

Frequency and Severity of COVID-19 Acute Symptoms Among Symptomatic US Adults Testing Positive for SARS-CoV-2: Early 2024-2025 Respiratory Season Results of a Nationwide Study

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INTRODUCTION

- The burden of COVID-19 in the United States remains significant for the 2024-2025 season [1].
- COVID-19 symptoms and severity have evolved over time [2-5].
- Evidence assessing COVID-19 symptom burden in the post-pandemic period is limited.

OBJECTIVE

- This study characterized the burden of acute COVID-19 symptoms among test-confirmed symptomatic US adults for the post-pandemic 2024-2025 respiratory season.

METHODS

- Symptomatic US adults testing positive for SARS-CoV-2 within 5 days since symptom onset at CVS Health from 10/24/2024-4/15/2025 (CT.gov: NCT05160636) were included.
- Self-reported socio-demographics, clinical characteristics and vaccination status were collected via an online survey.
- Participants self-reported the presence of 14 CDC-based acute symptoms [6] via recall for the presence of symptoms prior to infection (pre-infection period) and on the day of study enrollment for current symptom (Day 1).
- Symptom severity was measured by patients using FDA-based scales. [7]
 - Stuffy or runny nose, sore throat, cough, headache, feeling hot or feverish, chills or shivering, body aches, fatigue or tiredness, nausea, and difficulty breathing or shortness of breath were measured using 4-point scale (0=none, 1=mild, 2=moderate, 3=severe).
 - Vomiting and diarrhea were measured using the frequency (0, 1-2, 3-4 and ≥5 times) in the last 24 hours.
 - Change in smell and change in taste were measured using ‘no change’, ‘change’, and ‘cannot’.
- Prevalence of any symptoms and of individual symptoms measured by patients as moderate/severe and total symptom counts were described and compared across time points using a paired t-test.

RESULTS

- Of 347 participants, 290 (83.6%) participants were unvaccinated and 57 (16.4%) were vaccinated with 2024-2025 KP.2 BNT162b2 COVID-19 vaccine. Mean (SD) age was 45.6 years (14.2), 77.0% were female, and 64.6% had at least one comorbidity.
 - Among those vaccinated, mean (SD) time since vaccination was 104.8 (45.8) days. (Table 1)
- At enrollment, the mean (SD) number of any acute symptoms was 9.5 (2.2).The most prevalent symptoms reported at enrollment were stuffy/runny nose (97.7%), cough (95.1%), and fatigue (92.2%). The most common symptom that patients reported as moderate/severe was stuffy or runny nose (74.8%). Fatigue was the most frequent symptom that patients reported as severe (33.6%). Vomiting (7.8%) was less often reported at enrollment. (Figure1)
- There was a significant increase of +8.1 in the mean number of symptoms reported at enrollment relative to pre-infection (p<0.001). The mean (SD) number of symptoms measured as moderate or severe by patients reported at enrollment was 6.6 (2.6), showing an increase of +6.5 from pre-infection (p<0.001). The mean (SD) number of symptoms measured as severe by patients reported at enrollment was 3.2 (2.6), showing an increase of +3.2 from pre-infection (p<0.001) (Table 2)

Table 1. Patient Characteristics

	Statistics
Total n	347
Age, years, mean (SD)	45.6 (14.2)
Gender, n (%)	
Male	78 (22.5%)
Female	267 (77.0%)
Unknown	2 (0.6%)
Race / Ethnicity, n (%)	
White or Caucasian	266 (76.7%)
Black or African American	22 (6.3%)
Hispanic	36 (10.4%)
Other	23 (6.6%)
US Geographic Region, n (%)	
Northeast	40 (11.5%)
South	193 (55.6%)
Midwest	98 (28.2%)
West	15 (4.3%)
Other/Unknown	1 (0.3%)
Social Vulnerability Index ^a , mean (SD)	0.36 (0.21)
≥1 comorbid condition ^b , n (%)	224 (64.6%)
Vaccination Status, n (%)	
2024-2025 KP.2 BNT162b2 COVID-19 vaccine	57 (16.4%)
Unvaccinated or not up-to-date	290 (83.6%)
Time since 2024-2025 KP.2 BNT162b2 COVID-19 vaccine, days, mean (SD)	104.8 (45.8)
Time from onset of COVID-19 symptom to Day 1, days, mean (SD)	4.2 (3.6)
Antiviral Use (Nirmatrelvir/Ritonavir, Molnupiravir and other), n (%)	186 (53.6%)

^a Social Vulnerability Index is a score that ranges from 0 to 1. Higher values correspond to higher vulnerability [8].
^b Comorbid conditions include cancers or malignancies (other than skin cancer), cerebrovascular disease, chronic kidney disease, chronic lung conditions, chronic liver disease, endocrine disorders, heart conditions, mental health conditions, obesity (BMI >30), weakened immune system/ immunocompromised, blood disorders, smoker, or active tuberculosis.

Figure 1. Symptoms at Enrollment in Patients with COVID-19, %

Symptom	Mild (%)	Moderate (%)	Severe (%)
Stuffy or runny nose	22.9	45.8	29.0
Cough	30.7	44.4	20.0
Fatigue or tiredness	18.3	40.3	33.6
Headache	26.1	37.7	22.9
Body aches	29.6	32.2	19.4
Sore throat	28.1	33.3	18.8
Feeling hot or feverish	28.7	32.2	13.6
Chills or shivering	23.2	29.0	12.8
Difficulty breathing	32.5	21.2	2.3
Change in taste	33.9	9.3	
Diarrhea	23.2	9.6	2.9
Nausea	23.8	9.0	2.0
Change in smell	22.6	11.3	
Vomiting	0.6	7.0	0.3

Change in smell and change in taste were treated as mild, and unable to smell and unable to taste were treated as severe.

Table 2. ARI Symptom Summary over Time

	Pre-infection	Day 1	Change ^a
Number of symptoms of any severity	1.4 (1.7)	9.5 (2.2)	+8.1 (2.4)
Number of symptoms measured by patients as moderate or severe	0.1 (0.5)	6.6 (2.6)	+6.5 (2.6)
Number of symptoms measured by patients as severe	0.0 (0.2)	3.2 (2.6)	+3.2 (2.6)

^a All P values of paired t-test less than 0.001.

DISCUSSION & CONCLUSIONS

- These 2024-2025 respiratory season results show that the burden of symptomatic COVID-19 in the US remains high in the post-pandemic period.
- The most frequently reported symptoms were cough, stuffy nose, and fatigue experienced by >90% patients. On average, patients reported >3 symptoms as severe.
- Our current study population was predominantly female and white, and all data collected were self-reported. Generalizing findings to a different season or a different population may be limited.
- The findings of this study highlight the importance of implementing and promoting effective preventative strategies, including updated COVID-19 vaccination, to mitigate both individual and public health impacts.

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Disclosures

A.Y., T.H., J.C.C., M.G., S.M.C.L., L.P., and M.D.F. are employees of Pfizer and may hold stock or stock options of Pfizer. L.L.L. and X.S. are employees of CVS Health and hold stock of CVS Health.

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