

EVIDENCE SYNTHESIS BRIEFING NOTE

TOPIC: UNDERSTANDING THE POST-COVID CONDITION

Information finalized as of April 1, 2022.^a

This Briefing Note was completed by the Research, Analysis, and Evaluation Branch (Ministry of Health) based on information provided by members of the COVID-19 Evidence Synthesis Network. Please refer to the [Methods](#) section for further information.

Purpose: This briefing note examines the definitions, prevalence, risk factors, symptoms, quality of life (QoL), and activities of daily living of the post COVID-19 condition for the general, working age adult, and low-income populations.

Research Findings: There was limited information identified about health system utilization, expected burdens, and working age and low-income populations. Evidence from systematic reviews, living reviews, and individual studies yielded the following details:

- **Definitions:** Post COVID-19 condition definitions share similar components such as persistent symptoms and/or delayed symptoms of SARS-CoV-2 infection beyond four weeks from symptom onset.
- **Prevalence:** Global prevalence of post COVID-19 condition is estimated at 43% of all cases. In North America, prevalence is estimated at 30%. Studies report the prevalence of post COVID-19 condition among people with confirmed COVID-19 symptoms varies across follow-up points: four weeks (83%), two to five months (55%), 12 weeks (59%), after 12 weeks (62%), and six months (54%).
- **Risk Factors:** Common risk factors include: severe/critical acute infection; female sex; older age; obesity; hospital admission at symptom initiation; dyspnea or abnormal chest auscultation; and number of symptoms during acute SARS-CoV-2 infection.
- **Symptomatology:** Commonly reported symptoms of post-COVID-19 condition are chronic fatigue, dysosmia (disordered smell perception), dyspnea (shortness of breath), taste dysfunction, headache, pain (e.g., chest, joint, muscle), poor sleep quality, and reduced exercise capacity.
- **QoL:** Post-COVID-19 condition symptoms may lead to decreased QoL and health-related quality of life in the general population and low-income populations.
- **Activities of Daily Living:** The need for care assistance among the general population significantly increases after COVID-19 infection, and individuals who were not dependent previously are reported to be partially dependent on others in the performance of daily activities.
- **Impact on the Working Age Population:** Work absences are variously reported: 9%-40% of those previously employed at two to three months after discharge; 12%-23% of mild-to-moderate and non-hospitalized cases for three to seven months after acute disease; and 70% of hospitalized and non-hospitalized cases for 13 weeks or more.

Analysis for Ontario: Based on the emerging available data, post COVID-19 condition has the potential to impact the physical and mental health of a substantial proportion of Ontario's population, as well as impact health care system resources in the coming years.

^a This briefing note includes current available evidence as of the noted date. It is not intended to be an exhaustive analysis, and other relevant findings may have been reported since completion.

Objectives and Search Methods

This briefing note examines the research and jurisdictional reports on post COVID-19 condition for: 1) the general population; and 2) working age adults and low-income populations. In particular:

- **General Population:** Definitions; underlying causes; prevalence and associated symptoms and sequelae; risk factors and mitigation; health system utilization; functional limitations; use of long-term disability and employment; and expected burden for Ontario.
- **Working Age/Low-Income Populations:** Symptom prevalence by body system (e.g., neurological, respiratory); symptom duration and intensity over time; acuity level of illness; quality of life (QoL) and activities of daily living impacts; work-related impacts (e.g., leaves of absence); health care services received; and analysis/modelling considerations.

This briefing note is an update of [RAEB's Evidence Synthesis Briefing Note on Long COVID](#) (Oct 29, 2021) and a Science Advisory Table's (SAT) report on [Understanding the Post-COVID-19 Condition \(Long COVID\) and the Expected Burden for Ontario](#) (Sept 14, 2021). The literature search was limited to sources published from October 1, 2021 to April 2022; however, where applicable, information was included outside of this date range if it was not present in the previously completed RAEB's Evidence Synthesis Briefing Note or SAT report listed above.

Limitations

- Most of the information identified on general aspects of post COVID-19 condition (i.e., definitions, method of diagnosis, prevalence, and risk factors) are largely unchanged from the RAEB and SAT reports listed above.
- There are no standardized definitions and diagnostic criteria (e.g., validated self-reported questionnaires versus clinical assessments) used across studies. In particular:
 - A report (Mar 16, 2022) by Public Health Ontario noted that study populations, follow-up periods, outcome measures, and analysis methods were highly heterogeneous across systematic reviews and primary studies, making direct comparisons challenging.¹
 - A report (2021) by the World Health Organization (WHO) indicated that there are multiple names in use in the literature to refer to post COVID-19 condition, such as: long COVID; chronic COVID syndrome; late sequelae of COVID-19; post-acute sequelae of SARS-CoV-2 infection (PASC); and long haul COVID.² This Briefing Note will apply the term post COVID-19 condition.
- There was limited information identified on the following topics:
 - The impact of post COVID-19 condition on health system utilization, work- and disability-related impacts, and expected burdens across jurisdictions, including Ontario.
 - The impact of post COVID-19 condition on working age and low-income populations. For example, this was emphasized in the following studies:
 - A review (Oct 2021) on the acute and post-acute neurological manifestations of COVID-19 reported that population data from low- and middle-income countries are scarce, leading to uncertainties in measuring neurological impacts.³
 - A US study (Apr 2022) on Black, Indigenous, and Latinx communities noted few studies address inequities in outcomes associated with post COVID-19 condition.⁴
 - The impact of vaccination on post COVID-19 condition. In particular:
 - A Canadian Agency for Drugs and Technologies in Health (CADTH) draft scoping review (Mar 16, 2022) on the clinical classification and interventions for post COVID-19 condition did not identify many published studies assessing the impact of COVID-19 vaccination on post COVID-19 condition. The scoping review did not identify many studies of individuals who received the

COVID-19 vaccine, making it unclear whether receiving a COVID-19 vaccine before or after developing post COVID-19 condition will impact symptoms.⁵

- The clinical recommendations and/or methodological quality of most of the sources identified are unclear as the Research, Analysis, and Evaluation Branch does not have the expertise to make such assessments; methodological assessments published by other research groups are reported where available.

Supporting Evidence

[Table 1](#) below summarizes the scientific evidence and jurisdictional experiences on post COVID-19 condition among the general population, low-income populations, and working age population. In the [Appendix](#), additional details are provided in [Table 2](#) (Summary of Systematic Reviews on Post COVID-19 Condition), and [Table 3](#) (Summary of Individual Studies on Post COVID-19 Condition). In terms of jurisdictional experience, information is mainly presented from Canada and the United Kingdom.

Table 1: Scientific and Jurisdictional Information on Post COVID-19 Condition

Scientific Evidence	<p>Definitions</p> <ul style="list-style-type: none"> ○ Definitions of post COVID-19 condition have been defined by many studies and share similar components, such as persistent symptoms and/or delayed symptoms of SARS-CoV-2 infection beyond four weeks from symptom onset,⁶ and signs and symptoms that develop during or after SARS-CoV-2 infection that are not explained by an alternative diagnosis, and continue for three weeks;⁷ beyond four weeks;⁸ or, at least two months.⁹ <p>Prevalence</p> <ul style="list-style-type: none"> • Since the official name and definition for the condition are not yet established, determining an overall prevalence of post COVID-19 condition among COVID-19 survivors remains challenging. There is high heterogeneity in prevalence estimates. <ul style="list-style-type: none"> ○ Prevalence at Follow-up Periods: Eight identified systematic reviews (SRs) reported on post COVID-19 condition prevalence at multiple follow-up points, ranging from four to 12 weeks after COVID-19 diagnosis to 12 months after symptom onset.^{10,11,12,13,14,15,16,17} For example: <ul style="list-style-type: none"> ▪ A SR (Dec 16, 2021) reporting on post COVID-19 condition prevalence estimated that 59% of people with confirmed COVID-19 had symptoms at 12 weeks and 62% had symptoms at >12 weeks.¹⁸ ▪ A preprint SR (Nov 3, 2021) reporting on 36 studies estimated that 83% of people with confirmed COVID-19 had symptoms four weeks after diagnosis and 56% experienced symptoms after 12 weeks.¹⁹ ▪ A SR (Oct 13, 2021) reported on post COVID-19 condition prevalence at three follow-up periods: one month (54%); two to five months (55%); and six months (54%).²⁰ ○ Global Prevalence: A preprint SR (Nov 16, 2021), reporting on 29 studies comprising 886,388 COVID-19 positive patients, estimated a global pooled prevalence of post COVID-19 condition at 43% of all cases (57% among patients hospitalized). Reports from North America had the lowest pooled prevalence at 30%. Overall, the SR estimated that about 100 million people had or are still living with post COVID-19 condition worldwide.²¹
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	<p><u>Symptomatology</u></p> <ul style="list-style-type: none"> ● Emerging evidence about the type of symptoms and long-term health effects post COVID-19 condition suggests that many adults can experience a range of symptoms after their initial COVID-19 infection. <ul style="list-style-type: none"> ○ <u>Common Symptoms:</u> The most common symptoms reported are: chronic fatigue, dysosmia (disordered smell perception), dyspnea (e.g., shortness of breath), taste dysfunction, headache, pain (e.g., chest, joint, muscle), poor sleep quality, and reduced exercise capacity.^{22,23,24,25,26,27,28,29,30,31} In addition, persistent symptoms also affect the cognitive, musculoskeletal, respiratory, nervous, gastrointestinal, cardiac, and psychological systems (e.g., post-traumatic stress disorder, anxiety, depression).^{32,33,34,35} For example: <ul style="list-style-type: none"> ▪ <u>Neuropsychiatric Symptoms:</u> A SR and meta-analysis (Dec 17, 2021) on the persistent neuropsychiatric symptoms associated with post COVID-19 condition across 51 studies and 18,917 patients assessed at least 20 days after acute COVID-19 infection. The neuropsychiatric symptoms included cognitive dysfunction (20.2%, 10.3–35.7), and psychological outcomes, such as: sleep problems (27.4%), anxiety (19.1%), post traumatic stress disorder (PTSD) (15.7%), and depression (12.9%).³⁶ <p><u>Risk Factors</u></p> <ul style="list-style-type: none"> ● The identified literature reported that having five symptoms in the first week of illness (i.e., fatigue, headache, shortness of breath, hoarse voice, and myalgia) may increase the risk for post COVID-19 condition.³⁷ The following factors also may increase the risk for the condition. <ul style="list-style-type: none"> ○ Number of symptoms during acute SARS-CoV-2 infection;³⁸ severe/critical acute infection;^{39,40} female sex;^{41,42} older age;⁴³ obesity;⁴⁴ hospital admission at symptom initiation;⁴⁵ and dyspnea or abnormal chest auscultation.⁴⁶ <p><u>Quality of Life (QoL)</u></p> <ul style="list-style-type: none"> ● Two identified studies investigated how post COVID-19 condition impacted QoL outcomes for patients, reporting that the symptoms led to a decreased QoL in the general population.^{47,48,49} <ul style="list-style-type: none"> ○ A SR (Dec 16, 2021) of 39 studies examined post COVID-19 condition symptoms at >12 weeks after initial infection. Overall, 57% of the study samples reported a decreased QoL at 12 weeks after initial infection. The prevalence of QoL were identified for: 1) pain or discomfort (36%); 2) mobility issues (32%); 3) depression or anxiety (27%); 4) decrease in usual activities (23%); and 5) issues with self-care (10%).⁵⁰ ○ A SR and meta-analysis (Aug 31, 2022) on symptoms of post COVID-19 condition reported that an overall prevalence result was reported for poor QoL. Additionally, the study reported prevalence results of individual factors in the EQ-5D-5L questionnaire (higher scores represent more problems with the specified factor): 1) mobility (36%); 2) personal care (8%); 3) usual activities (28%); 4) pain/discomfort (42%); and 4) anxiety/depression (38%). Poor QoL was significantly higher among post COVID-19 patients with admission to intensive care unit and fatigue.^{51,b} <p><u>Activities of Daily Living</u></p> <ul style="list-style-type: none"> ● A review (Jan 27, 2021) on the epidemiology of post COVID-19 condition among a general population reported that the need for care assistance significantly increased (52.4%) after COVID-19 infection compared to before (7.7%); 41.1% of cases who were not dependent
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^b The EQ-5D-5L is a questionnaire that comprises five dimensions: mobility, self-care, usual activities, pain and/or discomfort and anxiety and/or depression. Each dimension has 5 levels: no problems, slight problems, moderate problems, severe problems, and extreme problems ([EQ-5D, n.d.](#)).

	<p>previously were at least partially dependent on others in the performance of daily activities subsequently.⁵²</p> <p><u>Impact on the Working Age Populations</u></p> <ul style="list-style-type: none"> ● Prevalence: A SR (Oct 16, 2021) of 13 studies on post COVID-19 condition among working age patients (aged 15-67 years) reported that the prevalence of the condition ranged from 16% to 87% of workers.⁵³ ● Work Absences: A review (Mar 15, 2022) on post COVID-19 condition stated that almost 50% of 102 primary studies reported some degree of social and family-life impairment, long absence periods off work, adjusted workloads, and loss of employment. For example, the review reported on study findings on work-related implications: <ul style="list-style-type: none"> ○ In studies on previously hospitalized participants, absence from work due to post COVID-19 condition was reported in 9%-40% of those previously employed at two to three months after discharge. ○ Research on primarily mild-to-moderate and non-hospitalized SARS-CoV-2 cases reported that about 12%-23% remained absent from work (or had long absence periods) at three to seven months after acute disease. ○ A study with a mixed sample (hospitalized and non-hospitalized) reported that 70% of participants were absent from work for a period of 13 weeks or more, while another study (hospitalized and non-hospitalized) reported that 31% were still out of work at six weeks after acute illness.⁵⁴ ● Workload Adjustments: The review (Mar 15, 2022) also reported that many of those living with post COVID-19 condition are forced to adjust or reduce their workload.⁵⁵ For example: <ul style="list-style-type: none"> ○ Two studies (July, 2020; Nov, 2021) included in the review followed up on previously hospitalized participants for two months and reported that their employed participants adjusted their employment to their current circumstances. In the UK study (July, 2020), 15% percent of hospitalized patients remained off-sick from work at the two-month follow-up.⁵⁶ The US study (Nov, 2021) reported that 40% of their employed participants had reduced hours and/or modified duties upon their return to work.⁵⁷ ○ Three studies (Feb, 2021; April, 2021; Jul, 2021) reported that, at follow-ups of three to eight months, the proportions of hospitalized participants (mild to moderate cases) who adjusted or reduced their workloads ranged from 8%-45%.^{58,59,60} ○ Two studies (Jan, 2021; Aug, 2021) reported permanent employment loss in relation to deteriorating health, with one reporting that 11% and the other 13.8% of their previously employed participants were unemployed at two months after acute disease.^{61,62} <p><u>Impact on Low-Income Populations</u></p> <ul style="list-style-type: none"> ● Limited Data: A US study (Apr, 2022) on Black, Indigenous, and Latinx communities noted few studies addressing inequities in post COVID-19 condition outcomes in the context of material resource deprivation caused by low socio-economic status, chronic stress brought on by racial/ethnic discrimination, or place-based risk. Moreover, the overall lack of complete data for cases, deaths, and vaccine uptake by race and ethnicity complicates the ability to understand the etiology and factors associated with mitigation of post COVID-19 condition in the US. <ul style="list-style-type: none"> ○ Recommendations: The study recommended jurisdictions use the Centers for Disease Control and Prevention (CDC) Social Vulnerability Index (SVI)^c to mitigate the impact of
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^c Indices, such as the SVI, are geographical-based statistical tools that capture the relative average advantage and disadvantage of those living in an area. These tools incorporate metrics such as income, levels of education completed, and housing quality.

	<p>systemic racism and socioeconomic adversity, which correlate with the disproportionately higher rates of COVID-19 morbidity, mortality, and transmission in black, Indigenous, and Latinx communities.⁶³</p> <ul style="list-style-type: none"> ● Symptomatology: A review (Oct, 2021) on acute and post-acute neurological manifestations of COVID-19 indicated that data from low- and middle-income countries are scarce, leading to uncertainties in the measure of neurological findings of COVID-19.⁶⁴ ● QoL: A review (Oct 28, 2021) on the impact of COVID-19 on health-related quality of life (HQoL) of patients reported that the impact on HRQoL was considerable among patients with post COVID-19 condition. In patients from low-income countries, there was a greater impact on HRQoL. The study noted that a higher HRQoL among COVID-19 patients in high-income countries (e.g., United Kingdom, Norway) may be due to better health services of the countries rather than other factors compared to low-and-middle income countries (e.g., Iran).⁶⁵
International Scan	<p>Definition</p> <ul style="list-style-type: none"> ● A WHO (Oct 6, 2021) study on standardizing the clinical case definition for long-term symptoms associated with COVID-19 uses the term post COVID-19 condition; however, the study notes that multiple names are in use, such as: long COVID; chronic COVID syndrome; late sequelae of COVID-19; post-acute sequelae of SARS-CoV-2 infection (PASC); and long haul COVID.⁶⁶ <p>Prevalence</p> <ul style="list-style-type: none"> ● The Office for National Statistics (Aug 5, 2021) in the United Kingdom reported that approximately 40% of all people with post COVID-19 condition will continue living with sequelae for over 12 months.⁶⁷
Canadian Scan	<p>Definition</p> <ul style="list-style-type: none"> ● A Government of Canada report (Sept 24, 2021) on post COVID-19 condition defined it as having COVID-19 symptoms for weeks or months after their initial recovery and may occur in some people after infection.⁶⁸ <p>Prevalence</p> <ul style="list-style-type: none"> ● A living systematic review (Dec 4, 2021) on care models for long COVID reported that, at the time of writing, Canadian prevalence data were unavailable. Based on findings in a preprint SR (Nov 16, 2021) on the global prevalence of post-acute sequelae of COVID-19, the living review estimated that upward of 500,000 Canadians may need to seek care for long COVID.⁶⁹ <p>Symptomatology</p> <ul style="list-style-type: none"> ● The Government of Canada report (Sept 24, 2021) on post COVID-19 condition reports that for adults the most common symptoms are different for adults and children: <ul style="list-style-type: none"> ○ Adults: Fatigue, memory problems, sleep disturbances, shortness of breath, anxiety and depression, general pain and discomfort, difficulty thinking or concentrating, and PTSD. <ul style="list-style-type: none"> ▪ There have been reports of more than 100 symptoms or difficulties with everyday activities. About 80% of adults reported one or more symptoms in the short-term (four to 12 weeks after their initial COVID-19 infection).

For example, using the data collected with the tools, entities can identify population groups who may benefit more from the COVID-19 vaccines ([Medeiros et al., 2022](#)).

	<ul style="list-style-type: none"> ▪ About 60% of adults reported one or more symptoms in the long-term (more than 12 weeks after their initial COVID-19 infection) and 10% said that they were also unable to return to work in the long-term. ○ <u>Children</u>: The most common symptoms that are reported in children include fatigue, headaches, weight loss, muscle pain, sleep disturbances, stuffy or runny nose, and difficulty thinking or concentrating. <ul style="list-style-type: none"> ▪ Approximately 58% of children had one or more symptoms four weeks or more after their initial COVID-19 infection. ▪ These symptoms can be mild to severe and can sometimes disappear and reappear. Some patients report that over-exertion (both mental and physical) may make the condition worse.⁷⁰ <p><u>Risk Factors</u></p> <ul style="list-style-type: none"> ● The Government of Canada report (Sept 24, 2021) states that people are at risk of developing post COVID-19 condition if they were hospitalized or needed intensive care during recovery; or had a mild to severe infection with symptoms or even mild infection without symptoms.⁷¹
Ontario Scan	<ul style="list-style-type: none"> ● No information identified.

Methods

The COVID-19 Evidence Synthesis Network is comprised of groups specializing in evidence synthesis and knowledge translation. The group has committed to provide their expertise to provide high-quality, relevant, and timely synthesized research evidence about COVID-19 to inform decision makers as the pandemic continues. The following members of the Network provided evidence synthesis products that were used to develop this Evidence Synthesis Briefing Note:

- Canadian Agency for Drugs and Technologies in Health. (March 2022). Clinical Classification and Interventions for Post–COVID-19 Condition: A Scoping Review (Draft). CADTH.
- Decary, S., Dugas, M., Stefan, T., Langlois, L., Skidmore, B., Bhéreur, A., & LeBlanc, A. (December 4, 2021). [Care Models for Long COVID – A Living Systematic Review. First Update – December 2021](#). SPOR Evidence Alliance, COVID-END Network.
- Public Health Ontario. (March 16, 2022). Post-Acute COVID-19 Syndrome (PACS) in Adults – What We Know So Far (Confidential). Public Health Ontario.

For more information, please contact the [Research, Analysis and Evaluation Branch \(Ministry of Health\)](#).

Appendix

Table 2: Summary of Systematic Reviews on Post COVID-19 Condition

Jurisdiction, Number of Relevant Studies, and Review Type	Objective, Population, Follow-up time Inclusion	Long-term Symptom(s) and Prevalence	Risk Factors for Post COVID-19 Condition	Health Care Utilization
Working-Age Population				
<ul style="list-style-type: none"> International N=13 studies Systematic review 	<ul style="list-style-type: none"> Objective: Evaluate the evidence on PCS among workers. Population: Working-age patients (aged 15–67 years). Follow-up time: From nine days to five months after symptom onset or after hospital discharge. 	<ul style="list-style-type: none"> Symptom Prevalence: A wide range of patients (16%–87%) have PCS. Symptoms: The most common disorders reported were: <ul style="list-style-type: none"> <i>Pneumological Symptoms:</i> Symptoms included continued shortness of breath, dyspnea, chest pain; and <i>Neuropsychological Symptoms:</i> Symptoms included muscle weakness, loss of smell, sleep difficulties, anxiety, depression, post-traumatic stress disorder [PTSD]). <i>Organic sequelae:</i> The most frequent health condition associated with having had COVID-19 was: <ul style="list-style-type: none"> Pulmonary fibrosis. 	<ul style="list-style-type: none"> Risk Factors: High risk of post COVID-19 condition was related to: <ul style="list-style-type: none"> Number of symptoms during acute SARS-CoV-2 infection; Severity of the disease; and High serum levels of D-dimer.^d 	<ul style="list-style-type: none"> None reported.⁷²
General Population				
<ul style="list-style-type: none"> International N=120 studies Systematic scoping review 	<ul style="list-style-type: none"> Purpose: To synthesize what is known from literature about persistent COVID-19, its signs and symptoms, its 	<ul style="list-style-type: none"> Symptoms: Predominant symptoms among individuals with post COVID-19 condition were: <ul style="list-style-type: none"> Fatigue; 	<ul style="list-style-type: none"> Number of Symptoms: Having five symptoms in the first week is a risk factor for post COVID-19 condition (i.e., fatigue; headache; shortness of breath; hoarse voice; 	<ul style="list-style-type: none"> None reported.⁷³

^d D-dimer is a protein fragment (small piece) that is made when a blood clot dissolves in the body. A D-dimer test identifies D-dimer in blood ([MedlinePlus, November 8, 2021](#)).

Jurisdiction, Number of Relevant Studies, and Review Type	Objective, Population, Follow-up time Inclusion	Long-term Symptom(s) and Prevalence	Risk Factors for Post COVID-19 Condition	Health Care Utilization
	<p>pathophysiology, and the current management recommendations.</p> <ul style="list-style-type: none"> • Population: Adult and pediatric patients with post COVID-19 condition symptoms (population non-specified). • Follow-Up Time: Not reported. 	<ul style="list-style-type: none"> ○ Breathlessness; ○ Arthralgia (joint stiffness); ○ Sleep difficulties; and ○ Chest pain. • Long-Term Sequelae: Reports also point to the risk of long-term sequelae with cutaneous, respiratory, cardiovascular, musculoskeletal, mental health, neurologic, and renal involvement in those who survive the acute phase of the illness. 	<p>and myalgia [muscle aches and pains]).</p> <ul style="list-style-type: none"> • Prolonged Symptoms: Some prolonged COVID-19 symptoms are associated with: <ul style="list-style-type: none"> ○ Age 40 to 60 years; ○ Hospital admission at symptom initiation; ○ Severe COVID-19; and ○ Dyspnea or abnormal chest auscultation. • Mental Health: Mental health risk factors include: <ul style="list-style-type: none"> ○ Loss of a loved one; ○ Hospitalization; ○ Containment measures such as isolation and quarantine; ○ Being in low-income regions; ○ Financial stressors; ○ Having disabilities; ○ Female gender; and ○ Older age. 	
<ul style="list-style-type: none"> • International (preprint) • N=29 studies • Systematic review and meta-analysis 	<ul style="list-style-type: none"> • Purpose: Examine the prevalence of post-acute sequelae SARS-CoV-2 infection (PASC) across the world and to assess geographic heterogeneities. • Population: COVID-19 patients (population non-specified). • Follow-Up Time: 30 to 120 days. 	<ul style="list-style-type: none"> • PASC Prevalence: Global estimated pooled PASC prevalence was 0.43 (95% CI: 0.35, 0.63). <ul style="list-style-type: none"> ○ Hospitalized: PASC prevalence estimate of 0.57 (95% CI: 0.45, 0.68), among those hospitalized during the acute phase of infection. ○ Gender: Estimates of PASC prevalence varied across gender: <ul style="list-style-type: none"> ▪ Females: 0.49 [95% CI: 0.35, 0.63]; and 	<ul style="list-style-type: none"> • Risk Factors: These groups have higher odds of having PASC: <ul style="list-style-type: none"> ○ Female Sex: 1.57 (95% CI: 1.09, 2.26); and ○ Pre-Existing Asthma: 2.15 (95% CI: 1.14, 4.05). 	<ul style="list-style-type: none"> • Health effects of COVID-19 appear to be prolonged and can exert marked stress on the healthcare system. <ul style="list-style-type: none"> ○ Worldwide, PASC comprises a significant fraction (0.43 [95% CI: 0.35, 0.63]) of COVID-19 tested positive cases and more than half of hospitalized COVID-19 cases.⁷⁴

Jurisdiction, Number of Relevant Studies, and Review Type	Objective, Population, Follow-up time Inclusion	Long-term Symptom(s) and Prevalence	Risk Factors for Post COVID-19 Condition	Health Care Utilization
		<ul style="list-style-type: none"> ▪ <i>Males</i>: 0.37 [95% CI: 0.24, 0.51]. ○ <i>Regional Estimates</i>: Estimates of PASC prevalence varied across regions: <ul style="list-style-type: none"> ▪ <i>Asia</i>: 0.49 (95% CI: 0.21, 0.42); ▪ <i>Europe</i>: 0.44 (95% CI: 0.30, 0.59); and ▪ <i>North America</i>: 0.30 (95% CI: 0.32, 0.66). ○ <i>Follow-Up Times</i>: Estimates of global PASC prevalence varied by days after index test positive date: <ul style="list-style-type: none"> ▪ <i>30 days</i>: 0.36 (95% CI: 0.25, 0.48); ▪ <i>60 days</i>: 0.24 (95% CI: 0.13, 0.39); ▪ <i>90 days</i>: 0.29 (95% CI: 0.12, 0.57); and ▪ <i>120 days</i>: 0.51 (95% CI: 0.42, 0.59). ○ <i>Symptoms</i>: Prevalence estimates varied according to common symptoms: <ul style="list-style-type: none"> ▪ <i>Fatigue</i>: 0.23 (95% CI: 0.13, 0.38); and ▪ <i>Dyspnea</i>: 0.13 (95% CI: 0.09, 0.19). 		
<ul style="list-style-type: none"> • International • N=51 studies • Systematic review and meta-analysis 	<ul style="list-style-type: none"> • <u>Purpose</u>: Examine the prevalence of persistent neuropsychiatric symptoms in survivors of COVID-19. • <u>Population</u>: Adults (aged 18+ years) with a history of 	<ul style="list-style-type: none"> • <u>Symptom Prevalence</u>: The prevalence of neurological and mental health outcomes include: 	<ul style="list-style-type: none"> • None reported. 	<ul style="list-style-type: none"> • None reported.⁷⁵

Jurisdiction, Number of Relevant Studies, and Review Type	Objective, Population, Follow-up time Inclusion	Long-term Symptom(s) and Prevalence	Risk Factors for Post COVID-19 Condition	Health Care Utilization
	<p>polymerase chain reaction (PCR)-confirmed or clinically suspected SARS-CoV-2 infection (population non-specified).</p> <ul style="list-style-type: none"> • Follow-up time: The mean duration of follow-up after COVID-19 was 77 days (range 14–182 days). 	<ul style="list-style-type: none"> ○ Neurological Symptoms: Common neurological symptoms were: <ul style="list-style-type: none"> ▪ Objective cognitive dysfunction (20.2%, 10.3–35.7); ▪ Dysosmia (disordered smell perception) (1.14%, 8.2–15.6); ▪ Taste dysfunction (7.4%, 4.7–11.4); and ▪ Headache (6.6%, 3.6–12.0). ○ Mental Health Symptoms: Common outcomes were: <ul style="list-style-type: none"> ▪ Sleep problems (27.4%, 21.4–34.4); ▪ Anxiety (19.1%, 13.3–26.8); ▪ Post-traumatic stress disorder (PTSD) (15.7%, 9.9–24.1); and ▪ Depression (12.9%, 7.5–21.5). 		
<ul style="list-style-type: none"> • International • N=81 studies • Systematic review and meta-analysis 	<ul style="list-style-type: none"> • Objective: Examine the proportion of individuals experiencing fatigue and cognitive impairment 12 or more weeks following COVID-19 diagnosis. • Population: COVID-19 patients (n=25,268; population non-specified). • Follow-Up Time: Periods ranged from 2.8 to 11.2 months. 	<ul style="list-style-type: none"> • Symptom Prevalence: Twelve or more weeks following COVID-19 diagnosis participants experienced: <ul style="list-style-type: none"> ○ Fatigue: Proportion of individuals experiencing fatigue 0.32 (95% CI, 0.27, 0.37); ○ Cognitive Impairment: Proportion of individuals exhibiting cognitive impairment was 0.22 (95% CI, 0.17, 0.28). 	<ul style="list-style-type: none"> • Risk Factors: Similar incidences of fatigue and cognitive impairment were observed amongst: <ul style="list-style-type: none"> ○ Hospitalized; and ○ Non-hospitalized populations. 	<ul style="list-style-type: none"> • None reported.⁷⁶

Jurisdiction, Number of Relevant Studies, and Review Type	Objective, Population, Follow-up time Inclusion	Long-term Symptom(s) and Prevalence	Risk Factors for Post COVID-19 Condition	Health Care Utilization
<ul style="list-style-type: none"> International N=18 studies Systematic review and meta-analysis 	<ul style="list-style-type: none"> Objective: Systematically synthesize evidence on post COVID-19 condition symptoms persisting for at least 12 months. Population: COVID-19 survivors (n=8,591); hospitalized and non-hospitalized. Follow-Up Time: 12 months after symptom onset or hospital admission. 	<ul style="list-style-type: none"> Symptom Prevalence: One year after infection, a sizeable proportion of COVID-19 survivors still experience residual symptoms involving various body systems. The most prevalent symptoms were: <ul style="list-style-type: none"> Fatigue/weakness (28%, 95% CI: 18–39); Dyspnoea (18%, 95% CI: 13–24); Arthromyalgia (bone pain) (26%, 95% CI: 8–44); Depression (23%, 95% CI: 12–34); Anxiety (22%, 95% CI: 15–29); Memory loss (19%, 95% CI: 7–31); Concentration difficulties (18%, 95% CI: 2–35); and Insomnia (12%, 95% CI: 7–17). 	<ul style="list-style-type: none"> Risk Factors: Existing evidence suggests that the following are risk factors for experiencing long-term post COVID-19 condition symptoms: <ul style="list-style-type: none"> Female sex; and Severe/critical acute infection. 	<ul style="list-style-type: none"> None reported.⁷⁷
<ul style="list-style-type: none"> International N=44 observational studies Systematic review 	<ul style="list-style-type: none"> Objective: Evaluate the extent and timing of olfactory recovery following loss due to COVID-19 infection.^e Population: Adult patients (≥18 years) and children diagnosed with COVID-19 infection by positive PCR test, and who reported olfactory dysfunction (anosmia or hyposmia). 	<ul style="list-style-type: none"> Symptoms: Olfactory recovery was found to occur as early as seven days, with most patients recovering olfaction within 30 days. <ul style="list-style-type: none"> Olfactory recovery most often occurred within the first two weeks from symptom onset with a rate of recovery at one month as 	<ul style="list-style-type: none"> Risk Factors: Patients with initial poor olfactory scores had slow rates of olfactory recovery. <ul style="list-style-type: none"> However, the majority of studies did not observe medical co-morbidities, demographics, or general symptoms to be a pertinent factor in olfactory recovery. 	<ul style="list-style-type: none"> None reported.⁷⁸

^e Olfactory loss (anosmia) has been identified as one of the common symptoms related to COVID-19 infection and may sometimes be the primary presenting symptom or the sole manifestation of disease in patients with COVID-19. Recovery of olfactory function has an important impact on patients' quality of life ([Jafar et al., November 9, 2021](#)).

Jurisdiction, Number of Relevant Studies, and Review Type	Objective, Population, Follow-up time Inclusion	Long-term Symptom(s) and Prevalence	Risk Factors for Post COVID-19 Condition	Health Care Utilization
	<ul style="list-style-type: none"> • <u>Follow-Up Time</u>: Timing of evaluations ranged from 10 days to six months. 	<p>high as 94.6%; at six months the rate of recovery was as high as 85.7%.</p>		
<ul style="list-style-type: none"> • International • N=39 studies • Systematic review 	<ul style="list-style-type: none"> • <u>Objective</u>: Compare ongoing symptomatic COVID-19 (OSC) (four to 12 weeks) and post COVID-19 syndrome condition (after 12 weeks) with respect to symptomatology, abnormal functioning, psychological burden, and quality of life. • <u>Population</u>: Adults (18+ years) with post COVID-19 condition (population non-specified). • <u>Follow-Up Time</u>: Four to 12 weeks after infection; and, beyond 12 weeks. 	<ul style="list-style-type: none"> • <u>Symptoms Prevalence of OSC</u>: Between four and 12 weeks the most prevalent symptoms were: <ul style="list-style-type: none"> ○ Fatigue (43%; range 5–83%) ○ Sleep disorders (36%; 10–69%) ○ Respiratory symptoms: <ul style="list-style-type: none"> ▪ Dyspnoea (31%; 2–64%); ▪ Cough (26%; 5–45%). ○ Other symptoms: These included: <ul style="list-style-type: none"> ▪ Arthralgia (23%; 10–48%); ▪ Myalgia (18%; 1–32%); ▪ Chest pain (17%; 3–35%); ▪ Headache (17%; 4–36%); ▪ Fever (15%; 1–51%); ▪ Expectoration (14%; 1–25%); ▪ Weight loss (13%; 6–17%); ▪ Skin problems (12%; 8–15%); ▪ Anosmia (11%; 2–21%); ▪ Ageusia (11%; 1–25%), and ▪ Confusion (11%; 9–14%). • <u>Symptoms Prevalence of PCS</u>: Over 12 weeks post-disease onset the most common symptoms were: 	<ul style="list-style-type: none"> • None reported. 	<ul style="list-style-type: none"> • None reported.⁷⁹

Jurisdiction, Number of Relevant Studies, and Review Type	Objective, Population, Follow-up time Inclusion	Long-term Symptom(s) and Prevalence	Risk Factors for Post COVID-19 Condition	Health Care Utilization
		<ul style="list-style-type: none"> ○ Fatigue: 44% (10–71%); ○ Dyspnoea (shortness of breath): 40% (6–73%); ○ Myalgia (muscle aches and pains): 34% (2–86%); and ○ Sleep disorder: 33% (18–57%). ○ Other symptoms included: <ul style="list-style-type: none"> ▪ Cough (22%; 3–59%); ▪ Hair loss (20%; 6–29%); ▪ Palpitations (20%; 4–62%); ▪ Arthralgia (joint stiffness; 13%; 6–29%); ▪ Throat pain (12%; 3–29%); ▪ Anosmia (loss of smell): 10% (5–13%); and ▪ Chest pain (10%; 1–22%). ● Quality of Life (QoL): A decreased QoL was recorded by 40% (23–53%) in those with OSC and 57% (51–67%) in those with PCS including: <ul style="list-style-type: none"> ○ Pain or discomfort (36%; 27–48%); ○ Mobility issues (32%; 7–56%); ○ Depression or anxiety (27%; 14–46%); ○ A decrease in usual activities (23%; 2–37%); and ○ Issues with self-care (10%; 1–17%). 		

Jurisdiction, Number of Relevant Studies, and Review Type	Objective, Population, Follow-up time Inclusion	Long-term Symptom(s) and Prevalence	Risk Factors for Post COVID-19 Condition	Health Care Utilization
<ul style="list-style-type: none"> International N=12 observational studies Systematic review and meta-analysis. 	<ul style="list-style-type: none"> Objective: Evaluate the pooled prevalence of poor QoL in post-acute COVID-19 syndrome (PACS) and evaluate the effects of persistent symptoms and intensive care unit (ICU) admission on the poor QoL. Population: Adult PACS patients (n=4,828); population non-specified. Follow-Up Time: Ranged from 30 to 180 days. 	<ul style="list-style-type: none"> Prevalence: Amongst PCS patients, the pooled prevalence of poor QoL was (59%; 95% CI: 42%–75%). Individual Factor Prevalence: Prevalence of individual factors (measured by the EQ-5D-5L questionnaire) included:^f <ul style="list-style-type: none"> Mobility (36%, 10–67%); Personal care (8%, 1–21%); Usual activities (28%, 2–65%); Pain/discomfort (42%, 28–55%); and Anxiety/depression (38%, 19–58%). Persistent Symptom Prevalence: Prevalence of persistent symptoms included: <ul style="list-style-type: none"> Fatigue (64%, 54–73%); Dyspnea (39.5%, 20–60%); Anosmia (20%, 15–24%); Arthralgia (24.3%, 14–36%); Headache (21%, 3–47%); Sleep disturbances (47%, 7–89%); and Mental health (14.5%, 4–29%). 	<ul style="list-style-type: none"> Poor QoL was significantly higher among PSC patients with: <ul style="list-style-type: none"> ICU admission (p = 0.004); and Fatigue (p = 0.0015). 	<ul style="list-style-type: none"> None reported.⁸⁰
<ul style="list-style-type: none"> International N=18 studies Systematic review and meta-analysis 	<ul style="list-style-type: none"> Objective: Determine the prevalence of neurological and neuropsychiatric symptoms 	<ul style="list-style-type: none"> Symptom Prevalence: Overall prevalence for neurological post COVID-19 symptoms were: 	<ul style="list-style-type: none"> Neuropsychiatric symptoms substantially increased in prevalence between mid- and long-term follow-up. 	<ul style="list-style-type: none"> None reported.⁸¹

^f The EQ-5D-5L is a validated questionnaire to evaluate a patient's quality of life by assessing the following five factors: mobility, self-care, usual activities, pain or discomfort, and anxiety or depression. Categorization within each factor is divided into five levels that range from no problems to extreme problems ([Malik, et al., 2021](#)).

Jurisdiction, Number of Relevant Studies, and Review Type	Objective, Population, Follow-up time Inclusion	Long-term Symptom(s) and Prevalence	Risk Factors for Post COVID-19 Condition	Health Care Utilization
	<p>reported after acute COVID-19 onset.</p> <ul style="list-style-type: none"> • Population: Adult (18+ years) 10,530 COVID-19 patients (hospitalized and non-hospitalized). • Follow-up time: Three (12 weeks) to six months after acute COVID-19 onset. 	<ul style="list-style-type: none"> ○ Fatigue (37%, 95% CI: 25%–48%); ○ Brain fog (32%, 10%–54%); ○ Memory issues (28%, 22%–35%); ○ Attention disorder (22%, 7%–36%); ○ Myalgia (17%, 9%–25%); ○ Anosmia (12%, 8%–16%); ○ Dysgeusia (10%, 6%–14%); and ○ Headache (15%, 4%–26%). • Neuropsychiatric conditions included: <ul style="list-style-type: none"> ○ Sleep disturbances (31%, 19%–42%); ○ Anxiety (23%, 14%–32%); and ○ Depression (17%, 10%–24%). 	<ul style="list-style-type: none"> ○ <i>Hospitalized patients:</i> At three (or more) months post-infection, patients hospitalized for acute COVID-19 had reduced frequency of: <ul style="list-style-type: none"> ▪ Anosmia; ▪ Anxiety; ▪ Depression; ▪ Dysgeusia; ▪ Fatigue; ▪ Headache; ▪ Myalgia; and ▪ Sleep disturbance. ○ <i>Hospital admission:</i> Hospital admission was associated with higher frequency of: <ul style="list-style-type: none"> ▪ Memory issues (OR: 1.9, 95% CI: 1.4–2.3). ○ <i>ICU admission:</i> Compared to cohorts with <20% of ICU admission during acute COVID-19, cohorts with >20% of patients admitted experienced higher prevalence of: <ul style="list-style-type: none"> ▪ Fatigue; ▪ Anxiety; ▪ Depression; and ▪ Sleep disturbances. 	
<ul style="list-style-type: none"> • International • N=9 observational studies • Systematic review 	<ul style="list-style-type: none"> • Objective: Examine the nature and frequency of persistent symptoms experienced by patients after mild COVID-19 infection. • Population: Adult patients who had been through a mild COVID-19 infection (population non-specified). 	<ul style="list-style-type: none"> • Symptom Prevalence: The frequency of persistent symptoms in patients after mild COVID-19 infection ranged between 10% and 35%. • Symptoms: Symptoms persisting after a mild COVID-19 infection: 	<ul style="list-style-type: none"> • None reported. 	<ul style="list-style-type: none"> • None reported.⁸²

Jurisdiction, Number of Relevant Studies, and Review Type	Objective, Population, Follow-up time Inclusion	Long-term Symptom(s) and Prevalence	Risk Factors for Post COVID-19 Condition	Health Care Utilization
	<ul style="list-style-type: none"> • <u>Follow-Up Time</u>: Three to 16 weeks. 	<ul style="list-style-type: none"> ○ Fatigue (most frequent); ○ Dyspnoea; ○ Cough; ○ Chest pain; ○ Headache; and ○ Decreased mental and cognitive status and olfactory dysfunction. 		
<ul style="list-style-type: none"> • International • N=57 studies • Systematic review 	<ul style="list-style-type: none"> • <u>Objective</u>: Estimate organ system-specific frequency and evolution of PASC. • <u>Population</u>: Survivors of COVID-19 (n=250,351; median age: 54.4 yrs.; 56% male) of which 79% were hospitalized during acute COVID-19. • <u>Follow-Up Time</u>: Three follow-up periods: one month; two to five months; and six months. 	<ul style="list-style-type: none"> • <u>Prevalence</u>: PACS prevalence (at least one symptom) was reported at three follow-up periods: <ul style="list-style-type: none"> ○ <i>Short Term</i>: 54.0% (45.0%-69.0%; 13 studies) at one month; ○ <i>Intermediate Term</i>: 55.0% (34.8%-65.5%; 38 studies) at two to five months; and ○ <i>Long Term</i>: 54.0% (31.0%-67.0%; nine studies) at six or more months. • <u>Symptom Prevalence</u>: Symptom prevalence was reported for these systems: <ul style="list-style-type: none"> ○ <i>Pulmonary Sequelae</i>: Most prevalent symptom was: <ul style="list-style-type: none"> ▪ Chest imaging abnormality (median [interquartile range], 62.2% [45.8%-76.5%]); ○ <i>Neurologic Disorders</i>: Most prevalent symptom was: <ul style="list-style-type: none"> ▪ Difficulty concentrating (median, 23.8% [20.4%-25.9%]); 	<ul style="list-style-type: none"> • None reported. 	<ul style="list-style-type: none"> • None reported.⁸³

Jurisdiction, Number of Relevant Studies, and Review Type	Objective, Population, Follow-up time Inclusion	Long-term Symptom(s) and Prevalence	Risk Factors for Post COVID-19 Condition	Health Care Utilization
		<ul style="list-style-type: none"> ○ <i>Mental Health Disorders</i>: Most prevalent symptom was: <ul style="list-style-type: none"> ▪ Generalized anxiety disorder (median, 29.6% [14.0%-44.0%]); ○ <i>Functional Mobility Impairments</i>: Most prevalent symptom was: <ul style="list-style-type: none"> ▪ General functional impairments (median, 44.0% [23.4%-62.6%]); and ○ <i>General and Constitutional Symptoms</i>: Most prevalent symptom was: <ul style="list-style-type: none"> ▪ Fatigue or muscle weakness (median, 37.5% [25.4%-54.5%]). ● <i>Other Symptoms</i>: Other frequently reported symptoms included: cardiac, dermatologic, digestive, and ear, nose, and throat disorders. 		

Table 3: Summary of Individual Studies on Post COVID-19 Condition

Jurisdiction, Number of Participants, and Study Type	Objective, Population, Follow-up Time	Reported Outcomes	Risk Factors	Health Care Utilization
General Population				
<ul style="list-style-type: none"> United States N=153,760; also, two sets of control cohorts with 5,637,647 (contemporary controls) and 5,859,411 (historical controls) individuals Retrospective cohort study 	<ul style="list-style-type: none"> Purpose: Examine the post-acute cardiovascular manifestations of COVID-19 after one year. Population: Individuals with COVID-19 included in healthcare databases from the US Department of Veterans Affairs (population non-specified). Follow-Up Time: Median follow-up times for participant groups included: <ul style="list-style-type: none"> COVID-19 group: 347 days; Contemporary control group: 348 days; and Historical control group: 347 days. 	<ul style="list-style-type: none"> Outcomes: Beyond the first 30 days of infection, people with COVID-19 exhibited increased risks and 12-month burdens of incident cardiovascular disease. Disease includes: <ul style="list-style-type: none"> Cerebrovascular disorders; Dysrhythmias; Ischemic and non-ischemic heart disease; Pericarditis; Myocarditis; Heart failure and thromboembolic disease. 	<ul style="list-style-type: none"> Risk Factors: Risks of cardiovascular disease were evident regardless of: <ul style="list-style-type: none"> Age; Race; Sex; and Other cardiovascular risk factors, including: <ul style="list-style-type: none"> Obesity; Hypertension; Diabetes; Chronic kidney disease; and Hyperlipidemia. Risks were also evident in people without any cardiovascular disease before exposure to COVID-19, providing evidence that these risks might manifest even in people at low risk of cardiovascular disease. 	<ul style="list-style-type: none"> Not reported.⁸⁴
<ul style="list-style-type: none"> United States (preprint) N=2,965,506 electronic health records (EHR) Retrospective cohort study 	<ul style="list-style-type: none"> Purpose: Examine the incidence of new-onset long-term psychiatric manifestations for patients who have recovered from COVID-19 infection. Population: Adult COVID-19 positive patients (population non-specified). Follow-Up Time: Two periods following COVID-19 infection: 	<ul style="list-style-type: none"> Outcomes: Patients who have recovered from COVID-19 are at an increased risk for developing new-onset mental illness, especially anxiety disorders; risk is most prominent in the first 120 days following infection. <ul style="list-style-type: none"> <i>New Onset Mental Disorders:</i> There was a significant increase in incidence of new-onset 	<ul style="list-style-type: none"> None reported. 	<ul style="list-style-type: none"> Study recommends that to cope with the excess in psychiatric morbidity experienced by survivors of COVID-19, health services should focus efforts early in the post COVID-19 clinical course.⁸⁵

Jurisdiction, Number of Participants, and Study Type	Objective, Population, Follow-up Time	Reported Outcomes	Risk Factors	Health Care Utilization
	<ul style="list-style-type: none"> ○ 21-120 days; and ○ 121-365 days. 	<p>mental disorders in the period of 21-120 days following COVID-19 (3.8%, 3.6-4.0) compared to patients with respiratory tract infections (3%, 2.8-3.2).</p>		
<ul style="list-style-type: none"> • United States • N=1,726,683 veterans • Observational study 	<ul style="list-style-type: none"> • Purpose: Examined kidney outcomes in long COVID (i.e., risks of acute kidney injury [AKI], estimated glomerular filtration rate [eGFR] decline, end stage kidney disease [ESKD], and major adverse kidney events [MAKE]).^{g,h} • Population: 30-day survivors of COVID-19 (population non-specified). • Follow-Up Time: 30 days. 	<ul style="list-style-type: none"> • Outcomes: Compared with non-infected controls, 30-day survivors of COVID-19 exhibited excess eGFR declines during the acute phase of COVID-19 infection: <ul style="list-style-type: none"> ○ <i>Non-hospitalized:</i> -3.26 ml/min per 1.73 m² per year (-3.58 to -2.94); ○ <i>Hospitalized:</i> -5.20 ml/min per 1.73 m² per year (-6.24 to -4.16); and ○ <i>Admitted to intensive care:</i> -7.69 ml/min per 1.73 m² per year (-8.27 to -7.12). 	<ul style="list-style-type: none"> • Risk Factors: Beyond the acute illness, 30-day survivors of COVID-19 exhibited higher risks of: <ul style="list-style-type: none"> ○ AKI (adjusted hazard ratio [aHR], 1.94); ○ eGFR decline ≥30% (aHR, 1.25); ○ eGFR decline ≥40% (aHR, 1.44); ○ eGFR decline ≥50% (aHR, 1.62); ○ ESKD (aHR, 2.96); and ○ MAKE (aHR, 1.66). 	<ul style="list-style-type: none"> • None reported.⁸⁶
<ul style="list-style-type: none"> • Italy • N=402,216, and 192 COVID-19 survivors respectively at one, six, and 12 months; 95 (subgroup) evaluated longitudinally at one-, six- and 12-months follow ups • Single cohort study 	<ul style="list-style-type: none"> • Purpose: Investigate the psychopathological impact of COVID-19 in Italy one year after infection, outlining the trajectory of symptomatology. • Population: COVID-19 survivors (population non-specified). • Follow-Up Times: One, six, and twelve months after the COVID-19 outbreak. 	<ul style="list-style-type: none"> • Outcomes: Study examined results for depression, anxiety, PTSD, and fatigue. <ul style="list-style-type: none"> ○ At six months: <ul style="list-style-type: none"> ▪ 94 (44%) patients self-rated in the clinical range in at least one psychopathological dimension. ○ At 12 months: 	<ul style="list-style-type: none"> • Risk Factors: The following factors were reported: <ul style="list-style-type: none"> ○ The following groups exhibit increased scores in all the psychopathological domains: <ul style="list-style-type: none"> ▪ Females; and ▪ Patients with a positive psychiatric history. ○ <i>Sex and Time:</i> There was an interaction effect of sex 	<ul style="list-style-type: none"> • None reported.⁸⁷

^g The estimated glomerular filtration rate (eGFR) is a calculation used to estimate how well kidneys are filtering certain agents produced by the body, such as creatinine (a waste product that comes from the normal wear and tear on muscles), and cystatin C (a protein that slows down the breakdown of other protein cells ([National Kidney Foundation, n.d.](#))).

^h Major adverse kidney event [MAKE] was defined as estimated glomerular filtration rate decline ≥50%, end stage kidney disease, or all-cause mortality ([Bowe et al., 2021](#)).

Jurisdiction, Number of Participants, and Study Type	Objective, Population, Follow-up Time	Reported Outcomes	Risk Factors	Health Care Utilization
		<ul style="list-style-type: none"> ▪ 86 (45%) patients self-rated in the clinical range in at least one psychopathological dimension; ▪ 63 (33%) patients experienced pathological fatigue. 	<p>and time was observed for depression ($F = 8.63, p < 0.001$) and anxiety ($F = 5.42, p = 0.005$).</p> <ul style="list-style-type: none"> ▪ Males showed a significant increasing trend of depression and anxiety symptoms; and ▪ Females showed a decreasing trend of depression anxiety symptoms. 	

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