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glucose levels leading to increased fetal insulin production.⁵ Future work could focus on identifying patients who may derive the most benefit from antenatal late preterm corticosteroids. ■

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The authors report no conflict of interest.

Research reported in this publication was supported, in part, by the National Institutes of Health (NIH) [National Center for Advancing Translational Sciences](#) (grant number UL1TR001422). The content is solely the responsibility of the authors and does not necessarily represent the official views of the NIH. The NIH played no role in the study design, collection or interpretation of data, and decision to publish the results.

A version of this study was presented at the 40th annual meeting of the Society for Maternal-Fetal Medicine, Grapevine, TX, February 3–8, 2020.

The Northwestern Institutional Review Board approved this research (protocol number: STU00204844; approved on March 8, 2017) with a waiver of informed consent.

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Childbirths at home and in birthing centers rose during COVID-19: Oregon 2020 vs prior years



OBJECTIVE: In March 2020, as COVID-19 was first recognized in the United States, reports emerged about how severe COVID-19 could be among pregnant individuals, and clinicians had to speculate about its potential effects on newborns.¹ Out of concern for patient, clinician, and neonatal safety, system-based hospitals—hospitals owned by an organization operating outpatient practices, including primary care—rapidly implemented COVID-19 policies, restricting companions during childbirth and separating parents with COVID-19 from their babies.^{2,3} Fear of COVID-19 and commensurate changes in hospital policies may have led some pregnant individuals to choose to deliver in independent hospitals, in birthing centers, or at home.^{4,5} Our objectives were to compare place of birth between 2020 and years before the COVID-19 pandemic

and to investigate whether changes in place of birth differed between system-owned and independent hospitals and urban and rural regions in Oregon.

STUDY DESIGN: We connected 2 Oregon data sources (Oregon Health Authority Vital Statistics and Oregon Perinatal Collaborative) with the Johns Hopkins COVID-19 data tracker and the novel Health Systems Provider Database to examine overall trends in place of birth (in the hospital, in a birthing center, or at home) between system-owned and independent hospitals and between urban and rural areas. Birth location was defined as rural or urban using county-type designation from the Centers for Medicaid & Medicare Services. The institutional review boards of the Boston Children's Hospital and Harvard University approved this study.

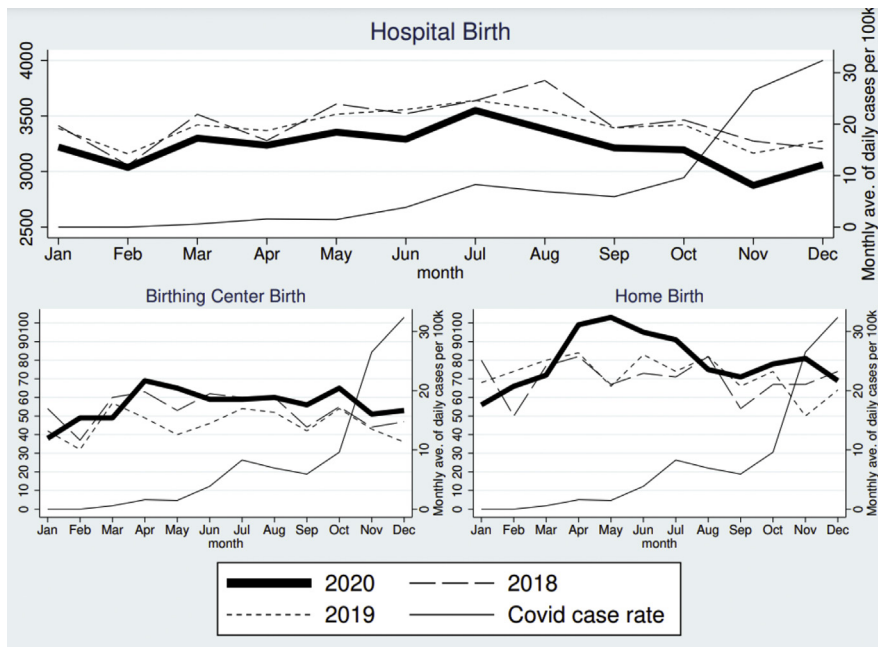
TABLE 1
Predicted vs actual 2020 births by facility type

Month	Year	Facility type	Actual births in 2020	Predicted births in 2020	Difference (actual vs predicted)	Student <i>t</i> test <i>P</i> value
Jan.	2020	Hospital	3220	3317	-97	.016
Feb.	2020	Hospital	3036	3114	-78	.051
March	2020	Hospital	3300	3513	-213	<.001 ^a
April	2020	Hospital	3236	3441	-205	<.001 ^a
May	2020	Hospital	3354	3652	-298	<.001 ^a
June	2020	Hospital	3290	3583	-293	<.001 ^a
July	2020	Hospital	3550	3695	-145	<.001 ^a
Aug.	2020	Hospital	3381	3737	-356	<.001 ^a
Sept.	2020	Hospital	3212	3536	-324	<.001 ^a
Oct.	2020	Hospital	3195	3440	-245	<.001 ^a
Nov.	2020	Hospital	2875	3218	-343	<.001 ^a
Dec.	2020	Hospital	3060	3337	-277	<.001 ^a
Jan.	2020	Birthing center	38	50	-12	<.001 ^a
Feb.	2020	Birthing center	49	46	+3	.318
March	2020	Birthing center	49	56	-7	.021
April	2020	Birthing center	69	57	+12	<.001 ^a
May	2020	Birthing center	65	58	+7	.026
June	2020	Birthing center	59	58	+1	.716
July	2020	Birthing center	59	60	-1	.712
Aug.	2020	Birthing center	60	59	+1	.844
Sept.	2020	Birthing center	56	53	+3	.287
Oct.	2020	Birthing center	65	52	+13	<.001 ^a
Nov.	2020	Birthing center	51	54	-3	.270
Dec.	2020	Birthing center	53	52	+1	.741
Jan.	2020	Home	56	70	-14	<.001 ^a
Feb.	2020	Home	66	67	-1	.758
March	2020	Home	72	76	-4	.334
April	2020	Home	99	80	+19	<.001 ^a
May	2020	Home	103	77	+26	<.001 ^a
June	2020	Home	95	78	+17	<.001 ^a
July	2020	Home	91	77	+14	<.001 ^a
Aug.	2020	Home	75	77	-2	.575
Sept.	2020	Home	71	69	+2	.599
Oct.	2020	Home	78	69	+9	.019
Nov.	2020	Home	81	64	+17	<.001 ^a
Dec.	2020	Home	69	68	+1	.785

^a Indicates *P*-value of .05 or less

Smith. Place of birth during COVID-19. *Am J Obstet Gynecol* 2022.

FIGURE
Changes in place of birth during COVID-19, Oregon 2018 to 2020



ave., average.

Smith. Place of birth during COVID-19. *Am J Obstet Gynecol* 2022.

We used regression modeling and Student *t* tests to compare predicted birth numbers with actual birth numbers by facility type, system-owned or independent status, and urban or rural location between 2020 and previous years in 2 ways: predicted 2020 values using (1) 2010–2019 data and (2) an average of 2 preceding years, 2018–2019. These models produced (1) a predicted number of births by place for 2020 vs previous years had births followed existing trends and (2) a percentage change in place of births from 2018 to 2020. We considered a 2-sided *P* value of .05 to be significant.

RESULTS: Comparing actual births in 2020 with predicted births in 2020, decreases in hospital birth were statistically significantly from March 2020 to December 2020, the period affected by COVID-19 (*P* < .001 for all months), and the decrease remained greater than predicted by secular trends. Decreases in system-owned hospital births were significant from March 2020 to December 2020 (*P* < .001 for all months). Increases in birthing center and at-home births were statistically significant in the spring of 2020 (*P* < .01) during the first wave of COVID-19. (Table 1)

Comparing actual births in 2020 with actual births in 2018–2019, in-hospital births declined by 4.4%. That decline reflected a net decline of 4.6% among system-owned hospitals but reflected a net increase of 3.0% among independently owned hospitals (Figure). Births outside of hospitals increased by

12.5%; that net increase was because of a 13.5% increase in births at birthing centers and an 11.9% increase in births at home (Table 2). Shifts toward out-of-hospital births occurred in both urban and rural areas (Table 3).

TABLE 2
Birth volume by place of birth: Oregon 2020 vs mean of 2018 and 2019^a

Variable	2020	2018 and 2019 (mean)	Percentage change
Total live births	40,338	41,935	−3.8
At hospitals	38,709	40,487	−4.4
System owned	37,827	39,631	−4.6
Independently owned	882	856	+3.0
Outside of hospitals	1629	1447	+12.5
At birthing center	673	593	+13.5
At home	956	855	+11.9

Percentage change is calculated as follows: (number of births in 2020–average number of births across 2018 and 2019)/average number of births across 2018 and 2019. Birth numbers exclude births at hospitals without a labor and delivery unit or without a recorded place of birth (33 in 2020).

^a Indicates *P*-value of .05 or less

Smith. Place of birth during COVID-19. *Am J Obstet Gynecol* 2022.

TABLE 3

Birth volume in by place of birth and region of state: Oregon 2020 vs mean of 2018 and 2019

Variable	Urban			Rural		
	2020	2018 and 2019 (mean)	Percentage change	2020	2018 and 2019 (mean)	Percentage change
Total live births	30,877	32,739	−5.7	9461	8979	+2.9
At hospitals	29,685	31,652	−4.8	9024	8836	−3.2
System owned	Too few independent hospitals to compute difference					
Independently owned						
Outside of hospitals	1192	1088	+9.6	437	360	+21.4
At birthing center	573	504	+13.7	100	89	+12.4
At home	619	584	+6.1	337	271	+24.4

Percentage change is calculated as follows: (number of births in 2020—average number of births across 2018 and 2019)/average number of births across 2018 and 2019.

Smith. Place of birth during COVID-19. *Am J Obstet Gynecol* 2022.

CONCLUSION: In Oregon, in-hospital births declined significantly during the first year of COVID-19 and affected system-owned hospitals more than independent ones. Similar dynamics may be present nationwide as COVID-19 continues in the United States.

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This work was supported by grant number U19 HS024072 (A.T.C., A.Z., E.S., S.E.H., and D.M.C.).

The authors report no conflict of interest.

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Social vulnerability and use of postpartum long-acting reversible contraception and sterilization



OBJECTIVE: Postpartum contraception is a highly effective clinical intervention that can help women achieve their personal goals and improve population health outcomes,

including healthy birth spacing. Social determinants of health—the conditions in which people live, work, and play—can affect health outcomes,^{1,2} including maternity