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# Implementation of Public Health England infection prevention and control guidance in maternity units in response to the COVID-19 pandemic<sup>†</sup>

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## SUMMARY

**Background:** This study aimed to explore the successes and barriers to the implementation of Public Health England (PHE) infection prevention and control guidance in English maternity units during the COVID-19 pandemic.

**Methods:** Qualitative semi-structured interviews with obstetricians, midwives and neonatologists who worked in a maternity unit in England, UK, between March 2020 and July 2021. A thematic analysis was performed.

**Results:** Successes to the implementation of PHE guidance were related to existing infrastructure, training satisfaction, and organisational culture where subthemes considered the importance of a multidisciplinary approach, COVID-19 dedicated roles and hospital-wide communication. Barriers to implementation related to the applicability of the guidance with subthemes highlighting contradictions between updates, specialties and hospitals, undesirable timings and frequency of guidance updates, reductions in staff compliance and delayed implementation. Finally, the layout of some units made it difficult to implement various aspects of the guidance (e.g., social distancing), and many detailed issues related to information technology compatibility, a lack of availability and accessibility to appropriate personal protective equipment (PPE), and variations in testing arrangements between units.

**Conclusions:** This research provides information on the experiences of healthcare professionals working on maternity units during the COVID-19 pandemic. Findings illustrate the importance of effective hospital-wide communication and the need for consistent,

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easily understood guidance. These results will be used to inform the content of an expert panel consensus meeting.

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## Introduction

In 2020, a global pandemic occurred due to a novel coronavirus, SARS-CoV-2 which causes COVID-19. The unprecedented scale and speed of the COVID-19 pandemic had a significant impact on healthcare, resulting in the delivery of many services being halted. Maternity care is a service which cannot be delayed or stopped. Therefore, the delivery of maternity care needed to adapt quickly to the rapidly evolving pandemic and its many related uncertainties. The unpredictability of maternity care and different admission pathways create further complexities in infection prevention and control (IPC) procedures, all requiring differing approaches to mitigate the risk of transmission. Furthermore, many maternity units see high numbers of women, their partners and babies and there is often insufficient space to allow for social distancing and limited isolation facilities in inpatient areas. Another complexity is the close relationship with the neonatal service and associated visiting arrangements for parents and families to babies on the neonatal unit. Worldwide, evolving evidence shows that maternity services have employed infection prevention and control measures in response to the COVID-19 pandemic in varying ways; specifically related to testing arrangements, visiting restrictions placed on birthing partners and the use of telephone and video platforms to replace or supplement face-to-face care consultations [1,2].

Until being superseded by the UK Health Security Agency (UKHSA) in April 2021, Public Health England (PHE) was responsible for protecting individuals from health threats, including those posed by infectious diseases. Throughout the pandemic, PHE published IPC guidance for healthcare services [3]. The implementation of this guidance has resulted in significant changes to the way women using maternity care are managed in terms of placement, isolation and the precautions required to keep healthcare staff and other healthcare users safe.

Maternity units will have undoubtedly implemented PHE 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. Therefore, the aim of this study was to explore the successes and barriers to the implementation of PHE IPC guidance in English maternity units during the COVID-19 pandemic.

## Methods

### Participants

Social media platforms and personal contacts of the research team and collaborators were utilised to publicise the study. This study was also part of a wider project, where a national survey was conducted to determine how guidance had been implemented and whether gaps in the guidance existed.

Survey participants were asked to provide contact details if they wished to be contacted regarding future research. Survey responders were selected and contacted based on their experiences, such that purposeful sampling of units allowed for the recruitment of a mixture of units with different experiences in implementing PHE guidance (little or no difficulties/some difficulties/major difficulties). Furthermore, this approach allowed for the collection of rich data to address the research questions.

Participants were invited to take part if they had worked as an obstetrician or neonatologist or midwife at an English NHS maternity or neonatal unit during the COVID-19 pandemic (March 2020 onwards).

### Procedure

The study was granted local ethical approval from the Faculty of Medicine & Health Sciences Research Ethics Committee at the University of Nottingham. Study advertisements and posters were shared on various social media platforms (e.g., Twitter, Facebook). Potential participants made direct contact with the research team to indicate their interest and were then provided with a Participant Information Sheet and invited to ask any questions. A small number of participants identified other potential participants who fulfilled the inclusion criteria and were asked to share the study details with them such that communication with the research team was instigated by the potential participant and they did not feel compelled to reply in a certain manner or feel pressured to take part.

### Data collection

Participants were provided with detailed verbal and written explanations of the study. Written informed consent was obtained prior to the start of the interview. Interviews were broadly structured as a time-course interview, such that participants were encouraged to share their experiences of working on a maternity unit at the start and in the midst of the pandemic, and up to the current day [4]. This approach allowed participants to take control of the interviews and position their experiences along the time course of the previous 12–18 months.

Prior to conducting any interviews with study participants, an interview guide was piloted. Following the pilot interview, the interview guide was modified such that introductory questions were included to address each of the main topics: implementation of PHE guidance, infection control measures and improvements to implementation of PHE guidance (see [Supplementary data](#)). Prior to all interviews, time was spent building rapport with the participants and, over time, the interview guide was slightly altered based on early findings and participants' experiences when discussing each topic.

All video-recorded interviews were conducted on Microsoft Teams. Data collection for the study was conducted between April and July 2021. In the context of the COVID-19 pandemic,

in England, the first lockdown was imposed on 23<sup>rd</sup> March 2020 such that participants were asked to recall their experiences of working on a maternity or neonatal unit during this time. The interview guide contained questions about testing, personal protective equipment (PPE), social distancing, partner restrictions, and participants were asked to share ideas regarding how they believed maternity services could better manage a pandemic. Interviews ranged in length from 25 min to 1 h 7 min. All interviews were transcribed verbatim from the recorded video.

### Data analysis

A thematic analysis of the data was completed, based on the six-step approach proposed by Braun and Clarke [5]. Throughout the process of thematic analysis, themes were further refined to accurately reflect all included codes. Initial refinement occurred at an individual reviewer level and then independently by a second reviewer. A discussion between both reviewers (S.H. and A.J.) took place to review proposed themes, resolve any conflicts, and produce a final list of themes.

## Results

### Sample characteristics

Sixteen participants (eight obstetricians, four midwives, two matrons (chief nurses), two neonatologists) were recruited. Participants had been practising for between 3.5 years and 39 years ( $17.9 \pm 9.8$  years) since qualification. Participants represented the majority of regions across England. Specifically, participants worked or had worked on a maternity unit in the following regions since March 2020: Midlands, seven; South-East, two; Cheshire and Merseyside, two; South-East London, one; Wessex, one; Cumbria and North-East, one; Yorkshire and Humber, one, and South-West, one.

## Main themes

### Successes to implementation

Three main themes were identified: (1) existing infrastructure; (2) training satisfaction; and (3) organisational culture. Organisational culture was split into three sub-themes.

#### Theme 1: Existing infrastructure

The existing infrastructure and layout of some units contributed towards the ability to effectively implement infection prevention and control guidance. Often, participants who worked on newer units spoke of being able to more easily isolate women appropriately, than those who worked on older units and who did not have, for example, sufficient single rooms with *en suite* facilities.

*And that is [a] massive place, so we never had problems with the social distancing using that clinical setting. However, and I don't know what the previous setting looked like, but when I started, I was told that you know, from the COVID perspective, we would have struggled if we weren't in this new setting.* (P16)

#### Theme 2: Training satisfaction

When asked to comment on training, participants described feeling satisfied with the training received, as well as the methods of delivery of training whilst working on a maternity unit during the COVID-19 pandemic.

*I think it probably was as good as it could be actually in terms of training. Because we weren't doing so much of the elective stuff, actually people could get trained up quickly, and those sorts of things for essential work on where it matters to our frontline, which is delivery suite.* (P1)

Satisfaction with training materials, resources and scenario-based training was also highlighted. This participant talks about the ease in understanding and implementing PPE guidance presented on posters around their unit.

*There was lots of adapted versions of it to make it fit for maternity, and eventually there was literally a poster on the wall which was like 'you wear this if you're caring for someone who hasn't got any symptoms, you wear this if it was someone who has got symptoms, this one if they're positive' and then it was really clear.* (P13)

#### Theme 3: Organisational culture

The organisational culture varied greatly between units. Units that adopted a wider team approach by working with other specialities in the hospital appeared to be more successful in implementing PHE guidance than those units that worked independently. This between-speciality approach often resulted in digestible maternity-specific guidance being filtered down to staff working on the unit. Organisational culture was split into three key sub-themes: multidisciplinary approach, COVID dedicated roles and hospital wide communication.

**Multidisciplinary approach.** A multidisciplinary approach was highlighted by participants as a factor which allowed for an effective implementation of infection control measures on their unit. One participant specifically spoke about reintroducing face-to-face appointments.

*And they've brought all those back now face to face, they're all back now – that's been a staggered approach, we looked at which ones we could bring back, that was carefully done, and we had a week. That was quite successfully done I think, that was done between the business unit, the antenatal clinic manager, the scan person, me as a matron, the obstetrician and the admin team.* (P12)

Another participant described how a multidisciplinary approach allowed for a successful implementation of the guidance.

*When we were implementing all our infection prevention measures and our COVID, our PPE etc., we worked in conjunction with the General Hospital, ... in fact we have been congratulated by the big infection prevention team that we have managed to successfully implement it over in the maternity hospital. So, but we're part of a team, a big team which covered all disciplines; medical, surgical, all different specialities. So, we were part of that big picture.* (P3)

This same participant also highlighted that a multidisciplinary approach allows for constant communication of guidance updates and associated support.

*We had weekly meetings, a multidisciplinary COVID meeting, weekly, regarding any new measures that were coming out or new*

guidance and then we could implement them, and it also was if we were unsure of anything then we could bring it to this meeting so that you were clear what you should be doing and then you could cascade the information to the clinical workplace. (P3)

**COVID dedicated roles.** Successes in implementing PHE guidance was often related to staff being dedicated to COVID-specific roles, which allowed for the cascade of appropriate and timely information to other maternity staff members.

*We did have, I managed in maternity to, well we had an infection prevention midwife who worked under me, and we managed to get her protected time so that she could focus completely on COVID. (P3)*

Another participant described the lack of this arrangement on their unit and the resultant lack of support and appropriate communication channels.

*A dedicated person who was in charge of the COVID response from an early, from the beginning of the pandemic and who was solely responsible for sharing the information and collating the information, so we all had to someone to go to. (P13)*

**Hospital-wide communication.** The importance of appropriate communication to allow for the effective relay of information between the hospital and units themselves was highlighted by many participants. It was clear that communication was improved when units had a dedicated voice at hospital wide meetings.

*We started these weekly CAG [Clinical Advisory Group] meetings that would usually be led by our medical director. And then there would be a representative from each division, medical and nursing or midwifery, and we would try and sit on those, and we were having them, in fact – I say it's weekly, we were having them daily at the peaks and we've changed the frequency, depending. (P10)*

Another participant described that obstetric representation at hospital-wide meetings allowed for regular updates of the ever-changing situation.

*Our department met and that meant that the voice of obstetrics was then relayed up to the next level up at the trust, and information came back down so everybody knew how many cases we had in the trust, what was our level of PPE, how many days of supplies of sterile gowns did we have. All of that information was being shared and it was so important because it meant that when people asked us questions, we knew the answers and they knew we were engaged. (P5)*

### Barriers to implementation

Three main themes were identified: (1) application of guidance; (2) infrastructure and resources; and (3) variances in testing arrangements. Application of guidance and infrastructure and resources were both split into five subthemes.

#### Theme 1: Application of guidance

Many issues existed related to the implementation of the guidance due to the release and adoption of contradictory information and practices, a lack of specificity and compliance, and, in many cases, delays in actioning necessary infection prevention and control measures. Applicability of guidance was split into four key subthemes: contradictions, specificity to maternity, staff compliance, timings & frequency, and delayed implementation.

**Contradictions.** One major barrier to the implementation of PHE guidance was related to participants' beliefs that much of the guidance was contradictory, both in updates and between specialities and hospital sites, which often led to great confusion. This participant detailed an example of contradictions between specialities.

*The sonographers were a group who were really anxious at the start about PPE and they had different guidance coming through their Royal College, I think. I don't know if this has been brought up in other interviews. And there was a time when somebody gave, or there was a decision made that they could wear FFP3 masks, so they were walking around with their FFP3 masks on, and I was saying you don't need it. (P10)*

Another participant detailed the need to develop consistent, more easily understood guidance across different specialties to allow for a wider, more streamlined approach to implementation of infection control measures.

*Joint statements from RCOG [Royal College of Obstetricians and Gynaecologists], RCM [Royal College of Midwives], PHE so there's no variation. It's not, you know, not ambiguous and guidelines, you know, get updated with time to implement. And you know consistent advice really... I think the other thing is joined up between, so like our microbiologists, we had to say this is the RCM, RCOG guideline. So, I think joint colleges, you know, joining together so if you say right, we have to test all inpatients, then think about all the different kinds of inpatients, children, neonates, maternity. (P7)*

**Specificity to maternity.** Concerns were raised by many that the guidance was not specific to maternity and it lacked detail on ways to address some of the unique aspects of care at birth. This created ambiguity, often related to PPE requirements in different scenarios. One participant described instances where staff felt unprotected when attending women in labour.

*We just had staff who went, but I want more protection than this guidance is saying. So, because very early on it was like, well if it's not an aerosol generating procedure, you don't need an FFP3. But we had midwives working with women in a relatively small space. They're going well, she's coughing, she's vomiting, she's huffing and puffing 'cause she's in labour, this sort of feels like an aerosol generating procedure, even though no one's putting a tube down. (P5)*

The lack of specificity to maternity often resulted in units adapting the guidance to ensure appropriate care was provided to pregnant women. This participant detailed the adaptations made on their unit regarding testing for gestational diabetes.

*The reason why they decided to do that was because the diabetic team felt that if we stick ourselves for doing just the glycosylated haemoglobin, or if we don't do the GTT [Glucose Tolerance Test], we'll miss on a third of our population from being diagnosed from gestational diabetes and based on that they just carried on. So, it wasn't like they were, we implemented everything but, you know, we obviously, did few things which were, which weren't advised to do, but we did it from bearing in mind the dynamics of our population and what our data indicated us to do. (P16)*

**Staff compliance.** Issues related to staff compliance were raised throughout the interviews. Specifically, participants spoke of issues with social distancing, for example at handover times, and a lack of compliance with PPE guidance.

*But then we were all just congregating in the, like in the corridor, so we may as well just been in that room anyway, because there wasn't any social distancing happening in the corridor, we were just sort of standing altogether in that space, and I think when something like that starts, it's really hard to then stop that happening every shift, twice a shift, so that definitely could have been improved. (P2)*

One participant attributed a recent lapse in compliance due to the roll out of the vaccination programme.

*I have personally noticed that compliance has been slipping over the last couple of months, and it's just that people are fed up, they've been vaccinated, the thought of wearing that, it's the eye protection. (P5)*

**Timings and frequency.** Four participants referred to the undesirable timings related to the release of guidance updates. Updates were released on Friday afternoons, and experiences of frantically trying to implement the new guidance before the weekend were shared.

*I definitely think timing was one of the big things -- like I said at the beginning, the guidance would come out five o'clock on a Friday, when you were supposed to be off all weekend, and so you would not be home till really late and it is a probably a rush job and you want your staff to be safe over the weekend as well. (P13)*

There were also many mentions of the number and frequency of guidance updates which often resulted in participants being unable to keep up with the new guidance. As a result, this participant shared that staff members relied on each other to share pertinent information.

*There were more e-mails than you could stay on top of, and I couldn't, I swear I don't think I've read even twenty percent of the update emails that we had just, we as a team, just relied on each other to filter the most important information through by word of mouth. (P15)*

**Delayed implementation.** Participants also described delays in implementation of the guidance which had a negative impact on staff safety. One participant detailed a delay in the implementation of social distancing, PPE and testing on their unit.

*So even the simplest things at the beginning of the pandemic like PPE -- for example, my father-in-law, he works at a factory, and he was actually out wearing PPE before we were. Social distancing was implemented at other places before it was up at the hospital, which when you spoke to other people who don't work in health-care, [they] thought it was absolutely ludicrous that that was the case, even things like testing. (P13)*

Furthermore, another participant described delays in incorporation aspects of staff concern into national guidance documents.

*What we were hearing on our sort of national communication groups was what the staff were asking for and what they were scared of. And that wasn't sort of implemented into national guidance until a later stage, and I feel that everything that we raised as a clinical body, so we would hear the concerns of staff... and we did feel that there was a specific delay in guidance regarding maternity. (P10)*

## **Theme 2: Infrastructure and resources**

Units experienced barriers to the implementation of PHE guidance related to the existing infrastructure and availability

of resources. The set-up and flow of some units made it difficult to implement and comply with published guidance, whilst many participants detailed issues with being unable to comply with published guidance due to the nature of their roles and a lack of availability and accessibility to PPE. Infrastructure and resources was split into five key subthemes: IT compatibility, PPE availability, difficulties with cohorting, nature of clinical role, and fit testing arrangements.

**IT compatibility.** Participants shared details of the IT set-up on their units being incompatible with what the guidance was suggesting. For example, this participant spoke of a lack of resources to enable individuals to work from home:

*And lots of people ended up working from home, but the infrastructure of the hospital, actually having the physical computers for people to work from home weren't there. (P9)*

Additionally, this participant spoke of the inability to alter handovers due to the lack of available software in some areas of the unit.

*Only other way would be to do it via teams in different rooms for which we don't have the resources. (P15)*

**PPE availability.** Shortages of PPE, especially at the start of the pandemic, was a big issue for a lot of units. Participants described instances where PPE was being reused, insufficient PPE was being worn in certain scenarios and resources were used for alternative means. Often, this led to participants sourcing PPE elsewhere.

*To begin with we didn't have enough PPE and that was a problem. And then from [them] saying that we should have visors or eye protection, people were buying them themselves off Amazon. (P1)*

This participant describes the desperate situation on their unit at the start of the pandemic.

*People were using binbags because we'd run out of aprons, you know, so just cutting a head and the little arms out. (P9)*

**Ease of cohorting.** The layout of some units, in particular older units, often did not allow for appropriate cohorting of women. Delays in receiving test results also contributed to difficulties in cohorting women when their test results were unknown. This participant details instances where mixing of cases occurred due to a lack of space on their unit.

*But then, you know, sometimes there wasn't capacity, so negative women would be put in that pending bay and then I know times that someone in the pending bay has been positive and then the lady that's had a negative test on discharge has then been told to isolate. (P2)*

**Nature of clinical roles.** Many participants spoke of the nature of their roles not allowing for compliance with the guidance. In particular, there were several mentions of the inability to comply with social distancing guidelines whilst delivering clinical care. This participant details how the layout and care plan on their neonatal unit does not fit with the distancing guidance for staff:

*One of the main things was that on a neonatal unit, it's almost impossible to remain two metres apart, mainly because in our base there are three or four incubators in each bay. Yeah, on a shift there's normally anywhere between like five medics and the nurses*



*that are looking after that baby. So that part is just impossible.* (P4)

**Fit testing arrangements.** Finally, there was ample evidence to suggest that fit testing for FFP3 respirators was inadequate on many units. Specific issues related to stocks of FFP3 respirators running out and staff needing to be re-tested or wear masks that did not fit properly. This created fear amongst many staff, especially when they were attending surgeries wearing incorrect masks.

*We were having to constantly have these fit mask testing clinics all the time because the masks, we couldn't get them issued 'cause they were running out so there was lots of resources wasted.* (P3)

Furthermore, there were many mentions of staff being unable to attend fit testing clinics due to shift patterns which, in some cases, meant that participants had still not been fit tested.

*I still haven't been fit tested. And I know that a lot of staff still haven't been fit tested, and if they failed the fit test, then you know there wasn't anything else provided.* (P2)

### **Theme 3: Variances in Testing Arrangements**

Barriers to the routine implementation of PHE guidance existed due to units adopting different processes for the testing of both women and partners. Specifically, some participants spoke about arranging testing for women prior to attending the unit for an elective caesarean section, whilst others did not test any elective admissions. These two extracts demonstrate the discrepancies in testing for women across different units.

*Anyone having elective caesarean sections they were, when they came for their pre-clerking, they were COVID swabbed so that when they came in for their electives they, we had a result.* (P3)

*Elective sections we've never tested, as far as I can gather.* (P6)

Furthermore, in some units, partners were tested and in others they were not.

*So, the women who came in in labour were automatically all COVID swabbed and their partners.* (P3)

*Well partners aren't being tested, they're just being asked to wear a mask and socially distance.* (P1)

However, in units where partner testing had been implemented, there were instances where partners refused a test due to the potential consequences of not being able to be present with the woman during labour and the birth if they tested positive.

*People were just deciding and choosing not to test themselves just because they were worried that if they are going to be positive then they won't be allowed, you know, to be with their, with the women.* (P16)

## **Discussion**

Factors contributing to the successful implementation of PHE guidance included: having an existing unit infrastructure that made it possible to implement social distancing; satisfaction with training and the delivery of training materials (e.g., easily understood posters on donning and doffing); and adoption of a multi-disciplinary approach whereby maternity

staff were dedicated to COVID-19 response roles, attended hospital-wide meetings and shared digestible relevant information with colleagues working on the maternity unit.

Barriers to the implementation of PHE guidance included: confusion related to contradictions between different guidance documents and the frequency of updates; a lack of staff compliance and specificity to maternity; variances in testing arrangements for both women and partners across units; difficulties in implementing testing procedures; and existing infrastructure and resources not allowing for a streamlined implementation of the guidance.

This study is the first to explore healthcare professionals' experiences in implementing guidance released by PHE in response to the COVID-19 pandemic. Whilst we attempted to recruit participants from various regions of England to ensure wide geographical representation, seven of the 16 participants worked in the Midlands region. Of these 16 participants, only two were neonatologists, which limited the discussion from a neonatal perspective. The range in interview lengths may indicate that some participants were not fully engaged in the process, but this could equally be a reflection of the time pressure that participants were experiencing due to the pandemic. As interviews were conducted at one time only, participants may have naturally drawn on more recent experiences. Furthermore, at the time of interview, some participants were on secondments (e.g., research midwife posts) or they had been deployed to other areas of the hospital which may have impacted on their ability to recall experiences whilst working on a maternity unit.

This study identified varying levels of success in the implementation of PHE guidance in maternity units in England in response to the COVID-19 pandemic. Participants detailed that, where guidance was successfully implemented, there were structured communication channels in place where individuals were allocated to attend hospital-wide COVID update meetings and share key information with colleagues in maternity. These experiences are consistent with previous research: a global online survey of 714 maternity healthcare professionals completed in March to April 2020 concluded that, to allow for an effective response to the pandemic, there was a need for formal information-sharing channels [6].

Findings about infrastructure and resources, specifically PPE availability, are aligned with other studies where deficiencies in PPE were described as compromising patients' and healthcare professionals' safety in Iran [7], Europe [8] and worldwide [6]. The subtheme of IT compatibility was also identified as part of the infrastructure and resources theme. Participants spoke about a lack of IT resources and incompatible work environments at home. Results of an online survey exploring available resources for NHS staff working from home during the pandemic, offered agreements with the results of the current work whereby 79% (99 of 128) of respondents were able to work from home, but 21 of 99 respondents described not having adequate resources to enable optimal work [9]. Of those individuals who were able to work effectively from home, roles included planning departmental activities, creating rotas, conducting telephone clinics, delivering online training and completing quality improvement projects and research. As hybrid working continues, it is crucial that staff working from home have access to suitable equipment to allow for the full utilization of the NHS workforce [9,10]. Our results regarding ease of cohorting, existing infrastructure and the nature of clinical

roles are also in accordance with the findings from previous works where, firstly, experiences were shared regarding difficulties in implementing social distancing, especially on smaller, older units [6], and secondly, the care requirements for women in labour and during birth and the limited space in which to safely deliver this care, puts maternity staff at an increased risk of contracting COVID-19 [11].

The subtheme of timings and frequency was identified as part of the application of guidance theme. Participants expressed feelings of confusion related to not being able to keep up with the frequent changes to the guidelines. Hantouzhadeh *et al.* [7] conducted interviews with 12 maternity healthcare workers (eight midwives, four gynaecologists) to explore their experiences of providing pregnancy and childbirth care during the COVID-19 pandemic in Iran. These participants also reported feeling confused and fearful due to the unknown nature of the disease and the frequent guidance updates. These combined findings require urgent attention, especially given recommendations that maternity services should maintain clear lines of communication with women to update them on ever-changing care arrangements and visiting policies [12].

Specificity to maternity was identified as another subtheme of application of guidance. Participants highlighted that, due to the guidance not being specific to maternity, often units disregarded the advice to ensure appropriate care was provided to pregnant women. In some cases, this included altering the set guidance on testing for gestational diabetes and in other cases, participants spoke of their unit choosing to ignore the guidance to allow women to have a partner present. Linked with this, there was report of variances in testing arrangements between units which often resulted in partners refusing tests due to the consequences of missing out on attending with a woman during labour and childbirth. The results of a scoping review also revealed that, across the world, maternity units differed in terms of the restrictions placed on birthing partners [1]. For example, depending on the hospital, sometimes women could have a partner present once dilation had started and in other cases the woman had to be in established labour (i.e., at least 4 cm dilated) before the partner could attend the unit [8,13–16]. Walsh *et al.* [17] raised a COVID-19 call for humane care on the topic of altered partner restrictions in maternity. The call referred to the blanket application of hospital visitor restrictions ignoring the important role of some visitors (e.g., partners in maternity settings) [18]. As a result, the findings of previous qualitative work showed that, on some occasions, partners missed the birth of their child because of imposed restrictions [19]. Partners may also have to leave the maternity unit shortly after the birth, and women could receive devastating news or have to make life-changing decisions without the support of their partner. Whilst the overarching aims of these visitor restrictions were to reduce footfall and promote social distancing, and is appropriate in most areas of healthcare, it is crucial that, given these combined findings, guidance is adapted for maternity services to minimize the risk of negative outcomes and emotional distress for both the woman and their partner.

The learnings presented in the current work are crucial to inform effective response strategies to any subsequent outbreaks of COVID-19 and/or future pandemics. Steward *et al.* [20] published a quality-improvement report which aimed to share and support clinical decision making for health

professionals working in maternity by drawing upon the expertise of obstetric physicians working in Southeast London, UK. Aligned with current findings whereby participants highlighted that a multidisciplinary approach allowed for a more successful implementation of PHE guidance, Steward *et al.* [20] described that the formation of fortnightly multidisciplinary team virtual huddles with midwives, obstetricians, obstetric physicians, and obstetric anaesthetists allowed individuals to share clinical experiences, and any operational and service challenges. Importantly, these huddles have provided a platform to build trust across the sector by facilitating effective teamwork and supporting clinical decision making. There was, however, no representation from neonatology. Moving forward, to strengthen the response to the COVID-19 pandemic, maternity and neonatal units should look to develop multidisciplinary strategies to allow for shared learning and constant communication between specialties.

Previously, the RCM strongly recommended that, to ensure the continuation of safe and high-quality maternity care during the COVID-19 pandemic, it is critical that maternity staff are not deployed to other areas or services within the hospitals [8]. Furthermore, in the UK, whilst in some instances telephone and video consultations have proven to be acceptable and valued by women, a reduction in face-to-face communication between women and midwives has undoubtedly created issues with care access for women who do not use English as their first language or who lack IT skills, and it may have provided fewer opportunities to identify some issues, such as domestic violence [8]. Previous work indicates that whilst women understand the reasons for a move to virtual consultations, they are concerned that a lack, or reduction, of in-person care will not allow for the identification of any issues related to the growth and wellbeing of the baby as their pregnancies progress [19]. To allow for the delivery of high-quality maternity care, it is therefore crucial that women who may experience language barriers or barriers to the use of virtual technologies are given the opportunity to arrange face-to-face consultations. Furthermore, face-to-face consultations must be prioritized in instances where concerns exist regarding the woman's home life and the growth and development of the baby requires close evaluation.

In conclusion, these results provide valuable insights into the experiences of healthcare professionals working in maternity units during the COVID-19 pandemic. Findings illustrate the importance of effective hospital-wide communication and the need for consistent, easily understood guidance which is specific to maternity. There is a need for staff to be allocated to COVID-19 response roles. Ideally, arrangements would also be put in place to allow for effective testing strategies and placement of women, however this is often difficult due to existing infrastructure. To further understand the experiences of maternity staff during the pandemic, future work should look to explore differences in perceived successes and barriers between staff in management roles and those in predominantly clinical practice roles, to allow for further recommendations to support the effective implementation of infection prevention and control measures during the COVID-19 pandemic, any local outbreaks, and any future pandemics.

Subsequent research in this programme of work will involve the presentation of these results to healthcare professionals and parents, followed by an expert panel consensus meeting to

determine the content of a best practice guide for use in maternity settings.

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### Conflict of interest statement

The authors have no conflicts of interest to declare.

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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.2022.04.018>.

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