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# Impact of the COVID-19 pandemic on midwifery-led service provision in the United Kingdom in 2020-21: Findings of three national surveys

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ABSTRACT

*Background:* The COVID-19 pandemic required all healthcare systems to adapt quickly. There is some evidence about the impact of the pandemic on United Kingdom maternity services overall, but little is known about the impact on midwifery-led services, including midwifery units and home birth services.
*Objective:* To describe changes to midwifery-led service provision in the United Kingdom and the Channel Islands during the COVID-19 pandemic.
*Design:* Three national surveys were circulated using the United Kingdom Midwifery Study System (UKMidSS) and the Royal College of Midwives (RCM) Heads and Directors of Midwifery Network. The UKMidSS surveys took place in wave 1 (April to June 2020) and in wave 2 (February to March 2021). The RCM survey was conducted in April 2020.
*Findings:* The response rate to the UKMidSS surveys was 84% in wave 1 and 70% in wave 2, while 48% of Heads and Directors of Midwifery responded to the RCM survey. Around 60% of midwifery units reported being open as usual in wave 1, with the remainder affected by closures. Fewer unit closures (15%) were reported in the wave 2 survey. Around 40% of services reported some reduction in home birth services in wave 1, compared with 15% in wave 2. The apparent impact of the pandemic varied widely across the four nations of the United Kingdom and within the English regions.
*Conclusions:* The pandemic led to increased centralisation of maternity care and the disruption of midwifery-led services, especially in the first wave. Further research should focus on the reasons behind closures, the regional variation and the impact on maternity care experience and outcomes.


## Introduction

Coronavirus disease 2019 (COVID-19), a new emergent coronavirus caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was declared by the World Health Organization (WHO) as a public health emergency of international concern on 30th January 2020 (World Health Organization, 2020a). As such, health care systems had to quickly adapt to respond to a new and unexpected disease which required immediate action while minimising disruption to routine care provision.

Evidence about the effects of COVID-19 emerging during the first wave of the pandemic indicated that pregnant women were not more susceptible to the disease compared to the general population and that most did not have a severe illness and recovered well, with more than two thirds being asymptomatic (Khalil et al., 2020; Knight et al., 2020; Maraschini et al., 2020; Yang et al., 2020; Vousden et al., 2021). The WHO's living systematic review, reporting in September 2020, concluded that pregnant women with COVID-19 infection were at increased risk of admission to an intensive care unit (ICU), increased risk of preterm birth and that their babies also had an increased risk of admission for neonatal care. Vertical transmission of Sars-Cov-2 is rare (Gale et al., 2021) and available evidence indicates that neonatal infection is not increased by vaginal birth, breastfeeding or contact with the mother (Chen et al., 2020; Walker et al., 2020; Wang et al., 2020).

Evidence about care in labour, mode of birth and immediate postnatal care during the pandemic supports vaginal birth, unless caesarean birth is indicated for obstetric reasons; delayed cord clamping; breastfeeding, skin to skin care; and the avoid-

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ance of separation of mother and baby (Walker et al., 2020; World Health Organization, 2020b). In terms of neonatal outcomes for babies who tested positive for COVID-19 or who were born to a mother who had tested positive, studies have shown reassuring results and a relatively low frequency of spontaneous preterm birth (Knight et al., 2020; Parazzini et al., 2020; Wang et al., 2020; Gale et al., 2021). The current evidence, therefore, indicates overall a good outcome for both mother and babies in most cases, although more recent evidence relating to newer variants in unvaccinated women gives more cause for concern (Vousden et al., 2021).

In the United Kingdom (UK), most women give birth in an obstetric unit, but about 14% give birth in alongside midwifery units (AMU) or freestanding midwifery units (FMU) (Walsh et al., 2018), and just over 2% give birth at home (Office for National Statistics, 2022). Women with straightforward pregnancies who are at low risk of complications are encouraged to plan birth in a midwifery unit rather than in a hospital obstetric unit (NICE, 2014), because this is associated with a reduced risk of intervention for the mother with no increase in adverse perinatal outcomes (Brocklehurst et al., 2011; Scarf et al., 2018).

Several changes affected the provision of maternity services in the UK from the start of the COVID-19 outbreak (Jardine et al., 2021), against a background of changing guidance from the Royal Colleges and National Health Service (NHS) England, developed on the basis of emerging evidence and consensus about best practice (Brigante et al., 2020). Routine antenatal and postnatal care were recommended to continue, with some virtual consultations where possible to minimise the risk of transmission (Royal College of Obstetricians & Gynaecologists and Royal College of Midwives, 2020). For intrapartum care, NHS England stressed that FMUs and home births could help reduce pressure on hospital services by keeping women out of hospital (NHS England, 2020). Centralisation of maternity services in hospital-based obstetric units was discouraged, with community-based care and community births for healthy women/people and newborns recommended (International Confederation of Midwives, 2020; Royal College of Midwives, 2020). However, emerging anecdotal evidence during the pandemic indicated that effective provision of these midwifery-led services was partly influenced by the local context, including variation in staff shortages and increased pressure on ambulance services. To reduce the potential impact of any midwifery staff shortages on maternal and neonatal outcomes it was recommended that redeployment of midwives should take place only within maternity services rather than to different clinical areas (Royal College of Midwives, 2020).

This paper reports the results of three national surveys that aimed to quantify the impact of the COVID-19 pandemic on the provision of maternity services across the UK and the Channel Islands during the first and second waves of the pandemic (March-June 2020 and September 2020-April 2021), with a particular focus on midwifery units and community-based services.

## Methods

### *Study design*

We carried out national surveys of practice and service provision. Two surveys were carried out using the UK Midwifery Study System (UKMidSS), a research infrastructure and network of midwife 'reporters' in all UK midwifery units who contribute date to national observational research studies and surveys of practice (Rowe et al., 2016; Glenister et al., 2020). The UKMidSS surveys were designed by RR and AM, with input from MJ and RP, and other members of the UKMidSS Steering Group. Using a different survey instrument, but covering many of the same topics, the third survey was carried out by the Royal College of Midwives (RCM) and collected data from the RCM Heads of Midwifery (HoMs) and Directors of Midwifery (DoMs) Network, including all senior service managers from the four countries of the UK and the Channel Islands. It was designed by LB and other RCM officers, including MJ. The UKMidSS and RCM surveys were designed and delivered separately, but are reported here together as they covered related and complementary topics.

### *Data collection*

In the first UKMidSS survey, described below as the 'UKMidSS Wave 1' survey, UKMidSS reporters in all 202 participating FMUs and AMUs were invited to take part in a short survey sent out by email on 1st April 2020. Reminders to complete the survey were sent to non-responders twice a month, as part of routine UKMidSS reminders. Responses were received between 1st April and 22nd June 2020.

The survey asked UKMidSS reporters to describe the impact of COVID-19 on the unit for which they were responding by selecting one or more of the following six response options:

- The midwifery unit is closed to admissions
- The midwifery unit has been closed/merged with the obstetric unit to provide COVID positive and COVID negative areas
- Community midwives have been redeployed to work in the hospital/obstetric unit
- Women are actively being encouraged to plan birth at home or in a community setting
- Home birth services are being scaled back/cancelled
- Other (please give detail below)

Respondents were invited to give any additional information about the impact of COVID-19 or elaborate on their answers in a free text box.

A repeat UKMidSS survey, described below as the 'UKMidSS Wave 2' survey, was circulated on 1st February 2021, to capture the impact of the second wave of the pandemic, to all reporters in the 201 FMUs and AMUs taking part in UKMidSS studies at the time. Reminders were sent to non-responders twice a month as before. Responses were received between 1st February and 31st March 2021. In addition to the six response options used in the first survey, four additional response options were included:

- A birth partner can be with the woman when she attends for an early labour assessment
- A birth partner can be with the woman when she is in established labour
- A birth partner can visit the woman during her postnatal stay
- A birth partner can remain with the woman throughout her postnatal stay

For the RCM survey, all the 153 HoMs and DoMs were invited to take part in rapid repeat surveys via the RCM forum distribution list, conducted during the weeks beginning 20th April, 11th May and 26th October 2020. The RCM surveys were developed and administered using the Advantage Survey Monkey platform and the links to each survey stayed open only for a week in order to capture rapid changes in service provision. The findings reported here are from the survey distributed in the week beginning 20th April for comparability with the first UKMidSS survey, and because the findings of that week's survey were representative of the other surveys carried out by the RCM. The RCM survey included open and closed questions about midwifery staffing and shortages, the provision of homebirth and midwifery-led settings (including reasons for any closures), waterbirth, antenatal and postnatal care, and any reports of freebirthing (choosing to give birth without a midwife in attendance). The RCM survey was not repeated in wave 2 of the pandemic, as at that point HoMs and DoMs were also reporting through other mechanisms (e.g. to NHS England).

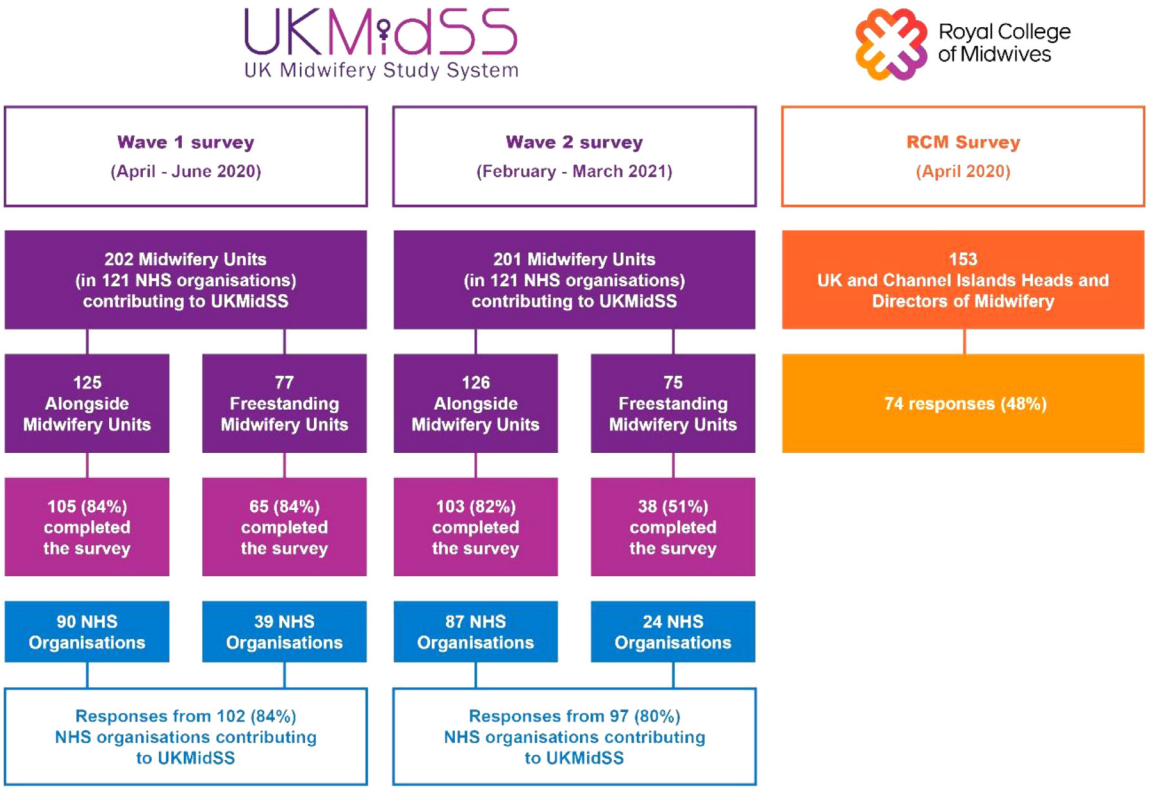


**Fig. 1.** Survey response.

*Analysis*

For the UKMidSS surveys, response rates for each survey wave were calculated using the number of responding units as the numerator and the total number of units participating in UKMidSS at the time of the survey as the denominator, overall and for AMUs and FMUs separately. Descriptive analysis was conducted, tabulating frequencies and percentages. Responses from the devolved nations of the UK (Scotland, Wales and Northern Ireland) and the NHS regions of England (North East and Yorkshire, North West, Midlands, East of England, London, South West and South East), and from different types of unit (AMU vs FMU) were compared using the Chi square test. McNemar's test was used to determine if there were differences in proportions between wave 1 and wave 2. For the UKMidSS surveys, where two or more units responded from within the same NHS organisation responses were not necessarily the same so all analyses were carried out at unit level. For questions about home birth services, responses from units in NHS organisations with different configurations of care (AMU only, AMU and FMU, FMU only) were compared using frequencies and percentages and the Chi square test. We used the statistical software package Stata 16 (StataCorp, 2019).

For the RCM survey, which in contrast to the UKMidSS surveys was carried out at the level of NHS organisation (NHS Trust or Health Board), descriptive analysis was conducted using the analysis function of the Survey Monkey platform to capture frequencies and percentages. Not all respondents answered all questions in the survey; percentages for each question were calculated using the total number of responses to that question as the denominator. Free-text from the RCM survey open-ended questions was used in two ways. First, simple analysis of the free text was carried out by LB. Following familiarisation with the data, the text was inductively coded and codes grouped under overarching 'themes', which were reviewed by MJ and others involved in the RCM survey. These themes are presented below as context for the other findings. Findings from the quantitative questions in the UKMidSS and RCM surveys were also mapped against the free text themes by LB to identify where responses might help explain or shed light on these.

*Ethical approval*

As surveys of practice, in line with the Healthcare Quality Improvement Partnership's guide for clinical audit, research and service review (Healthcare Quality Improvement Partnership, 2011), these surveys were not subject to the Department of Health's UK Policy Framework for Health and Social Care Research (HRA, 2020) and therefore research ethics approval was not required.

*Service user involvement*

For the UKMidSS surveys, the study design and results were overseen by the UKMidSS Steering Group which includes two lay members who represent the views and experiences of maternity service users. There was no involvement of service users in the development of the RCM survey.

## Results

*Response*

For the UKMidSS Wave 1 survey, responses were received from 170 of the 202 units (84%) contributing to UKMidSS, of which 105 (62%) were AMUs and 65 (38%) FMUs (Fig. 1). The units responding represented 102 (84%) of the 121 NHS Trusts or Health Boards (NHS organisations) contributing to UKMidSS. Of these, 63 NHS organisations had one midwifery unit, and 39 had two or more mid-

**Table 1**
UKMidSS Wave 1 survey results.

| | AMU n=105 | | FMU n=65 | | Total n=170 | | P value* |
|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | |
| **Midwifery unit status** | | | | | | | |
| Open | 63 | 60.0 | 44 | 67.7 | 107 | 62.9 | 0.31** |
| Closed | 4 | 3.8 | 21 | 32.3 | 25 | 14.7 | |
| Merged with labour ward | 38 | 36.2 | 0 | 0.0 | 38 | 22.4 | |
| **Home birth services scaled back/cancelled** | | | | | | | |
| No | 48 | 45.7 | 47 | 72.3 | 95 | 55.9 | 0.001 |
| Yes | 57 | 54.3 | 18 | 27.7 | 75 | 44.1 | |
| **Women actively encouraged to plan birth at home/in community** | | | | | | | |
| No | 95 | 90.5 | 46 | 70.8 | 141 | 82.9 | 0.001 |
| Yes | 10 | 9.5 | 19 | 29.2 | 29 | 17.1 | |
| **Community midwives redeployed to labour ward** | | | | | | | |
| No | 86 | 81.9 | 55 | 84.6 | 141 | 82.9 | 0.65 |
| Yes | 19 | 18.1 | 10 | 15.4 | 29 | 17.1 | |

*Chi square or Fisher's exact test as appropriate
**calculated on open vs closed or merged status

wifery units. The response rate did not differ between AMUs and FMUs (84%).

For the UKMidSS Wave 2 survey, responses were received from 141 of the 201 eligible units (70%), of which 103 (73%) were AMUs and 38 (27%) FMUs. The units responding represented 97 NHS organisations (80%) contributing to UKMidSS, of which 68 had one midwifery unit and 29 had two or more midwifery units. Responses to the Wave 2 survey were received from 82% of AMUs and 51% of FMUs (Fig. 1).

For the RCM survey, a total of 74 complete responses were received from the HoM and DoMs network. There are 153 HoMs and DoMs in the RCM network, however, some of these work for the same NHS organisation (where there are multiple sites each with their own HoM/DoM). Based on the number of HoMs/DoMs invited to take part through the network the response rate was 48% and responses came from across all nations of the UK and the Channel Islands (Fig. 1).

**Table 2**
RCM survey results (wave 1).

| | Heads/Directors of Midwifery n=74 | |
|---|---|---|
| | n | %* |
| **Midwifery unit status** | | |
| Open | 40 | 67.8 |
| Closed | 19 | 32.2 |
| Missing | 15 | |
| **Home birth services status** | | |
| Offered as normal | 33 | 47.0 |
| Discontinued | 30 | 43.0 |
| Restricted | 5 | 7.0 |
| Scaled up | 1 | 1.5 |
| Awaiting guidance | 1 | 1.5 |
| Missing | 4 | |

*Percentage calculated excluding missing

## *Findings*

### *Midwifery unit closures*

In the UKMidSS Wave 1 survey almost two thirds (63%) of midwifery units reported being open to admissions as usual, with 25 units (15%) completely closed to admissions (Table 1). Approaching one third of FMUs (32%) reported being closed to admissions at some point because of the pandemic, compared with only four AMUs (4%), but a further 38 AMUs (36%) were merged with the obstetric unit to create a separate area for women with suspected or confirmed COVID-19.

Northern Ireland (43%), the Midlands (20%) and Scotland (20%) reported the highest proportion of units closed to admissions (Supplementary data file, Fig. 1). Overall, the region reporting the lowest impact on midwifery unit provision was the South West, with 92% of units reported to be open as usual.

In the RCM survey, 68% of responding HoMs and DoMs reported that their midwifery units continued to be open (Table 2). For those 19 (32%) organisations that reported the closure of midwifery units, 'requisition' was described as the main reason in 17 (71%) organisations, with most units reporting more than one factor. Respondents reported in free text comments that where midwifery units were requisitioned as separate COVID-19 triage or care units, often as a decision made at NHS Trust or Board level, this was because their facilities suited for this purpose, including having single rooms, piped oxygen and a separate entrance.

In the UKMidSS Wave 2 survey, 120 units (85%) reported being open as usual (Table 3) ($p<0.001$ for comparison with Wave 1) (Fig. 2). Compared with the Wave 1 survey, fewer FMUs reported being closed (6 units, 16%) and fewer AMUs were merged with the labour ward (12 units, 12%).

### *Home birth services*

In the UKMidSS Wave 1 survey almost half (44%) of units reported that home birth services had been scaled back or cancelled at some point (Table 1). Free text comments indicated that in some units respondents perceived that this change was introduced or being considered to reduce the pressure on the local ambulance service. Compared with AMUs, respondents from FMUs were less likely to report home birth services being scaled back (28% vs 54%). We also compared responses from units in NHS organisations with different configurations of care (Table 4). Almost 60 % of units in organisations with only AMUs reported that home birth services had been scaled back or cancelled, compared with 36% of units in organisations with both AMUs and FMUs, and 25% of units in organisations with only FMUs (Table 4).

The regions/nations most affected by home birth service discontinuation were London (79%), the Midlands (60%) and the North West (58%), with the South West (23%) and Wales (0%) the least affected (Supplementary data, Fig. 2).

Only 29 units (17%) reported that women were being actively encouraged to give birth at home or in an FMU during the pan-

**Table 3**
UKMidSS Wave 2 survey results.

| | AMU n=103 | | FMU n=38 | | Total n=141 | | |
|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | P value* |
| **Midwifery unit status** | | | | | | | |
| Open | 88 | 85.5 | 32 | 84.2 | 120 | 85.1 | 0.856** |
| Closed | 3 | 2.9 | 6 | 15.8 | 9 | 6.4 | |
| Merged with labour ward | 12 | 11.6 | 0 | 0.0 | 12 | 8.5 | |
| **Home birth services scaled back/cancelled** | | | | | | | |
| No | 84 | 81.6 | 36 | 94.7 | 120 | 85.1 | 0.062 |
| Yes | 19 | 18.4 | 2 | 5.3 | 21 | 14.9 | |
| **Women actively encouraged to plan birth at home/in community** | | | | | | | |
| No | 87 | 84.5 | 22 | 57.9 | 109 | 77.3 | 0.001 |
| Yes | 16 | 15.5 | 16 | 42.1 | 32 | 22.7 | |
| **Community midwives redeployed to labour ward** | | | | | | | |
| No | 99 | 96.1 | 36 | 94.7 | 135 | 95.7 | 0.661 |
| Yes | 4 | 3.9 | 2 | 5.3 | 6 | 4.3 | |
| **A birth partner can be with the woman for early labour assessment** | | | | | | | |
| No | 45 | 43.7 | 14 | 36.8 | 59 | 41.8 | 0.465 |
| Yes | 58 | 56.3 | 24 | 63.2 | 82 | 58.2 | |
| **A birth partner can be with the woman when she is in established labour** | | | | | | | |
| No | 2 | 1.9 | 5 | 13.2 | 7 | 5.0 | 0.016 |
| Yes | 101 | 98.1 | 33 | 86.8 | 134 | 95.0 | |
| **A birth partner can visit the woman during her postnatal stay** | | | | | | | |
| No | 36 | 35.0 | 24 | 63.2 | 60 | 42.5 | 0.003 |
| Yes | 67 | 65.0 | 14 | 36.8 | 81 | 57.5 | |
| **A birth partner can remain with the woman throughout her postnatal stay** | | | | | | | |
| No | 84 | 81.6 | 24 | 63.2 | 108 | 76.6 | 0.022 |
| Yes | 19 | 18.4 | 14 | 36.8 | 33 | 23.4 | |

* Chi square or Fisher's exact test as appropriate.
**calculated on open vs closed or merged status.

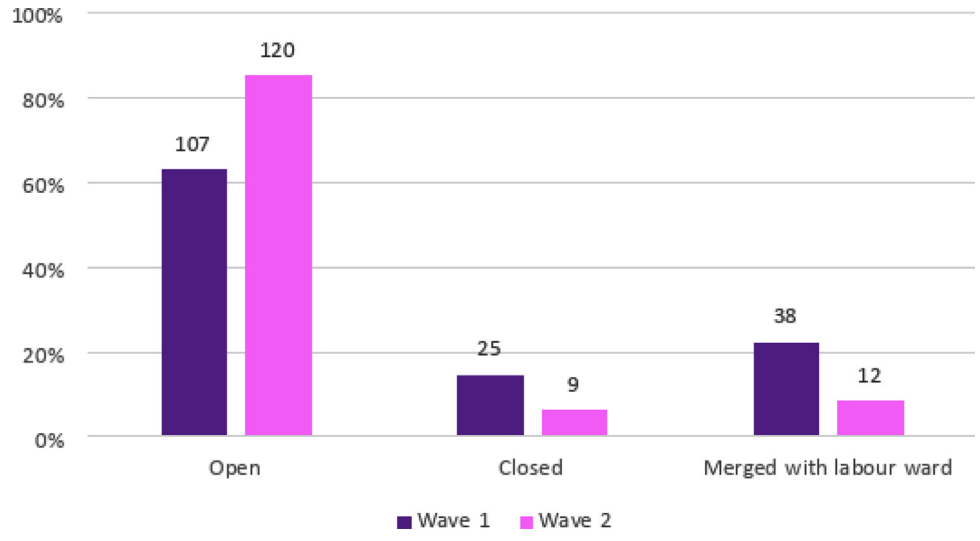


**Fig. 2.** Midwifery unit status reported in Wave 1 and Wave 2 surveys.

**Table 4**
Home birth services in NHS organisations with different configurations of care (UKMidSS Wave 1 survey).

| | Organisations with AMU only n(units)=72 | | Organisations with AMU & FMU n(units)=70 | | Organisations with FMU only n(units)=28 | | All organisations n(units)=170 | | p-value* |
|---|---|---|---|---|---|---|---|---|---|
| | n | % | n | % | n | % | n | % | |
| **Home birth services scaled back/cancelled** | | | | | | | | | |
| No | 29 | 40.3 | 45 | 64.3 | 21 | 75.0 | 95 | 55.9 | 0.001 |
| Yes | 43 | 59.7 | 25 | 35.7 | 7 | 25.0 | 75 | 44.1 | |
| **Women actively encouraged to plan birth at home/in community** | | | | | | | | | |
| No | 66 | 91.7 | 58 | 82.9 | 17 | 60.7 | 141 | 82.9 | 0.001 |
| Yes | 6 | 8.3 | 12 | 17.1 | 11 | 39.3 | 29 | 17.1 | |

*Chi square or Fisher's exact test as appropriate

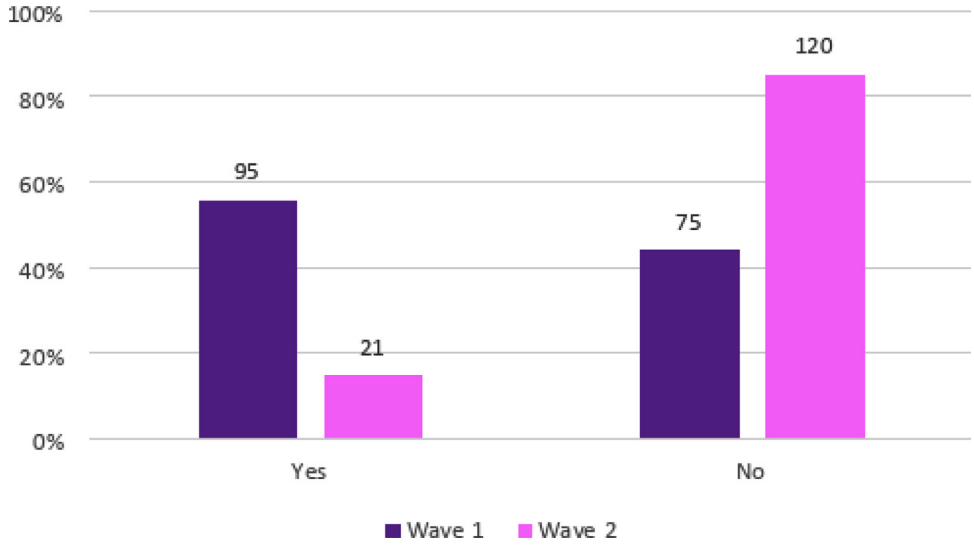


**Fig. 3.** Home birth services scaled back or cancelled (UKMidSS Wave 1 and Wave 2 surveys).

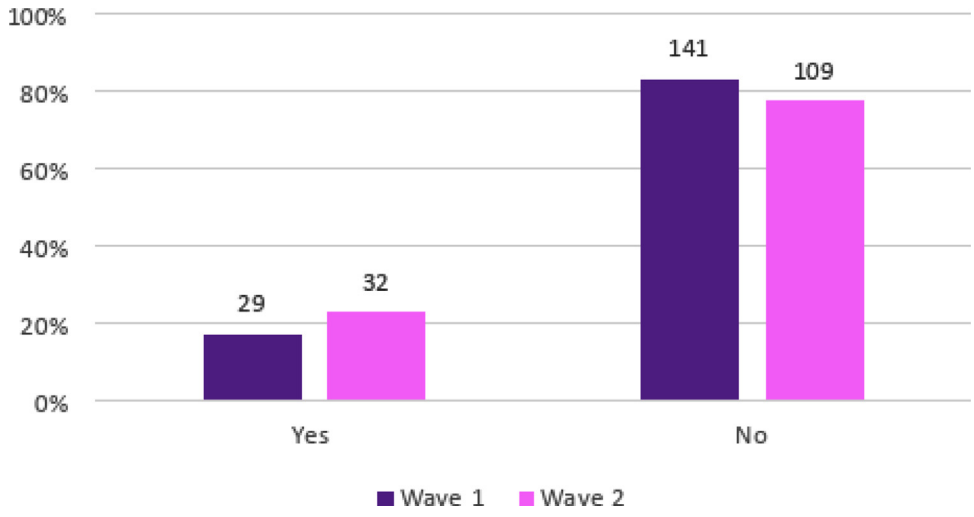


**Fig. 4.** Women encouraged to give birth at home or in community setting (UKMidSS Wave 1 and Wave 2 surveys).

demic, but responses to this question varied between AMUs (9%) and FMUs (29%) (Table 1) and in units in NHS organisations with different configurations of care (Table 4). The regions/nations where women were more encouraged to birth at home were the South West (46%), Wales (30%) and Scotland (25%) (Supplementary data, Fig. 3).

Responses to the RCM Survey indicated that home birth services continued as normal in 33 NHS organisations (49%) and had been suspended in 30 NHS organisations (43%), with a small number of services (5, 7%) providing a restricted home birth service for multiparous women only (Table 2). Only one trust indicated they had scaled up their homebirth service. Free text comments showed that the most common reasons for the suspension of home birth services were acute midwifery staff shortages, and concerns about capacity and response timings of the ambulance service to provide transfers if and when required. Many of those who responded expressed a concern about the ability of the service to respond safely to the perceived increase in interest for home births from women, at a time of significant midwifery shortages.

The UKMidSS Wave 2 survey indicated a substantial increase in the number of home birth services maintained, compared with the Wave 1 survey ($p<0.001$), with only 15% of services scaled back or cancelled (Fig. 3). Services in some parts of the country reported being unaffected by home birth service discontinuation (Supplementary data file, Fig. 2).

Compared with the Wave 1 survey, a similar number of units (32, 23%) in the Wave 2 survey reported that women were actively encouraged to give birth at home or in a community setting (Tables 1 and 3, Fig. 4 and Supplementary data file, Fig. 3).

*Staff redeployment and shortages*

In the UKMidSS Wave 1 survey, 29 units (17%) reported that some community midwifery staff were being redeployed to provide intrapartum care in hospital, with no significant difference between AMUs and FMUs (Table 1). London (50%) and the South East (20%) were the most affected (Supplementary file, Fig. 4). In contrast, in the wave 2 survey only 6 units (4%) reported redeployment of community staff to the obstetric unit (Table 2 and Fig. 4) ($p<0.001$ comparing wave 1 vs wave 2) (Fig. 5).

In the RCM Survey, HoMs and DoMs were asked for a current estimate of the percentage shortages in their midwifery workforce. The responses ranged from 2 – 40%, with a median of 16% (Mean 18; SD 12.16)

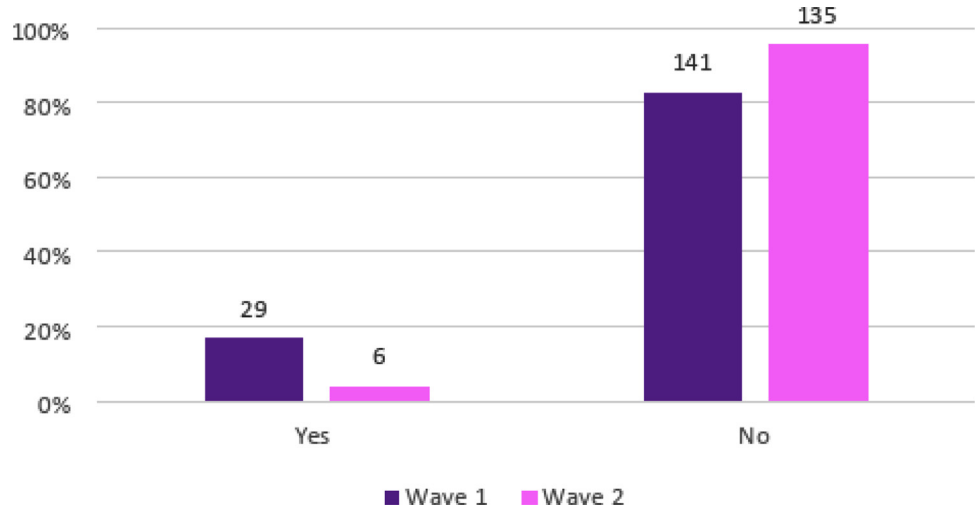


**Fig. 5.** Community midwives redeployed to the labour ward (UKMidSS Wave 1 and Wave 2 surveys).

*Partners and visiting*

In the UKMidSS Wave 2 survey, response options were added to capture impact on visiting for partners during early labour, established labour and in the immediate postnatal period.

Overall, 82 units (60%) reported that the woman's birth partner could be with her when she attended for early labour assessment (Table 3). Almost all units (134, 95%) reported that the partner could accompany the woman in established labour, but fewer FMUs reported this compared with AMUs (87% vs 98%, p=0.016).

Just over half of units (81, 57%) reported that partners were able to visit during the postnatal stay, but this was less common in AMUs compared with FMUs (65% vs 81%, p=0.003).

Only a quarter of units (33, 23%) reported that partners were able to remain with the woman throughout their postnatal stay, and this was also less common in AMUs compared with FMUs (18% vs 37%, p=0.022). There were wide regional differences with regards to partner visiting (Supplementary data file, Figs. 5 & 6).

*Other changes affecting services*

In the UKMidSS Wave 1 survey, 14% of respondents added information about other changes in their services as a result of the pandemic. The most common of these was the suspension of water births. The RCM survey results showed that most services continued to provide water birth as an option, with 63 (85%) reporting that they were providing water birth as an option as normal for asymptomatic women.

UKMidSS respondents also commonly reported a reduced schedule of antenatal and postnatal visits. Findings from the RCM survey showed that most maternity services (61, 82%), reduced both antenatal and postnatal face-to-face visits, replacing them with virtual appointments delivered on multiple online platforms.

The RCM survey included an open-ended question asking about any other concerns with regard to service provision, which was answered by 33 HoMs and DoMs. Three main interrelated 'themes' were identified from responses to this question: Midwives' safety and wellbeing; Demand for home birth; and Staffing shortages.

Theme 1: Midwives' safety and wellbeing

The first theme related to midwives' safety and wellbeing, particularly with regards to care provided in the community, issues with personal protective equipment (PPE) supply in the community, and the management of staff concerns and anxiety.

*"(We are) concerned about the risk of cross contamination from and to community midwives who are expected to don and doff when attending homebirths, BBA's* [*born before arrival*] *and unplanned homebirths. There is no national guidance on this process and no national position on suspending home birth services."*

*"The safety of the midwives seems to be overlooked. The country is in lockdown and yet midwives are expected to continue and provide care when we have no control over that environment* [*women's homes*]*. All the reports/updated guidance refers to the safety of the women and their babies which is of course important, however the midwives and support workers safety is paramount. They are working through extremely challenging times."*

Theme 2: Demand for homebirth

The second key theme identified was the challenge of maintaining home birth services against a background of increasing demand from women, and significant midwifery shortages.

*"We are noticing a significant increase in women choosing a home birth. The main reason for this appears to be that they don't want to come into hospital in case they catch COVID-19"*

*"Requests for home birth (are) increasing and (we are) unable to provide cover for this given current staffing. Promotion of home births is being advocated by doulas and charities advising safest method of birth at this time."*

Theme 3: Staffing shortages

The final theme from these responses was about staff shortages and implications for skill mix, particularly due to the number of midwives able to work from home but unable to provide public-facing care due to their personal health circumstances or because they were temporarily isolating.

*"The numbers of staff not at work does not give a true reflection of staffing shortfalls as we have a large number of staff who are non patient facing but want to remain in work."*

"The information requirements regarding staffing absence does not illustrate the picture in relation to safe services, it's a complex picture based on skill mix, geography and percentage within one team rather than the workforce overall."

## Discussion

The results from these three national surveys, carried out using two well-established networks, show that the COVID-19 pandemic had a significant impact on the provision of midwifery-led services in the UK, especially during the first wave of the pandemic in March-May 2020. While the impact appeared reduced in

the second wave in early 2021, there was still some disruption to midwifery-led services, and in both waves there was significant regional variation. The three surveys did not capture whether service provision returned to normal between the first and second waves of the pandemic. However, some other evidence about maternity care during the pandemic suggests that service reconfiguration and disruption to service provision may have continued between the two waves (Harrison et al., 2021; Silverio et al., 2021).

In the first wave, around a third of midwifery units were either closed to admissions at some point or merged with the obstetric unit to create a separate 'COVID positive' area. Heads and Directors of Midwifery reported that AMUs merged with the obstetric unit were often 'requisitioned' because of a decision made at NHS Trust or Board level. When FMUs were closed, respondents reported that this was often because of staff shortages in the FMU itself or in the obstetric unit in the same organisation. Redeployment of midwifery unit staff to cover staff shortages was common, affecting 17% of units. Home birth services were also scaled back or cancelled in 44% of units overall, with some NHS regions, such as London, reporting this to be as high as 79%. In other areas, such as the South West of England and Wales, home birth services were less affected.

Our surveys provide more evidence that in the UK, the reconfiguration of maternity services during the pandemic was driven towards centralised, hospital-based care (Berg et al., 2021). At the beginning of the pandemic there was a strong focus on infection control and trying to reduce infection rates especially among staff, including those who may have been worried about becoming infected when attending home births (Berg et al., 2021). Decisions to centralise care in hospitals with obstetric units may also reflect the widespread belief that hospitals are the safest place to give birth (Coxon et al., 2017), and that birth outside a hospital, in a midwifery unit or at home, is as an 'alternative' option, 'outside' the norm (Yuill et al., 2020). This is despite evidence, for example, that for women who are healthy with straightforward pregnancies, planning birth in a midwifery unit is as safe as planning birth in a hospital obstetric unit or labour ward (Brocklehurst et al., 2011; Scarf et al., 2018).

National guidance for maternity services during the pandemic recommended a staged approach when reconfiguration of services required staff redeployment due to shortages, or resulted in an inability to provide all birth options. RCM/RCOG guidance about the provision of midwifery-led settings and home birth during the pandemic (Brigante et al., 2020) was informed by a rapid review, conducted by the RCM Professorial Group and highlighted the need for maintaining community care (Renfrew et al., 2020). The recommended three-phase approach to reconfiguration of maternity services took into account midwifery staffing shortages and capacity in the ambulance service. Evaluation of any reconfiguration was recommended throughout, with appropriate communication to staff, involvement of service users and local Maternity Voices' Partnerships and swift de-escalation where necessary (Brigante et al., 2020). Beyond the UK, the International Confederation of Midwives recommended maintaining home birth and midwifery-led units during the pandemic, in those countries where health systems routinely provide community-based care with appropriate midwifery support, emergency equipment and transfer (International Confederation Midwives, 2020).

Our surveys cannot provide any evidence about the extent to which the recommended 'staged approach' was used. Comments submitted by senior midwifery managers in response to the RCM survey highlighted the need to maintain a safe service against a background of sometimes unpredictable staffing shortages. Reports in the media (Summers, 2020) also cited concerns about staffing shortages and ambulance capacity, but the extent to which these were concerns about anticipated or actual shortages is unknown. We are not aware of any regional-level data about midwifery shortages or ambulance capacity during the pandemic that could help us determine the extent to which centralisation, closures of units and scaling back of home birth services were justified in any given region. COVID-19 infection rates also varied in different regions and nations of the UK at different times during the pandemic with, for example, London having higher rates and the South West having lower rates in the first wave (Davenport et al., 2020; Challen et al., 2021).

We found significant variation between regions/countries in the degree to which services were centralised and, for home birth services, we also found variation between NHS organisations with different configurations of care (i.e. with AMUs only, a combination of AMUs and FMUs, or FMUs only). It is possible that this variation reflects the severity of the impact of the pandemic, in terms of infection rates and consequent pressure on maternity services, in different parts of the country. However, home birth rates in the UK also vary by region, with the South West of England and Wales typically having higher home births than other parts of the UK (Office for National Statistics, 2019), so the regional differences we found may reflect a stronger pre-existing commitment to birth at home or in community settings in those areas. Respondents from FMUs were also less likely to report home birth services being scaled back or cancelled, compared with respondents from AMUs, and were more likely to report that women were being actively encouraged to give birth at home or in a community setting. These observed differences between responses from AMUs and FMUs with respect to home birth were largely explained by responses from AMUs in NHS organisations without FMUs, which were more likely to report scaling back of home birth services compared with units in organisations with FMUs. Around one third of FMUs were closed during the first wave of the pandemic and a similar number reported the scaling back or cancellation of home birth services, but our findings may be indicative of an overall stronger commitment to the maintenance of home birth and community services during the pandemic in NHS organisations with FMUs. This explanation also finds some support from a cross-national study comparing maternity service responses to the pandemic in the UK and the Netherlands, which found that in the Netherlands, which has a longstanding tradition of support for home birth, there was an explicit policy to encourage women to give birth at home, even when testing positive with COVID-19 (Berg et al., 2021).

Improvements in service provision were noted in the second wave of the pandemic in early 2021, with fewer units closed (6% vs 15%), fewer units reporting redeployment of community midwives (4% vs 17%) and fewer home birth services scaled back/cancelled (15% vs44%). Again, our findings cannot illuminate whether this was because the impact of the pandemic on staffing and capacity was less severe in the second wave, or whether services were more prepared and therefore more able to adapt. Despite some overall improvement, in the second wave of the pandemic there continued to be significant impacts on whether partners could attend early labour assessment (not permitted in 40% of units), be with the woman during labour (not possible in 5% of units) or visit during the woman's postnatal stay (not possible in 43% of units). National guidance supporting the reintroduction of access for partners, visitors and other companions for pregnant women had been published in September 2020 (Royal College of Obstetricians and Gynaecologists, Royal College of Midwives, The Society and College of Radiographers, NHS England, 2020). Our findings support other work showing that there was significant variation in access for partners and other birth companions throughout the pandemic (Iacobucci, 2020; Thomson et al., 2022), with many organisations not 'getting the balance right' between access and restrictions (Lalor et al., 2021), and there is anecdotal evidence of restrictions continuing into 2022 in some areas (Birthrights, 2022).

Where midwifery-led services were scaled back or withdrawn completely during the pandemic, the inevitable consequences for women and their partners were reduced choice and a likely poorer overall experience of care (Sanders and Baylock, 2021). The UK vision for maternity services is to provide personalised, safe, and woman-centred care to women and their families and to ensure continuity of carer for women (NHS England, 2016). The World Health Organization also explicitly recognizes a "positive childbirth experience as a significant end point for all women undergoing labour" and emphasizes that care should not only be centred on meeting the needs of the mother and newborn, but also her partner and significant close people (World Health Organization, 2020c). In the context of a global pandemic some disruption to routine health services, including maternity, is perhaps inevitable; particularly considering that the UK has experienced one of the highest mortality rates in Europe because of COVID-19 (Iacobucci, 2021). It has been argued however that the response from some organisations was disproportionate and inconsistent, and that women's individual needs and circumstances were insufficiently taken into account, especially with regards to birth place options and companionship from birth partners (Birthrights, 2020). A UK survey found that changes to service provision generated barriers in accessing care, resulting in anxieties for women about 'being alone' in labour, women being unable to access birthing pools or experiencing delays with planned inductions (Karavadra et al., 2020). The removal of many aspects of women and family-centred care had unintended consequences including a lack of essential clinical care, confusion over advice and distress and emotional trauma for women (Sanders and Baylock, 2021). Women described virtual consultations as impersonal and said that they made it harder to disclose information about their mental health (Karavadra et al., 2020). There is some evidence that overall rates of perinatal mental health disorders increased internationally during the pandemic, including anxiety and depression, with links to the modification of maternity services (Fan et al., 2021). We were unable to assess any impact of the changes we observed on outcomes for women and babies, but in terms of interventions and outcomes, in England one study has reported evidence of increased rates of obstetric intervention, including induction and Caesarean section, but little evidence of impact on adverse outcomes (Gurol-Urganci et al., 2022). The impact on maternity staff was also beyond the scope of the surveys reported here, but is important to consider (Horsch et al., 2020).

*Strengths and limitations*

These surveys provide the first systematically collected evidence focusing on the impact of the COVID-19 pandemic on community and midwifery-led service provision. The timing of our surveys captured the initial response to the pandemic, including the peak of the first wave in the UK, and the subsequent response to the second wave early in 2021. The surveys benefited from being conducted through well-established networks. For the UKMidSS surveys, using a well-established research network of midwife reporters resulted in high response rates, which enhances the generalizability of the findings. The RCM survey used the active HoMs and DoMs network, providing important contextual information not available in the UKMidSS surveys. The two UKMidSS surveys, carried out in the first and second wave of the pandemic, enabled us to compare service response at the two time points and also enabled regional comparisons.

Limitations include the fact that the surveys had differing response rates and data collection tools, with the first UKMidSS survey being open for a relatively long period of time, between April and June 2020, while the RCM survey was only open for a week. Overall however the findings of the surveys were consistent, showing that changes to service provision were likely to have been in place for at least a few months.

Any changes to policies around birth partners were only captured by the UKMidSS Wave 2 survey, so we did not have any wave 1 data to compare with. Neither the UKMidSS surveys nor the RCM survey asked about service user involvement in service changes.

## Conclusions

The findings from these three national surveys document how the pandemic led to the centralisation of UK maternity care and the disruption of midwifery-led service provision, especially during the first wave of the pandemic in April-June 2020. There was significant regional variation in this disruption, and some suggestion that in NHS organisations with a stronger pre-existing commitment to community provision there was less centralisation. It was also apparent that in the second wave midwifery-led services were maintained to a greater extent. Further research should focus on the impact of this disruption on women's and families' experience of maternity care, the potential effect of service reconfiguration on maternal and neonatal outcomes and explore the ways in which services that did and did not preserve their midwifery-led services during the pandemic managed things differently. Further research should also focus on the impact of staff shortages on midwifery-led services and how those impacted on women's choice and outcomes.

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As surveys of practice research ethics approval was not required.

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## Authors' contribution

LB: Conceptualization (RCM survey); Methodology (RCM survey); Data curation (RCM survey); Formal analysis (RCM survey; Project adminstration (RCM survey); Writing - original draft; Writing - review & editing. AM: Conceptualization (UKMidSS surveys); Methodology (UKMidSS surveys); Data curation (UKMidSS surveys); Formal analysis (UKMidSS surveys); Project adminstration (UKMidSS surveys); Visualization; Writing - original draft; Writing - review & editing. MJ: Conceptualization; Writing - review & editing. RP: Conceptualization; Writing - review & editing. RR: Conceptualization; Methodology; Supervision; Project adminstration; Visualization; Writing - review & editing.

## Declaration of Competing Interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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## Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.midw.2022.103390.

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