COVID-19 Hospitalizations among Women of Reproductive Age at Risk for and Living with HIV in the US

742

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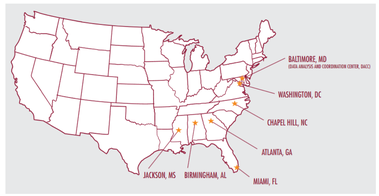
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Background

- People living with HIV (PLWH) experience higher risk of severe COVID outcomes, including hospitalization and mortality which may be exacerbated by HIV-related immune dysregulation and comorbid conditions.
- COVID is associated with poor reproductive health outcomes, including increased risk of adverse pregnancy events and maternal morbidity.
- Women with HIV (WWH), particularly those of reproductive age, represent a vulnerable population with overlapping risks for both HIV- and COVID-related complications.
- We describe COVID-related hospitalizations among reproductive-aged WWH and women without HIV (WWoH) among women enrolled in the Study of Treatment and Reproductive outcomes in the Southern US (STAR cohort).

Methods

Study of Treatment And Reproductive Outcomes



Study Design & Population
- Longitudinal observation cohort
- Cis-gender women aged 18-45
- Persons living with or at-risk for HIV (PLWH; PLWOH)
- 6 U.S. Southern Sites

Analytic Sample
- Baseline vists: March 2021 – August 2023
- Participants enrolled after COVID questions added
- N = 759 included
- English and Spanish questionnaires

Measures
- Sociodemographics
- HIV status (4th-gen Ag.Ab testing)
- Pregnancy status (urine pregnancy test)
- COVID self-reported history
  - Prior positive COVID test
  - COVID-related hospitalization
  - COVID vaccination (yes/no)

Ethical Oversight
- Single IRB approval (University of Miami)
- Written informed consent
- Participant compensation

Statistical Analysis
- Fisher's exact tests (categorical variables)
- ANOVA (continuous variables)
- Comparisons by HIV status
- Restricted analysis among women with prior COVID
- Four-group comparison
  1. Hospitalized WWH
  2. Non-hospitalized WWH
  3. Hospitalized WWoH
  4. Non-hospitalized WWoH
- Significant variables collapse across HIV status
- R version 4.4.0

Missing data handling
- <5% per variable
- Pairwise deletion

Acknowledgments

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Results

Table 1. Key Sociodemographic and COVID Variables by HIV Status

	WWH (N = 419)	WWoH (N = 28)	P-value	Overall (N = 675)
	n(%) or M(SD)			
Age	35.7 (6.35)	32.1 (7.52)	**<0.001**	34.3 (7.02)
Race				
Non-Hispanic White	33 (7.9)	33 (12.9)	**0.002**	66 (9.8)
Non-Hispanic Black	332 (79.4)	169 (66.3)		501 (74.2)
Hispanic (Any Race)	39 (9.3)	35 (13.7)		74 (11.0)
Non-Hispanic Other Race	14 (3.3)	18 (7.1)		32 (4.7)
Marital Status			**<0.001**	
Married	75 (17.9)	30 (11.7)		105 (15.6)
Not Married	254 (60.8)	195 (76.2)		449 (66.5)
Other	13 (3.1)	4 (1.6)		17 (2.5)
Widowed, Divorced, or Separate	76 (18.2)	27 (10.5)		103 (15.3)
Monthly Household Income (USD)			**<0.001**	
<$1,000	148 (36.7)	67 (27.9)		215 (31.9)
$1,000 - $3,000	171 (42.4)	91 (37.9)		262 (38.8)
>$3,000	84 (20.8)	82 (34.2)		166 (24.6)
Current Employment			**<0.001**	
Working full time	155 (37.2)	96 (37.5)		251 (37.2)
Working part time	45 (10.8)	41 (16.0)		86 (12.7)
Unemployed	142 (34.1)	83 (32.4)		225 (33.3)
Student	10 (2.4)	21 (8.2)		31 (4.6)
Disability	65 (15.6)	15 (5.9)		80 (11.9)
Currently Pregnant	55 (13.2)	21 (8.2)	0.059	76 (11.3)
Ever Vaccinated for COVID	284 (67.8)	164 (64.3)	0.356	448 (66.4)
Ever Tested Positive for COVID	138 (32.9)	118 (46.1)	**<0.001**	256 (37.9)
Hospitalized for COVID	23 (5.5)	10 (3.9)	0.135	33 (4.9)
Hypertension			**0.002**	
Never	291 (69.5)	203 (79.3)		494 (73.2)
Yes, but not in the past year	64 (15.3)	35 (13.7)		99 (14.7)
Yes, in the past year	64 (15.3)	18 (7.0)		82 (12.1)
Diabetes / High Blood Sugar			0.066	
Never	359 (85.7)	228 (89.1)		587 (87.0)
Yes, but not in the past year	34 (8.1)	21 (8.2)		55 (8.1)
Yes, in the past year	26 (6.2)	6 (2.3)		32 (4.7)

Note. P-values are from Fisher's exact tests and analysis of variance tests.
WWH = Women with HIV. WWoH = Women without HIV. COVID = Coronavirus Disease 2019.

- Among 675 reproductive-aged women, 38% reported a prior positive COVID test; of those, 13% reported a COVID-related hospitalization.
- COVID-related hospitalization **did not differ by HIV status** among women with a prior positive COVID test (17% among WWH vs. 8% among WWoH, p:0=0.062).
- Across women with prior COVID, those hospitalized were **older, had lower household income, and were less likely to be working full time** compared with non-hospitalized women.
- **Marital status and employment** were significantly associated with COVID hospitalization (p=0.022 and p=0.046, respectively), with the highest hospitalization proportions observed among women who were widowed, divorced, separated or working part-time, unemployed, or on disability.

Table 2. Comparison of sociodemographic characteristics of women with a history of COVID by hospitalization and HIV status

	Hospitalized for COVID		Not Hospitalized for COVID			Overall (N = 253)
	WWH (N = 23)	WWoH (N = 10)	WWH (N = 114)	WWoH (N = 106)	P-value	
Age	33.4 (5.80)	36.1 (6.52)	34.5 (6.32)	30.5 (7.02)	**<0.001**	32.8 (6.84)
Race					**0.006**	
Non-Hispanic White	3 (13.0)	0 (0)	5 (4.4)	18 (17.0)		26 (10.3)
Non-Hispanic Black	13 (56.5)	7 (70.0)	91 (79.8)	58 (54.7)		169 (66.8)
Hispanic (Any Race)	5 (21.7)	2 (20.0)	15 (13.2)	22 (20.8)		44 (17.4)
Non-Hispanic Other Race	2 (8.7)	1 (10.0)	3 (2.6)	8 (7.5)		14 (5.5)
Marital Status					**0.015**	
Married	3 (13.0)	0 (0)	24 (21.1)	13 (12.3)		40 (15.8)
Not Married	12 (52.2)	6 (60.0)	68 (59.6)	81 (76.4)		167 (66.0)
Other	2 (8.7)	0 (0)	2 (1.8)	2 (1.9)		6 (2.4)
Widowed, Divorced, or Separate	6 (26.1)	4 (40.0)	20 (17.5)	10 (9.4)		40 (15.8)
Monthly Household Income (USD)					**0.002**	
<$1,000	6 (27.3)	4 (44.4)	33 (29.7)	19 (19.0)		62 (25.6)
$1,000 - $3,000	12 (54.5)	2 (22.2)	58 (52.3)	38 (38.0)		110 (45.5)
>$3,000	4 (18.2)	3 (33.3)	20 (18.0)	43 (43.0)		70 (28.9)
Current Employment					**0.028**	
Working full time	5 (21.7)	3 (30.0)	46 (40.4)	45 (42.5)		99 (39.1)
Working part time	5 (21.7)	2 (20.0)	10 (8.8)	16 (15.1)		33 (13.0)
Unemployed	10 (43.5)	4 (40.0)	43 (37.7)	28 (26.4)		85 (33.6)
Student	0 (0)	0 (0)	3 (2.6)	12 (11.3)		15 (5.9)
Disability	3 (13.0)	1 (10.0)	12 (10.5)	5 (4.7)		21 (8.3)
Currently Pregnant	5 (21.7)	2 (20.0)	13 (11.4)	7 (6.6)	0.083	27 (10.7)
Vaccinated for COVID	16 (69.6)	6 (60.0)	85 (74.6)	81 (76.4)	0.591	188 (74.3)
Hypertension					0.253	
Never	17 (73.9)	7 (70.0)	79 (69.3)	86 (81.1)		189 (74.7)
Yes, but not in the past year	3 (13.0)	2 (20.0)	15 (13.2)	13 (12.3)		33 (13.0)
Yes, in the past year	3 (13.0)	1 (10.0)	20 (17.5)	7 (6.6)		31 (12.3)
Diabetes / High Blood Sugar					0.674	
Never	20 (87.0)	9 (90.0)	98 (86.0)	97 (91.5)		224 (88.5)
Yes, but not in the past year	2 (8.7)	1 (10.0)	7 (6.1)	5 (4.7)		15 (5.9)
Yes, in the past year	1 (4.3)	0 (0)	9 (7.9)	4 (3.8)		14 (5.6)

n(%) or M(SD)
Note. P-values are from Fisher's exact tests and analysis of variance tests.
WWH = Women with HIV. WWoH = Women without HIV. COVID = Coronavirus Disease 2019.

Among reproductive-age women with history of COVID, hospitalization was more frequent among those with social and economic vulnerabilities, independent of HIV status

Table 3. Factors associated with hospitalization for COVID among women with HIV and without HIV (n = 253)

	Hospitalized for COVID (N = 33)	Not Hospitalized (N = 220)	P-value
Age	34.2 (6.05)	32.6 (6.94)	0.197
Race			0.616
Non-Hispanic White	3 (9.1)	23 (10.5)	
Non-Hispanic Black	20 (60.6)	149 (67.7)	
Hispanic (Any Race)	7 (21.2)	37 (16.8)	
Non-Hispanic Other Race	3 (9.1)	11 (5.0)	
Marital Status			**0.022**
Married	3 (9.1)	37 (16.8)	
Not Married	18 (54.5)	149 (67.7)	
Other	2 (6.1)	4 (1.8)	
Widowed, Divorced, or Separate	10 (30.3)	30 (13.6)	
Monthly Household Income (USD)			0.58
<$1,000	10 (32.3)	52 (24.6)	
$1,000 - $3,000	14 (45.2)	96 (45.5)	
>$3,000	7 (22.6)	63 (29.9)	
Current Employment			**0.046**
Working full time	8 (24.2)	91 (41.4)	
Working part time	7 (21.2)	26 (11.8)	
Unemployed	14 (42.4)	71 (32.3)	
Student	0 (0)	15 (6.8)	
Disability	4 (12.1)	17 (7.7)	
Living with HIV	23 (69.7)	114 (51.8)	0.062

n(%) or M(SD)
Note. P-values are from Fisher's exact tests and analysis of variance tests.
WWH = Women with HIV. WWoH = Women without HIV. COVID = Coronavirus Disease 2019.

Key Finding: 38% reported COVID infection, of which **13%** reported hospitalization, **not significantly different by HIV** status (17% WWH vs 8% WWoH) and highest in **lower-income** women **without full-time employment**.

Conclusions

- Among reproductive-aged women with a prior COVID, **COVID-related hospitalization was associated with social and economic vulnerability**, particularly marital status and employment/disability status, rather than HIV status alone.
- **Pregnant women with HIV showed a trend toward higher hospitalization** compared to pregnant women without HIV, highlighting the need for continued surveillance and tailored prevention strategies for this population.
- Women hospitalized for COVID were more likely to be **widowed, divorced, or separated and less likely to be working full time**, underscoring the role of structural and psychosocial factors in COVID severity.
- **Prevention and early treatment efforts should prioritize socioeconomically vulnerable women**, including those with HIV, to reduce COVID-related hospitalizations.