



# Prevalence and Risk Factors for Post-Acute Sequelae of COVID among Persons with HIV in Washington, DC

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# Background

- Post-acute sequelae of COVID (PASC) is defined as COVID symptoms persisting 28 days post-initial infection (CDC, 2021)
- PWH may be at increased risk of PASC due to
  - Co-morbidities
  - Immunosuppression
  - Chronic inflammation
- PWH are 1.75 to 4 times more likely to develop PASC compared to those without HIV (Peluso MJ & Antar AAR, 2023; Peluso MJ, et al, 2022; Deeks S, 2022)
- Prevalence of PASC among PWH ranges from 27% (Italy) to 44% (India) (Mazzitelli M, et al, 2022; Pujari S, et al, 2021)



# Background

The objective of this study was to characterize PASC prevalence, associated risk factors, and impact among PWH in Washington, DC



# Methods: Data source

- COVID-19 cross-sectional survey
- Conducted as a sub-study of the DC Cohort longitudinal study
  - EHR data abstraction on >12,000 consented PWH
  - 14 clinics in Washington, DC
  - Enrollment from Jan. 2011-present
- PASC-specific questions added 2/28/22
- COVID-19 survey data linked to DC Cohort EHR data



# Methods: Measures

PASC definition: self-endorsement of at least one COVID symptom lasting more than 28 days after initial COVID infection (CDC, 2021)

<b>Survey</b>	<b>EHR data</b>
<ul style="list-style-type: none"><li>• Demographics</li></ul>	<ul style="list-style-type: none"><li>• Viral load</li></ul>
<ul style="list-style-type: none"><li>• Comorbidities</li></ul>	<ul style="list-style-type: none"><li>• CD4</li></ul>
<ul style="list-style-type: none"><li>• COVID vaccinations</li></ul>	<ul style="list-style-type: none"><li>• HIV mode of transmission</li></ul>
<ul style="list-style-type: none"><li>• Acute COVID symptoms</li></ul>	<ul style="list-style-type: none"><li>• HIV duration</li></ul>
<ul style="list-style-type: none"><li>• Acute COVID severity</li></ul>	
<ul style="list-style-type: none"><li>• Acute COVID treatments</li></ul>	
<ul style="list-style-type: none"><li>• Acute COVID hospitalizations</li></ul>	
<ul style="list-style-type: none"><li>• PASC symptoms</li></ul>	
<ul style="list-style-type: none"><li>• Activities of daily living</li></ul>	



# Methods: Statistical Analysis

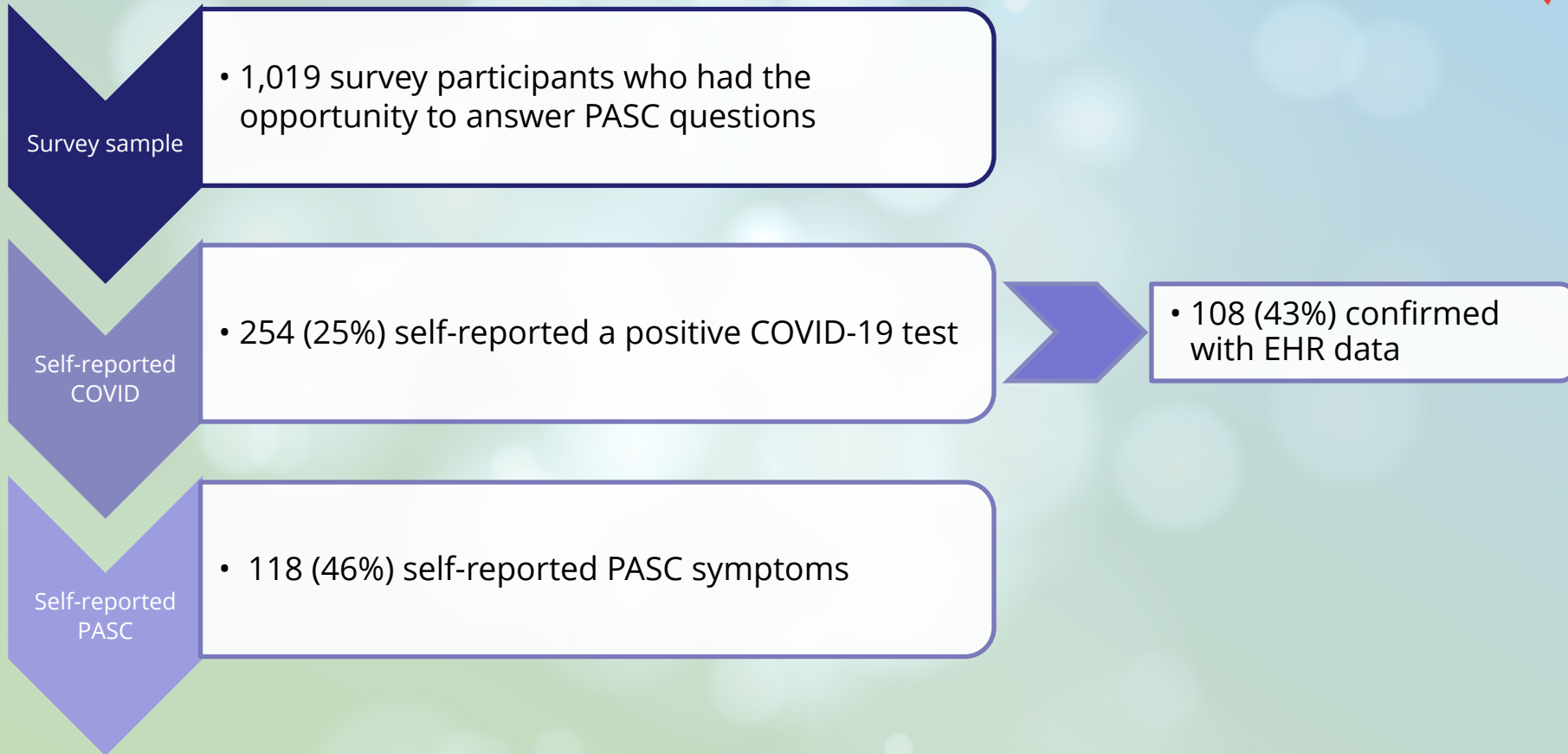
- Calculated frequency counts and prevalence estimates of:
  - Demographic characteristics
  - HIV-related characteristics
  - COVID characteristics
  - PASC symptoms
  - Impact of PASC on activities of daily living (ADL)
- Conducted multivariable logistic regression analyses to assess factors associated with PASC



# Results

# Figure 1: Frequency and prevalence of COVID and PASC among DC Cohort COVID Survey respondents

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**Table 1: Prevalence of demographic characteristics by PASC status among those who self-reported positive COVID test (n=254)**

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	PASC n=118 (46.0%)	No PASC n=136 (54.0%)	Chi square
	%	%	p-value
Age (median, IQR, Wilcoxon p-value)	52.43 (42.02, 61.51)	50.77 (40.38, 59.03)	0.35
Gender			
Female	27.12	20.59	0.22
Male	70.34	78.68	
Other	2.54	0.74	
Race/ethnicity			
Non-Hispanic White	21.05	16.79	0.76
Non-Hispanic Black	69.3	74.05	
Hispanic	4.39	5.34	
Other	5.26	3.82	
Employment status			
Employed	60.68	69.85	0.20
Retired or Disabled	23.08	14.71	
Unemployed	16.24	15.44	

**Table 2: Prevalence of HIV-related measures by PASC status among those who self-reported positive COVID test (n=254)**

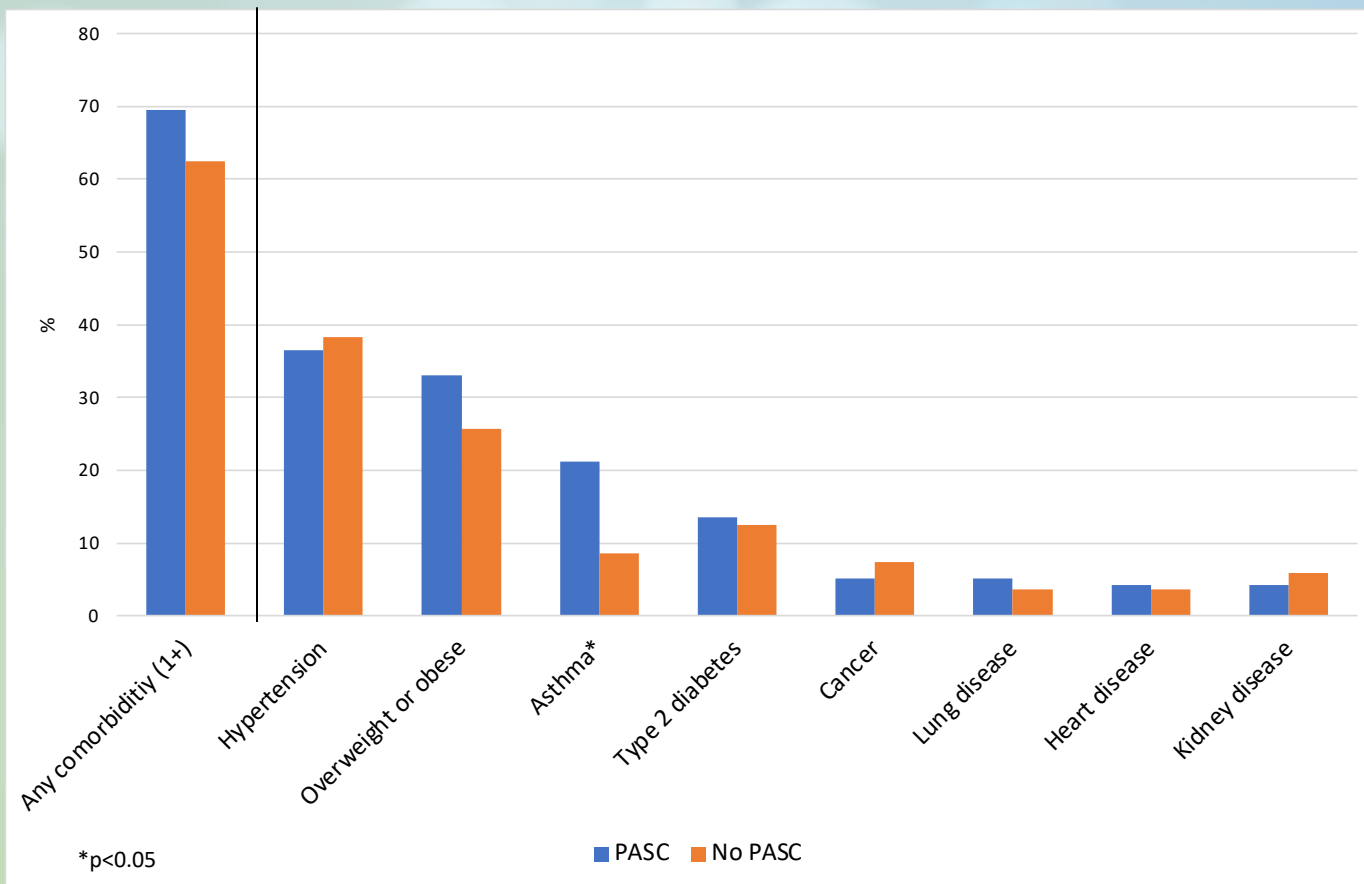
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	PASC n=118 (46.0%)	No PASC n=136 (54.0%)	Chi square
	%	%	p-value
Viral load suppression			
Not suppressed	8.04	7.03	0.77
Suppressed	91.96	92.97	
CD4			
≥200 cells/μL	96.49	95.49	0.69
<200 cells/μL	3.51	4.51	
On any ART			
No	20.48	29.25	0.17
Yes	79.52	70.75	
HIV duration (years) (median, IQR, Wilcoxon p-value)	17 (11, 25)	16 (10, 23.5)	0.33
Mode of transmission			
MSM	46.96	48.53	0.78
Hetero	33.04	27.21	
IDU	0.87	2.21	
Perinatal	0.87	0.74	
Other	18.26	21.32	

## Figure 2: Prevalence of self-reported history of medical conditions (excluding HIV) by PASC status

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### Table 3: COVID severity by PASC status (n=254)

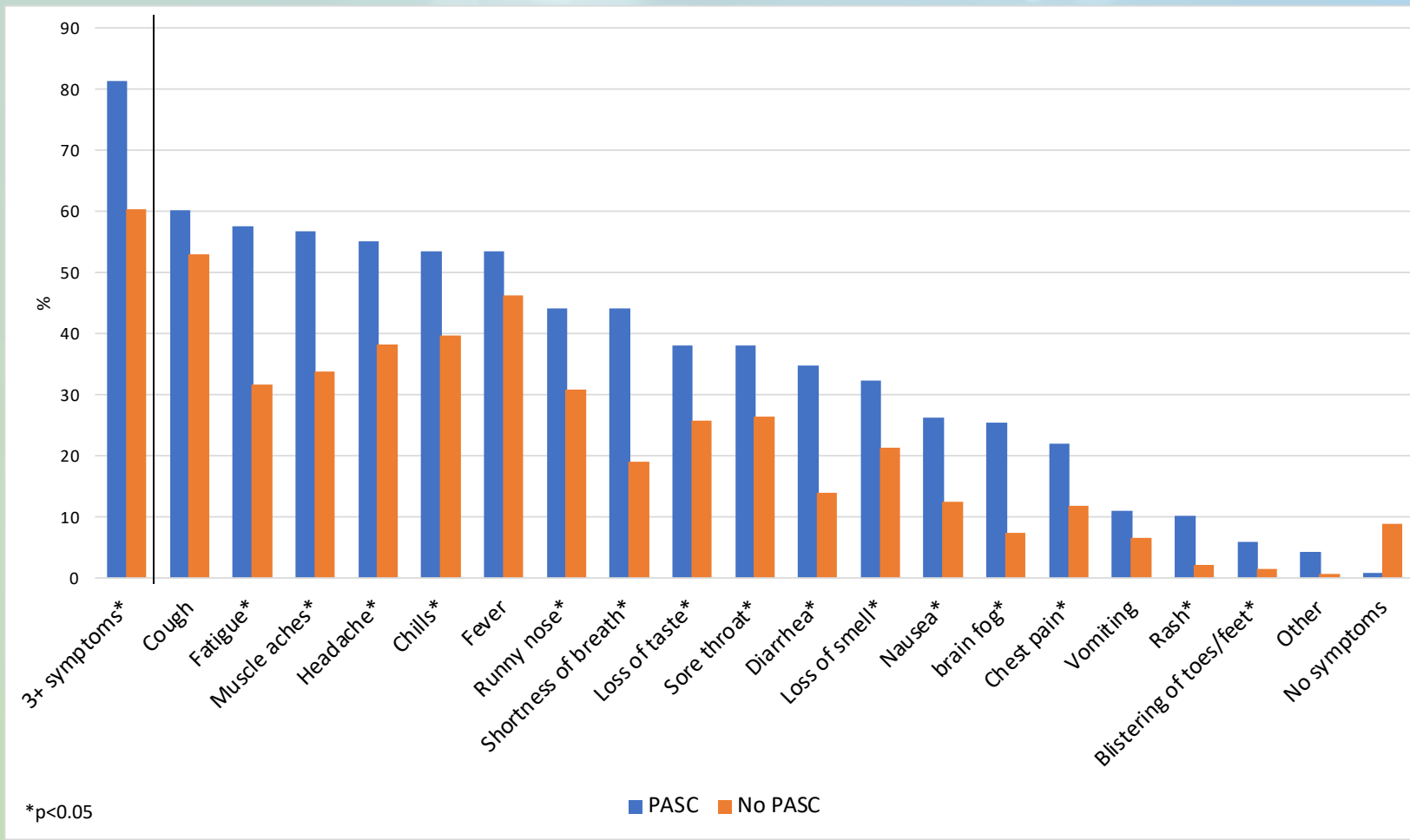
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	PASC n=118 (46.0%)	No PASC n=136 (54.0%)	Chi square
	%	%	p-value
Have you received a COVID-19 vaccine?			
Yes	95.73	93.33	0.41
Did you receive a booster of the COVID vaccine?			
Yes	77.06	76.86	0.97
Treatments for COVID-19 that you received			
Monoclonal antibodies	11.02	13.97	0.48
Intravenous antiviral medication	3.39	3.68	1.00
Convalescent plasma			
Steroids	4.24	2.21	0.48
Antibiotics	10.17	8.82	0.71
Oral antiviral medication	13.56	9.56	0.32
Other treatments	5.93	2.94	0.24
Ever hospitalized for COVID?			
Yes	10.91	4.72	<b>0.09</b>

# Figure 3: Prevalence of initial COVID symptoms by PASC status

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\*p<0.05

■ PASC ■ No PASC

**Table 4: Logistic regression analysis comparing those with and without PASC (n=254)**

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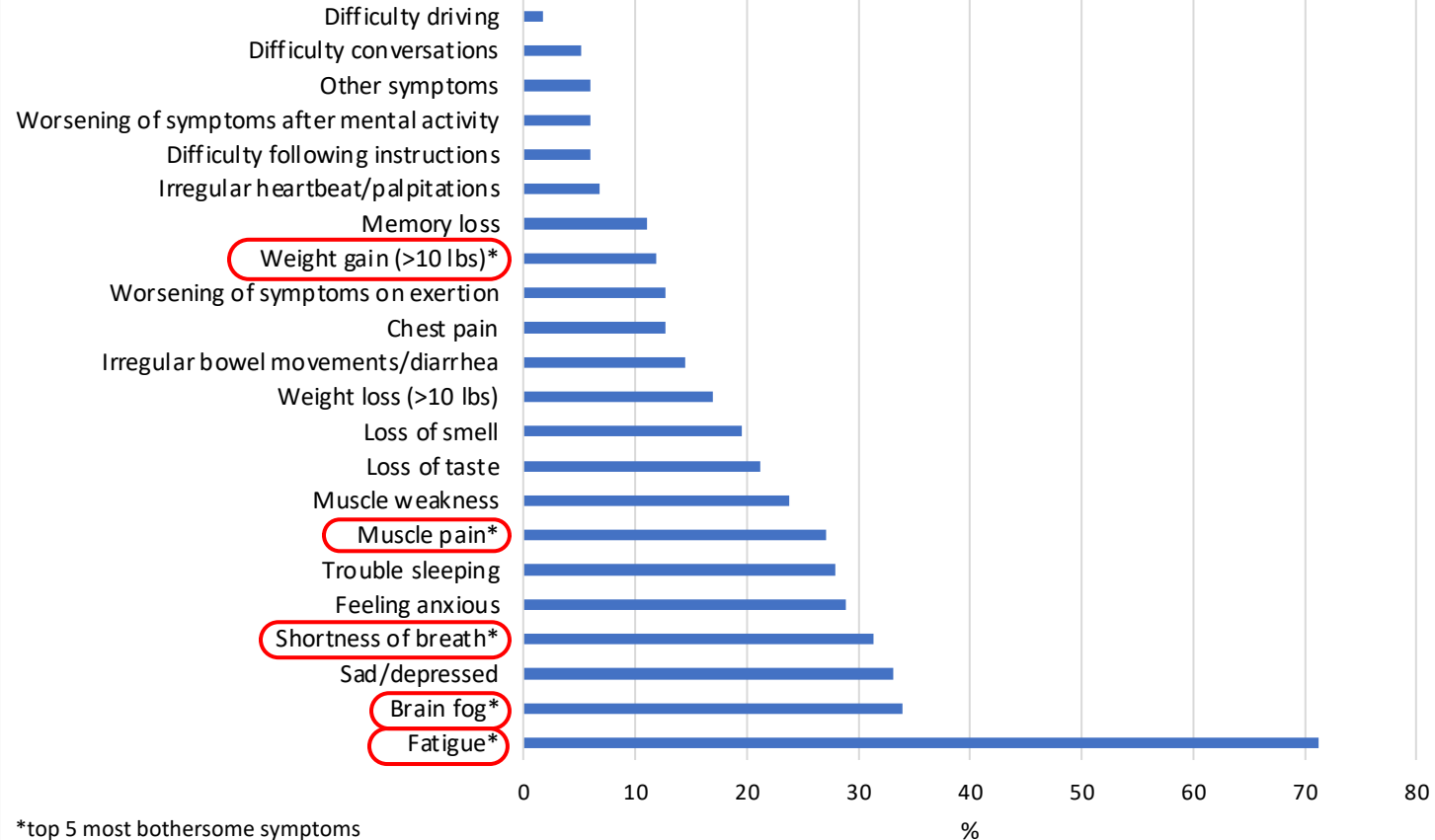


	aOR*	95% CI
Age (continuous)	1.01	0.99, 1.03
Gender		
Female		REF
Male	0.68	0.36, 1.28
Other	3.77	0.31, 45.80
Race/ethnicity		
Non-Hispanic White		REF
Other races/ethnicities	0.81	0.40, 1.66
Employment status		
Employed		REF
Retired or Disabled	<b>2.29</b>	<b>1.04, 5.05</b>
Unemployed	1.18	0.56, 2.52
Asthma	2.03	0.96, 4.30
Number of COVID symptoms >3 at initial COVID infection		
No		REF
Yes	<b>3.34</b>	<b>1.78, 6.27</b>

\*Model adjusts for age, gender, race/ethnicity, employment status, history of asthma, number of covid symptoms >3 at initial COVID infection

# Figure 4: Prevalence of PASC symptoms

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\*top 5 most bothersome symptoms

# PASC Severity

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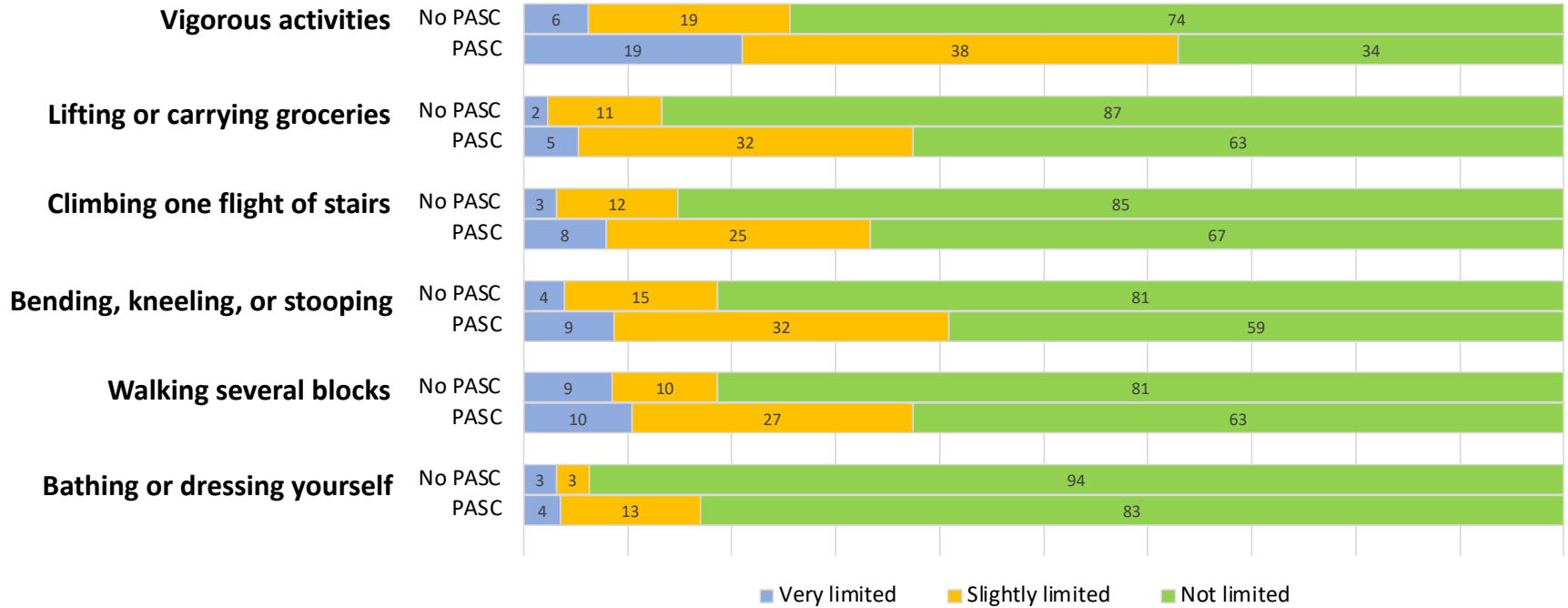


- How much has persistent COVID affected your day-to-day life?
  - 7% extremely
  - 21% moderately
  - 45% a little
  - 27% not at all
- Resolution or improvement in symptoms after vaccination:
  - 21% said vaccination made symptoms better
  - 57% vaccination did not impact symptoms
  - 9% said vaccination made symptoms worse
  - 10% symptoms were gone before vaccination
- 3.5% still receiving care for COVID-related symptoms



# Figure 5: Limitations of Activities of Daily Living Among PWH with and without PASC

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# Strengths and Limitations

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- Strengths:
  - Ability to link to EHR data
  - Adds to existing limited literature on PASC among PWH
- Limitations:
  - CDC measure of PASC is non-specific
  - Underlying COVID-like symptomology in PWH
  - Underlying limitations in ADLs among PWH

# Conclusions

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- High prevalence of PASC among PWH (46%)
- PWH with hospital stays for COVID or retired/disabled were more likely to have PASC
- PASC significantly impacted day to day life and ADLs
- Clinicians should be aware of risk for PASC among PWH
- Programs are needed to address the long-term impact of PASC on ADLs among PWH

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## **DC Cohort Sites and Site PIs**

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# Questions