Patients with Comorbidities Seek Care for Long-COVID-Like Symptoms at Higher Rates Than Others

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Last updated 28 June 2022 • Check for updates at EpicResearch.org

Key Findings:

- Patients with diabetes, hypertension, and obesity seek care for symptoms they might attribute to long COVID only slightly more often than patients with none of the studied comorbidities.
- Patients with any of the studied comorbidities seek care for long-COVID-like symptoms at much higher rates, regardless of whether they have had a COVID-19 infection.
- These findings suggest that patients and physicians should consider the role of any underlying health conditions when evaluating treatment options for long COVID.

To evaluate the impact of comorbidities on the risk of developing post-COVID syndrome, also known as long COVID,[1] we studied patients who had a single COVID-19 infection and sought care for symptoms that are commonly reported for patients with long COVID.[2] As symptoms associated with long COVID are fairly common with other illness, we calculated how frequently patients sought care for a new symptom between 28 and 180 days before their COVID-19 illness in comparison with how frequently those same patients sought care for a new symptom between 28 days and 180 days after. The difference between these rates represents long-term symptoms that may be associated with COVID-19 infection.

We first looked to see how having diabetes, hypertension, obesity, cancer, chronic kidney disease, mood disorders, heart disease, lung disease, or using substances or tobacco compared to having none of the studied comorbidities. We found that patients with no comorbidities sought care for symptoms associated with long-COVID 2.0% of the time before COVID-19 infection and 4.4% after COVID, a 2.4 percentage point change. Patients with one or more of the studied comorbidities demonstrated a before COVID baseline rate of 7.6 % and after COVID rate of 9.9%, a 2.3 percentage point change.

We then studied whether patients with specific comorbidities had a higher likelihood of long COVID symptoms. Patients with diabetes, hypertension, or obesity were found to have slightly higher increases in prevalence of symptoms after COVID-19 infection than before infection with increases of 2.8 percentage points, 2.7 percentage points, and 2.6 percentage points respectively.

Increase in Prevalence of Long COVID Symptoms After COVID-19 Diagnosis

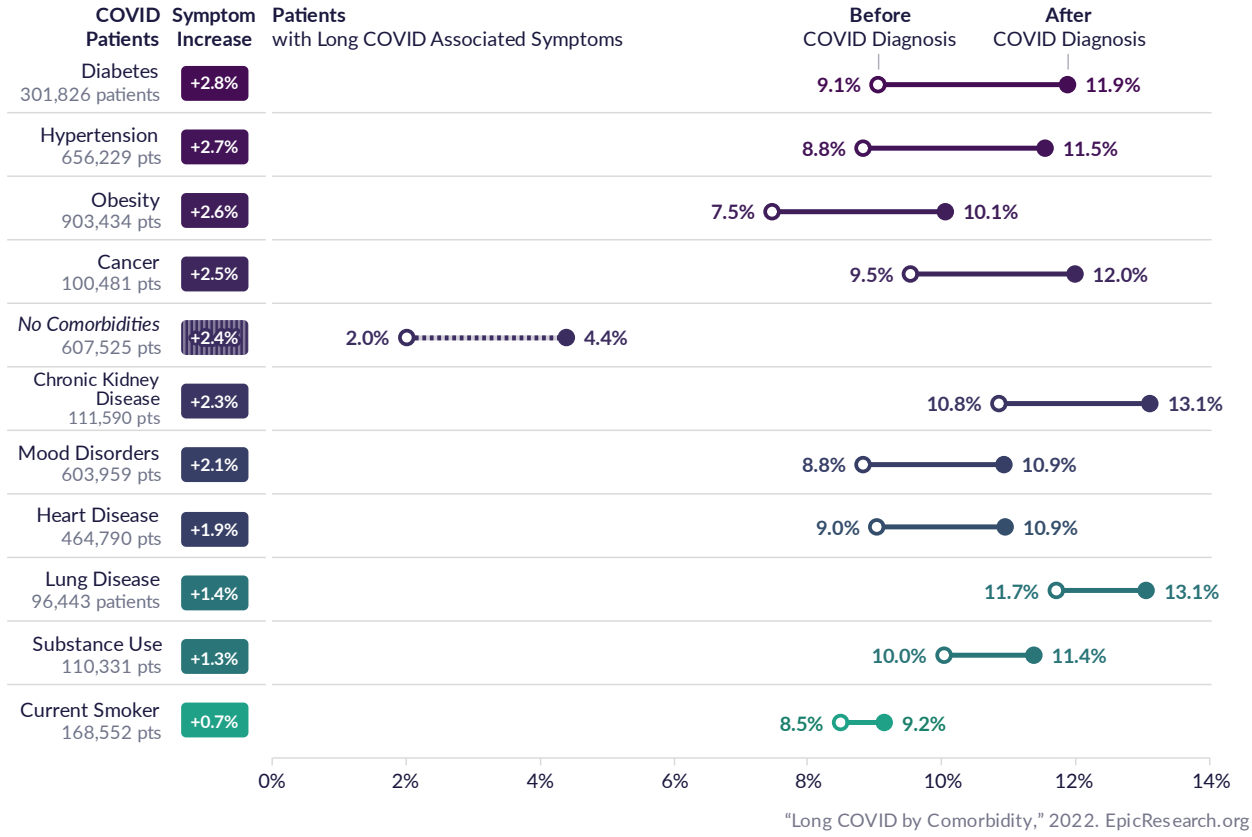

Figure 1. Percentage of patients seeking care for a new symptom associated with long COVID between 180 and 28 days before and between 28 days and 180 days after their COVID-19 infection. The symptom increase percentage represents the difference between these rates which represents new symptoms post-infection that may be attributed to long COVID. Those with the greatest increases are at the top of the figure.

While the change in rates is similar between patients with the studied comorbidities and those without, the before COVID rates are much higher among patients with any of the studied comorbidities. This indicates that patients with any of these comorbidities are more likely to present with long-COVID-like symptoms than those without. It might not be possible for patients or physicians to determine whether a new symptom is caused by comorbidity, long COVID, or some combination of the two. These findings suggest that patients and physicians should consider the role of any underlying health conditions when evaluating treatment options for long COVID.

These data come from Cosmos, a HIPAA-defined Limited Data Set of more than 142 million patients from 166 Epic organizations including 1,000 hospitals and 21,481 clinics, serving patients in all 50 states. This study was completed by two teams that worked independently, each composed of a clinician and research scientists. The two teams came to similar conclusions.

References

1. Centers for Disease Control and Prevention. Post-COVID Conditions. https://www.cdc.gov/coronavirus/2019-ncov/long-term-effects/index.html. Published September 16, 2021.
2. Epic Research. Nearly 1 in 10 COVID Patients Seek Treatment for Long-Term Symptoms. https://epicresearch.org/articles/nearly-1-in-10-covid-patients-seek-treatment-for-long-term-symptoms. Published July 20, 2021.

Data Definitions

Term	Definition
Tiredness or fatigue	Diagnoses mapped to ICD-10-CM code R53.1, R53.81, R53.82, or R53.83.
Loss of smell or taste	Diagnoses mapped to ICD-10-CM code R43.0, R43.1, R43.2, R43.8, or R43.9.
Palpitations	Diagnoses mapped to ICD-10-CM code R00.2.
Chest pain	Diagnoses mapped to ICD-10-CM code R07.1, R07.2, R07.81, R07.82, R07.89, or R07.9 .
Breathing difficulty	Diagnoses mapped to ICD-10-CM code R06.00, R06.01, R06.02, R06.09, or R06.9.
Myalgia	Diagnoses mapped to ICD-10-CM code M79.10, or M79.18.
Brain fog	Diagnoses mapped to ICD-10-CM code R41.0 (Disorientation, unspecified), R41.82 (Altered mental status, unspecified), R41.840 (Attention and concentration deficit), R41.89 (Other symptoms and signs involving cognitive functions and awareness), or R41.9 (Unspecified symptoms and signs involving cognitive functions and awareness) represent diagnoses that approximate the symptoms that patients with brain fog describe.
COVID Infected Patients	Patients with an initial COVID-19 infection between January 20, 2020, and June 30, 2021, who had at least one clinical encounter more than 180 days prior to their infection.
Long COVID After Infection	For COVID-19 Infected Patients, documentation of any of the above diagnoses between 4 weeks and 180 days after COVID-19 diagnosis for a patient who did not have that same diagnosis in an encounter prior to their COVID-19-positive date.
Long COVID Before Infection	For COVID-19 Infected Patients, documentation of any of the above diagnoses between 4 weeks and 180 days prior to the COVID-19 diagnosis for a patient who did not have that same diagnosis in an encounter prior to that period.
Cancer	Patients who have documentation of an encounter or billing diagnosis at least 180 days prior to their COVID infection that is mapped to SNOMED code 363346000 or an ICD-10-CM code of C*,

	except those also mapped to an ICD-10-CM code of D* or with a name that includes the text “H/O”, “history of”, “hx”, or “in remission.”
Chronic Kidney Disease	Patients who have documentation of an encounter or billing diagnosis at least 180 days prior to their COVID infection that is mapped to SNOMED code 431855005, 431856006, 433144002, or 431857002 or ICD-10-CM I12.9, I13.0, I13.10, N18.1, N18.2, N18.3, N18.4, or N18.9.
Current Smoker	Patients who have documentation of an encounter or billing diagnosis at least 180 days prior to their COVID infection that is mapped to SNOMED code 77176002 or whose most recent self-reported smoking status is either “Smoker,” “Current Everyday Smoker,” “Current Some Day Smoker,” “Heavy Tobacco Smoker,” “Light Tobacco Smoker,” or “Smoker, Current Status Unknown.”
Diabetes	Patients who have documentation of an encounter or billing diagnosis at least 180 days prior to their COVID infection that is mapped to SNOMED code 46635009, 420868002, 44054006, or 422014003, or ICD-10-CM code E10* or E11*, excluding diagnoses mapped to SNOMED code 11687002 or ICD-10-CM code O24.4*.
Heart Disease	Patients who have documentation of an encounter or billing diagnosis at least 180 days prior to their COVID infection that is mapped to SNOMED code 84114007 but not also SNOMED code 56675007 or ICD-10-CM code I11.0, I13.0, or I13.2 or ICD-10-CM code I50*, except I50.21, I50.31, I50.41, or I50.811.
Hypertension	Patients who have documentation of an encounter or billing diagnosis at least 180 days prior to their COVID infection that is mapped to SNOMED code 38341003 or ICD-10-CM code I10*, I11*, I12*, I13*, or I15*, excluding those mapped to O13*, O14*, or O15*.
Lung Disease	Patients who have documentation of an encounter or billing diagnosis at least 180 days prior to their COVID infection that is mapped to SNOMED code 413839001.
Mood Disorders	Patients who have documentation of an encounter or billing diagnosis at least 180 days prior to their COVID infection that is mapped to SNOMED code 46206005, ICD-10-CM code F31*, F33*, F34*, or F39*, or Clinical Classifications Software Refined (CCSR) MBD* codes.
Obesity	Patients who have documentation of an encounter or billing diagnosis at least 180 days prior to their COVID infection that is mapped to Clinical Classifications Software Refined (CCSR) END009 code or whose most recently calculated BMI was between 30 and 100.
Substance Use	Patients who have documentation of an encounter or billing diagnosis at least 180 days prior to their COVID infection that is mapped to Clinical Classifications Software Refined (CCSR) code MBD017, MBD018, MBD019, MBD020, MBD021, MBD022, MBD023, MBD024, MBD025, MBD29, MBD030, MBD031, MBD032, or MBD033 or who self-reported abusing substances.

No Comorbidities	Patients who have none of the conditions defined in the 10 comorbidity condition categories above prior to their COVID infection date.