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BRIEF REPORT

REVISED Modifications to the delivery of NHS face-to-face general practice consultations during the COVID-19 pandemic in England [version 3; peer review: 2 approved]

Lorna J. Duncan [ID]1, Kelly F.D. Cheng [ID]2

1Centre for Academic Primary Care, Population Health Sciences, Bristol Medical School, University of Bristol, Bristol, UK
2Bristol Medical School, University of Bristol, Bristol, UK

Abstract

Background: In order to minimise transmission of SARS-CoV-2, the virus causing COVID-19, delivery of English general practice consultations was modified in March 2020 to enable the separation of patients with diagnosed or suspected COVID-19 from others. Remote triage and consultations became the default, with adapted face-to-face contact used only when clinically necessary. Face-to-face delivery modifications were decided locally and this study aimed to identify the different models used nationwide in spring/summer 2020.

Methods: In June 2020, a survey was sent by email to the 135 Clinical Commissioning Groups (CCGs) responsible for planning and commissioning NHS health care services in England to identify the local organisation of face-to-face general practice consultations since March 2020.

Results: All CCGs responded. Between March and July 2020, separation of patients with diagnosed or suspected COVID-19 ('COVID-19 patients') from others was achieved using the following models:

1. zoned practices (used within 47% of CCGs), where COVID-19 and other patients were separated within their own practice;
2. 'hot' or 'cold' hubs (used within 90% of CCGs), separate sites where COVID-19 or other patients registered at one of several collaborating practices were seen;
3. 'hot' and 'cold' home visits (used within 70% of CCGs).

For around half of CCGs, either all their GP practices used zoning, or all used hubs; in other CCGs, both models were used. Demand-led hub availability offered flexibility in some areas. Home visits were mainly used supplementally for patients unable to access other services, but in two CCGs, they were the main/only form of COVID-19 provision.

Open Peer Review

Reviewer Status ✔✔

	Invited Reviewers	
	1	**2**
version 3 (revision) 01 Nov 2021	✔ report	✔ report
version 2 (revision) 20 Aug 2021	✔ report	? report
version 1 31 Mar 2021	? report	

1. **Helen Atherton** [ID], Warwick Medical School, Coventry, UK

2. **Mona Jeffreys**, Victoria University of Wellington, Wellington, New Zealand

Any reports and responses or comments on the article can be found at the end of the article.

Conclusions: Varied, flexible ways of delivering face-to-face general practice consultations were identified. Analysis of the modified delivery in terms of management of COVID-19 and other conditions, and other impacts on staff and patients, may both aid future pandemic management and identify beneficial elements for practice beyond this.

Keywords
COVID-19, SARS-CoV-2, coronavirus, general practice, primary care, face-to-face consultation, delivery model, transmission

This article is included in the Emerging Diseases and Outbreaks gateway.
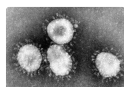
This article is included in the Coronavirus collection.

Corresponding author: Lorna J. Duncan (lorna.duncan@bristol.ac.uk)

Author roles: Duncan LJ: Conceptualization, Data Curation, Formal Analysis, Funding Acquisition, Investigation, Methodology, Project Administration, Supervision, Validation, Visualization, Writing – Original Draft Preparation, Writing – Review & Editing; **Cheng KFD**: Data Curation, Formal Analysis, Investigation, Methodology, Project Administration, Validation, Visualization, Writing – Review & Editing

<table>
<tr><td>REVISED</td><td>Amendments from Version 2</td></tr>
</table>

Detail has been added to the manuscript where necessary to more clearly distinguish between GP practices and the Clinical Commissioning Groups they are part of. Further explanation has been given to the 'data analysis' section in the Methods outlining the development of the seven overall models used to classify CCGs in this study; and clarification concerning the reported use of home visits in these models has been added to Figure 1. Sections on COVID-19 outbreaks linked to general practice, and the related Table, have been removed.

Any further responses from the reviewers can be found at the end of the article

Introduction

In March 2020 it was estimated that more than 80% of patients with COVID-19 would not require hospitalisation,[1] and it was likely that many would seek treatment in general practice. In order to minimise transmission of the causative severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) during general practice (GP) consultations, NHS England's Standard Operating Procedure was revised in March 2020 to a remote triage and consultation default, with adapted models for face-to-face contact used only when clinically necessary.[2] The use of telephone, video and online consultations in English general practice has been studied elsewhere.[3] In this paper we report on the delivery of face-to-face general practice consultations across England during the first wave of the pandemic, in spring/summer 2020.

The need to separate patients with diagnosed or suspected COVID-19 ['COVID-19' patients] from others to minimise cross-infection during clinically necessary face-to-face consultations was evident. NHS guidance suggested three possible ways to manage patients, premises and workforce for optimal Infection Prevention and Control (IPC):[2]

(i) Zoned practices: In this model, patient cohorts would be separated within their own practices. Designated areas e.g., 'red' and 'green' zones, would be used to manage COVID-19 and other patients, respectively. Careful management would be needed to minimise cross-contamination between groups, including separate walkways and consultation rooms, and staff allocated to one zone only. Zoning could therefore be impractical in some surgeries.

(ii) Hot and cold hubs: A general practice hub would be designated as either 'hot' or 'cold', to treat COVID-19 or other patients respectively. It would be available to patients registered at one of several locally collaborating practices. With hot hubs sited separately to non-COVID services, IPC procedures could be more straightforward than in zoned practices.[2,4]

(iii) Dedicated home visiting: Home visiting services, modified to minimise cross-contamination, would be necessary for patients unable to access other face-to-face services, or where such provision was otherwise considered appropriate during the pandemic. Staff would work exclusively with COVID-19 or other patients, and work undertaken during visits would be maximised to limit additional face-to-face consultations. This service could be organised collaboratively, such as across Primary Care Networks (groups of local GP practices), or by individual practices.

NHS guidance indicated decisions regarding model use were to be determined locally, and that these could require flexibility as patient demand and workforce capacity fluctuated throughout the pandemic. All decisions were to be made in agreement with the relevant Clinical Commissioning Group (CCG),[4] the organisation responsible for planning and commissioning NHS health care services in the area. In June 2020, 135 CCGs and 6761 GP practices were in operation across England, with each practice forming part of their local CCG.[5]

This study aimed to identify the ways in which local delivery of NHS face-to-face general practice was re-organised across England during the first wave of the pandemic.

Methods

A cross-sectional survey of the 135 CCGs in England was conducted to identify how face-to-face general practice consultations were delivered nationwide in spring/summer 2020.

Survey design

Survey questions were devised by the study team. They concerned models of face-to-face consultations used and the patient populations each were available to; prior use of the hub model; and planned evaluations. Questions were

pre-tested with a researcher experienced in survey design, two CCGs and one provider of primary healthcare. Minor changes to wording were made for clarity. The final questionnaire is available as *Extended data.*[6]

Data collection

Questions were sent by email to all CCGs in June 2020 under the Freedom of Information (FOI) Act 2000. This legislation enables public access to recorded information held by public authorities in England. Responsibility for cleansing data lies with the authorities responding to FOI requests[7] and research ethics approval was not required.

Individual CCGs were identified on the NHS England website and their FOI procedures followed. FOI regulations mandate a response timeframe of 20 working days. Where, rarely, replies were not received within 25 working days, follow-up emails were sent, and telephone calls made if necessary.

Data analysis

Full responses were collated in an Excel spreadsheet for analysis. Additional columns were created to summarise the use of hot hubs, cold hubs, zoned practices and home visits within each CCG. Queries regarding response interpretation were discussed during regular online meetings (June-October 2020) and in on-going email contact between the authors. Internet searches and occasional email / telephone communication with CCGs were also used for clarification (to establish whether specified 'hot sites' were hubs or zoned practices for example) or updates.

Emerging themes were discussed by the authors and further columns added to the spreadsheet indicating flexibility in operational hub numbers and co-location of hot hubs with cold services. Data was analysed individually and jointly in an iterative process as further responses were received.

Common patterns of delivery across the 135 CCGs were then identified using the summary columns indicating services for COVID-19 patients (hot hubs, zoned practices and home visits). Initially, data for each CCG reporting the use of hot hubs was examined to check whether zoned practices and/or hot home visits were also being used in any of their GP practices. Consideration was then made of how other services (cold hubs, cold practices and/or cold home visits) were operating across these CCGs. A similar process was repeated for the remaining CCGs, in which zoned practices and/or hot home visits, but no hot hubs, had been reported.

In this way, a total of 12 different forms of model use were identified, each describing overall delivery of general practice for COVID-19 and non-COVID-19 patients across a CCG. Due to the varied reporting of home visiting services however (e.g., as hot and/or cold home visits, or with no COVID-19 specification provided, or with an indication that they were organised outside of general practice), it was considered that categorisation of CCGs on this basis could be misrepresentative. Those models which varied only in the reported use or otherwise of home visits were therefore merged, resulting in the amalgamation of 10 of the 12 models into 5. Together with the two remaining original models, in which hot home visits were specified as the only or major form of provision for COVID-19 patients, this yielded a final set of 7 models to which each CCG was assigned for comparison. Data on population density[8] and GP practice numbers[5] were also obtained and added to the summary spreadsheet to aid analysis.

Results
Responses

Replies were received from all CCGs, 99% by 31st July 2020, with the final response received on 2nd October 2020.

Response interpretation

Terminology used in responses varied – 'hot sites', and 'resilience hubs' could refer to the same or different services for example, as could 'green' and 'amber' colour coding. Provision for non-COVID-19 patients was also sometimes unclear. Complete response sets (including any documentation provided on model pathways and usage data), were therefore used, together with internet searches and further CCG contacts, to interpret and categorise all face-to-face consultation types according to the models in this report.

The following interpretation of the data is the authors' own and has not been approved or otherwise by the CCGs. It relates to the period between March 2020 and CCG response dates (largely June/July 2020), and reflects all models in

use by GP practices within each CCG's boundaries. A summary spreadsheet supporting these findings, is available as *Underlying data.*[9]

Adapted delivery models

General practice face-to-face delivery was modified within each CCG using combinations of the three indicated models:

(i)   Zoned practices (model 1, Figure 1), available to their entire patient populations, were reported as in use within 47% of CCGs. Most commonly, two closed 'red' and 'green' areas with different entrances and exits were used. Rarely, cohorts were separated temporally, with COVID-19 patients alone seen at specific times. This model was described in updated NHS England guidance (version 2, dated 5th April 2020) for surgeries where provision of separate spaces was not possible.[2] 50 of the 63 CCGs in which zoned practices were operating indicated that hubs were also in use by some practices at the time of reporting.

(ii) 'Hot' or 'cold' hubs (models 2 and 3, Figure 1), were indicated as being used by some or all practices in 90% of CCGs. Each of these 121 CCGs had practices using hot hubs, with 23 also using cold hubs. Hubs were generally available to the entire patient populations of collaborating practices. Occasionally however, cold hubs had more specific uses - a 'super-green' hub for example, for patients requiring additional shielding, and a 'purple' hub for routine treatments such as vaccinations and maternity checks. Hub reach extended from several practices to entire CCGs and, in two instances, access was shared across neighbouring CCG boundaries. Hubs were sited in re-purposed buildings (surgeries for example, or hubs usually offering extended GP access), locations not previously used for healthcare including a racecourse and temporary structures (e.g., portacabins and marquees), or they were provided as drive-through facilities. Most CCGs reported use of hubs by their practices prior to the pandemic, mainly for the provision of extended hours GP access (after 6.30 pm Monday-Friday, and at weekends).

The use of one or more 'co-located' hubs was indicated in 21 CCGs, whereby hot hubs were sited adjacent to cold hubs (4CCGs) or cold practices (17 CCGs).

(iii) 'Hot' and/or 'cold' home visiting services, were reported as available within 70% of CCGs (25 of these indicated they were for COVID-19 appointments only, 31 that specified both hot and cold visits were available, while the remaining 39 CCGs did not indicate COVID-19 status). While these generally served patients unable to access other face-to-face GP services, they were the main form of face-to-face GP provision for COVID-19 patients in two CCGs. Delivery could be provided by individual practices, collaborative networks or CCG acute visiting services, and in some cases operated out of hubs. Home monitoring of COVID-19 patients, via delivery of pulse oximeters was also reported by nine CCGs, while two provided transport to face-to-face sites.

The different means of delivering face-to-face services were compared for each CCG. Some reported a consistent approach to hot and cold service delivery by each GP practice. In other CCGs however, distinct local patterns of delivery were used. The combined approaches taken by all GP practices operating within each CCG were therefore assessed and all CCGs were found to fit one of seven forms of overall service delivery, albeit with some distinctions, notably the different use of home visits and of co-located hubs.

The seven model combinations and their use by CCGs are shown in Figure 1, and in the summary analysis table.[9] Their distribution across England is illustrated in Figure 2.

More than half of CCGs reported the use of a common model for COVID-19 patients by each of their GP practices (model numbers 1-4). Indeed, the 'hot hubs + cold practices' model combination (#2) was the most frequently used nationwide, employed by 40% of CCGs. Only 9% of CCGs used zoned practices alone, and 1% used home visiting services as their main or only form of provision for COVID-19 patients.

As Figure 2 illustrates however, geographically larger CCGs tended to report the use of 'mixed' models of delivery (numbers 5-7), giving model combination #5 ('hot hubs + cold practices + zoned practices') the greatest coverage across England. However, the physical size of a CCG did not necessarily reflect its population size with both remote rural areas and large conurbations contributing to the English landscape. Indeed, wide ranges in population density – from 63.8 to 16,427 people/km^2 – were seen in the different CCGs, and this range was similar for those assigned to the single (1-4) and
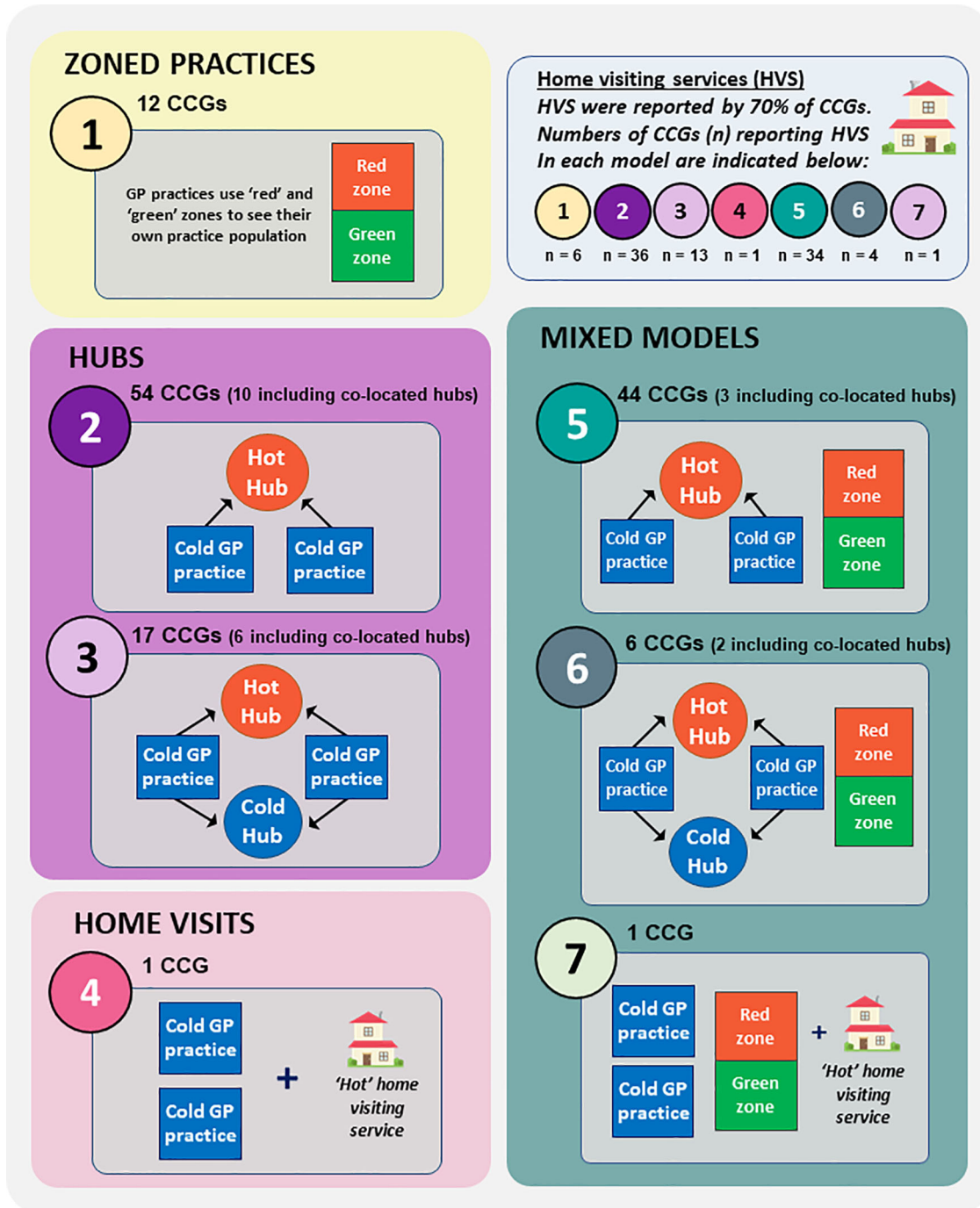
Figure 1. Models used to separate COVID-19 and other patients during face-to-face NHS GP consultations in England. Authors' interpretations of CCG responses according to the following definitions:

- Zoned practice: co-location of hot and cold services on a single site, serving own practice list
- Hot or cold hub: site of multi-practice working for COVID-19 or other patients respectively

COVID-19 services shown as 'hot' or 'red'; non-COVID-19 services shown as 'cold' or 'green'.

Models 1-4 are named according to their COVID-19 adaptation.

Each CCG (n = 135) was assigned to one of the seven model combinations according to overall use by GP practices within its boundaries. Individual practices may have used one or more of the models indicated within combination models. Home visiting service use varied within models and is indicated separately in the top, pale blue box.
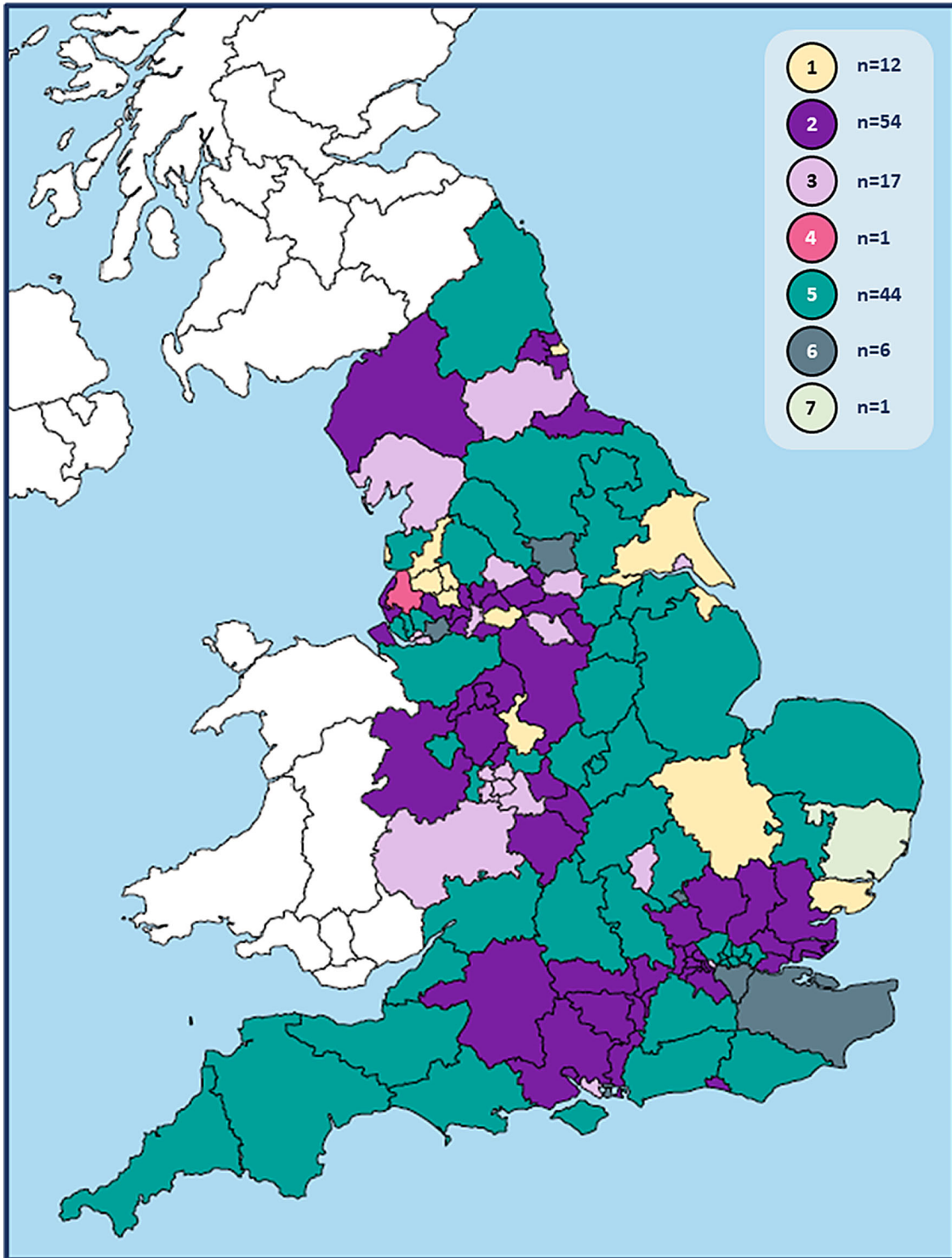
Figure 2. Local models used to separate COVID-19 and other patients during face-to-face GP consultations across England. Model combinations:* 1: zoned practices (+/- home visits) 2: hot hubs + cold practices (+/- home visits) 3: hot hubs, cold hubs + cold practices (+/- home visits) 4: hot home visits + cold practices 5: hot hubs, cold hubs + zoned practices (+/- home visits) 6: hot hubs, cold hubs, zoned practices + cold practices (+/- home visits) 7: zoned practices, cold practices + hot home visits.

*Authors' interpretations of CCG responses according to the following definitions:

- Zoned practice: co-location of hot and cold services on a single site, serving own practice list
- Hot or cold hub: site of multi-practice working for COVID-19 or other patients respectively

N.B. 16 CCGs did not describe face-to-face consultations for 'cold' patients. 15 of these were assigned to model combination 2 as hot hubs were described which were not co-located with cold services; and 1 was assigned to model combination 5. The face-to-face delivery data presented was correct between March 2020 and the date of response [by 30th July (n = 134) and October (n = 1) 2020].

mixed (5-7) COVID-19 models.[8,9] Similarly, the numbers of GP practices in each CCG ranged from 7 to 214 in June 2020 and these too showed a broad spread among both single and mixed models.[5,9]

Evaluations and flexible models

87% of CCGs reported on-going, complete or intended reviews, generally of hub and/or telephone triage use, although one CCG was considering the potential of its drive-through model for influenza vaccinations, and others were focusing on staff or patient perspectives. 25 CCGs reported reviewing usage to facilitate dynamic models, with hubs either available but as yet unused (n = 3), or numbers being flexed up and/or down (n = 22). [Assignment to model combinations 1-7 was based on provision at time of reporting.] Indeed, four of the twelve CCGs assigned to the 'zoned practice' model #1 reported having hot hubs available if needed. In mid-October 2020, with COVID-19 incidence rising in the second wave of the pandemic, contact with three of these, each in areas with markedly higher case numbers than the national average and in mandated local lockdowns,[10,11] revealed that, while their hubs remained available, escalation plans had not yet been necessary. Some other CCGs also indicated that only some of their potential hubs had been required.

17 CCGs provided data on face-to-face contact across 21 hot hubs. While representing only a small proportion of total hubs, wide variations in usage were seen, with average weekly consultation numbers ranging from 2 to 79 per hot hub (March to July 2020).

Discussion
Model use
All CCGs reported the use of zoned practices, hubs and/or home visits in various combinations by their GP practices. 73% reported the use of hot hubs (but no cold hubs), either with or without zoned practices. A further 17% incorporated cold hubs into these models. Only 9% of CCGs used zoned practices alone and 1% used home visiting services as their major or only form of provision for COVID-19 patients. Factors influencing model selection included appointment demand, existence of local collaborative networks, adaptability of premises and preferences for providing continuity of care. Different workforce capacities are also likely to have influenced this, with almost 10% of GP practices in England run by single GPs, and 1 in 3 of these GPs estimated to be at high risk for COVID-19 infection.[12] On-going assessment in CCGs enabled responsiveness to changing demand, mainly through altered hub availability.

50 CCGs were assigned to 'mixed models' combinations, using both hubs and zoned practices within their boundaries (combinations #5 and #6). This was in part related to the scheduled CCG mergers which took place on 1st April 2020 - one week into the first national lockdown - decreasing total numbers from 191 to 135. Thirteen of the eighteen emergent CCGs were assigned to mixed model combinations, and two of these reported distinct model usage aligned with their component former CCGs. It is possible that more detailed study of others would reveal similar patterns. Meanwhile, where model patterning could be identified in the 37 CCGs assigned to 'mixed models' combinations but not involved in mergers, either CCG-wide patterns or distinct areas of zoning and hubs were revealed.

Variations within model types
The distinction between zoned practice and hub models used was not as clear as indicated. Where hot hubs were co-located with cold services the requirement for strict management between hot and cold areas was as important as in zoned practices. Indeed, several CCGs reporting use of co-located hubs or zoned practices specified that separate entrances and exits were used, with some also reporting separate parking facilities. Other zoned practices meanwhile shared more similarities with distantly sited hubs, where red and green areas were split between main and branch surgeries for example, or where additional structures such as portacabins were used, to separate patient cohorts. Thus, it was not the case that the hub model always provided clearer separation and thereby simpler IPC adherence than zoned practices, as indicated in the guidelines.[2,4]

Use of dedicated home visits also varied. While within at least two CCGs this was the main or only form of COVID-19 face-to-face consultation, the use of home visits was not reported by 30% of CCGs. This may be due to the service being operated outside of primary care, as indicated by some. Home monitoring via pulse oximetry was also offered by general practice in a small number of CCGs during this period with, in one case, trained volunteers delivering the necessary equipment.

Further adaptations were shown by the temporary use of alternative non-healthcare settings and car-based models.

Strengths and limitations
The study methodology used has both strengths and limitations. The use of a national survey, CCG level data collection and FOI requests will be considered in turn.

While this national survey has provided a picture of face-to-face general practice delivery in the first months of the pandemic in England, it no longer reflects current practice. Nevertheless, it enables review of early adaptations with the benefit of increased understanding of SARS-CoV-2 transmission, and of various impacts of the modified models on staff and patients.[13-16] It may also be used to inform case site selection for more in-depth analysis to clarify issues such as those raised in this report, and to plan responses to further rises in incidence and new epidemics/pandemics.

The use of CCG level data facilitated a manageable national overview in an initial 6-week study. It is likely however that questioning at more local levels of organisation such as Primary Care Networks (groups of local GP practices serving populations of around 30,000 to 50,000 patients),[17] or at individual practice level would reveal greater nuance - in terms of model selection for example, practice size, staffing, local population and geographical factors may have been revealed to impact this, in addition to those indicated in our CCG responses. This may also be used to gain a better understanding of any distinct patterns of use within mixed models, and of home visiting services during the pandemic. Some CCG boundaries were also revealed to be somewhat flexible in terms of service delivery, with a degree of hub sharing reported. Close working was further indicated in some responses which were completed by one CCG on behalf of up to five others. The 2020 CCG mergers have already been discussed, and another round in April 2021 has since reduced numbers to 106. With all CCGs scheduled to merge across larger Integrated Care System boundaries in April 2022, a degree of complexity will be added to any future study utilising the current findings.

FOI requests, identified as a preferred data collection method by CCGs,[18] ensure high response rates within a mandated 4-week timeframe. They do not however readily permit further questioning, and both questions and responses may therefore be open to misinterpretation. While further investigation was used to minimize any error resulting from missing or ambiguous data, it is possible that models were misassigned in a small number of cases. [Data queries are noted in column J of the summary spreadsheet.][9] An additional issue resulted from generic text within some responses requiring a further request to publish. While many CCGs agreed to this, different stipulations by others could not be met under the terms of the Open Access licence used and the data could not be published here.

Conclusions
This study has provided an overview of adaptations to face-to-face GP consultations during the first four months of the COVID-19 pandemic in England. Varied and dynamic models were implemented to suit different and changing local conditions around the country. Evaluation of the delivery modifications described, including analysis of the management of both COVID-19 and other conditions, as well as other impacts on staff and patients, may also be used to identify beneficial elements of the rapidly enforced adaptations to inform practice both during the COVID-19 pandemic and beyond.

Acknowledgements
We would like to thank each CCG, for responding to our requests for information.

Data availability
Underlying data
The Re-use of Public Sector Information Regulations (RPSI) 2005 and copyright requirements have been invoked as imposing requirements around certain types of further use of survey data provided by some Clinical Commissioning Groups (CCGs). This may also apply to data received from other CCGs and it is therefore not possible to share this data under the terms of the Creative Commons Attribution 4.0 International license (CC-BY 4.0).

The data may be available from individual CCGs on request, with reference to the authors and this publication. Alternatively, Freedom of Information requests similar to those made by the authors may be used. Full details of these are provided in the *Extended data* and *Methods* section. A summary spreadsheet of the authors' analysis of this data is also available:

Figshare: Summary analysis of NHS face-to-face general practice models during the first wave of the COVID-19 pandemic in England March to July 2020, https://doi.org/10.6084/m9.figshare.14852517.v1.[9]

Data are available under the terms of the Creative Commons Attribution 4.0 International license (CC-BY 4.0).

Extended data
Figshare: Survey sent to Clinical Commissioning Groups in England, https://doi.org/10.6084/m9.figshare.14156741.v1.[6]

Data are available under the terms of the Creative Commons Attribution 4.0 International license (CC-BY 4.0).

References

1. Verity R, Okell LC, Dorigatti I, *et al.*: **Estimates of the severity of coronavirus disease 2019: a model-based analysis.** *Lancet Infect Dis.* 2020; **20**: 669–677.
PubMed Abstract | **Publisher Full Text** | **Free Full Text**

2. NHS_England: **Guidance and standard operating procedures.** *General practice in the context of coronavirus (COVID-19).* 2020 [Accessed 31 Oct 2020].
Reference Source

3. Murphy M, Scott LJ, Salisbury C, *et al.*: **Implementation of remote consulting in UK primary care following the COVID-19 pandemic: a mixed-methods longitudinal study.** *Br J Gen Pract.* 2021; **71**: e166–e177.
PubMed Abstract | **Publisher Full Text** | **Free Full Text**

4. NHS_England_and_NHS_Improvement: **GP Preparedness update letter.** 2020 [Accessed 25 Feb 2021].
Reference Source

5. NHS Digital: **Patients registered at a GP practice June 2020.** (Accessed 29 Sept 2021).
Reference Source

6. Duncan LJ: **Survey sent to Clinical Commissioning Groups in England.** *figshare. Journal Contribution.* 2021.
Publisher Full Text

7. Savage A, Hyde R: **Using freedom of information requests to facilitate research.** *Int J Soc Res Method.* 2014; **17**: 303–317.
Publisher Full Text

8. Public Health England: **Local Health 2020.** (Accessed 30 Aug 2021).
Reference Source

9. Duncan LJ, Cheng KFD: **Summary analysis of NHS face-to-face general practice models during the first wave of the COVID-19 pandemic in England, March to July 2020.** *figshare. Journal Contribution.* 2021.
Publisher Full Text

10. Public_Health_England: **National COVID-19 surveillance reports.** 2020 [Accessed 31 Oct 2020].
Reference Source

11. Public_Health_England: **National flu and COVID-19 surveillance reports.** 2020 [Accessed 25 Feb 2021].
Reference Source

12. Fisher R, Asaria M: **How might COVID-19 affect the number of GPs available to see patients in England?** 2020.
Reference Source

13. European_Centre_for_Disease_Prevention_and_Control: **Transmission of COVID-19.** 2020 [Accessed 25 Feb 2021].
Reference Source

14. Public_Health_England: **Wider Impacts of COVID-19 on Health (WICH) monitoring tool.** 2020. [Accessed 3 Sept 2020].
Reference Source

15. Duncan LJ, Cheng KFD: **Public perception of NHS general practice during the first six months of the COVID-19 pandemic in England.** *F1000Research.* 2021.
Publisher Full Text

16. Ipsos-MORI, Public Affairs: **The Health Foundation COVID-19 survey third poll, a report of survey findings.** 2021.
Reference Source

17. NHS England: **Primary Care Networks.** 2020.
Reference Source

18. Horrocks S, Pollard K, Duncan L, *et al.*: **Measuring quality in community nursing: a mixed-methods study.** *Health Serv Deliv Res* 2018; **6**(18).
Publisher Full Text

Open Peer Review

Current Peer Review Status: ✓ ✓

Version 3

Reviewer Report 23 November 2021

✓ **Mona Jeffreys**

Health Services Research Centre, Wellington Faculty of Health, Victoria University of Wellington, Wellington, New Zealand

I am happy to amend my recommendation to Approved, given the authors' comments.

Competing Interests: No competing interests were disclosed.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Reviewer Report 01 November 2021

✓ **Helen Atherton** iD

Warwick Medical School, Coventry, UK

No further comments.

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Access to general practice, remote consultation

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Version 2

Reviewer Report 27 September 2021

?

Mona Jeffreys
Health Services Research Centre, Wellington Faculty of Health, Victoria University of Wellington, Wellington, New Zealand

This report describes changes that were implemented by general practice in England during the early months of the COVID-19 outbreak (i.e. March to July 2020).

I am not clear about the lack of distinction regarding CCGs and practices. Some of the wording implies they are interchangeable terms (e.g. "The use of 'co-located' hubs was indicated in 21 CCGs, whereby hot hubs were sited adjacent to cold hubs (n = 4) or cold practices (n = 17)." Does this imply that within one CCG, all practices used the same model? If so, could this be stated explicitly? Figure 1 is equally confusing, with n=135 CCGs but n=12 "zoned practices".

Figure 1 is not clear. I suggest that changes are made to the text below coloured circles in the top right pane, so that it is clear (if I have understood this correctly) that of 12 practices that used zones, six also used hot and/or cold home visits. Although category 7 has only one practice (or CCG?) , it would be helpful to include a circle for this, for consistency with Figure 2.

It is not immediately clear to me how the data collected in the questionnaire resulted in the framework/ classification in Figure 1. In particular, what decisions/classifications were made by the authors to come up with the seven categories presented.

I am unclear of the relevance of the data presented on clusters/outbreaks in GP practices. The inclusion of this data in this report implies that there is a relationship between the model of care that the CCG implemented, and an outbreak at a practice (reported on a regional, not CCG level). This is adequately dealt with in the paragraph entitled "SARS-CoV-2 transmission", but I do feel that maybe the data should not be included in the methods and results section. The statement "25 COVID-19 outbreaks linked to general practice were reported nationally in this period." should be removed from the conclusion as this is a statement of results, and implies that the conclusion is based on this.

Is the work clearly and accurately presented and does it cite the current literature?
Yes

Is the study design appropriate and is the work technically sound?

Partly

Are sufficient details of methods and analysis provided to allow replication by others?
Partly

If applicable, is the statistical analysis and its interpretation appropriate?
Partly

Are all the source data underlying the results available to ensure full reproducibility?
No source data required

Are the conclusions drawn adequately supported by the results?
Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Equity in access to primary health care

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 28 Oct 2021
Lorna Duncan, University of Bristol, Bristol, UK

Dear Dr Jeffreys,

Many thanks for reviewing our paper and for your helpful comments. We have now used these to improve our manuscript as indicated below in our responses to each point:

1. *I am not clear about the lack of distinction regarding CCGs and practices. Some of the wording implies they are interchangeable terms (e.g. "The use of 'co-located' hubs was indicated in 21 CCGs, whereby hot hubs were sited adjacent to cold hubs (n = 4) or cold practices (n = 17)." Does this imply that within one CCG, all practices used the same model? If so, could this be stated explicitly? Figure 1 is equally confusing, with n=135 CCGs but n=12 "zoned practices".*

Thank you for highlighting this possibility for misinterpretation. We have now clarified the relationship between CCGs and GP practices in our Introduction. We have also updated the entire manuscript to ensure clearer distinction is made between GP practices and the CCGs they form part of wherever these terms are used. This includes, for example, greater clarity in Figure 1 that it was 12 of the 135 CCGs which were assigned to model #1, in which zoned practices (but not hubs) were used by their component GP practices. In relation to whether the models used by practices within any one CCG were common or heterogenous, we have also now clarified this both in the expanded *Data analysis* section in the Methods (please see also our response to your point 3 below); in the *Adapted delivery models* section, and the Figure 1 legend, in the Results; as well as in the *Model use* and *Strengths and limitations* sections in the Discussion.

2. *Figure 1 is not clear. I suggest that changes are made to the text below coloured circles in the top right pane, so that it is clear (if I have understood this correctly) that of 12 practices that used zones, six also used hot and/or cold home visits. Although category 7 has only one practice (or CCG?) , it would be helpful to include a circle for this, for consistency with Figure 2.*

Many thanks for highlighting the potential for confusion here. We have now expanded the Figure 1 legend to show that both model combinations 4 and 7 included home visits. We had not included them originally as these 2 models necessarily used home visits, but absolutely agree with you that it is clearer to show all 7 models in the top right pane. We have also included detail in the same legend to indicate that reference is being made to the CCGs rather than the GP practices. Fuller information about the decisions regarding the inclusion of home visiting services in our model classifications has also now been given in the manuscript (please see also item 3 below).

3. *It is not immediately clear to me how the data collected in the questionnaire resulted in the framework/ classification in Figure 1. In particular, what decisions/classifications were made by the authors to come up with the seven categories presented.*

Thank you for this point, we see now that this was not explained sufficiently in our Methods section and have added detail (in the *Data analysis* section) describing how we arrived at the seven model types used to classify CCGs in this study. This includes discussion around the inclusion of home visiting services within these models, related to differences in the ways in which they were reported. Clarification regarding the use of home visits in the different models has also been added to the top right pane in Figure 1.

4. *I am unclear of the relevance of the data presented on clusters/outbreaks in GP practices. The inclusion of this data in this report implies that there is a relationship between the model of care that the CCG implemented, and an outbreak at a practice (reported on a regional, not CCG level). This is adequately dealt with in the paragraph entitled "SARS-CoV-2 transmission", but I do feel that maybe the data should not be included in the methods and results section. The statement "25 COVID-19 outbreaks linked to general practice were reported nationally in this period." should be removed from the conclusion as this is a statement of results, and implies that the conclusion is based on this.*

In light of your comments, it is clear that the outbreaks data is continuing to distract from the focus of our report. It is helpful to know this, thank you, and we have now removed each related section, as well as the Table.

Many thanks for each of the points you have raised, we feel they have been very useful in enabling us to further improve this report.

Competing Interests: No competing interests were disclosed.

Reviewer Report 23 August 2021

https://doi.org/10.5256/f1000research.58863.r92493

Helen Atherton

Warwick Medical School, Coventry, UK

I am happy with the changes, thank you. I have no further comments.

Is the work clearly and accurately presented and does it cite the current literature?
Partly

Is the study design appropriate and is the work technically sound?
Partly

Are sufficient details of methods and analysis provided to allow replication by others?
Partly

If applicable, is the statistical analysis and its interpretation appropriate?
Partly

Are all the source data underlying the results available to ensure full reproducibility?
Partly

Are the conclusions drawn adequately supported by the results?
Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Access to general practice

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

- -

Version 1

Reviewer Report 04 May 2021

https://doi.org/10.5256/f1000research.55399.r83182

Helen Atherton

Warwick Medical School, Coventry, UK

This is a useful and clear report summarising the modifications made in general practice during the height of the pandemic.

There are a few key things that would strengthen the manuscript particularly in terms of message.

- The abstract background says the study looked at 'evidence for their effectiveness' which is an overstatement as this is very much a descriptive study. It would be more accurate to remove that.

- At present the paper is written as though we are still 'in' this stage of the pandemic. With vaccinations and the benefit of time changes are happening. It would be useful to couch the study as a description of service delivery in a time of crisis. Hot hubs are not going to be used in the same way now rates are extremely low. Your report is a really useful for any future lockdowns/rise in rates and as a learning tool and you don't couch it in those terms at present.

- I completely appreciate why you used survey methodology but it isn't ideal as you later highlight. Using FOI requests is such a good idea but does make this a slightly different approach, and probably worth discussing pros/cons in the discussion for the benefit of other researchers. I was interested as to whether it is worth it for the data you get.

- The data analysis section is very thin and would benefit from some extra detail.

- The PHE element is probably the weakest bit, the link between the models and the outbreaks is tenuous as you don't have any other data around what happened there. Where you describe the 25 outbreaks it would be useful to have more context in the text - how many cases, which models, where. If this is not available I think this needs to be highlighted.

- There are several limitations to be added to the discussion - for example the bit about the CCG mergers, which is important.

- The section in the discussion about transmission is useful context but comes a bit late in terms of understanding that bit of the work.

- The section on evaluation doesn't add anything at this point. Could you say instead what the practical application of your findings might be?

- Overall the manuscript lacks a bit of context, which is fine if it is just a descriptive exercise, but at the moment it isn't sure if it is something more than that. If it is a useful descriptive tool that is fine, but the conclusion probably needs to be toned down. In particular the line 'indicate their relative success in minimising transmission' - you just don't have the data to say that.

- Figure is really good and the succinct messaging was appreciated.

Is the work clearly and accurately presented and does it cite the current literature?

Yes

Is the study design appropriate and is the work technically sound?
Yes

Are sufficient details of methods and analysis provided to allow replication by others?
Partly

If applicable, is the statistical analysis and its interpretation appropriate?
Partly

Are all the source data underlying the results available to ensure full reproducibility?
No source data required

Are the conclusions drawn adequately supported by the results?
No

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Access to general practice

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.

Author Response 20 Aug 2021
Lorna Duncan, University of Bristol, Bristol, UK

Dear Dr Atherton,

Many thanks for taking the time to review this paper. We have used your detailed and helpful comments to improve our manuscript. Our specific responses to each of your points are listed below.

Key points to strengthen the manuscript:

1. *The abstract background says the study looked at 'evidence for their effectiveness' which is an overstatement as this is very much a descriptive study. It would be more accurate to remove that.*

We have removed this sentence further to your feedback. Please see also our response to your point 5 below.

2. *At present the paper is written as though we are still 'in' this stage of the pandemic. With vaccinations and the benefit of time changes are happening. It would be useful to couch the study as a description of service delivery in a time of crisis. Hot hubs are not going to be used in the same way now rates are extremely low. Your report is a really useful for any future*

lockdowns/rise in rates and as a learning tool and you don't couch it in those terms at present.

We have now ensured the entire manuscript is written from a historic perspective, looking back to the first wave of the pandemic in spring and early summer 2020. We wrote this report during the second wave as incidence fluctuated, and we had difficulty deciding how to contextualise it. We are grateful for your perspective and agree that this revision has given a much clearer context for the findings.

3. *I completely appreciate why you used survey methodology but it isn't ideal as you later highlight. Using FOI requests is such a good idea but does make this a slightly different approach, and probably worth discussing pros/cons in the discussion for the benefit of other researchers. I was interested as to whether it is worth it for the data you get.*

We have now included further discussion of the pros and cons of the use of both surveys and FOI requests in the new 'strengths and limitations' section. We were somewhat limited in the design of our study as COVID-19 restrictions required it to be completed remotely, and because it was initially intended as a 6-week project. Despite the limitations however, we feel this survey using FOI requests yielded useful information, either for case site selection and further investigation, or for retrospective analysis for initial management of any future epidemics, or future lockdowns as you suggest. Although it was not possible to include a comparative table of the CCG data received, we hope that the additional information now included in our summary analysis table (as *Underlying data*) supports this and is found useful. Please see also our response to your point 8 below.

4. *The data analysis section is very thin and would benefit from some extra detail.*

We have now incorporated more detail in our methodology section and have also added a summary version of our analysis spreadsheet as *Underlying data*. It is unfortunate that we are unable to include copies of the CCG and PHE responses under the terms of the Creative Commons Attribution 4.0 International license (CC-BY 4.0) used in this article. However, on considering your comments, we realised it may be helpful to offer permissible detail from which figures 1 and 2 were derived by adding a version of our analysis spreadsheet with the raw data removed. Of course this includes only an interpretation of the data received.

5. *The PHE element is probably the weakest bit, the link between the models and the outbreaks is tenuous as you don't have any other data around what happened there. Where you describe the 25 outbreaks it would be useful to have more context in the text - how many cases, which models, where. If this is not available I think this needs to be highlighted.*

We agree that the data we have concerning general practice-linked COVID-19 outbreaks is limited and we are grateful to you for highlighting the possible inference of a direct link between the models used and outbreaks from the text. This was not our intention and we have now given a fuller account of the reasoning for requesting this data and for including it in our report. We have also separated this work out in each section of the report.

To the best of our knowledge, this data has not otherwise been made publicly available and we feel it offers useful context around the scale of outbreaks in general practice. We

requested further information both from PHE and NHS England & NHS Improvement and have now mentioned this in our methodology section and reported the finding that transmission in staff was more common in general practice than that involving patients in one region. PHE was not able to provide more detail on specific outbreaks due to the potential for deductive disclosure however, and the table we have included in our report provides the most detailed data made available to us.

6. *There are several limitations to be added to the discussion - for example the bit about the CCG mergers, which is important.*

We have now expanded on our limitations section, to include discussion around the CCG mergers and several other items. Please see our response to item 8 below for more information.

7. *The section in the discussion about transmission is useful context but comes a bit late in terms of understanding that bit of the work.*

We agree and thank you for highlighting this. We have now moved this section to the introduction and expanded it.

8. *The section on evaluation doesn't add anything at this point. Could you say instead what the practical application of your findings might be?*

[Combined response for items 3, 6 and 8]. We have replaced both the 'evaluation' and 'limitations' sections with a fuller 'strengths and limitations' section. This includes further discussion of the survey methodology, using FOI requests at CCG level, the CCG mergers and possible applications of our study. We agree that this is likely to be far more useful than the two previously included sections – many thanks.

9. *Overall the manuscript lacks a bit of context, which is fine if it is just a descriptive exercise, but at the moment it isn't sure if it is something more than that. If it is a useful descriptive tool that is fine, but the conclusion probably needs to be toned down. In particular the line 'indicate their relative success in minimising transmission' - you just don't have the data to say that.*

This report is intended to offer a description of the face-to-face services offered in general practice in the initial phases of the pandemic. The information we included concerning outbreaks in general practice perhaps confused this although we do feel it adds some useful context to our data. We have now removed the line you mention and agree that our conclusion now more clearly represents our study.

10. *Figure is really good and the succinct messaging was appreciated.*

Many thanks, we are pleased you found this helpful! Thank you very much also for each of your comments which we feel have helped us to improve this report.

Competing Interests: No competing interests were disclosed.

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