

Introduction

Long COVID

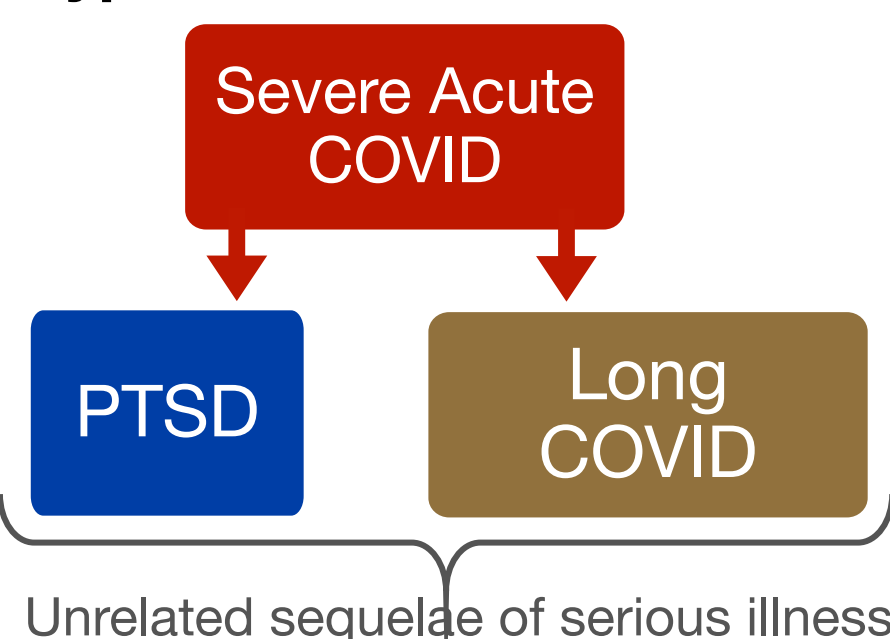
Definition	Manifestations vary, and may include...	
Chronic condition that occurs after SARS-CoV-2 infection and lasts at least 3 months ¹	Symptoms , such as:	Conditions , such as:
	- Shortness of breath	- Dysautonomia
	- Fatigue	- Mood disorders
	- Elevated heart rate	- Blood clots
	- Post-exertional malaise	- Autoimmune disorders

Evidence shows that **Long COVID** is strongly associated with **PTSD symptoms** and **history of trauma**.^{2,3,4} Different models have been proposed to explain this link, with several incorporating the **severity** of the Acute COVID illness:

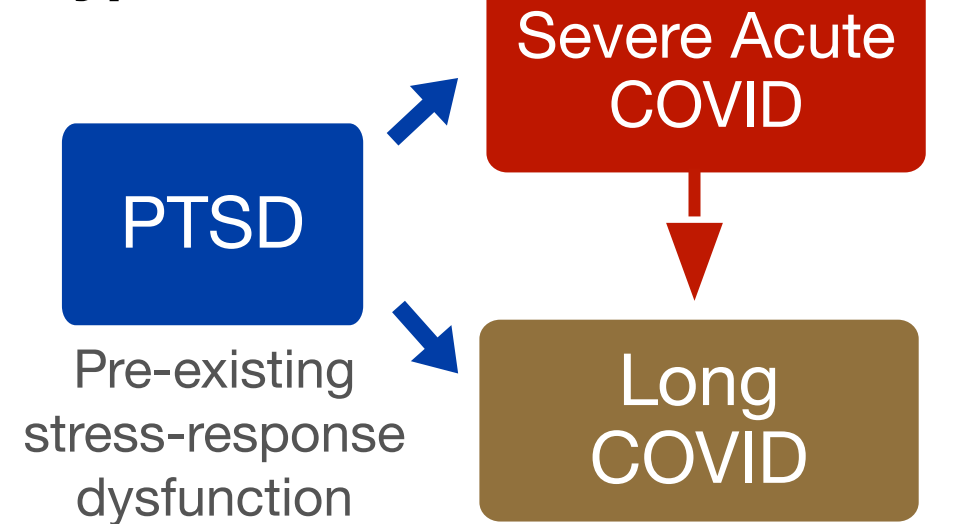
- Hypothesis 1:** Severity as a mutual risk factor for PTSD, Long COVID
 - ICU stay & intubation are known risk factors for PTSD⁵
- Hypothesis 2:** PTSD as mutual risk factor for Severe COVID, Long COVID
 - hypocortisolism, immune irregularities □ possible under- or over-response to viral illness⁶
 - PTSD = known risk factor for other post-viral illness (ME/CFS)⁷
- Hypothesis 3:** Complex interplay between the acute COVID severity, PTSD (onset before or after COVID), and development of long COVID⁶

This study will investigate if accounting for severity of acute COVID illness weakens the associations between lifetime diagnosis of PTSD and development of long COVID.

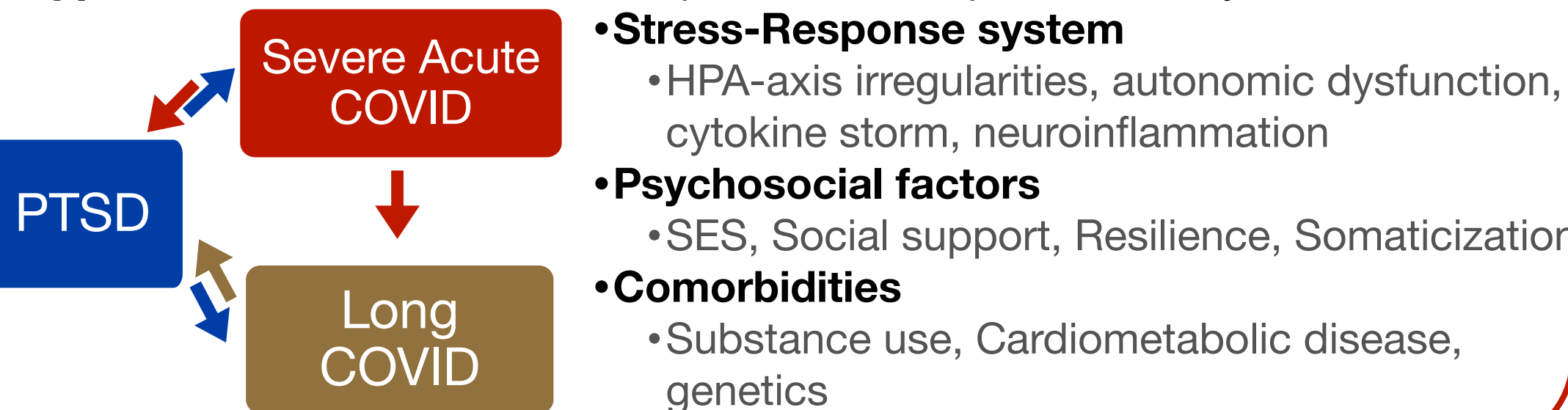
Hypothesis 1



Hypothesis 2



Hypothesis 3



Aims

Aim 1: To evaluate the association between lifetime PTSD diagnosis and Long COVID in US adults age 18-65 who have tested positive for COVID

Aim 2: To assess how adjusting for severity of acute COVID illness affects the association between lifetime PTSD and Long COVID

Aim 3: To identify additional risk factors of Long COVID

Methods

Data

National Wellness Survey (NWS), 2023 version: Cross-sectional, web-based survey of **US adults 18-65 yo**, conducted from 6/23/23 to 9/14/23)

Sample

NWS 2023 respondents who **ever tested positive for COVID** (self-reported)

Variables (self-reported)

PTSD: Lifetime PTSD diagnosis

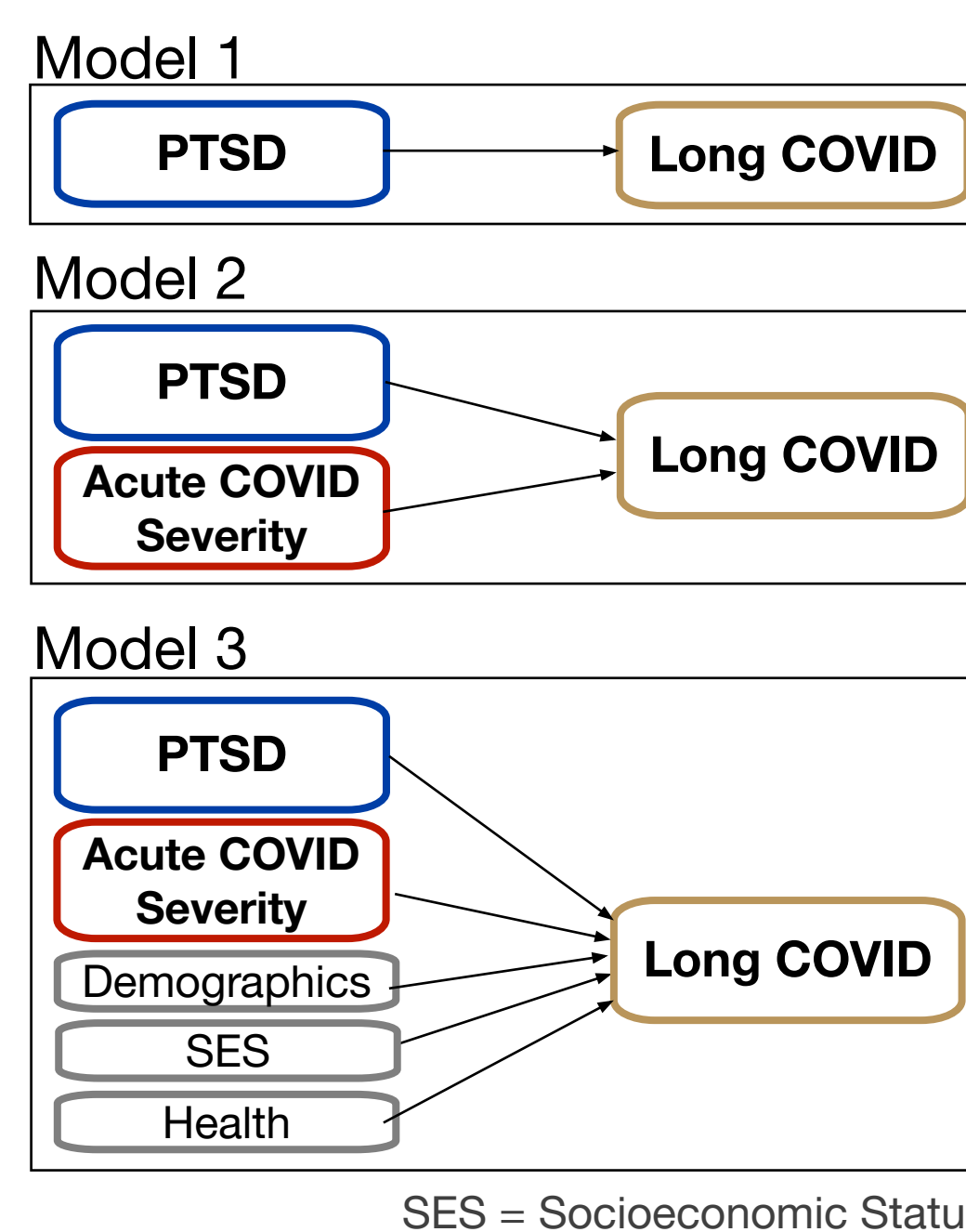
Acute COVID Severity: No Symptoms/Mild vs Moderate/Severe

Long COVID: 1 or more symptoms lasting ≥90 days, not present before COVID infection. (*Fatigue, Brain Fog, Difficulty breathing, Palpitations, Pain, Dizziness with standing, Depression/Anxiety, or Post-Exertional Symptoms*)

Statistical Approach

Nested models of logistic regression (see right)

Logistic Regression Models



SES = Socioeconomic Status

Results

Sample Description		
U.S. Adults 18–64yo who ever tested positive for COVID (n = 2743)		
Weighted Values (% or mean (std. error))		
	No PTSD (79.9%)	PTSD (16.1%)
No Long COVID	36.0	11.9**
Long COVID	64.0	88.1
COVID Severity		
No Sx/Mild Sx	46.3	33.6*
Mod/Severe Sx	53.7	66.4
Age		
	40.5 (0.47)	38.5 (0.72)
Sex		
Male	48.7	34.7**
Female/Other	51.3	65.4
Marital Status		
Not Married	40.5	55.5**
Married	59.5	44.6
Household Income		
<\$50k	25.6	41.1**
>\$50k	74.4	58.9
COVID Vaccine		
Vaccinated	75.8	66.3*
Unvaccinated	24.2	33.7
Smoking Status		
Never	56.4	32.8**
Former	20.8	29.5
Current	22.8	37.7
Comorbidities		
None	77.3	64.6**
1 or More	22.7	35.4

NOTES: *p <0.05; **p <0.0001
Comorbidities: Diabetes, Chronic Lung Disease, MI/CAD/Angina, and/or Autoimmune Disease

Regression Models 1, 2, & 3			
Odds of Long COVID in U.S. Adults 18–64yo who ever tested positive for COVID			
	Model 1 OR (95%CI)	Model 2 OR (95%CI)	Model 3 OR (95%CI)
Lifetime PTSD Diagnosis (vs no PTSD)	4.2** (2.9, 6.0)	3.9** (2.7, 5.6)	3.0** (2.0, 4.5)
Mod./Severe Acute COVID (vs No Symptoms/Mild)	--	2.4** (1.8, 3.2)	2.7** (2.0, 3.6)
Chart: Regression Model 3 OR, 95%CI (Log Scale)			
DEMOGRAPHICS (continuous)			
Age			
Sex			
Marital Status			
Household Income			
COVID Vaccine			
Smoking Status			
Comorbidities			
SES			
Health			

Discussion

Potential limitations of this study include self-reported data, subjective assessment of severity, and missed PTSD diagnosis.

The **PTSD group** was more likely to have **Long COVID**, 1 or more **comorbidities**, & income **under \$50k**
May reflect association of PTSD with poor health & SES

The **Non-PTSD group** was more likely to be **married** & **non-smokers**
May reflect PTSD's impact on **relationships**, **social support**, dysregulated **stress response** & maladaptive **stress coping**

Significantly **lower odds** of Long COVID seen with:
Older Age (OR 0.97)
May be protective via diminished **immune response**
Income Over \$50k (OR 0.72)
May be confounded by Long COVID increasing risk of **disability, unemployment**

Significantly **higher odds** of Long COVID seen with:
Lifetime PTSD (OR 4.2 □ 3.9 □ 3.0)
Association between PTSD and Long COVID is **not solely** due to confounding by severity (as in **Hypothesis 1**)
Moderate/Severe Acute COVID (OR 2.4 □ 2.7)
Higher odds after adjusting for other factors, suggesting **interaction** with moderating variable (e.g., younger people with severe COVID may be more likely to develop long COVID than older people with severe COVID)

Key Takeaways

-**Lifetime PTSD** is associated with up to **4:1 odds** of **Long COVID**, even for **asymptomatic** or **mild COVID** infection

-Further study of the link between PTSD and Long COVID could shed light on the **pathophysiology** and **interventions** for a potentially disabling condition.

References

- Ely EW, Brown LM, Fineberg HV. Long Covid Defined. *New England Journal of Medicine*. 2024;391(18):1746-1753. doi:10.1056/NEJMs2408466
- Efstathiou V, Stefanou MI, Demetriou M, et al. Long COVID and neuropsychiatric manifestations (Review). *Experimental and Therapeutic Medicine*. 2022;23(5). doi:10.3892/etm.2022.11290
- Sun L, Shang Z, Wu L, et al. One-quarter of COVID-19 patients developed PTSD symptoms: A one-year longitudinal study. *Psychiatry research*. 2023;323:115161. doi:10.1016/j.psychres.2023.115161
- Vyas CM, Wang S, Menor AM, et al. Association between childhood abuse and risk of post-COVID-19 conditions: Results from three large prospective cohort studies. *Brain, Behavior, and Immunity*. 2025;123:143-150. doi:10.1016/j.bbi.2024.08.046
- Kaseda ET, Levine AJ. Post-traumatic stress disorder: A differential diagnostic consideration for COVID-19 survivors. *The Clinical neuropsychologist*. 2020;34(7-8):1498-1514. doi:10.1080/13854046.2020.1811894
- Poyraz BC, Poyraz CA, Olgun Y, et al. Psychiatric morbidity and protracted symptoms after COVID-19. *Psychiatry Research*. 2021;295. doi:10.1016/j.psychres.2020.113604
- Dansie EJ, Heppner P, Furberg H, Goldberg J, Buchwald D, Afari N. The comorbidity of self-reported chronic fatigue syndrome, post-traumatic stress disorder, and traumatic symptoms. *Psychosomatics*. 2012;53(3):250-257. doi:10.1016/j.psym.2011.08.007