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Maternity services' responses to the COVID-19 pandemic: how Public Health England guidance was implemented in practice[†]

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SUMMARY

Introduction: The rapidly evolving COVID-19 pandemic required systemic change in how healthcare was delivered to minimize virus transmission whilst maintaining safe service delivery. Deemed at 'moderate-high risk', maternity patients are an important patient group that require consideration. Public Health England (PHE) issued national guidance on how to adjust these services.

Aim: To explore how maternity units in England implemented PHE guidance.

Methods: An online survey of 22 items was distributed to individuals that had worked on an England-based maternity unit during the COVID-19 pandemic. The questionnaire was designed and tested by the multidisciplinary research team. Data was collected from November 2020 to July 2021.

Findings: Forty-four participants across 33 maternity units responded. Ninety-three percent were able to test all women requiring an overnight stay for COVID-19. Only 27% reported birth partners were tested for COVID-19. Only 73% reported they were able to isolate all COVID-19-positive patients in single rooms. Eighty-four percent stated they were aware of current PHE guidance on personal protective equipment (PPE) and 82% felt 'confident' in donning/doffing of PPE. Priorities for the future include rapid testing and a focus on community service provision.

Conclusions: PHE COVID-19 guidance was implemented differently in maternity units across England due to the varying resources available at each trust leading to variable ability to test and isolate patients as recommended. More specific, tailored guidance for infection control measures against COVID-19 is needed for maternity settings due to their unique position.

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Introduction

The global COVID-19 pandemic caused by a novel coronavirus, SARS-CoV-2, created significant impact on the delivery of healthcare worldwide. The virus, spread by human-to-human transmission via droplets exposure and contact transfer, causes a spectrum of disease severity, from mild symptoms to severe illness, viral pneumonia and acute respiratory distress

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syndrome and may be fatal [1]. Patients accessing maternity services are a patient group defined as being at moderate to high risk from COVID-19 [2,3]. During the SARS-CoV pandemic, pregnant women were found to have high rates of pregnancy loss, foetal growth restriction, preterm birth and mortality [4]. SARS-CoV-2 has so far demonstrated higher rates of caesarean section, preterm birth, need for admission to a neonatal unit and stillbirth [5,6]. Therefore, it is paramount there is clear guidance for how maternity healthcare should be delivered in order to minimize transmission and subsequent risk.

The speed and scale of the COVID-19 pandemic was unprecedented and had a significant impact on healthcare, impacting which services could be delivered and how remaining care was delivered [7]. Public Health England (PHE) published guidance on how to reduce transmission within healthcare for those services which could not be delayed or conducted remotely [8].

Implementing PHE guidance has resulted in significant changes to the way women using maternity care are managed in terms of isolation, placement and the precautions required to keep patients, healthcare staff and other healthcare users safe. The unpredictability of maternity care means there are many different admission pathways, each presenting challenges and each requiring differing actions to mitigate risk of virus transmission. It is expected that maternity units will have implemented guidance in different ways and to date there has been no national exploration of these differences or of the extent to which it was possible for units to meet the guidance in full.

Establishing a consensus on the best practice approach to implementing safe clinical care for those with facilities for isolation or social distancing that are often limited when compared with medical or surgical units, is extremely important. Without this information, we are missing vital information which will inform our response to new variants or a future pandemic.

Infection control guidance needs to balance the risk to pregnant women from COVID-19 with the risk of adverse pregnancy outcomes from delayed or reduced antenatal or intrapartum care due to infection control measures. During the pandemic, a clear message was to stay away from healthcare unless absolutely necessary [9]. The general population were subsequently reluctant to seek healthcare advice due to anxiety around catching COVID-19 or concern about unnecessarily taking up a professional's time [10]. Importantly, these same messages rarely applied to maternity services which were one of the few areas of hospital activity that continued to run at normal capacity throughout the pandemic. As a result, there may be important lessons that can be learned that could be applied to plans for the recovery of other clinical services.

Objective

To explore how maternity units in England implemented PHE guidance and to understand the limitations and successes to enable a robust future response.

Methods

A 22-item online survey was designed by S.H. and reviewed by K.F.W., E.B., D.S., J.G. and created using JISC online surveys®. Prior to distribution, it was user-tested by members of the multi-

disciplinary research team (see [Supplementary data](#)). Individuals were invited to complete the survey if they had worked as a midwife, trainee or consultant obstetrician on an England-based maternity unit during the COVID-19 pandemic. Individuals were asked to answer questions related to isolation arrangements, testing arrangements, partner restrictions, social distancing, personal protective equipment (PPE) and the management of COVID-19 confirmed/suspected patients. The final question of the survey asked individuals to provide any further information regarding ways in which they thought maternity services could better manage a pandemic.

The survey was a voluntary, open survey, and the study population was a convenience sample from individuals who could be reached through e-mails sent to members of relevant professional bodies and through social media. Anonymous survey links were distributed via several networks: British Intrapartum Care Society (BICS), UK Audit and Research Collaborative in Obstetrics and Gynaecology (UKARCOG), Royal College of Midwives (RCM) and British Association of Perinatal Medicine (BAPM). Study collaborators were asked to share the survey link on social media. Data collection ran from November 2020 to July 2021.

To reduce participant burden, unnecessary questions were eliminated through skip logic techniques and adaptive questioning. User-testing confirmed that the survey was of an appropriate length to allow for completion in a reasonable amount of time (approximately 10 min). Participants were not required to answer all questions to proceed with the survey, though it needed to be completed in one sitting. To reduce the number and complexity of some questions, follow-up questions appeared dependent on the answer(s) provided previously. Participants were asked to provide an e-mail address if they were happy to be contacted about future research but were reminded that all answers to the survey would remain anonymous. Informed consent was assumed by completion of the survey.

Analysis

The study was funded by the Healthcare Infection Society and granted local ethical approval from the Faculty of Medicine & Life Sciences Research Ethics Committee at the University of Nottingham (Ref: FMHS 165-0121).

JISC online surveys® only collects and analyses full responses and completion checks were not built-in; therefore, partly completed surveys were automatically removed from the final analysis. Only individuals within the research team were granted access to data stored within JISC online surveys. Once anonymous survey data was downloaded for analysis, data was stored on a secure server and accessible only to the research team. Prior to analysis, data was de-identified by removing all email addresses provided for contact regarding future studies.

Descriptive statistics of survey data were generated using SPSS (version 26). Data was presented as *N* (% of total responses) and where appropriate, mean \pm 1 standard deviation (SD), and minimum and maximum data were reported. Statistical correction methods were not used.

Results

A total of 44 individuals (21 obstetricians, two senior trainee obstetricians, 14 midwives, three senior midwives, one clinical fellow, one service director, one labour ward coordinator and

one clinical midwifery manager) completed the survey from 33 different NHS hospitals across England (see [Supplementary data](#)).

Isolation/management of cases

Thirty-two respondents (73%) reported that it was possible to isolate all confirmed and/or suspected COVID-19 patients in single rooms, as shown in [Figure 1](#). Nine respondents (21%) reported that it was possible to isolate more than half of patients, two respondents (4.5%) were able to isolate fewer than half and one respondent (2.3%) was not able to isolate any patients in single rooms.

In asymptomatic patients where COVID-19 status is unknown, 10 respondents (23%) managed the majority of patients by isolating in single rooms. Nineteen respondents (44%) reported patients were 'cohorted in bays with maintenance of social distancing of at least 2 m', 13 respondents (30%) answered 'cohorted in bays with maintenance of social distancing of 1 m plus additional measures' and five respondents (12%) answered 'managed as usual'. Two respondents (4.7%) answered 'other' stating there is often not enough room to group confirmed negative and outstanding cases separately, and that patients used to be cohorted in bays but are now kept in single rooms, where possible. [Table I](#) shows the availability of single rooms in a variety of maternity settings.

In instances where patients had been exposed to a COVID-19 positive case (similar to a household setting), 35 respondents (80%) answered that they were 'isolated in single rooms', 11 respondents (25%) answered 'cohorted in bays', three respondents (6.8%) answered 'exposed contacts are not identified and/or managed' and one respondent (2.3%) answered 'other' explaining 'it doesn't matter, we see them anyway'.

Testing

Forty-one respondents (93%) reported that they were able to test all women who required an overnight stay, and three respondents (6.8%) were able to test more than half of women who stayed on the unit overnight.

When asked to describe barriers faced to testing all elective admissions, respondents reported experiencing operational logistics related to the time taken to take a swab and follow-

Table I

Availability of single rooms in the four areas of the maternity unit

Area	Yes (N)	No (N)	Number of single rooms (range)
Induction area	27	16	1–18
Antenatal inpatient	36	4	1–16
Postnatal inpatient	39	1	1–31
Triage/assessment	30	11	1–7

up. Others described instances where women were declining testing, it being harder to plan and/or predict induction of labour, and the visit to undergo the pre-elective test being viewed as an unnecessary visit.

Sixteen respondents (62%) believed that it would be beneficial for patient management to have a process in place which allowed for all elective admissions to be tested, four respondents (15%) thought that it would not be beneficial, and six respondents (23%) cited other reasons. Five respondents stated 'N/A' or 'we do test' which likely indicates that the question should not have been answered and one participant stated 'possibly but unclear if the test is valid if they go home and return'.

Thirty respondents (70%) reported that all COVID-19 testing took place on the same hospital site as their unit, nine respondents (21%) reported that some testing took place on the same hospital site and four respondents (9%) reported that all testing took place elsewhere.

[Figure 2](#) presents information on the time taken to receive the majority (>75%) of COVID-19 test results.

Partner testing

Respondents were asked if birthing partners were tested for COVID-19 in a multi-answer question. Seven respondents (16%) reported that all birth partners were tested, three respondents (6.8%) answered 'only those who we anticipate will be in hospital overnight', 32 respondents (73%) stated that no birth partners were tested and three respondents (6.8%) answered 'other' with the following explanations: personal choice on testing, elective sections only and not currently but will be initiated at a later date.

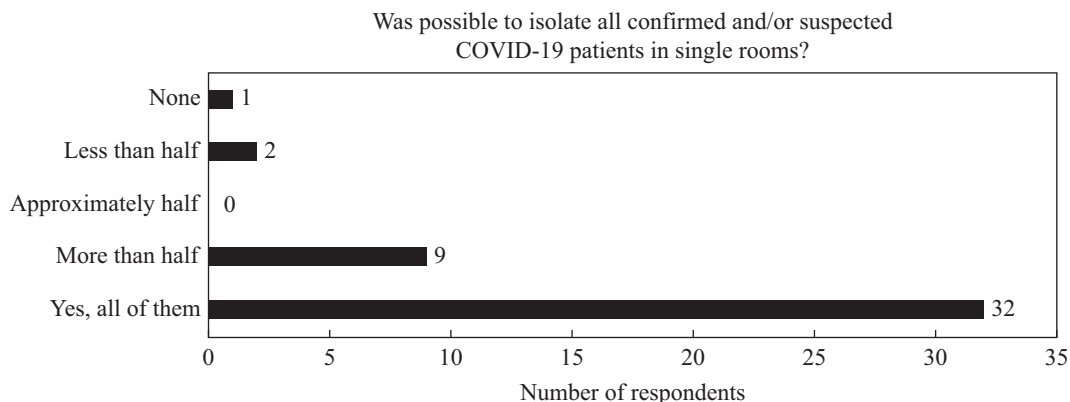


Figure 1. Participant responses to the question, 'Was it possible to isolate all confirmed and/or suspected COVID-19 patients in single rooms?'.

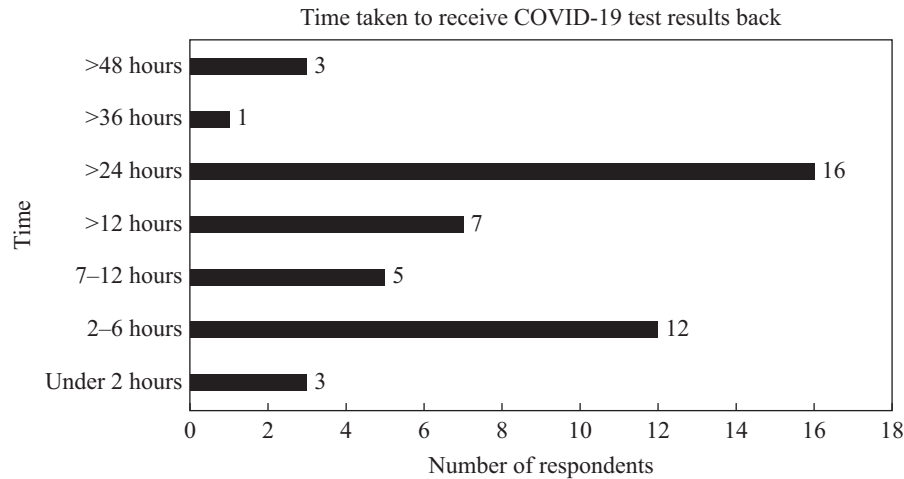


Figure 2. Number of hours between COVID test and result.

Social distancing

Table II shows whether maternity services were able to socially distance patients in a number of settings. Other areas' patients were socially distanced in included labour ward and dining room. One service described implementing 'pods' which seat two people so partners can sit in the waiting areas with women.

Hospital facilities

In a multi-response question, respondents were asked to report on any concerns about hospital facilities. Twenty-three respondents (64%) reported there were concerns regarding 'not enough toilets', 14 respondents (39%) were concerned that 'social distancing cannot be maintained during visits to the toilet' and 19 respondents (53%) expressed concerns regarding the frequency of cleaning.

PPE

Thirty-seven respondents (84%) reported that, throughout the pandemic, they were aware of the current guidance from PHE on what PPE should be worn. Seven responses (16%) stated that they were aware of the guidance 'at some points'.

Thirty-six respondents (82%) were confident in safely donning (put on) and doffing (take off) PPE, three respondents (6.8%) were not confident, five respondents (11%) were sometimes confident, and one respondent (2.3%) stated 'other' but did not provide any further information. Regarding patient and birth partners PPE practices, respondents reported that patients are not expected to wear masks in labour, but partners are.

Future

Respondents were asked to report on their level of confidence, on a scale of 1–10 (1 = not confident at all, 10 = very confident), in managing COVID-19 suspected or confirmed COVID-19 women as case numbers started to rise. Respondents' scores were as follows: 30 respondents (68%) voted 8, 9 or 10;

Table II

Ability to social distance patients in the four areas of the maternity unit

Area	Yes (2 m distance)	Yes (1 m + additional measures distance)	Not possible
In-patient wards	28 (57%)	17 (35%)	4 (8%)
Induction area	30 (64%)	13 (28%)	4 (8%)
Triage/assessment	29 (60%)	16 (33%)	3 (6%)
Waiting area in clinics	26 (53%)	19 (39%)	4 (8%)

11 respondents (25%) voted 4, 5 or 6; and three respondents (7%) voted 1, 2 or 3. Respondents offered suggestions for how maternity services could have been improved during the pandemic. Nine respondents highlighted the need for rapid COVID-19 testing. One highlighted that guidance changes quickly and is poorly disseminated to all staff. Another highlighted the importance of clear guidance for community service provision, where donning/doffing and hand hygiene are not as accessible as in hospital. Others called for clearer guidance for asymptomatic patients, clearer pathways for COVID-19-positive patients and more *en suite* single rooms. One respondent highlighted the importance of sufficient staff facilities to allow adequate social distancing, e.g., handover space, changing rooms. Another highlighted the problem with maintaining sufficient staffing levels whilst other staff members are isolating. One respondent suggested that text/phone contact with patients could check for presence of symptoms/ensure not self-isolating.

Discussion

The results outlined in this study demonstrated that the PHE COVID-19 guidance issued was implemented differently in maternity units across England. The varying resources available at each hospital resulted in differences in ability to test and isolate patients as appropriate, such as availability of single *en suite* rooms, speed of testing and ability to socially distance in communal areas such as waiting rooms. Additionally,

operational logistics and patient autonomy were key factors in reasons why all patients were not tested.

Ninety-three percent of respondents reported they were able to test all women requiring an overnight stay. Internationally, the importance of universal testing has been documented, identifying asymptomatic positive cases, easing patient and healthcare provider anxiety and having higher risks for all outcomes in women testing positive 10 days or less before delivery [11,12]. The barriers identified in this research included patient choice and the unpredictable nature of maternity admissions. Elsewhere, the general population has commented on reasons for declining testing include that sample extraction is unpleasant, fear of the consequences of a positive result and test results taking too long [13,14]. Our research found that only 27% of respondents' hospitals test birth partners. One paper commented on a desire for additional testing with one patient commenting "it was strange that my partner didn't get tested" [12]. Other studies have documented the need for close contact testing even in asymptomatic individuals [15].

Eighty-four percent described feeling confident with current PPE guidance. Elsewhere in the literature, healthcare professionals expressed difficulties in keeping up to date with change in guidance especially if off for short periods, e.g., two weeks of isolation [10]. Furthermore, most respondents reported feeling moderately to very confident in managing COVID-19 cases. Whilst our research did not measure patient outcomes, a healthcare professionals' confidence has a direct impact of patient experience. When examining the patient's perspective of the COVID-19 pandemic's effects on inpatient experiences, 34% of multiparous women reported increased post-partum anxiety compared with previous deliveries [12]. Those who tested positive described feelings of neglect and isolation from healthcare providers and feelings of difficulty with neonatal separation. One woman described feeling as though she had let her child down because she could not do skin to skin. Patients described fear of infection in the hospital, fear of leaving the house, difficulty with isolation from family and friends.

Outside of maternity care, the COVID-19 pandemic contributed positive movements in healthcare provision. Primary care highlighted the transition to increased service provision by utilization of telephone and video consultations [9]. Our research highlighted potential sources of improvement for maternity services including faster testing, a greater capacity for single rooms and *en suite* facilities.

The strengths of this study are that the questionnaire was created and piloted with a multidisciplinary research team. Findings were a collaborative result of a variety of specialists in different roles within maternity care over a multitude of hospitals across England. A limitation of this study is that testing rates are a healthcare professional's estimation and are not cross-checked with hospital data. Another limitation is that there were 44 responses nationally.

In conclusion, tailored guidance around infection control measures against COVID-19 are needed for maternity settings due to their unique requirements. A lack of specialty specific guidance results in a wide variation in practice. Guidance is urgently needed on birth partner testing and visitation.

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Conflict of interest statement

None.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jhin.2022.04.019>.

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