

# The experience of women who delivered during the first wave of COVID-19 pandemic in Belgium: a retrospective study



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**BACKGROUND:** The lockdown caused by the COVID-19 pandemic has imposed some restrictions on hospital activities, requiring medical staff to find efficient alternatives to ensure adequate medical care for patients.

**OBJECTIVE:** This study aimed to investigate the experience of pregnant women who delivered during the first wave of COVID-19, and to evaluate the impact of COVID-19–related restrictions.

**STUDY DESIGN:** This was a retrospective multicenter study. All pregnant women who delivered a live infant between March 20, 2020 and June 20, 2020 were evaluated using a 35-item survey at 1 year following delivery. Each patient was contacted via 3 modalities. Patients who reported that their prenatal follow-up was interrupted were compared with those who reported that their prenatal follow-up was unchanged. Among 1096 patients who delivered a live infant across the 3 participating centers during the study period, 389 responses were needed for an estimated margin of error of 4%.

**RESULTS:** A total of 469 of 1096 (42.8%) patients answered the survey, of whom 151 (32.2%) reported that the follow-up of their pregnancy was interrupted (exposed group) and 318 (67.8%) reported that their follow-up was maintained as normal (unexposed group). The rate of presentation to the emergency department was higher in the exposed group than in the unexposed group ( $P=.001$ ). The level of dissatisfaction was also higher in the exposed group, and patients in this group would have postponed their pregnancy if they had known about the pandemic in advance ( $P<.001$  and  $P=.001$ , respectively).

**CONCLUSION:** Interruption and modification of antenatal follow-up in pregnant women is associated with patient dissatisfaction and increased presentation to the emergency department.

**Key words:** non-obstetrical infections, medical problems in pregnancy, prenatal care, psychiatric, pulmonary

## Introduction

SARS-CoV-2 infection during pregnancy is associated with multiple adverse maternal and neonatal outcomes. On the maternal side, COVID-19 is associated with an increased risk of mortality, along with intensive care admission, stillbirth, and postpartum depression.<sup>1–4</sup> In the international PregOuTCOV study, preterm birth, preeclampsia, postpartum hemorrhage, thromboembolic events, and cesarean delivery were more frequent in pregnant women infected with SARS-CoV-2 in comparison with noninfected

women.<sup>5</sup> The composite obstetrical outcomes were more frequent when the infection occurred after 20 weeks of gestation (WG). Similarly, on the neonatal side, neonatal intensive care unit admission, respiratory distress, and perinatal asphyxia were more frequent if the mothers were infected with SARS-CoV-2, especially after 26 WG.<sup>2,5</sup>

Since March 2020, the lockdown caused by the COVID-19 pandemic has imposed some restrictions on hospital activities, requiring medical staff to find efficient alternatives to ensure

adequate medical care for patients. Healthcare providers have needed to define basic medical services and prioritize telemedicine. Likewise, maternity hospitals have adopted different protective measures to manage this situation, such as interruption of prenatal follow-up of pregnant women, prohibition of companions during childbirth, and reduction in the duration of hospital stay.<sup>6,7</sup>

This study aimed to investigate the experience of pregnant women who delivered during the first wave of COVID-19,

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## AJOG Global Reports at a Glance

**Why was this study conducted?**

The lockdown caused by the COVID-19 pandemic has imposed some restrictions on hospital activities, requiring medical staff to find efficient alternatives to ensure adequate medical care for patients. This study aimed to investigate the experience of pregnant women who delivered during the first wave of COVID-19, and to evaluate the impact of COVID-19–related restrictions.

**Key findings**

Among the deliveries performed during the first wave of the COVID-19 pandemic, 32.2% had an antenatal care interruption. Patient dissatisfaction was high in this group, and visits to the emergency department were more frequent.

**What does this add to what is known?**

The interruption and modification of antenatal follow-up in pregnant women is associated with patient dissatisfaction and increased presentation to the emergency department.

and to evaluate the effects of the interruption of their prenatal follow-up.

**Materials and Methods**  
**Study design**

This was a questionnaire-based study conducted in 3 maternity hospitals in Belgium. All pregnant women who delivered a live infant during the period from March 20, 2020 to June 20, 2020 were eligible to answer the questionnaire. Exclusion criteria were: age <18 years, intrauterine fetal demise, and pregnancy termination for medical causes. Included patients were contacted at least 1 year after their delivery during the period from July 26, 2021 to October 14, 2021. Patients who reported that their prenatal follow-up was interrupted (exposed group) were compared with those who reported that their prenatal follow-up was normally continued (unexposed group).

Approval from the Ethics Committee was obtained according to local regulations before contacting patients (CE 2021/25 [July 13, 2021]). Informed consent was obtained according to guidelines.

**Protocol of pregnancy management during the first wave of COVID-19**

During the first wave of the pandemic, many restrictions were applied in maternity hospitals in Belgium. In 2 of the 3 participating centers, pregnancy follow-up was reduced to the minimum. Telemedicine was prioritized, and only 2 to 3

on-site appointments were scheduled (first, second, and third trimesters). The last appointment was done for fetal monitoring at approximately 39 to 40 WG. This follow-up was slightly modified in high-risk patients.<sup>8</sup> SARS-CoV-2 reverse transcription polymerase chain reaction (RT-PCR) from a nasopharyngeal swab was routinely performed 3 to 4 days before any planned hospital admission, or upon arrival in cases of unplanned admission. During labor, wearing a facial mask was mandatory for the patient and the medical team. The presence of a companion during labor and delivery was forbidden for a short period of time, although this restriction was later relaxed. During the postpartum period, early discharge from hospital was offered for clinically stable patients. Visits were forbidden at the beginning of lockdown; however, this restriction was also relaxed after a few weeks. Thereafter, only 1 companion was allowed to visit the mother during her hospital stay. In the third participating center, modifications were less strict. The number of on-site visits during antenatal follow-up was not modified, and wearing a mask during labor and delivery was only mandatory in patients with COVID-19 symptoms. After delivery, postpartum hospital stay was not reduced.

**Patient contact**

The questionnaire was constructed in French using an online survey creator

(Microsoft Forms, Office 365; Microsoft Corporation, Redmond, WA). It was translated to Dutch, German, English, and Arabic to suit the multicultural variability of the targeted population. Patients were contacted via 3 modalities. Each patient received a letter at home that explained the aims of the study and contained a link to the questionnaire web page. Two weeks later, each patient received a reminder via phone message that contained the same link. A second reminder was also sent via phone message 1 month later. Afterward, 2 physicians contacted patients by phone call once to thoroughly explain the study to those who did not respond to the questionnaire. All patients were invited to submit 1 response to the questionnaire. Three phone numbers were available for patients who experienced difficulties with the questionnaire or had inquiries about the study.

**Questionnaire details**

The questionnaire included 35 questions about the following information: maternal age, parity, term vs preterm delivery, highest level of education, source of information about COVID-19, social/psychological support, interruption of prenatal follow-up, presentation to the emergency department for pregnancy-related conditions, performance of RT-PCR and its result, route of delivery, complications during delivery and the postpartum period, obligation to wear a facial mask during delivery, hospital stay duration, evaluation of COVID-19 restrictions, breastfeeding, comparison with previous delivery (in multiparous women), presence of a companion during labor and delivery, plans for future pregnancies, and overall experience during the pregnancy. Questions about complications during delivery and the postpartum period were open, and the answers pertained to the patient's perspective; hence, only relevant answers were considered as true complications. The questionnaire was validated by a group of experts from the 3 centers.

## Statistical analysis and sample calculation

During the eligible period of inclusion, 1096 patients delivered a live infant across the 3 centers and hence were eligible to answer the questionnaire. The number of responses needed for an estimated 4% margin of error was 389. The patient response rate was predicted to be 35%; hence, the whole population was contacted to reach the target sample.

Data were analyzed using IBM SPSS Statistics, Version 26.0 statistical software (IBM Corp, Armonk, NY). Categorical variables were expressed as number (frequency). The Fisher exact or Pearson chi-square tests were used to compare categorical variables. Statistical significance was assumed when the *P* value was  $\leq .05$ .

## Results

Of the 1096 patients who were eligible for inclusion, 469 (42.8%) answered the questionnaire. The remaining patients were either unreachable because of incorrect address or phone number, or were not interested in the study. The response rate target was reached, and the estimated margin of error was recalculated at 3.4%.

Most included patients were aged between 20 and 39 years (40.1% between 20 and 29 years and 52.7% between 30 and 39 years). Approximately 55% were multiparas, of whom 97.7% had at least 1 previous live birth, 39.4% had at least 1 spontaneous abortion, and 29.7% had at least 1 previous pregnancy termination. Up to 91.5% answered the survey in French. Most patients had medium to high education level (35.2% secondary level, 48.8% university level, 1.9% doctorate). The major source of information about COVID-19 in this cohort was television (77.6%), followed by the internet (54.2%). Few patients received this information from healthcare providers such as midwives (5.8%), obstetricians (8.5%), or family medicine physicians (4.9%) (Table 1).

Among the 469 patients, 151 (32.2%) reported that the follow-up of their pregnancy was interrupted (exposed

Characteristics	N=469
<b>Maternal age, y</b>	
<20	5 (1.1%)
20–29	188 (40.1%)
30–39	247 (52.7%)
≥40	29 (6.2%)
<b>Spoken language</b>	
French	429 (91.5%)
Dutch	21 (4.5%)
English	5 (1.1%)
Arabic	14 (3.0%)
<b>Education level</b>	
Doctorate	9 (1.9%)
University level	229 (48.8%)
Secondary level	165 (35.2%)
Primary level	36 (7.7%)
Others	30 (6.4%)
<b>Previous pregnancies</b>	
Previous live birth	253/259 (97.7%)
Previous spontaneous abortion	102/259 (39.4%)
Previous pregnancy termination	77/259 (29.7%)
<b>Source of information about COVID-19<sup>a</sup></b>	
Internet	254 (54.2%)
Television	364 (77.6%)
Magazine	22 (4.7%)
Obstetrician	40 (8.5%)
Midwife	27 (5.8%)
Family medicine physician	23 (4.9%)
Others	56 (11.9%)

<sup>a</sup> Multiple responses are possible.  
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group), and 318 (67.8%) reported that their follow-up remained unchanged (unexposed group). Compared with the unexposed group, patients in the exposed group had significantly higher rates of presentation to the emergency department (32.5% vs 18.9%;  $P=.001$ ), were more frequently screened for COVID-19 by RT-PCR before or during pregnancy (52.3% vs 39%;  $P=.007$ ), and had lower preterm birth and higher

postdate birth rates (8.6% vs 15.1% and 15.9% vs 9.7%, respectively;  $P=.037$ ). Nevertheless, the rate of cesarean delivery, the complications during delivery and the postpartum period, the rate of positive RT-PCR, and the hospital stay duration were comparable between the groups (Table 2).

Information about COVID-19 was provided during prenatal consultations to 64.8% and 61.6% of patients in the

TABLE 2

**Obstetrical course and outcomes in patients with interrupted vs noninterrupted prenatal follow-up**

Outcome	Noninterrupted follow-up N=318	Interrupted follow-up N=151	P value
Presentation to the emergency department during pregnancy	60 (18.9%)	49 (32.5%)	.001
Screening with RT-PCR before or during delivery	124 (39%)	79 (52.3%)	.007
Positive RT-PCR during pregnancy or delivery	8 (2.5%)	8 (5.3%)	.121
Cesarean delivery	62 (19.5%)	28 (18.5%)	.806
Complications during delivery	28 (8.8%)	22 (14.6%)	.059
Complications during the postpartum period	14 (4.4%)	6 (4.0%)	.830
Gestational age at delivery			
Preterm	48 (15.1%)	13 (8.6%)	.037
Term	239 (75.2%)	114 (75.5%)	
Postdate	31 (9.7%)	24 (15.9%)	
Hospital stay, d			
1	13 (4.1%)	12 (7.9%)	.233
2	91 (28.6%)	35 (23.2%)	
3	103 (32.4%)	55 (36.4%)	
4	43 (13.5%)	23 (15.2%)	
≥5	68 (21.4%)	26 (17.2%)	

RT-PCR, reverse transcription polymerase chain reaction.

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noninterrupted and interrupted follow-up groups, respectively ( $P=.502$ ). Most patients had conjugal or familial support, and this was not significantly different between the groups ( $P=.601$ ). There was a significant difference in the level of satisfaction about COVID-19 restrictions between the groups ( $P<.001$ ). The rate of nonsatisfaction was higher in the group of interrupted follow-up (29.1% vs 14.2%). For most patients, a companion was present during delivery, and this was not significantly different between the study groups ( $P=.962$ ). Furthermore, the incidence of negative emotions concerning the absence of a companion was also not significantly different ( $P=.473$ ). There were more patients in the interrupted follow-up group who were not willing to deliver again in the same maternity hospital (19.2% vs 10.7%;  $P=.014$ ); however, the reasoning was not entirely related to COVID-19 restrictions (31% vs 26.5%;  $P=.689$ ). Most patients decided to breastfeed. Fear of transmitting COVID-19 to the

infant was not an important reason for cessation of breastfeeding (7.4% vs 4.4%;  $P=.628$ ). Similarly, more than half of patients had a desire for future pregnancy, and fear of COVID-19 was not an important reason for not wanting to become pregnant in the future (10.9% vs 6.9%;  $P=.339$ ). Half of patients were anxious about the health of their infants who were born during the pandemic, but the level of anxiety was not statistically different between the 2 groups ( $P=.466$ ). Among multiparous women, 30.3% in the interrupted and 19.7% in the noninterrupted follow-up group found that the conditions of the index pregnancy were worse than those of the previous delivery before the pandemic, whereas 42.1% and 23.5% found that the conditions were better in the index pregnancy, respectively ( $P<.001$ ). Approximately 41.5% of patients in the noninterrupted and 58.3% in the interrupted follow-up group would have postponed their pregnancy if they had known about the pandemic before becoming pregnant ( $P<.001$ ) (Table 3).

### Comment Main findings

This study aimed to investigate the opinion of pregnant women regarding COVID-19 restrictions that were applied by maternity hospitals at the beginning of the pandemic. Patients who reported that their antenatal follow-up was interrupted were more unsatisfied than their counterparts who reported that their follow-up was unchanged. These patients also had more frequent visits to the emergency department, although pregnancy and postpartum complications did not increase. Another important finding of this study was that patients with interrupted follow-up had lower preterm delivery and higher postdate delivery rates in comparison with patients with noninterrupted follow-up.

### Comparison with the published literature

The total lockdown during the first wave of the COVID-19 pandemic caused a disruption in antenatal care.<sup>9,10</sup> Prenatal

**TABLE 3**  
**Psychological impact of the interrupted vs noninterrupted prenatal follow-up**

XXX	Noninterrupted follow-up N=318	Interrupted follow-up N=151	P value
Information about COVID-19 during prenatal consultations			
Given	206 (64.8%)	93 (61.6%)	.502
Not given	112 (35.2%)	58 (38.4%)	
Support during pregnancy			
Conjugal	105 (33.0%)	44 (29.1%)	.601
Familial	140 (44.0%)	67 (44.4%)	
None	73 (23.0%)	40 (26.5%)	
Satisfaction about COVID-19 restrictions			
Very satisfied	121 (38.1%)	42 (27.8%)	<.001
Satisfied	152 (47.8%)	65 (43.0%)	
Unsatisfied	45 (14.2%)	44 (29.1%)	
Wearing facial mask during delivery			
Yes	141 (44.3%)	81 (53.6%)	.059
No	177 (55.7%)	70 (46.4%)	
Compared with the previous pregnancies, the conditions of the index pregnancy are:			
Better	43/183 (23.5%)	32/76 (42.1%)	<.001
Worse	36/183 (19.7%)	23/76 (30.3%)	
The same	104/183 (56.8%)	21/76 (27.6%)	
Status of companion during delivery			
Absent	50 (15.7%)	24 (15.9%)	.962
Present	268 (84.3%)	127 (84.1%)	
Feeling about the absence of a companion during delivery			
Bad	38/50 (76.0%)	20 (83.3%)	.473
Good	12/50 (24.0%)	4 (16.7%)	
Desire to deliver again in the same hospital in the future			
No	34 (10.7%)	29 (19.2%)	.014
Cause: COVID-19 restrictions	9/34 (26.5%)	9/29 (31%)	.689
Breastfeeding			
No	45 (14.2%)	27 (17.9%)	.295
Cause: fear of COVID-19	2/45 (4.4%)	2/27 (7.4%)	.628
Desire for future pregnancy			
No	130 (40.9%)	64 (42.4%)	.757
Cause: COVID-19	9/130 (6.9%)	7/64 (10.9%)	.339
Anxiety about the health of the infant who was born during the pandemic			
Very anxious	32 (10.1%)	20 (13.2%)	.466
Anxious	112 (35.2%)	56 (37.1%)	
Not anxious	174 (54.7%)	75 (49.7%)	
Postponing of the pregnancy if the patient knew about the pandemic before its onset			
No	186 (58.5%)	63 (41.7%)	.001
Yes	132 (41.5%)	88 (58.3%)	

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care is one of the most important routine medical services. Current antenatal care systems focus primarily on medical risks; however, screening for depression and anxiety during prenatal and postpartum periods is equally important and has been shown to be beneficial.<sup>11–13</sup> Furthermore, it is well known that most common obstetrical adverse outcomes such as preterm birth, fetal growth restriction, congenital abnormalities, or stillbirth can be prevented or anticipated with adequate routine prenatal care.<sup>4,11,13</sup> Childbirth is one of the most sensitive events in a couple's lifetime. Moreover, pregnancy per se induces a variety of emotional changes and psychiatric conditions, such as anxiety, stress, and depression.<sup>13,14</sup> Despite the fact that pregnant women were classified as a "vulnerable group" during the COVID-19 pandemic, the antenatal and postnatal care services were severely affected.<sup>12,15</sup>

COVID-19 was classified as a pandemic by the World Health Organization on March 11, 2020. Consequently, Belgian maternity hospitals have since had to drastically change the way they provide patient care. These modifications varied widely among the different maternity units, which also led to an increase in anxiety in pregnant women. Social isolation, anxiety, stressful events, and inappropriate pregnancy follow-up may lead to serious prenatal and postnatal complications.<sup>9,16</sup> According to the Maternal Mental Health Alliance, up to two-thirds of women who gave birth during the pandemic had mental health issues during or after pregnancy.<sup>17</sup> The uncertainty among pregnant women was further exacerbated by a lack of guidance from healthcare professionals, and confusing and rapidly changing media messages.<sup>18</sup> In this study, most patients received their medical information about COVID-19 from television or the internet, rather than from their gynecologists, family physicians, or midwives. Such sources may be dangerous when the information is not valid from a medical point of view; hence, healthcare providers should increase their efforts to guide their patients properly.

Another important finding of this study was the decreased preterm birth rate in the study population. This finding has also been reported in previously published studies.<sup>19–21</sup> Teleworking, decreased social interactions, decreased infections, decreased car driving, reduced life stress, decreased accidents, reduced smoking owing to being indoors, partner support, and reduced chances of drug use because of the lockdown were proposed as possible factors to explain this finding.<sup>20,21</sup>

### Clinical implications

During pandemics, healthcare providers and authorities must implement the optimal measures to protect patients and medical teams. Sometimes, the implementation of restrictions is sudden because of the rapid evolution of the pandemic. Convincing women of the importance of frequent and regular antenatal follow-up care, and then interrupting this follow-up or shifting to telemedicine visits may affect the mental and psychological health of pregnant women.<sup>22</sup> This study demonstrates that maternal psychological health should be carefully considered during the implementation of measures that restrict the access of pregnant women to antenatal follow-up.

### Research implications

It is very early to judge whether COVID-19 restrictions will have a long-term effect on the mental and psychological health of women who delivered during the period of the implementation of these restrictions, as well as their children. Long-term longitudinal studies could be of interest to investigate this issue and to help healthcare providers fine-tune policies during possible future pandemics.

### Strengths and limitations

In this multicenter study, we examined a particular population of pregnant women who delivered during the period when the lockdown and COVID-19 restrictions were implemented. This study therefore reported the impact of COVID-19 on obstetrical experience in Belgian pregnant women. Many facts

about the effects of COVID-19 on pregnant and nonpregnant women were not clear at that time. Initial restrictions were thought to be crucial for protecting both pregnant women and healthcare workers, and were relaxed afterward because of the developing knowledge about the disease. Patients with intrauterine fetal demise and abortion were excluded because these events could have affected patients' answers. The initial studied population was multicultural, and thus the questionnaire was translated to the most common languages spoken by these patients. In addition, a medical assistance team was always available to help patients who experienced difficulties in responding to the questionnaire.

Some limitations may be encountered in such studies, the most important of which is response rate to the questionnaire. In this study, up to 43% of women answered the questionnaire despite the use of 3 different means of communication and the 3 to 4 reminders that were sent to patients. This may be because of many factors that were not examined, such as the length of the questionnaire, the absence of interest in responding to these questions, or the unwillingness to recall emotions about previous negative experiences. In the study of Blumenberg et al,<sup>23</sup> short and long questionnaires were distributed and reminders were sent with high and low frequency to 1277 persons. The response rate was 54.3%. The authors found that the response rate increased after sending frequent reminders; however, it was not influenced by questionnaire length. Another possible limitation is the duration between the event and the questionnaire. Some patients may have forgotten their experience, the recollection of which might especially depend on whether the pregnancy and delivery went smoothly.

### Conclusion

Interruption or modification of antenatal follow-up leads to dissatisfaction and increases the likelihood of presentation to the emergency department. Additional studies are needed to address the

long-term effects of the COVID-19 pandemic in general, and of COVID-19 restrictions during pregnancy and delivery on the mental health of women and children. ■

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