'You might want to try this website [...] all you have to do is cut-and-paste a link and some people then have immediately got the website on

their phone. (GP, HC19, Round 2)

SMS proved useful for fitness-to-work notes, contacting patients about prescriptions and sending questionnaires to risk-stratify people with long-term conditions. Most GPs preferred a photograph-plus-telephone-consultation to video-consultations for static problems that require visual assessment (e.g. a rash).

Rather than initially setting up a video-consultation [it's better] to ask them to take a picture of it [...] because the patient spends time getting a decent photo, and you're not hanging on for each video consult for five or ten minutes while you get the technology working. (GP, HC11, Round 1)

Most felt it was too early to appraise the impact of e-consultations. Some practices hoped that the response-window of e-consultations (e.g. 48 hours) would enable them to spread demand more flexibly.

Challenges with remote consulting:

From June-July 2020, as consultation volumes and complexity increased, GPs found telephone consulting at high volumes to be more mentally intense and less satisfying.

Working from a long screen of lots of telephone calls, with holding lots of risks for a long time, and having then also removed what many GPs find the most enjoyable part of their job – talking and touching and sensing patients in the room – the day job has become a bit of a hard grind. (GP, HC20, Round 2)

Some felt an increased strain in making clinical decisions, prescribing and holding more clinical risk over the phone:

I had someone [on the phone] with a bit of abdominal pain, chest tightness, anxious, pain in feet, PR [per rectum] bleeding, you just think 'Gosh - where do I even start with this' Yes, It can be a bit tricky over the phone. (GP, H16, Round 4)

Most GPs felt that, although they were seeing patients face-to-face when necessary, in the context of a pandemic, this depended on weighing up competing risks to the patient and practice. Practices with a large elderly, deprived or immigrant population pointed out that non-verbal cues were more important in some groups of patients than others:

I work in a relatively deprived multi-ethnic area [...] sometimes it's more difficult to be able to take a very clear and reliable history over the telephone and be able to make safe management decisions. (GP, HC5, Round 1)

GPs had varying levels of IT problems with video-consultations, highlighting that seamless technology is essential for successful implementation. While GPs had high initial expectations of video calls, as the pandemic eased, many felt that face-to-face was increasingly preferable to video for patients who needed visual assessment.

I think the initial excitement about video consulting [...] there is quite a bit of faff around it and [...] there is not that much that it adds. [...] When we first started and absolutely not seeing patients and that was very useful, now I think probably if you needed a video, you might just think I might just see them [face-to-face] at this point. (GP, HC20, Round 4)

Other GPs pointed out that they also often needed to examine the patient and visualise close-up.

I kind of thought I would be doing more video by now, but [...] I'm still doing mostly phone. I think I'm finding things that I want to see. I want to feel more than see, mostly. (GP, HC8, Round 4)

Some clinicians found it challenging to know when to switch to video and were concerned that they may have missed problems in telephone consultations because patients had not reported physical signs.

E-consultations registered by a clinician were <1% of all consultations in July 2020. While soft launches allowed practices to pilot and understand the impacts of e-consultations, they also had the consequence that e-consultations were partly seen as an additional stream of work:

It's like having more than one email account, isn't it? You have got to check in all different places for incoming stuff [it's] much more efficient to have everything coming into a single point. (GP, HC19, Round 4)

GPs also raised concerns about remote consultations which were commonly raised before COVID-19; firstly that e-consultations would be used “inappropriately”²⁰, secondly that all types of remote consultation would lead to “double doing”²¹; thirdly that SMS, e-consultations and video would increase access for those with IT skills, and enforce already existing health inequities.^{22 23}

The government have constantly got it completely wrong about how many people are internet ready. I have long conversations all the time [with people who] haven't got a computer at home or they have and they just haven't got the foggiest about how to do anything other than watch Netflix on it (GP, HC21, Round 3)

Discussion

Summary findings

There was widespread consensus in March 2020 that remote consulting was required to contain COVID-19. Collective action was rapidly taken so that 90% of GP and 46% of nurse consultations were delivered remotely in April 2020. Although consultation rates reduced in April-July 2020 compared to April-July 2019, general practice maintained a focus on older patients, shielding patients and patients with poor mental health; with increased consultation rates in all these groups.

GPs and nurses found telephone consulting was sufficient for many patient problems. SMS-messaging increased more than 3-fold, as it was used for photographs, sending video-consultation links and sharing information with patients after the consultation. Video consulting was useful for children, nursing homes, MDT meetings and problems which require dynamic assessment. However, many GPs preferred a photograph-plus-telephone-consultation for many problems which require visual assessment.

After the initial response to the crisis, some GPs found high levels of remote consulting a strain. Many GPs missed face-to-face contact, were concerned about clinical risk and found it difficult to set a threshold for seeing patients face-to-face as lockdown eased.

Strengths and limitations

To our knowledge, this is the first mixed-methods study on the change in UK general practice employing simultaneous longitudinal interviews with staff, and longitudinal analysis of patient records. This study used a large dataset of over 350,000 patients. Our main exposure event was UK lockdown combined with the instruction to deliver remote consulting. As this applied across the UK, the rates of change we found are likely to be generalisable across England. By using quantitative consultations data, we overcame the current issues facing NHS digital experimental appointments data, whereby the number of GP-patient interactions taking place since April 2020 has been systematically undercounted.²⁴ In our interviews we found that GPs do not necessarily record consultation type consistently. By additionally using clinical codes to identify consultation type we more accurately identified telephone consultations than relying on consultation type alone, although we recognise that we may have misclassified some video-consultations.

A key limitation is that we were unable to interview patients. Furthermore, there was an element of self-selection in practice recruitment and, although we sought a diverse mix, the deprivation mix was slightly polarised, represented by the top and the bottom three quintiles. There was a potential for bias in recording of patient characteristics, for example, older patients are more likely to be missing ethnicity.²⁵ Nonetheless, apart from ethnicity, the proportions of missing data are low. Lastly, our findings on e-consultations may not be as transferable as the other findings. The e-consultation platform being soft-launched locally was an algorithm-based digital triage platform, used as an alternative to telephone access. Other platforms with different features and access models (e.g. AskmyGP²⁶) may have had different results.

Comparison with the literature

We found that a high level of telephone consultation is feasible. In July 2020, when UK lockdown was easing and practices were reducing their threshold for seeing patients face-to-face, 83% of GP consultations and 38% of nurse consultations in BNSSG were still conducted by telephone. We found a greater proportion of remote consulting than the recent study using RCGP research surveillance centre (RSC) data, which found 26% of appointments were face-to-face and 71% by phone.^{4 11} This may be because we more accurately coded consultation type by using clinical codes as well as consultation type, which relies on the clinician coding this correctly. The cross-sectional RSC study found more remote consulting amongst people in IMD quintile 1 (most deprived).⁴ In our longitudinal study, we found no significant effect of deprivation on the change in the volume of telephone or face-to-face consulting between 2019 and 2020.

Other studies on video-consultations in outpatients and primary care, have shown uptake of 1-2% despite positive comments from staff and patients.^{27 28} Our findings suggest that part of the reason for the low proportion in general practice could be the relatively limited usefulness of video-consultations over telephone or face-to-face in the majority of circumstances.

Conclusions

The shift to remote consulting was a successful initial response to the pandemic and focus was maintained on vulnerable patients. However, the promotion of remote consulting as a preferred way of working may be premature. While some GPs found them efficient for certain consultations, the sense of coherence that drove such a high proportion of remote delivery was the need for social distancing. As volumes and complexity increased, many GPs found remote management more time-consuming, challenging, carrying greater clinical risk, and less satisfying. Although GPs want to continue some of the benefits of remote consulting, the model may need to evolve. It is also significant that GPs recognised remote consulting requires a separate skillset, which can be improved with training and practice. Such training and support now need retrospective implementation following the rapid progress with remote consultation during the COVID-19 pandemic.

Tables

Table 1: Characteristics of all patients registered in participating practices in July 2019

Age	Registered patients (n)	%
0-4 years	18,685	5.32
5-17 years	46,822	13.34
18-49 years	158,993	45.3
50-69 years	77,952	22.21
70-84 years	35,875	10.22
85+ years	12,639	3.60
Gender	n	%
Male	175,952	50.13
Female	175,009	49.86
<i>Missing</i>	5	<0.01
IMD quintile	n	%
1 (most deprived)	71,378	20.34
2	55,002	15.67
3	53,129	15.14
4	73,119	20.83
5 (least deprived)	96,608	27.53
<i>Missing</i>	1,730	0.49
Ethnicity	n	%
White	228,624	65.14
Asian/Asian British	11,774	3.35
Black/African/Caribbean/Black British	12,234	3.49
Mixed/Multiple ethnic groups	5,368	1.53
Other	1,210	0.34
<i>Missing</i>	91,756	26.14
Mental health	n	%

Good	318,329	90.70
Poor *	32,637	9.30
Shielding	n	%
Not shielding	337,758	96.24
Shielding	13,208	3.76

*Defined as patients with severe mental illness (based on QOF rules²⁹) OR patients with depression (based on QOF rules) OR patient prescribed antidepressants in the last three months (excluding tricyclics, as these are commonly used for non-mental health conditions)

Table 2: Changes in consulting rates in April-July 2020 compared to April-July 2019 overall, and stratified by patient characteristics

GP CONSULTATIONS	IRR	95%CI	p-value*	IRR	95%CI	p-value*	IRR	95%CI	p-value*
Change in consultation rates (2020 vs. 2019)	0.89	0.85-0.92	<0.001	0.16	0.14-0.19	<0.001	2.76	2.33-3.27	<0.001
By Age category			<0.001			<0.001			0.371
0-4 years	0.81	0.75-0.87	<0.001	0.23	0.20-0.27	<0.001	2.62	2.19-3.14	<0.001
5-17 years	0.65	0.60-0.70	<0.001	0.12	0.10-0.14	<0.001	2.20	1.84-2.64	<0.001
18-49 years	0.91	0.85-0.98	0.010	0.16	0.14-0.19	<0.001	2.77	2.33-3.30	<0.001
50-69 years	0.89	0.82-0.95	0.001	0.16	0.14-0.19	<0.001	2.76	2.32-3.29	<0.001
70-84 years	0.95	0.89-1.02	0.198	0.19	0.16-0.22	<0.001	2.83	2.37-3.37	<0.001
85+ years	1.08	1.02-1.23	0.034	0.24	0.21-0.29	<0.001	2.80	2.34-3.34	<0.001
By Mental health status			<0.001			0.652			0.232
Good mental health	0.84	0.81-0.87	<0.001	0.16	0.14-0.18	<0.001	2.61	2.26-3.02	<0.001
Poor mental health	1.07	1.03-1.11	<0.001	0.17	0.15-0.19	<0.001	2.96	2.56-3.41	<0.001
By Shielding status			<0.01			0.019			0.690
Not shielding	0.87	0.83-0.91	<0.001	0.16	0.14-0.18	<0.001	2.67	2.31-3.10	<0.001
Shielding	1.11	1.05-1.16	<0.001	0.20	0.17-0.22	<0.001	2.79	2.41-3.23	<0.001
By Gender			0.168			0.779			0.739
By IMD quintile			0.757			0.497			0.794
By Ethnicity			0.743			0.167			0.414
NURSE/PARAMEDIC CONSULTATIONS	IRR	95%CI	p-value	IRR	95%CI	p-value	IRR	95%CI	p-value
Change in consultation rates (2020 vs. 2019)	0.83	0.76-0.91	<0.001	0.54	0.49-0.59	<0.001	5.51	3.81-7.97	<0.001
By Age category			0.168			0.779			0.739

0-4 years	1.00	0.86-1.15	0.973	0.83	0.71-0.96	0.014	5.77	4.04-8.23	<0.001
5-17 years	0.62	0.53-0.72	<0.001	0.29	0.25-0.35	<0.001	4.70	3.33-6.64	<0.001
18-49 years	0.87	0.76-1.01	0.062	0.53	0.46-0.61	<0.001	6.79	4.90-9.40	<0.001
50-69 years	0.89	0.77-1.03	0.108	0.56	0.49-0.65	<0.001	5.69	4.11-7.87	<0.001
70-84 years	0.86	0.75-0.99	0.039	0.56	0.48-0.65	<0.001	5.46	3.93-7.58	<0.001
85+ years	0.83	0.72-0.96	0.012	0.51	0.44-0.60	<0.001	5.42	3.85-7.63	<0.001
By Mental health status			0.01			0.016			0.843
Good mental health	0.79	0.72-0.86	<0.001	0.54	0.49-0.59	<0.001	5.86	4.30-7.98	<0.001
Poor mental health	0.98	0.90-1.07	0.689	0.64	0.58-0.71	<0.001	5.61	4.09-7.69	<0.001
By Shielding status			<0.001			0.0012			0.277
Not shielding	0.83	0.74-0.93	0.002	0.53	0.47-0.60	<0.001	5.38	3.85-7.52	<0.001
Shielding	1.14	1.01-1.29	0.029	0.72	0.63-0.82	<0.001	6.98	4.92-9.90	<0.001
By Gender			0.333			0.874			0.747
By IMD quintile			0.918			0.923			0.859
By Ethnicity			0.125			0.069			0.922

Note. Table 2 shows output from the negative binomial models. The overall changes in consulting in 2020 compared to 2019 are presented in the orange rows. Blue rows show the p-value for the interaction between consulting year and patient characteristics. Changes in consulting rates are only presented by the different levels of a patient characteristic for characteristics if the interaction p-value is less than 0.05 for at least one of the three outcome models.

Table 3: List of quotes illustrating collective action

Collective action taken in March 2020

Drop in volumes created time for action: *It was very easy to turn around our system from being very face-to-face to telephone [...] with lockdown the patient demand disappeared for various conditions and so that gave us a bit of room to breathe. (Practice Manager, HC18, Round 2)*

Moved to total same-day triage: *We almost immediately moved to a telephone triage service for everything [...] it had to be a same day telephone triage service so you couldn't triage something one day and then book it in three days later because by that time someone could have developed symptoms. (GP, H12, Round 1)*

Closed online booking: *there's no online booking, it's purely for 111. (GP, H11, Round 1)*

Video consultation roll-out: *AccuRx [SMS messaging service] who work alongside EMIS [electronic patient record system] have really put their heads together and come up with a very robust easy way of doing it. We've all bought video cameras and we can do that [video calls]. (GP, HC 21, Round 2)*

Enabled shielding staff to work from home: *We've got two nurses who are shielding, so they're not here at all. [...] The HCA, she's doing all the shielding calls. [...] Then [the nurse] is just doing all the asthma reviews [...]. (Nurse Manager, HC8, Round 3)*

Moved to single patient appointment lists: *We moved to one long call list we all shared. We'd pick off that list for the people who are working both in the building and those who were working remotely, who were well but at home for various reasons. (GP, HC10, Round 1)*

No appointment times given: *The receptionist will say that the doctor will call you back and it will be some time this morning, but they're not giving a specific time. [...] People have been happy about that. They're locked down anyway, (GP, HC11, Round 1)*

Proactive follow-up of shielded and vulnerable: *Shielded patients have all received calls to see how they are and make sure they're aware of services [...] available to them. We've also contacted all the patients on the serious mental health register as well. (GP, HC5, Round 3)*

Slower implementation of e-consultations: *we're just going to do a very soft start and not really advertise it to start [...] just try and iron out some of the initial process queries. (GP, H2, Round 2)*

Changes made

Some changed back to individual patient appointment lists: *we were working on this incredibly long, almost, it felt, never-ending list. It's so long. Then if you had five doctors in, there would be approximately 100 slots on that list. You would just be rather soullessly charging through it thinking, will I ever get to the bottom? Are my colleagues working as hard as I am? (GP, H19, Round 4)*

But some stayed on shared patient lists: *I mean, other practices around us have swapped back to an individual list but the strength of the shared list is that it enables people to [...] work more as a team. If someone has to see a couple of patients in PPE and gets very behind and the other people are cracking on with calls (GP, HC11, Round 4)*

Re-introduced receptionist triage: *I think a few weeks ago, when we perhaps had more capacity, it was fine for them [receptionists] to just throw everything on the duty doctor list. But now that [...] it is getting busier [we are] encouraging reception to book things more routinely. (GP, HC16, Round 4)*

Re-introduced pre-bookable appointments: *in order to avoid seeing things on the day that might have gone away in a week [...] we are now just moving to allocate to clinicians their own lists and put in some pre-bookable phone calls for like two-week advance bookings. (GP, H20, Round 4)*

New consultation slot types: *We've got Blue-coloured slots and Purple slots [...] They're all telephone slots, um the difference is the Blue telephone slots are just for a new problem [...] and the Purple slots are for people that can have a follow-up telephone call after a problem's been dealt with. (Nurse, H3, Round 2)*

(See Supplementary File 5 for additional quotes on the other reflexive monitoring constructs)

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Figures

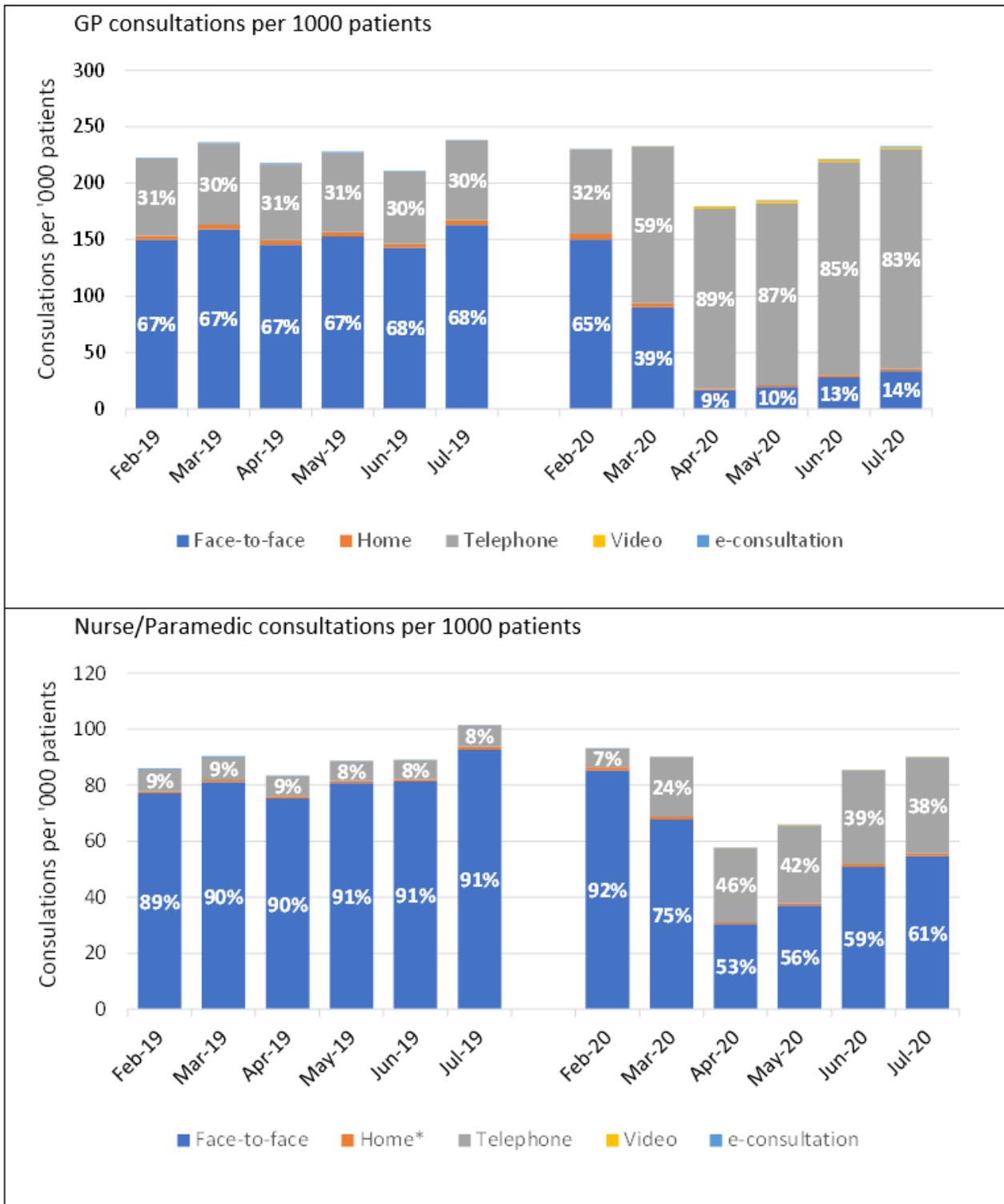


Figure 1

GP and Nurse/Paramedic consultations per 1000 registered patients, Feb-Jul 2019 and Feb-Jul 2020

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