

Evaluation of Maternal Age, Race and Ethnicity role in the Male-Female birth ratios during and after the COVID-19 Pandemic in Florida

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Background

Numerous studies have identified and examined the now well-established phenomenon of decreased ratios of male to total births (i.e. lower secondary sex ratio) during economic decline, natural and unnatural disasters^{1,2}. Secondary sex ratios in relation to race and ethnicity around “high stress events” have been rarely studied and to our knowledge has not been studied in Hispanic Americans. There are no current studies that have evaluated secondary sex ratios in relation to COVID-19.

Objective

To compare sex ratios (presented as females and males to total per cents) before and during the COVID-19 pandemic by race/ethnicity.

Methods

A total of 23,719 births from ten HCA Healthcare hospitals in Florida were analyzed, from January 1, 2019 through April 30, 2021. Births and birth gender ratios were categorized by self-reported race/ethnicity categories and analyzed using Pearson chi-square. The “before pandemic” period was defined from January 1, 2019 to January 31, 2020. The “During pandemic” was February 1, 2020 to April 31, 2021. A total of 353 births were excluded from this analysis given no documented race or ethnicity in the dataset.

Results

Race was categorized among Non-Hispanic Whites, Non-Hispanic Blacks, Hispanic and others. No statistical difference was identified between the Before and During periods when analyzing race/and ethnic groups (Table 1).

Table 1. Percent of births by race before and during COVID periods

	Before (average)	During (average)	Total	P-value
White NH	61.5% (6,600)	62.1% (7,230)	13,830	0.3810
Black NH	21.7% (2,324)	21.1% (2,455)	4,779	0.2906
Hispanic	4.8% (516)	5.3% (622)	1,138	0.0705
Other	12.0% (1,285)	11.5% (1,334)	2,619	0.2252
Total	10,725	11,641	23,366	

However, as describe in Table 2, there was a statistically significant difference for the male/female ratio in the “During” Pandemic period (p-value=0.033). The percent of Non Hispanic Blacks males significantly decrease during the pandemic period p-value=0.0481.

Table 2. Comparison of baby males percents by race before and during COVID periods

	Before (average)	During (average)	P-value
White NH	61.2% (3,365)	62.2 (3,650)	0.2640
Black NH	22.0% (1,210)	20.5% (1,202)	0.0481
Hispanic	5.0% (275)	5.6% (330)	0.1388
Other	11.8% (678)	11.7% (684)	
Total	5,498	5866	11,364

The mean age of the mothers of our study was 28 years. Non statistical significant difference was identified in the mean maternal age during the “Before” and “During” periods of our study (p-value=0.132).

Discussion

There was a statistically significant drop in male births from the Black non Hispanic group during the pandemic period compared to the before period, This supports the historically documented association between exogenous population stressors and secondary sex ratio. This finding is limited to the births that occurred in the state of Florida among ten HCA facilities. The were 353 births with unknow information regarding the race variable that were not analyzed in this study. Further analyses is recommended on these group to discard bias from the results. A new hypothesis that might be driven out of this study is why, Whites and Hispanics were not affected as much as Blacks in the male ratio decrease.

Conclusion

In comparing monthly gender ratio both before and during the COVID-19 pandemic by maternal age and race/ethnicity we found no difference in maternal age. However, there was a statistically significant difference in the decrease of gender ratio among Non-Hispanic Blacks in the “During Pandemic” period. Given the CDC documented disproportionate ratio of infection, hospitalizations and death secondary to COVID-19 amongst minorities across the nation we believe this study warrants cause to broaden the study population to include the entire nation.. We further believe that next steps should examine the perceptions of social climate during this period such as healthcare disparities, access to care and social classes.

References

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