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Characterizing Long COVID Symptoms Patterns in Younger and Older Adults

Manuela Di Fusco,[1] Laura Lupton,[2] Joseph C. Cappelleri,[1] Alon Yehoshua,[1] Mary M. Moran,[1] Laura Puzniak,[1] Santiago MC Lopez,[1] Xiaowu Sun[2]

[1]Pfizer Inc, New York, NY; [2]CVS Health, Woonsocket, RI

AIMS

- Long COVID is a major public health concern[1,2].
- The objectives of these analyses were to evaluate long COVID symptoms patterns over six months post-infection, by age.

METHODS

- Symptomatic, SARS-CoV-2-positive US outpatients aged ≥18 years tested at a CVS Health pharmacy between 03/02/2023 and 05/18/2023 were included in this study (NCT05160636).
- In alignment with the CDC's definition, we assessed 30 long COVID symptoms at week 4, month 3 and month 6 post-infection.
- Week 4 was considered the start of long COVID. Patients were stratified by age: ≥50 years (older adults), <50 years (younger adults).
- Unadjusted results were tested using chi-square tests or Fisher's exact tests (for sparse data) for between group differences.
- Adjusted results were analyzed using a mixed-effect logistic model that controlled for relevant covariates including: time (categorical: Week 4, Month 3 and Month 6), age ≥50, sex, vaccination status, comorbidities, race/ethnicity, US region, and work in healthcare, and interaction terms of age ≥50 by time and vaccination status by time, with unstructured correlation matrix for repeated measurements.

RESULTS

- Of 643 study participants, 505 self-reported ≥1 long COVID symptom four weeks post-infection: 209 (41.4%) older adults and 296 (58.6%) younger adults. Both new symptoms and a continuation of symptoms after Week 4 were allowed in our definition.

RESULTS cont'd

- Respectively, their mean age was 62.1 and 35.1 years, 64.1% and 75.3% were female, 36.4% and 17.2% reported ≥1 comorbidity (Table 1).
- Older adults had a higher proportion of participants that were vaccinated (62.1% vs 39.3%) and used antivirals (35.1% vs 14%) (p<0.05) (Table 1).
- The two age groups had similar (p>0.05) mean number (Figure 1) and distribution of long COVID symptoms across all time points: ~90% reported 1 to 5 symptoms during the long COVID phase (Figure 2).
- In both age groups, long COVID symptoms spanned multiple physiological systems; the most commonly reported were neurologic (i.e., difficulty thinking or concentrating) followed by general symptoms (i.e., fatigue, exercise intolerance), and then respiratory and heart symptoms (i.e., cough, shortness of breath) (Figure 3).
- The frequency of symptoms was generally similar (p>0.05) between groups, with respiratory and digestive symptoms resolving faster based on percentage decrease from Week 4 to Month 6 (Figure 3); overall, observed and adjusted results were similar.

Table 1. Baseline characteristics

	Older adults (N=209)	Younger adults (N=296)	P-value[3]
Age, years, mean (SD)	62.1 (8.1)	35.1 (7.9)	<0.001
Female, n (%)	134 (64.1%)	223 (75.3%)	0.003
Race / Ethnicity, n (%)			<0.001
White or Caucasian	153 (73.2%)	152 (51.4%)	
Black or African American	15 (7.2%)	25 (8.5%)	
Hispanic	21 (10.0%)	52 (17.6%)	
Asian	8 (3.8%)	41 (13.9%)	
Other	12 (5.7%)	26 (8.8%)	
US Geographic Region, n (%)			0.168
Northeast	34 (16.3%)	34 (11.5%)	
South	87 (41.6%)	114 (38.5%)	
Midwest	46 (22.0%)	67 (22.6%)	
West	42 (20.1%)	81 (27.4%)	
Prior SARS-CoV-2 positive test, n (%)	79 (39.1%)	125 (46.0%)	0.137
Vaccinated with BNT162b2[1], n (%)	133 (63.6%)	127 (42.9%)	<0.001
Time since last BNT162b2 vaccine dose, days, mean (SD)	299 (200)	365 (212)	0.001
COVID-19 Antiviral use, n (%)	69 (33.0%)	43 (14.5%)	<0.001
≥1 comorbid condition[2], n (%)	76 (36.4%)	51 (17.2%)	<0.001

1. BA.4/5 bivalent BNT162b2 mRNA vaccine
2. Comorbid conditions include asthma or chronic lung disease, cirrhosis of the liver, immunocompromised conditions or weakened immune system, diabetes, heart conditions or hypertension, overweight or obesity
3. P-value refers to the difference across the two groups.

RESULTS cont'd

Figure 1. Mean number of long COVID symptoms by age

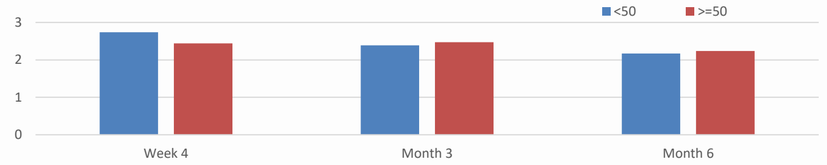


Figure 2. Distribution of number of long COVID symptoms by age, over time

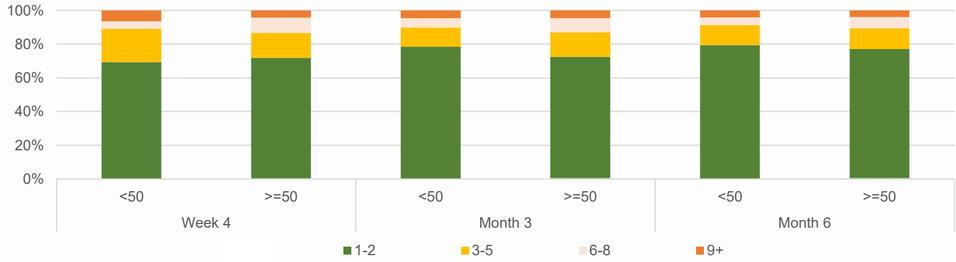
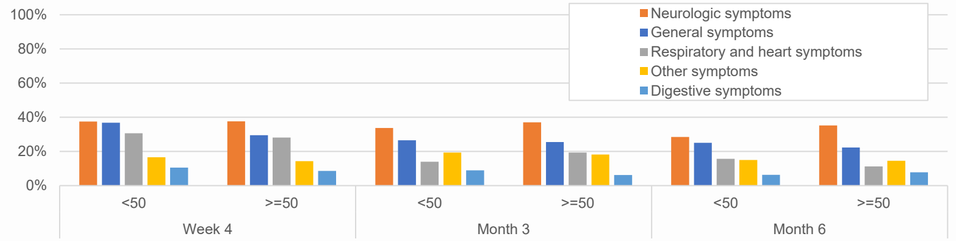


Figure 3. Frequency of ≥1 systemic, respiratory and gastrointestinal long COVID symptoms by age, over time



CONCLUSIONS

- The study found substantial and prolonged long COVID burden in both older and younger adults during the endemic phase of COVID-19.
- Both groups still experienced long COVID symptom burden six months post-infection.
- These findings support broad recommendations for interventions mitigating long COVID burden in the general population regardless of age.
- Limitations included self-reported data, limited sample size, and lack of pre-COVID-19 symptom history.

References

1. CDC (2025) Long COVID Basics | COVID-19 | CDC
2. CDC (2025). Clinical Overview of Long COVID | COVID-19 | CDC

Disclosures

M.D.F., J.C.C., A.Y., M.M.M, L.P. and S.M.C.L. are employees of Pfizer and may hold stock or stock options of Pfizer.

L.L. and X.S. are employees of CVS Health and hold stock of CVS Health.

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For more information please contact:

Manuela Di Fusco, Pfizer Inc.; New York, NY, 10001 USA.
Phone: 718-288-1620
Manuela.DiFusco@pfizer.com;
www.pfizer.com

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