Multivariate negative binomial regression was performed to assess for associations between county demographics and NAS rates. Analyses were stratified by opioid overdose rates as a proxy for opioid use disorder prevalence. Overdose rate was divided into tertiles (low, middle, high) for stratification.

RESULTS: The rate of NAS was 6.5 per 1,000 live births (Table1). There was a strong correlation between NAS and overdose rates (rho=0.64, p<0.0001). For counties with the highest overdose rates, rural status and higher levels of poverty, manufacturing jobs, and unemployment were associated with increased NAS rates. High capacity MOAT was associated with reduced rates of NAS in counties with low overdose rates. However, in counties with high overdose rates, increasing MOAT capacity was not associated with decreasing NAS rates.

CONCLUSION: Increasing MOAT capacity may lead to reduced NAS in counties with low overdose rates, but it remains insufficient for counties with the highest overdose rates. Study findings suggest an unresolved, critical gap for MOAT treatment in areas with high opioid use disorder prevalence.

Table1: Association between NAS Rates and County-Level Characteristics

Variable	Rate of NAS per 1,000 live births	Model Results Stratified by Fatal and Nonfatal Overdose Rates[a]	
		Lowest Tertile IRR (95% CI, p-value)	Highest Tertile IRR (95% CI, p-value)
Urban/Rural			
Urban	6.54	Ref	Ref
Intermediate	5.90	0.60 (0.28-1.3, p=0.18)	0.83 (0.62-1.10, p=0.2)
Rural	7.44	1.2 (0.54- 2.72, p=0.63)	0.49 (0.34-0.71, p=0.0002)
Mental Health Provider Shortage Area			
No	4.47	Ref	Ref
Yes	6.72	2.47 (1.29, 4.70, p=0.006)	1.77 (1.19-2.63, p=0.005)
Poverty			
Quartile 1	6.35	Ref	Ref
Quartile 2	4.45	0.77 (0.30-1.96, p=0.59)	0.89 (0.64-1.24, p=0.49)
Quartile 3	5.73	1.09 (0.66- 1.79, p=0.74)	0.65 (0.46-0.92, p=0.01)
Quartile 4	11.31	2.34 (0.88- 6.38, p=0.09)	1.47 (1.20-1.79, p=0.0001)
Unemployment			
Quartile 1	5.45	Ref	Ref
Quartile 2	6.54	1.25 (0.57-2.79, p=0.57)	1.30 (1.1-1.58, p=0.009)
Quartile 3	7.39	0.72 (0.31-1.68, p=0.44)	1.79 (1.39-2.32, p<0.0001)
Quartile 4	7.34	1.97 (0.82- 4.73, p=0.13)	1.63 (1.20-2.23, p=0.002)
Manufacturing[b]			
Quartile 1	6.83	Ref	Ref
Quartile 2	6.56	1.08 (0.65-1.78, p=0.77)	1.12 (0.94-1.32, p=0.18)
Quartile 3	5.35	0.68 (0.42-1.10, p=0.12)	0.83 (0.61-1.13, p=0.24)
Quartile 4	6.28	0.72 (0.34-1.49, p=0.37)	1.26 (1.06-1.49, p=0.009)
Maternal OAT Capacity[c]			
No capacity	4.99	0.39 (0.23-0.66, p=0.0005)	1.42 (1.04-1.94, p=0.03)
Low capacity	6.99	Ref	Ref
High capacity	7.51	0.59 (0.35-0.99, p=0.046)	2.32 (1.58-3.41, p<0.0001)

Footnotes:
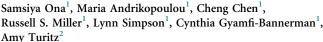Middle tertile omitted for simplicity
NAS: neonatal abstinence syndrome; IRR: incidence rate ratio; CI: confidence interval; OAT: opioid agonist therapy; Ref: reference
[a] Overdose rate is defined as the total instances of fatal and nonfatal overdoses occurring in women 15-45 among all women age 15-45
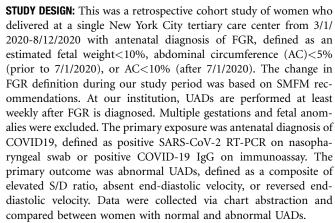[b] Manufacturing is defined as the proportion of all jobs that are manufacturing
[c] Maternal OAT capacity is defined as the county's capacity to provide OAT to pregnant patients. No capacity indicates no providers in the county prescribe OAT to pregnant women; the remaining counties were divided in half based on the ratio of number of providers accepting pregnant patients to number of births (a proxy for potential need)

951 **The association between COVID19 infection and umbilical artery dopplers in growth-restricted pregnancies**

Samsiya Ona[1], Maria Andrikopoulou[1], Cheng Chen[1], Russell S. Miller[1], Lynn Simpson[1], Cynthia Gyamfi-Bannerman[1], Amy Turitz[2]
[1]Columbia University Irving Medical Center, New York, NY, [2]Division of Maternal Fetal Medicine, Columbia University Irving Medical Center, New York, NY

OBJECTIVE: The effect of COVID19 infection on pregnancies affected by fetal growth restriction (FGR) is unknown. We aim to determine whether COVID19 infection worsens the severity of fetal growth restriction as characterized by umbilical artery Doppler studies (UADs).

STUDY DESIGN: This was a retrospective cohort study of women who delivered at a single New York City tertiary care center from 3/1/2020-8/12/2020 with antenatal diagnosis of FGR, defined as an estimated fetal weight<10%, abdominal circumference (AC)<5% (prior to 7/1/2020), or AC<10% (after 7/1/2020). The change in FGR definition during our study period was based on SMFM recommendations. At our institution, UADs are performed at least weekly after FGR is diagnosed. Multiple gestations and fetal anomalies were excluded. The primary exposure was antenatal diagnosis of COVID19, defined as positive SARS-CoV-2 RT-PCR on nasopharyngeal swab or positive COVID-19 IgG on immunoassay. The primary outcome was abnormal UADs, defined as a composite of elevated S/D ratio, absent end-diastolic velocity, or reversed end-diastolic velocity. Data were collected via chart abstraction and compared between women with normal and abnormal UADs.

RESULTS: 91 women met inclusion criteria. 7 (7.7%) women had COVID19 during pregnancy and 27 (29.7%) had abnormal UADs. COVID19 was diagnosed in 6 women with normal UADs and 1 with abnormal UADs (9.4% vs 4.0%, p=0.67) (Table 1). Controlling for age, race, body mass index, smoking, and maternal disease, there was no difference in abnormal UADs between COVID19 positive and negative patients (aOR 0.94, 95% CI 0.09-10.00). Of maternal factors evaluated, only maternal hypertensive disease of pregnancy was associated with abnormal UADs (aOR 4.68, 95% CI 1.36-16.07) (Table 2).

CONCLUSION: We did not find a significant association between COVID19 infection and umbilical artery Dopplers in pregnancies affected by FGR. Maternal hypertensive disease of pregnancy may increase the risk of abnormal UADs in these pregnancies.

Table 1: Maternal characteristics by umbilical artery Doppler status

	Normal umbilical artery Dopplers (n=64)	Abnormal umbilical artery Dopplers (n=27)	P value
COVID19 positive, n (%)	6 (9.4%)	1 (4%)	0.67
Maternal age in years, median (IQR)	31 (28-37)	32 (27-36)	0.96
Race or ethnicity, n (%)			0.03
African American	6 (9%)	8 (30%)	
White	20 (31%)	4 (14%)	
Hispanic	29 (46%)	8 (30%)	
Other	9 (14%)	7 (26%)	
Body mass index, mean (SD)	29.2 (25.0-32.6)	28.7 (24.7-36.8)	0.35
Smoking, n (%)	2 (3%)	3 (11%)	0.15
Maternal disease, n (%)			
Cardiovascular disease	0	4 (15%)	<0.01
Pregestational diabetes	0	1 (4%)	0.30
Asthma	8 (13%)	6 (22%)	0.34
Hypertensive disease of pregnancy	9 (14%)	11 (41%)	0.011
Renal disease	1 (2%)	1 (4%)	0.51

Table 2: Adjusted odds of abnormal umbilical artery Dopplers

	aOR	95% CI	P value
COVID-19 positive	0.94	0.09-10.00	0.96
Maternal age in years	0.996	0.91-1.09	0.93
Race or ethnicity			0.09
Hispanic vs White	1.24	0.24-6.26	
Black vs White	5.67	0.93-34.59	
Other vs White	2.01	0.47-8.57	
Body mass index	4.22	0.75-23.67	0.52
Smoking	4.13	0.49-34.85	0.19
Maternal disease			
Asthma	1.54	0.36-6.55	0.56
Hypertensive disease of pregnancy	4.68	1.36-16.07	0.014
Renal disease	2.53	0.07-94.05	0.61

aOR, adjusted odds ratio. Adjusted for age, race, smoking, body mass index, and maternal disease.