

Racial/Ethnic Disparities in COVID-19 Infection among Working-Age Women with Precancerous Cervical Lesion

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KEY MESSAGES

- The racial/ethnic disparities in COVID-19 infection among PCL women was observed.
 - NHB and Hispanic PCL women had a higher risk of COVID-19 infection than NHW.
- Younger working-age women had a higher risk of COVID-19 infection.
- Women residing outside of the greater New Orleans area had an increased risk of infecting COVID-19.

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BACKGROUND

Precancerous cervical lesion (PCL) is most likely diagnosed in working-age women. In Louisiana, over 98% of PCL cases were diagnosed at aged 18-65 and women aged 20-34 had the highest incidence rate. Before the Omicron variant spread, COVID-19 prevalence was higher in young and middle aged adults and minorities in the United States. Because most of PCL cases occurred in the similar age group as COVID-19, this study aimed to assess the racial/ethnic disparities in COVID-19 infection on this specific population.

OBJECTIVE

To assess the racial/ethnic disparities in COVID-19 Infection among PCL women aged 18-65.

METHODS

Study Cohort
Women with precancerous cervical lesion (PCL) diagnosed in 2009-2021, including CIN3, CIS, severe dysplasia, AIS, and high-grade dysplasia for year ≥2019, were obtained from the Louisiana Tumor Registry. We included PCL women aged 18-65 either at time of a COVID-19 diagnosis or year 2021 for COVID free patients. PCL women died before 2020 were excluded.

COVID-19 Data

We linked eligible PCL women with the Louisiana statewide COVID-19 2020-2021 data to identify patients with COVID-19 infection.

Variables

- Outcome variable: COVID-19 diagnosis (Yes vs No).
- Race/ethnicity was categorized as non-Hispanic white (NHW), non-Hispanic black (NHB), Hispanic, and others.
- Other covariates included age, marital status, type of insurance, census-track level SES quintiles (higher group indicates the higher SES), and Louisiana metro status (Non-metro, greater New Orleans, and other metro).

Table 1. Patient characteristics among working-age women with PCL diagnosed in 2009-2021 by COVID-19 infection status

Variables	COVID-19 Diagnosis		p-value	Variables	COVID-19 Diagnosis		p-value
	No (N=12,945) Count (%)	Yes (N=1,644) Count (%)			No (N=12,945) Count (%)	Yes (N=1,644) Count (%)	
Race/Ethnicity			<.0001	Health insurance			0.0827
NHW	7952 (90.2)	860 (9.8)		P/M/O	979 (86.7)	150 (13.3)	
NHB	4099 (85.9)	671 (14.1)		Medicaid	638 (89.0)	79 (11.0)	
Hispanic	698 (88.2)	93 (11.8)		No/unknown	11328 (88.9)	1415 (11.1)	
Other	196 (90.7)	20 (9.3)		SES			0.0197
Age ¹			0.0058	Group 1	2612 (87.3)	379 (12.7)	
18-29	1561 (86.8)	237 (13.2)		Group 2	2576 (88.7)	328 (11.3)	
30-39	6388 (88.6)	821 (11.4)		Group 3	2546 (89.7)	292 (10.3)	
40-49	3310 (89.0)	408 (11.0)		Group 4	2679 (88.3)	354 (11.7)	
50-65	1686 (90.5)	178 (9.6)		Group 5	2532 (89.7)	291 (10.3)	
Marital status			0.1002	Metro status			0.5352
Married	1031 (88.0)	140 (12.0)		Non-metro	1883 (88.7)	241 (11.4)	
Single	2178 (87.7)	307 (12.4)		GNO	2140 (89.4)	254 (10.6)	
Unknown	9736 (89.1)	1197 (11.0)		Other metro	8922 (88.6)	1149 (11.4)	

¹Age at COVID-19 diagnosis or year 2021
Abbreviation: NHB, non-Hispanic black; NHW, non-Hispanic white, P/M/O, Private/Medicare/other public; GNO, Greater New Orleans

Figure 1. COVID-19 infection rate by race/ethnicity and COVID-19 diagnosis year

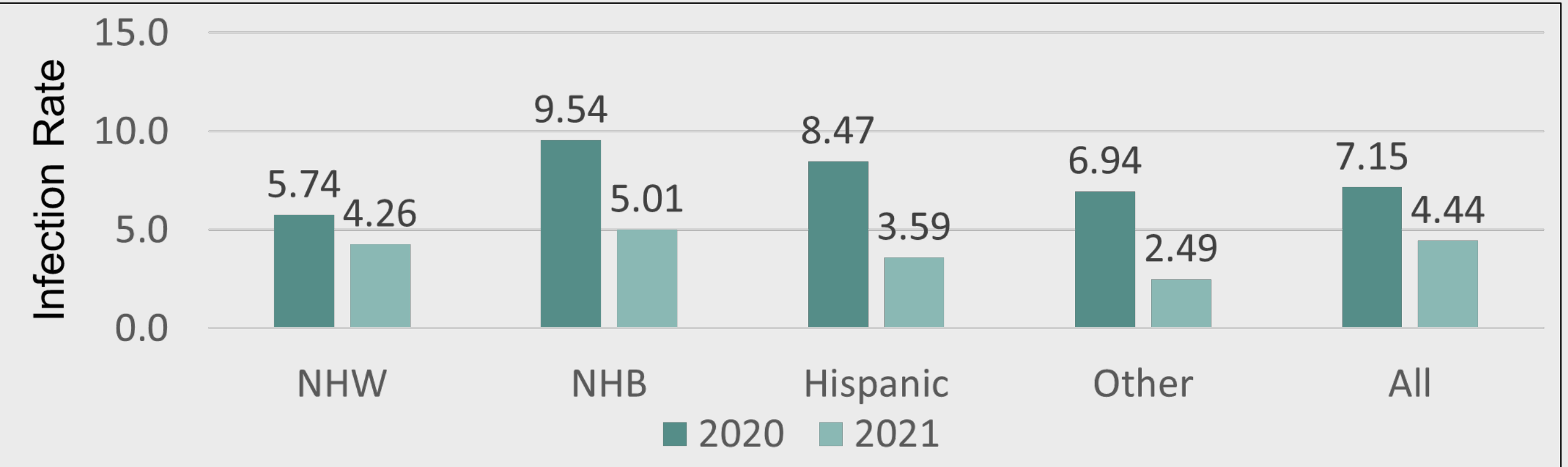


Table 2. Factors associated with COVID-19 infection among working-age women with PCL diagnosed in 2009-2021

Variables	OR (95% CI)	aOR (95%CI)	Variables	OR (95% CI)	aOR (95%CI)
Race/Ethnicity			Health insurance		
NHB vs NHW	1.51 (1.36-1.69)	1.55 (1.38-1.75)	Medicaid vs P/M/O	0.81 (0.61-1.08)	0.73 (0.54-0.98)
Hispanic vs NHW	1.24 (0.99-1.55)	1.30 (1.03-1.63)	No/unlk vs P/M/O	0.81 (0.68-0.97)	0.80 (0.66-0.97)
Other vs NHW	0.96 (0.61-1.53)	1.02 (0.64-1.62)	SES		
Age ¹			Group 2 vs 1	0.88 (0.75-1.03)	0.99 (0.84-1.16)
18-29 vs 50-65	1.44 (1.17-1.77)	1.43 (1.16-1.76)	Group 3 vs 1	0.79 (0.67-0.93)	0.93 (0.78-1.10)
30-39 vs 50-65	1.22 (1.02-1.44)	1.22 (1.03-1.45)	Group 4 vs 1	0.91 (0.78-1.06)	1.10 (0.93-1.30)
40-49 vs 50-65	1.17 (0.97-1.40)	1.17 (0.98-1.41)	Group 5 vs 1	0.79 (0.67-0.93)	0.96 (0.80-1.15)
Marital status			Metro status		
Single vs Married	1.04 (0.84-1.28)	0.95 (0.76-1.18)	Non-metro vs GNO	1.08 (0.90-1.30)	1.24 (1.02-1.51)
Unknown Married	0.90 (0.75-1.09)	0.88 (0.72-1.08)	Other metro vs GNO	1.08 (0.94-1.25)	1.17 (1.01-1.36)

¹Age at COVID-19 diagnosis or year 2021
Abbreviation: aOR, Adjusted OR; NHB, non-Hispanic black; NHW, non-Hispanic white, P/M/O, Private/Medicare/other public; GNO, Greater New Orleans

Statistical Analysis

Descriptive statistics on covariates by COVID-19 infection status were presented and chi-square test was used to assess the unadjusted association. Logistic regression was employed to assess the racial/ethnic differences in COVID-19 infection among working-age women with PCL disease.

RESULTS

- Of 14,589 eligible PCL women, 11.3% were diagnosed with COVID-19 and 83% were confirmed with a positive PCR test.
- NHB had the highest percentage of COVID-19 infection (14.1%), followed by Hispanic (11.8%) (Table 1). NHW and other race/ethnicity had a similar infection rate, 9.8% and 9.3%, respectively (Table 1).
- The COVID-19 infection rate decreased as age increased, with 13.2% for PCL women aged 18-29 and 9.6% for those aged 50-65.
- COVID-19 infection was higher in 2020 than in 2021 across all racial/ethnic groups (Figure 1).
- In the crude model, only NHB showed a higher risk of COVID-19 infection than NHW. However, after adjustment the odds of infection for NHB was 55% higher (95% CI 1.38-1.75) and Hispanic was 30% higher (95% CI 1.03-1.63) than NHW.
- Compared to those aged 50-65, younger age groups were more likely to have COVID-19 with an aOR of 1.43 (95% CI 1.16-1.76) for aged 18-29, 1.22 (95% CI 1.03-1.45) for aged 30-39.
- Additionally, compared to greater New Orleans, PCL women residing in non-metro or other metro county had a higher risk of COVID-19 infection with an aOR of 1.24 (95% CI 1.02-1.51) and 1.17 (95% CI 1.01-1.36), respectively.

CONCLUSIONS

After adjusting for age and socioeconomic covariates, there is substantial variation in racial/ethnic disparities in COVID-19 infection among working-age PCL women. Other risk factors, such as comorbidities and individual behavior, that could cause these disparities need further investigation.