

Midwest Health Disparities in Pregnancy Outcomes before, during, and after COVID-19

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Purpose:
To describe birthweight and preterm birth outcomes before, during, and after the psychosocial stressor impact of Covid-19 among pregnant women including Indigenous American, Black and White individuals.

Introduction:

- A higher percentage of marginalized racial and ethnic groups reported increased stress during the pandemic than White people. (McKnight-Eily et al., 2021)
- Social stressors are associated with adverse effects on birthweight and gestational length. (Hobel et al., 2008; Bergeron et al., 2023)
- On average, pregnant women of color reported higher levels of stress due to COVID 19 than pregnant White women. (Preis et al., 2020)
- Women who identify as a member of a racial or ethnic group historically devalued in the US have smaller babies on average. (Aizer & Currie, 2014)
- For the purposes of this study, the date that the United States became largely concerned with COVID-19 was February 25th 2020, as this was the day the CDC first announced anticipated disruption to the day-to-day life of the general population. (CDC Museum COVID-19 Timeline, 2023)

Methods:

- We reviewed a large retrospective data set spanning April 2011-September 2022, that includes 9,541 de-identified pregnant primigravidas between the ages of 18-45 who gave birth in Sanford hospitals at a gestational length of <43 weeks.
- Data is categorized by race as it appears in the participants' medical charts; the three categories included in this study are African American/Black (Black), American Indian or Alaskan Native (Indigenous American; IA), and Caucasian/White (White).
- Data is split into three COVID-19 periods:
 - "Before": Birth prior to Feb. 25 2020 (with Feb. 25 as the US COVID start date).
 - "Transitional": Birth between Feb. 25 2020-Dec. 15 2020 (With Dec. 15 as 42 weeks post COVID start).
 - "After": Birth after Dec. 15 2020

Statistical Analysis:
The data was analyzed descriptively with the continuous and categorical variables summarized, using mean and standard deviation or frequencies and percentages as applicable. The outcomes were visualized using tables and bar charts.

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Results:
The data did not show trends of lower birthweight or gestational length across COVID-19 periods, however, as anticipated gestational length of Black and IA individuals tended to be shorter than their White counterparts. The increase in preterm births among Black individuals in the After COVID-19 period suggests support for our hypothesis, however, additional follow-up analyses are necessary in this area to determine whether the cause is COVID stress, racial discrimination, or other relevant factors. The decrease in IA preterm birth weights from the Transitional to After COVID-19 periods would similarly benefit from further study.

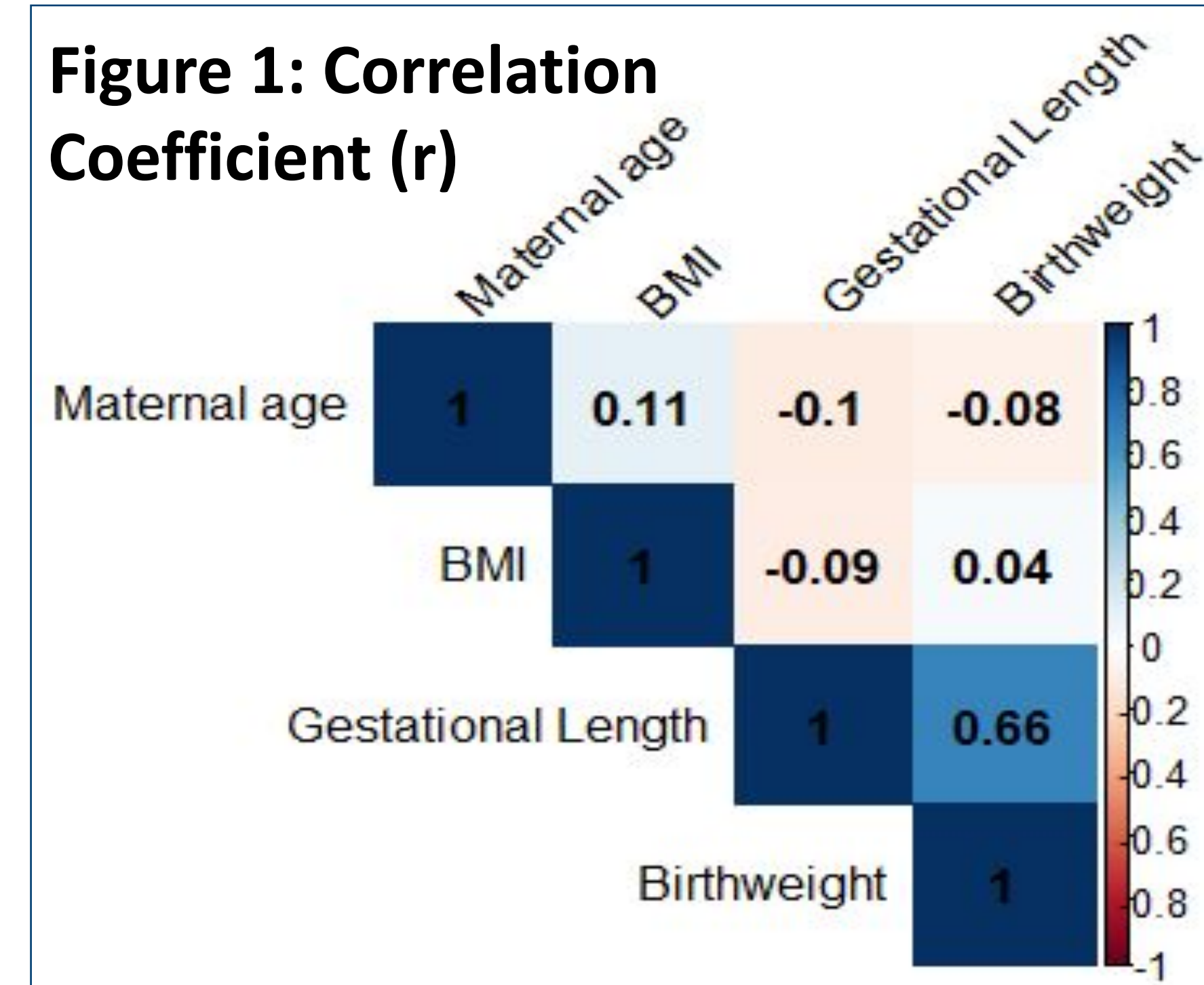


Figure 1: Heat map showing associations between covariates and variables.

Table 1: Within each epoch, mean and standard deviation are shown above for covariates BMI and maternal age, and frequency of categorical variables race and fetal sex.
Table 2 : Average gestational length in weeks for each racial category across COVID periods.

Table 1: Demographics

	Before (N=6624)	Transitional (N=909)	After (N=2008)	Total (N=9541)
Age at episode start				
Mean (SD)	27.0 (4.6)	27.2 (4.5)	27.7 (4.5)	27.2 (4.6)
BMI				
Mean (SD)	27.9 (6.3)	28.1 (6.4)	28.1 (6.5)	27.9 (6.4)
Frequency (%)				
Race				
Black	177 (2.7%)	28 (3.1%)	57 (2.8%)	262 (2.7%)
IA	214 (3.2%)	29 (3.2%)	51 (2.5%)	294 (3.1%)
White	6233 (94.1%)	852 (93.7%)	1900 (94.6%)	8985 (94.2%)
Fetal sex				
Female	3225 (48.8%)	450 (49.6%)	963 (48.0%)	4638 (48.7%)
Male	3379 (51.1%)	458 (50.4%)	1042 (51.9%)	4879 (51.2%)

Table 2: Gestational Week by Race and COVID-19 Period

Maternal race	COVID-19 period	Mean	% diff by period	% diff from Baseline	SD	Median	IQR
IA	Before	38			3.38	39	3
	Transitional	37.38	98%		4.14	38	2
	After	38.51	103%	101%	2.11	39	1.5
Black	Before	38.06			4.39	39	2
	Transitional	38.57	101%		1.45	39	2
	After	37.42	97%	98%	3.86	39	3
White	Before	38.49			2.67	39	2
	Transitional	38.4	100%		2.42	39	2
	After	38.39	100%	100%	2.37	39	2

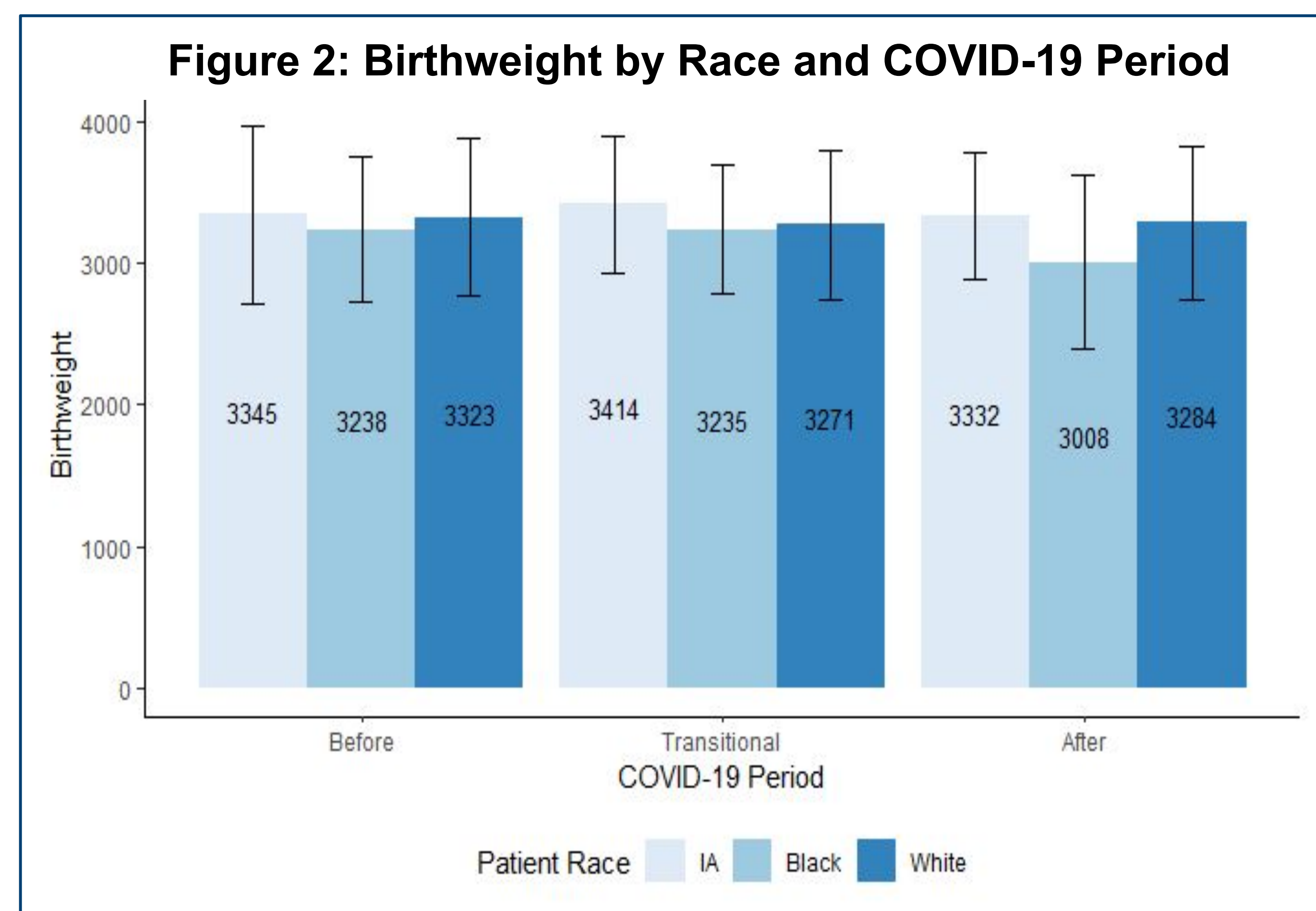
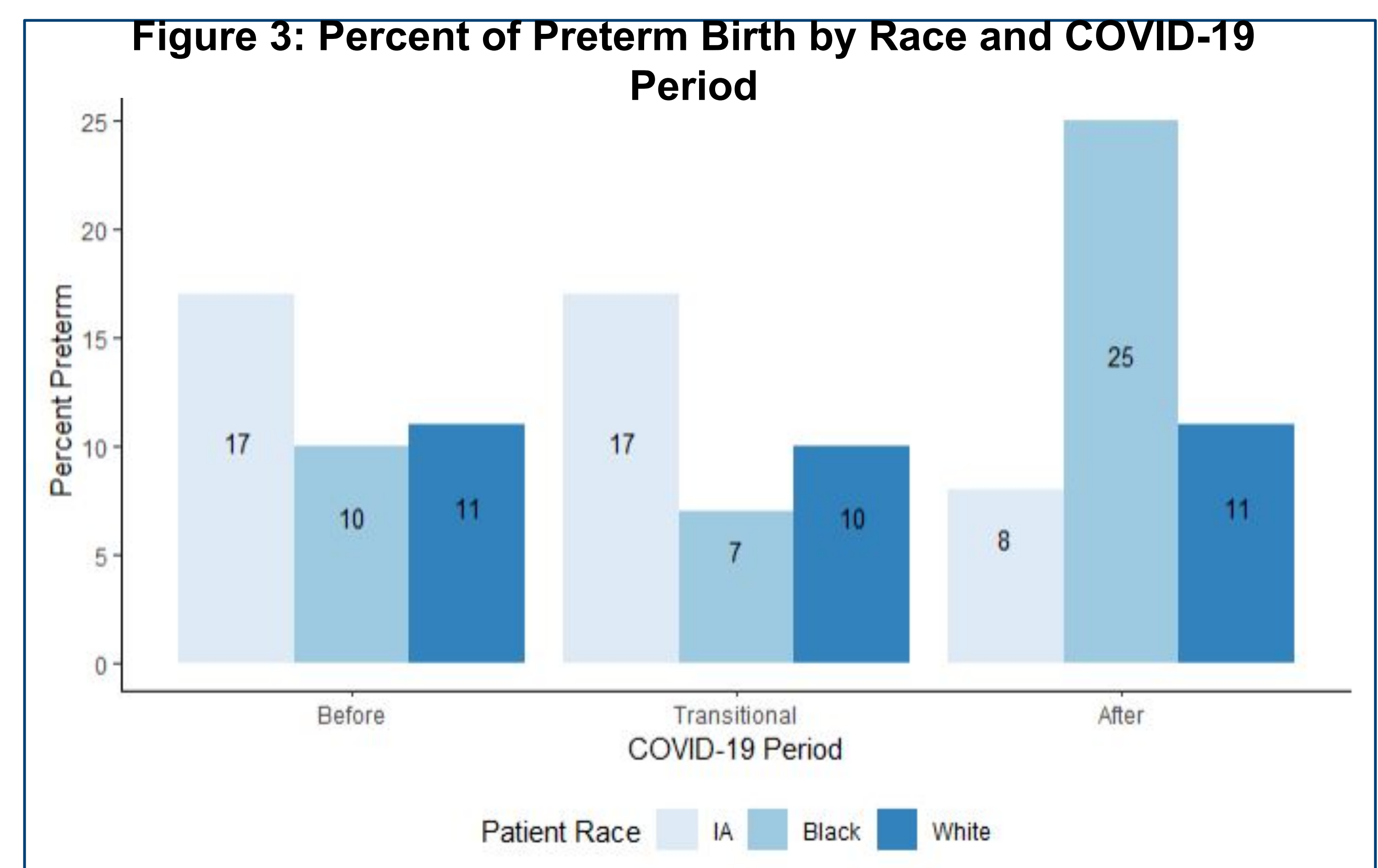


Figure 2 : Average birthweight for each categorical race in each COVID period. There is no distinct difference in birthweight across each variable.

Figure 3 : Percentage of preterm births across racial categories in COVID periods. There is no difference in White (N= 8985) individuals across periods, however, IA (N= 294) showed a decrease in the After period while Black (N= 262) showed an increase.



Conclusion/Discussion:
The trends described here, across COVID time periods in both Black and IA communities, suggest an unequal impact of the COVID-19 pandemic on historically underprivileged racial and ethnic backgrounds. The data sets for these communities are smaller (IA: N=294; Black: N=262) compared to their White counterparts (N=8985). For follow-up analyses we will account for these sample differences using robust methods, including propensity matching. Future research might consider the role of racially mediated stress differences during analyses of these epochs, or oversample for individuals of these backgrounds to identify these relationships.

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