Change in the Incidence of Stillbirth and Preterm Delivery During the COVID-19 Pandemic

High rates of preterm birth and cesarean delivery have been reported in women with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection.[1] However, studies have inadequate power to assess uncommon outcomes like stillbirth (fetal death ≥24 weeks' gestation). The UK Obstetric Surveillance System reported 3 stillbirths among 247 completed pregnancies in women with confirmed coronavirus disease 2019 (COVID-19) vs the national rate (12.1 per 1000 births vs 4-5 per 1000 births).[2] We assessed the change in stillbirth and preterm delivery rates during the pandemic.

Methods | We compared pregnancy outcomes at St George's University Hospital, London, in 2 epochs: from October 1, 2019, to January 31, 2020 (preceding the first reported UK cases of COVID-19), and from February 1, 2020, to June 14, 2020. Outcomes included stillbirth, preterm birth, cesarean delivery, and neonatal unit admission. We investigated all stillbirths and repeated the analysis after excluding late terminations for fetal abnormalities, as the definition of stillbirth in the UK includes late termination at 24 weeks' gestation or beyond.

Group comparisons were made using Mann-Whitney and Fisher exact tests. The analysis was performed using Stata 11, release 11.2 (StataCorp) and GraphPad Prism 5.0 for Windows (InStata, GraphPad Software Inc). A 2-sided $P < .05$ defined statistical significance. Ethics committee approval and informed consent were not required per the UK Health Research Authority.

Results | There were 1681 births (1631 singleton, 22 twin, and 2 triplet pregnancies) in the prepandemic period and 1718 births (1666 singleton and 26 twin pregnancies) in the pandemic period. There were fewer nulliparous women (45.6% vs 52.2%; $P < .001$) in the pandemic period than in the prepandemic period and fewer women with hypertension (3.7% vs 5.7%; $P = .005$) in the pandemic period than the prepandemic pe-

Table 1. Comparison of Maternal and Pregnancy Characteristics Between the Prepandemic Period (October 1, 2019, to January 31, 2020) and the Pandemic Period (February 1, 2020, to June 14, 2020)

Maternal characteristics	Prepandemic period (n = 1681 births)[a]	Pandemic period (n = 1718 births)[a]	*P* value
Age, median (IQR), y	33.0 (29.0-36.0)	33.0 (29.0-36.0)	.20
BMI, median (IQR)[b]	24.56 (22.02-28.13)	24.34 (21.77-28.37)	.54
Nulliparity, No./total No. (%)	864/1655 (52.2)	708/1553 (45.6)	<.001
Race/ethnicity, No. (%)[c]			
White	772 (46.7)	799 (47.2)	.14
Afro-Caribbean	181 (10.9)	198 (11.7)	
Asian	287 (17.3)	276 (16.3)	
Mixed race	45 (2.7)	47 (2.8)	
Other[d]	166 (10.0)	131 (7.7)	
Unknown (or not stated)	204 (12.3)	241 (14.2)	
Maternal diabetes, No./total No. (%)[e]	184/1655 (11.1)	169/1692 (10.0)	.31
Maternal hypertension, No./total No. (%)[f]	95/1655 (5.7)	62/1692 (3.7)	.005
Multiple pregnancy, No./total No. (%)	24/1655 (1.5)	26/1692 (1.5)	.89

Abbreviations: BMI, body mass index; IQR, interquartile range.

[a] Discrepancies between the denominator for some of the categories and the number of pregnancies included in the study are due to missing data.

[b] BMI was calculated as weight in kilograms divided by height in meters squared.

[c] Race/ethnicity was assessed in the study as it has a well-established association with stillbirth and preterm birth outcomes. The categories for race/ethnicity were defined by the investigators and self-reported at the first hospital appointment during pregnancy.

[d] Includes any race/ethnicity not included in the listed categories.

[e] Includes gestational diabetes and diabetes diagnosed before pregnancy (type 1 and type 2).

[f] Includes gestational hypertension, preeclampsia, and hypertension diagnosed before pregnancy.

Table 2. Comparison of the Study Outcomes Between the Prepandemic Period (October 1, 2019, to January 31, 2020) and the Pandemic Period (February 1, 2020, to June 14, 2020)

Outcomes	Prepandemic period (n = 1681 births)[a]	Pandemic period (n = 1718 births)[a]	Difference (95% CI)	*P* value
Stillbirths, No./total No. (No. per 1000 births)	4/1681 (2.38)	16/1718 (9.31)	6.93 (1.83 to 12.0)	.01
Excluding late terminations for fetal abnormality, No./total No. (No. per 1000 births)	2/1681 (1.19)	12/1718 (6.98)	5.79 (1.54 to 10.1)	.01
Preterm birth, No./total No. (%)				
Prior to wk 37	113/1655 (6.8)	127/1692 (7.6)	−0.68 (−2.43 to 1.07)	.46
Prior to wk 34	42/1655 (2.5)	62/1692 (3.7)	1.13 (−0.05 to 2.30)	.07
Cesarean delivery, No./total No. (%)	423/1655 (25.6)	419/1692 (24.8)	−0.79 (−3.73 to 2.14)	.60
Admission to neonatal unit, No./total No. (%)	103/1677 (6.1)	106/1702 (6.2)	0.09 (−1.53 to 1.71)	.94

[a] Discrepancies between the denominator for some of the categories and the number of pregnancies included in the study are due to missing data.

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riod, and there were no significant differences in other maternal characteristics (**Table 1**).

The incidence of stillbirth was significantly higher during the pandemic period (n = 16 [9.31 per 1000 births]; none associated with COVID-19) than during the prepandemic period (n = 4 [2.38 per 1000 births]) (difference, 6.93 [95% CI, 1.83-12.0] per 1000 births; P = .01) (**Table 2**), and the incidence of stillbirth was significantly higher when late terminations for fetal abnormality were excluded during the pandemic period (6.98 per 1000 births vs 1.19 per 1000 births in the prepandemic period; difference, 5.79 [95% CI, 1.54-10.1]; P = .01). There were no significant differences over time in births before 37 weeks' gestation, births after 34 weeks' gestation, neonatal unit admission, or cesarean delivery (Table 2).

During the pandemic period, 19 patients with COVID-19 were hospitalized in the study site maternity department. None of the pregnant women who experienced stillbirth had symptoms suggestive of COVID-19, nor did the postmortem or placental examinations suggest SARS-CoV-2 infection. Universal testing for SARS-CoV-2 started on May 28, 2020, and only 1 pregnant woman, who had a live birth, had a positive test result.

Discussion | This study demonstrates an increase in the stillbirth rate during the pandemic. A direct consequence of SARS-CoV-2 infection is possible. Although none of the stillbirths in the pandemic period were among women with COVID-19, surveillance studies in pregnant women reported that as much as 90% of SARS-CoV-2–positive cases were asymptomatic.[3-5] Moreover, until recently, UK national policy limited testing to symptomatic individuals requiring hospitalization. Alternatively, the increase in stillbirths may have resulted from indirect effects such as reluctance to go to the hospital when needed (eg, with reduced fetal movements), fear of contracting infection, or not wanting to add to the National Health Service burden. Changes in obstetric services may have played a role secondary to staff shortages or reduced antenatal visits, ultrasound scans, and/or screening. Although differences in the populations in the 2 periods were observed, the lower proportion of nulliparous and hypertensive women during the pandemic period would have been expected to be associated with a lower rather than higher risk of stillbirth. However, hypertension in pregnancy may have been underdiagnosed during the pandemic as women had fewer face-to-face antenatal visits. Other possible explanations include change in referral patterns with more high-risk women referred to St George's Hospital or chance due to the short time frame of the study.

Limitations of this study include its retrospective nature, single-center setting, small numbers, short time frame, and lack of information on the causes of stillbirths. Moreover, a comparable period in 2019 was not used, but this should not affect the results as there is no seasonality to stillbirths in the UK.

Asma Khalil, MD
Peter von Dadelszen, PhD
Tim Draycott, MD
Austin Ugwumadu, PhD
Pat O'Brien, MBBCh, MRCOG, MFFP
Laura Magee, PhD

Author Affiliations: Fetal Medicine Unit, St George's University of London, London, United Kingdom (Khalil, Ugwumadu); School of Life Course Sciences, King's College London, London, United Kingdom (von Dadelszen, Magee); Department of Women's Health, North Bristol NHS Trust, Westbury on Trym, United Kingdom (Draycott); Department of Women's Health, University College London Hospitals, London, United Kingdom (O'Brien).

Corresponding Author: Asma Khalil, MD, Fetal Medicine Unit, Department of Obstetrics and Gynaecology, St George's University Hospitals, NHS Foundation Trust, Blackshaw Road, London SW17 0QT, United Kingdom (akhalil@sgul.ac.uk).

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Concept and design: Khalil, von Dadelszen, O'Brien, Magee.
Acquisition, analysis, or interpretation of data: Khalil, Draycott, Ugwumadu, O'Brien, Magee.
Drafting of the manuscript: Khalil, Draycott, Ugwumadu, O'Brien.
Critical revision of the manuscript for important intellectual content: All authors.
Statistical analysis: Khalil.
Administrative, technical, or material support: Khalil, von Dadelszen, Ugwumadu, Magee.

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1. Khalil A, Kalafat E, Benlioglu C, et al. SARS-CoV-2 infection in pregnancy: a systematic review and meta-analysis of clinical features and pregnancy outcomes. *EClinicalMedicine*. Published online July 3, 2020. doi:10.1016/j.eclinm.2020.100446

2. Knight M, Bunch K, Vousden N, et al; UK Obstetric Surveillance System SARS-CoV-2 Infection in Pregnancy Collaborative Group. Characteristics and outcomes of pregnant women admitted to hospital with confirmed SARS-CoV-2 infection in UK: national population based cohort study. *BMJ*. 2020;369:m2107. doi:10.1136/bmj.m2107

3. Campbell KH, Tornatore JM, Lawrence KE, et al. Prevalence of SARS-CoV-2 among patients admitted for childbirth in Southern Connecticut. *JAMA*. Published online May 26, 2020. doi:10.1001/jama.2020.8904

4. Sutton D, Fuchs K, D'Alton M, Goffman D. Universal screening for SARS-CoV-2 in women admitted for delivery. *N Engl J Med*. 2020;382(22):2163-2164. doi:10.1056/NEJMc2009316

5. Khalil A, Hill R, Ladhani S, Pattisson K, O'Brien P. Severe acute respiratory syndrome coronavirus 2 in pregnancy: symptomatic pregnant women are only the tip of the iceberg. *Am J Obstet Gynecol*. Published online May 7, 2020. doi:10.1016/j.ajog.2020.05.005

Prevalence of Psychotropic and Opioid Prescription Fills Among Community-Dwelling Older Adults With Dementia in the US

A 2015 report highlighted the paucity of knowledge about prescribing of psychotropics to adults with dementia in community settings.[1] Prior estimates are more than 10 years old and exclude benzodiazepines and opioids.[2,3] Given the risk of harm when prescribing such central nervous system (CNS)–active medications to older adults with dementia, more data are needed to inform research and policy.[4] We estimated CNS-active medication prescriptions among community-dwelling older adults with dementia, identifying the most commonly prescribed medications.

Supplemental content

Methods | We identified all fee-for-service Medicare beneficiaries aged 65 years or older with a primary or secondary diagnosis of dementia (eTable 1 in the Supplement) on a claim for a face-to-face clinical encounter between October 1, 2014, and September 30, 2015. Analysis was limited to those with

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