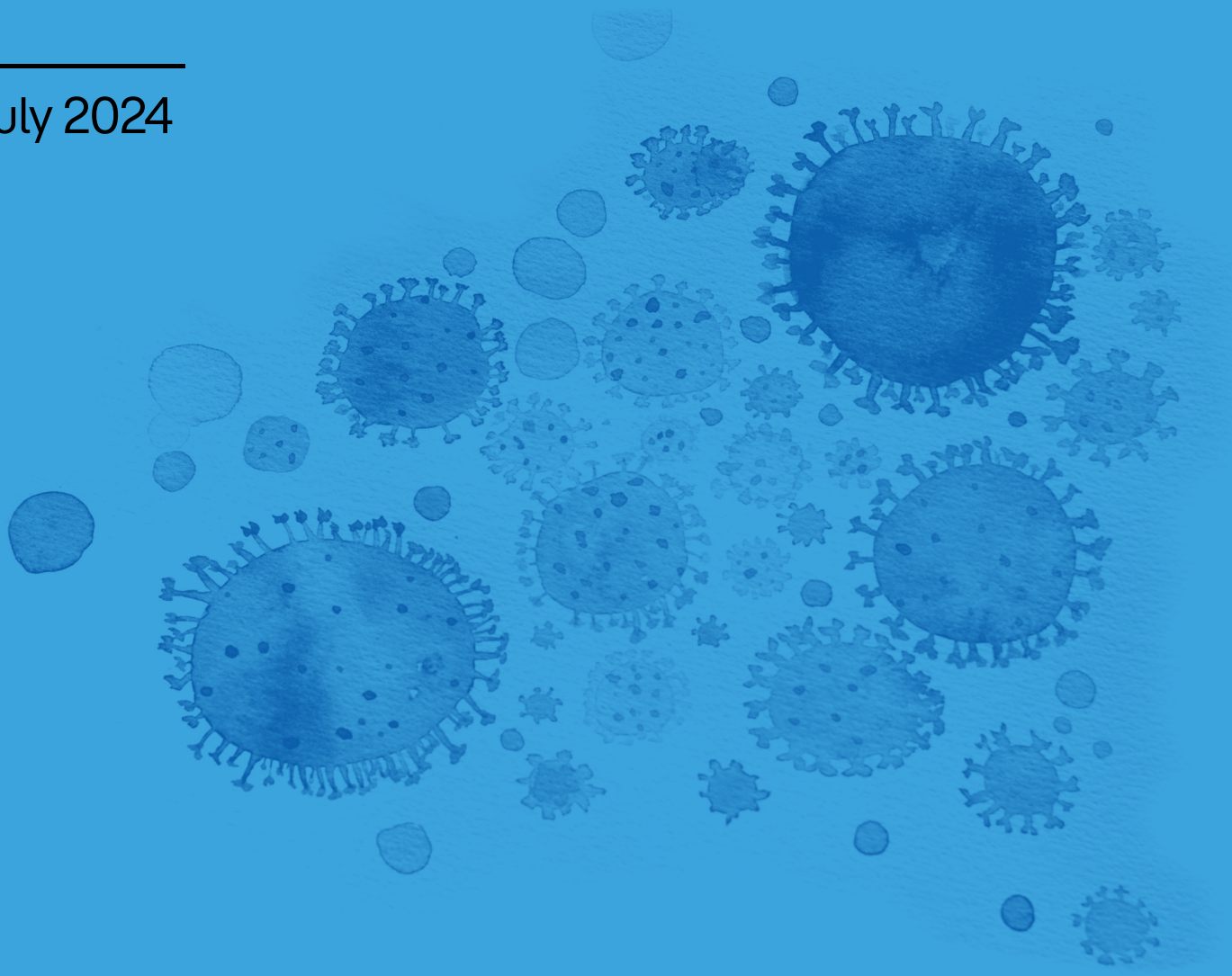
NIHR Policy Research Programme Reviews Facility

Supporting national policy development and implementation

Reviews on Long COVID

A scope of the literature: update

July 2024



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Reviews on Long COVID: A scope of the literature. Update July 2024

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Summary

- For this update, we identified 33 published reviews and 43 review protocols for Long COVID.
- The number of reviews (n=33) is fewer than in April 2024 (n=36), January 2024 (n=42), and October 2023 (n=46), but more than in July 2023 (n=31).
- The largest category of reviews focused on treatment or rehabilitation (13/33), whereas the prevalence of symptoms or effects (n=7, for this update) was the largest category within all previous reports.
- We identified four reviews on risk factors with or without prevalence, three on pathobiology or mechanisms, and two on prevention; the other four were on treatment with: prevalence (n=2), prevention (n=1), or risk factors (n=1).
- We identified fewer protocols (n=43) than in the previous update (April 2024, n=63) and July 2023 (n=53), but a similar number to January 2024 (n=42) and October 2023 (n=44).
- As in previous reports, the largest two categories of protocols focused on the prevalence of symptoms or effects (16/43), and treatment or rehabilitation (11/43).
- Six protocols were focused on risk factors with or without prevalence, and four were on prevention; these numbers are similar to those in previous reports. Three protocols were on experiences of Long COVID with or without prevalence, and three protocols were on pathobiology; pathobiology and treatment; and prevalence and treatment.

Introduction

This is the tenth update (eleventh report) in an ongoing series of quarterly evidence scans, for published and ongoing systematic reviews related to Long COVID, requested by the Department of Health and Social Care. The last update covered the period from January to April 2024.[1]

For the current update, we identified systematic reviews and review protocols focused on Long COVID that were published between early April and early July 2024. Long COVID was conceptualised broadly as any symptoms or effects that persist or develop after acute COVID-19 infection.

Methods

Identification of reviews

The Cochrane Database of Systematic Reviews (CDSR; via Wiley) and Epistemonikos were searched to identify reviews about Long COVID. In addition, MEDLINE (via Ovid) and CINAHL (via EBSCO) were searched with retrieval limited to systematic reviews.[2,3] The searches took place on 2nd July, 2024 and were limited by date to capture those records added to the databases since the last searches in April 2024. No language restrictions were applied. A further search of PROSPERO was undertaken, by the review team, up to the 3rd July, 2024 to

[1] Khouja C, Raine G, Harden M, Sutcliffe K, Sowden A (2024) Reviews on Long COVID: A scope of the literature. Update April 2024. London: EPPI Centre, UCL Social Research Institute, UCL Institute of Education, University College London.

[2] Navarro-Ruan T, Haynes RB. Preliminary comparison of the performance of the National Library of Medicine's systematic review publication type and the sensitive clinical queries filter for systematic reviews in PubMed. J Med Libr Assoc. 2022;110:43-46.

[3] Booth A. Chapter 3: Searching for Studies. In: Noyes J, Booth A, Hannes K, Harden A, Harris J, Lewin S, Lockwood C (editors), Supplementary Guidance for Inclusion of Qualitative Research in Cochrane Systematic Reviews of Interventions. Version 1 (updated August 2011). Cochrane Collaboration Qualitative Methods Group, 2011.

identify any new ongoing reviews. Due to the rapid nature of the project, the database searches were designed to balance the need to retrieve as many relevant systematic reviews as possible against the limited time available for screening. The search strategies can be found in Appendix 1 (page 22).[4]

Study selection

To be included, reviews needed to have a primary focus on Long COVID (however conceptualised and defined) and be systematic in nature. A review was considered systematic if it reported some search terms and inclusion criteria, as well as the number of references found and studies included, and identified or referenced the included studies. Reviews could focus on adults and/or children and include primary studies of any design or other reviews (i.e., reviews of reviews). We did not apply criteria relating to the length of time after infection owing to variation in how Long COVID has been defined in the literature. Reviews were only included if the full text was readily available, and we excluded pre-prints. Titles and abstracts were screened by one reviewer; two reviewers screened the full text of each retrieved paper.

Key findings

From the database searches, 789 records were identified in total, and after duplicates were removed, 392 records were screened in EPPI-reviewer.[5] From PROSPERO, we identified 166 and screened 161 records, after duplicates were removed. We included **33 published reviews and 43 protocols for ongoing reviews**. The flowchart of studies is shown in Appendix 2, page 29. Table 1 provides a summary of all reviews identified for this update by focus. The full reference and aim or research questions for each included review are provided on pages 8 to 14, and for the protocols on pages 14 to 21. Table 2 (Appendix 3, page 30) provides a summary of the reviews identified across all 11 reports we have produced to date.

Table 1: Summary of reviews (April to July 2024)

Review status Primary focus	Systematic review	Review of reviews	Living review	Evidence Map
Published reviews (n=33)				
Treatment or rehabilitation	12			1
Treatment or rehabilitation and prevention	1			
Prevention	2			
Prevalence of symptoms or effects	7			
Prevalence, and treatment	2			
Risk factors +/- prevalence	3	1		
Risk factors +/- prevalence, and treatment	1			
Pathobiology or mechanisms	3*	1*		
Protocols - ongoing reviews (n=43)				
Treatment or rehabilitation	11			
Prevention	3		1	
Prevalence of symptoms or effects	15	1		
Prevalence, and treatment	1			
Risk factors +/- prevalence, and Prevention	6			
Pathobiology or mechanisms	1			

[4] Due to resource limitations and speed of the review, we have not searched the Long COVID living map which may include further relevant systematic reviews.

[5] Thomas, J., Graziosi, S., Brunton, J., Ghouze, Z., O'Driscoll, P., Bond, M. & Koryakina, A. (2023) EPPI-Reviewer: advanced software for systematic reviews, maps and evidence synthesis. EPPI Centre, UCL Social Research Institute, University College London.

Pathobiology or mechanisms and treatment	1			
Experiences with or without prevalence	3			

* One publication included both a review of reviews and a standard systematic review

Published reviews

The number of systematic reviews identified for this update (n=33) was fewer than the previous update in April 2024 (n=36), and the update in January 2024 (n=42), but more than the same quarter last year, July 2023 (n=31). All these reports were based on the same databases and search strategy.

Treatment or rehabilitation (n=13)

Thirteen reviews focused solely on treatment or rehabilitation. This is the largest category of reviews in this update, and more than in any of our previous reports (for example, April 2024, n=5; January 2024, n=7; October 2023, n=11; and July 2023, n=5). The largest number in previous reports was 11 in both October 2023 and April 2022.

One review was an update to an evidence map of reviews on treatments for Long COVID (#1 Ostolin, et al., 2023). An earlier update to this map was included in our April 2023 report. One review was on models of care for Long COVID (#5 Chou, et al., 2024); we also identified a second publication (a longer report) for this review paper. Of the remaining 11 reviews, one was on both treatment and rehabilitation interventions, specifically for brain fog (#8 Gorenshtein, et al., 2024), six were on rehabilitation only, and four were on treatments only.

Three of the six rehabilitation reviews were specifically on respiratory or pulmonary rehabilitation (#3 Calvache-Mateo, et al., 2024; #6 Dalko, et al., 2024; and #12 Ortiz-Ortigosa, et al., 2024); the review by Dalko and colleagues focused on virtual reality to assist respiratory rehabilitation. Two of the six reviews were on non-specific exercise rehabilitation, for fatigue in patients with or without post-exertional malaise (#7 Gloeckl, et al., 2024), or for fitness (#11 Nantakool, et al., 2024). The last of the six reviews was on telerehabilitation for various fitness measures and quality of life in both COVID and Long COVID patients (#10 Martins, et al., 2024).

Two of the four treatment reviews were on specific treatments for any Long COVID symptoms. These were on Qigong, (a Chinese movement and meditation intervention, #2 Antonelli and Donelli, 2024), and hyperbaric oxygen therapy (#13 Wu, et al., 2024). The other two reviews were on specific treatments for specific symptoms. These were on traditional, complementary or integrative medicine for fatigue (#4 Chen, et al., 2024), and platelet-rich plasma for olfactory dysfunction (#9 Maniaci, et al., 2024).

Treatment or rehabilitation, and prevention (n=1)

One review focused on both treatment and prevention. This review was on various vitamin supplements to prevent or manage both COVID and Long COVID (#14 Sinopoli, et al., 2024). Only one included study was on Long COVID, and it covered vitamin D to prevent Long COVID.

Prevention (n=2)

Two reviews focused solely on prevention. This was a similar number to those in the previous two reports (April 2024, n=1; and January 2024, n=3).

One of the reviews was on antiviral drugs during COVID illness to prevent Long COVID (#16 Jiang, et al., 2024). The other was on vaccination to prevent Long COVID in children and adolescents (#15 Gutfreund, et al., 2024). There are now 11 reviews that focus on vaccination to prevent Long COVID, across all reports to date.

Prevalence of symptoms or effects (n=7)

Seven reviews focused solely on the prevalence of symptoms or effects. While this is the second largest category of reviews in this update (treatment being the largest), it is the fewest reviews on this topic compared with all reports to date. The lowest number in any previous report was 16 in July 2023; numbers over the past year were April 2024, n=21; January 2024, n=18; October 2023, n=20; and July 2023, n=16. Prevalence was the largest category of reviews across all earlier reports.

Two reviews were on the prevalence of any Long COVID symptoms (#17 Barilaite, et al., 2024; and #18 da Silva Brilhante, et al., 2024). The other four were on specific symptoms, including memory problems (#19 Martins, et al., 2024), cognitive impairment (#20 Panagea, et al., 2024), loss of smell and taste (#21 Passos, et al., 2024), cardiovascular abnormalities in athletes (#22 Tsampasian, et al., 2024), and atrial fibrillation (#23 Zuin, et al., 2024).

Prevalence of symptoms or effects, and treatment or rehabilitation (n=2)

Two reviews were on both prevalence and treatment or rehabilitation. One was on heterotopic ossification (developing bone in soft tissues; #24 Chaitani, et al., 2024), and the other was on new daily persistent headache during and after COVID infection (#25 Dhiman, et al., 2024).

Risk factors with or without prevalence of symptoms or effects (n=4)

Four reviews focused on risk factors for Long COVID and its prevalence, or just risk factors. This is almost the same as the previous report (April 2024, n=5), fewer than in January 2024 (n=9) and the same quarter last year (July 2023, n=6), but more than in October 2023 (n=1).

One of the four was a review of reviews of observational studies on any risk factors and the prevalence of Long COVID (#26 Hua, et al., 2024). The other three were standard systematic reviews. One was on any risk factors for Long COVID (#29 Muley, et al., 2024). The other two focused on risk factors for cognitive symptoms (#27 Austin, et al., 2024), and neurological and psychiatric symptoms (#28 Knapp, et al., 2024).

Risk factors with or without prevalence of symptoms or effects, and treatment (n=1)

One review was on both treatment and risk factors. This review focused on the prevalence, risk factors and treatments for dysphonia and other voice alterations after COVID infection (#30 Espina Gonzalez, et al., 2024).

Pathobiology or mechanisms (n=3)

Three reviews were on pathobiology or the mechanisms of Long COVID. This is a similar number to the previous two reports (April 2024, n=2; and January 2024, n=2), fewer than October 2023 (n=6), and more than the same quarter last year (July 2023, n=1).

One of the reviews comprised both a review of reviews and a standard systematic review on the pathophysiological mechanisms of Long COVID (#31 Diar, et al., 2024). The other two were standard systematic reviews that focused on sex-specific transcriptome alterations (#32 Rusu, et al., 2024), and electroencephalography (EEG) findings, comparing brain changes in Long COVID with those in fibromyalgia, and chronic fatigue syndrome (#33 Silva-Passadouro, et al., 2024).

Protocols - ongoing reviews (n=43)

We identified 43 protocols for ongoing reviews, which was fewer than the April 2024 report (n=61), but a similar number to the previous two reports (January 2024, n=41; October 2023, n=41). The number in this update was fewer than the same quarter last year (July 2023, n=52).

As in previous reports, most of the protocols focused on the prevalence of symptoms or effects (n=16), or treatment or rehabilitation (n=11). The remaining protocols were on risk factors (n=6), prevention (n=4), pathobiology (n=1), prevalence and treatment (n=1), pathobiology and treatment (n=1), and experiences of Long COVID with or without prevalence of symptoms or effects (n=3).

Treatment or rehabilitation (n=11)

Eleven protocols for ongoing reviews were on treatment or rehabilitation. This was fewer than in the previous report (April 2024, n=20) and the same quarter last year (July 2023, n=26), but similar to January 2024 (n=13), and more than October 2023 (n=8).

Four protocols were on rehabilitation. One was on the short and long-term effects of pulmonary rehabilitation to improve lung function (#35 Chakraverty, et al., 2024). One focused on remote monitoring of respiratory rehabilitation to improve quality of life (#34 Cayrol and Viana, 2024). The other two focused on improvements in quality of life and physical function, using exercise and respiratory rehabilitation (#40 Longlalerng and Khuna, 2024), or randomised controlled trials of physical training modes (#37 Ferrari, et al., 2024).

Five protocols were on treatments. Two were on hyperbaric oxygen therapy; one for Long COVID in general (#38 Li, et al., 2024), and the other specifically for cognitive dysfunction (#39 Liau and Nundy, 2024). The other three protocols were on medications for lung fibrosis (#43 Shu, et al., 2024); aromatherapy for olfactory dysfunction (#44 Silva dos Santos and dos Santos Oliveira, 2024); and arts therapies for brain fog (#41 Luo, et al., 2024).

Two protocols covered both rehabilitation and treatment. One was on any intervention for improving functional outcomes for people with Long COVID (#42 Sharma, et al., 2024). The other was on non-drug interventions for people with Long COVID aged 13 to 25 years (#36 Choi, et al., 2024).

Prevention (n=4)

Four protocols focused on prevention; two were on vaccination (#46 Anadon, et al., 2024, and #47 Luo, et al., 2024). The other two protocols were for treatments during COVID-19 illness to prevent Long COVID. One was for a living systematic review on nirmatrelvir-ritonavir (#45 Srisurapanont, et al., 2024). The other was on antivirals, corticosteroids, and monoclonal antibodies (#48 Sun, et al., 2024). The number of protocols on prevention was similar to the previous four reports (April 2024, n=3; January 2024, October 2023, and July 2023, all n=2).

Prevalence of symptoms or effects (n=16)

Sixteen protocols were for reviews of the prevalence of symptoms or effects. This is fewer than in the April 2024 (n=24) and October 2023 (n=22) reports, but more than in the January 2024 (n=14), and July 2023 (n=12) reports.

One of the protocols was for a review of reviews on sexual health after COVID-19 (#49 Zhu, et al., 2024). The remaining protocols were for standard systematic reviews or scoping reviews.

Five protocols were on any Long COVID symptoms, in specific populations or over time. Four of these were on symptoms in patients in Africa (#51 Ansah, et al., 2024); in patients infected with the Omicron variant (#63 Wang, et al., 2024); in healthcare workers (#58 Pereira and Gomes da Silva Ferreira, 2024); and in adults and the elderly, comparing symptoms with the sequelae of other respiratory viruses (#59 Pinto, et al., 2024). The fifth protocol was on the changes in symptoms over time (#56 Hu, et al., 2024).

Ten protocols focused on specific Long COVID symptoms, groups of symptoms or diagnoses. Two had a respiratory or cardiopulmonary focus; one was on lung function (#64 Yoon, et al., 2024), and the other was on change in VO_2max in athletes (#60 Procyk and Kasiak, 2024). One protocol focused on fatigue (#61 Soto Guerrero, et al., 2024); and one was on cognitive or neurological symptoms (#53 Crubelati, et al., 2024). Two protocols had a focus on musculoskeletal symptoms; one was on necrotising osteomyelitis of the jaw (#52 Canfora and Vardas, 2024), and the other was on bone mineral density, bone biomarkers and joints, comparing symptoms with those in the acute phase of illness (#50 Alghamdi, et al., 2024). One protocol was on balance problems in post-viral illness, including Long COVID, with a subgroup analysis planned by virus type (#57 McGrath, et al., 2024). The remaining three protocols were on diagnoses of cholangiopathy (#54 Ferreira de Almeida e Borges, et al., 2024), inflammatory bowel disease (#55 Hadjivasilis, et al., 2024), or diabetes (#62 Talanki, et al., 2024) after COVID-19.

Prevalence of symptoms or effects, and treatment (n=1)

One protocol was on rehabilitation interventions and the prevalence of malaise after exertion, in Long COVID patients (#65 Bobos, et al., 2024).

Risk factors with or without prevalence of symptoms or effects (n=6)

Six protocols were for reviews of risk factors with or without prevalence of symptoms for Long COVID. This is the same number of protocols as in last year's July and October 2023 reports; one fewer than the January 2024 report (n=7); and two fewer than the April 2024 report (n=8).

One protocol was on any risk factors and the incidence of any Long COVID symptoms (#71 Xu, et al., 2024). Two protocols were on any risk factors for specific symptoms; cognitive symptoms (#68 Monteiro, et al., 2024), and cardiovascular symptoms (#69 Mozafary Bazargany, et al., 2024). The remaining three protocols were on specific risk factors for any Long COVID symptoms; the persistence of virus in tissues (#66 Dai and Huang, 2024), smoking (#67 Li, et al., 2024), and sociodemographic, clinical and immune factors (#70 Nguepou Tchopba, et al., 2024).

Pathobiology or mechanisms (n=1)

One protocol was on pathobiology or mechanisms of Long COVID. The numbers of protocols on pathobiology have varied over the past four reports, but remained few, with four in April 2024, one in January 2024, none in October 2023, and three in July 2023.

The protocol in this update was on biomarkers, and the potential for drug discovery for Long COVID (#72 Baalbaki, et al., 2024).

Pathobiology and treatment (n=1)

One protocol was for a review on biomarkers and optimal management for Long COVID in sub-Saharan Africa (#73 Kengni Ngueko, et al., 2024).

Experiences with or without prevalence of symptoms or effects (n=3)

Three protocols were on the experiences of Long COVID patients with or without the prevalence of symptoms or effects (#74 George and Devakirupai, 2024; #75 Potter, et al., 2024; and #76 Seesawang and Thongtaeng, 2024); one of these was for a mixed-methods review on the experiences of Long COVID in older adults with chronic illness, including the prevalence of symptoms (#76 Seesawang and Thongtaeng, 2024).

1) Published Reviews (n=33)

Treatment/rehabilitation (n=13)

Evidence map (review of reviews and an update, also in the April 2023 report)

1. Ostolin TLVDP, Miranda RA da R, Abdala CVM. Mapa de evidências sobre sequelas e reablitação da COVID-19 pós-aguda: uma versão atualizada em julho de 2022. *Pan American Journal of Public Health / Revista Panamericana de Salud Pública* 2023;47:30. doi: https://doi.org/10.26633/RPSP.2023.30

Review aim: *To update the evidence map on the effects of interventions for post-acute COVID-19 rehabilitation*.

Standard systematic reviews

2. Antonelli M, Donelli D. Evaluating qigong as integrative support for COVID-19 and Long-COVID-19 rehabilitation: a systematic review. *Frontiers in Psychology* 2024;15:1403130. doi: https://dx.doi.org/10.3389/fpsyg.2024.1403130

Review aim: *To investigate the potential of Qigong, an ancient Chinese practice characterised by gentle movements, controlled breathing, and meditative elements, in the management and rehabilitation of COVID-19 and Long-COVID patients*.
NB Section on Long COVID

3. Calvache-Mateo A, Reychler G, Heredia-Ciuro A, et al. Respiratory training effects in Long COVID-19 patients: a systematic review and meta-analysis. *Expert Review of Respiratory Medicine* 2024;18:207-17. doi: https://dx.doi.org/10.1080/17476348.2024.2358933

Review aim: *To analyze the effects of respiratory training for patients with Long COVID-19, on their respiratory muscle strength, lung function, dyspnea, and functional capacity*.

4. Chen XY, Lu CL, Wang QY, et al. Traditional, complementary and integrative medicine for fatigue post COVID-19 infection: a systematic review of randomized controlled trials. *Integrative Medicine Research* 2024;13:101039. doi: https://dx.doi.org/10.1016/j.imr.2024.101039

Review aim: *To evaluate the efficacy and safety of Traditional, Complementary and Integrative Medicine for fatigue*.

5. Chou R, Herman E, Ahmed A, et al. Long COVID Definitions and models of care: a scoping review. *Annals of Internal Medicine* 2024;21:21. doi: https://dx.doi.org/10.7326/M24-0677

Review aim: *To perform a scoping review on definitions of Long COVID and provide an overview of care models, including a proposed framework to describe and distinguish models*.

Linked publication – full report: Chou R, Dana T, Ahmed AY, et al. Long COVID Models of Care. Technical Brief No. 45. (Prepared by the Pacific Northwest Evidence-based Practice Center under Contract No. 75Q80120D00006.) AHRQ Publication No. 23-EHC024. Rockville, MD: Agency for Healthcare Research and Quality; April 2024. doi: https://doi.org/10.23970/AHRQEPCTB45.

6. Dalko K, Elsuson HA, Kalter I, et al. Virtual reality applications for the implementation of domestic respiratory rehabilitation programs for patients with Long COVID and post-COVID condition: scoping review. *JMIR Serious Games* 2024;12:e52309. doi: https://dx.doi.org/10.2196/52309

Review aim: *To provide an overview of existing scientific evidence on the development and implementation of virtual-reality-assisted respiratory rehabilitation programmes for patients with Long COVID and post-COVID condition and to synthesise the results.*

7. Gloeckl R, Zwick RH, Furlinger U, et al. Practical recommendations for exercise training in patients with Long COVID with or without post-exertional malaise: a best practice proposal. *Sports Medicine - Open* 2024;10:47. doi: https://dx.doi.org/10.1186/s40798-024-00695-8

Review aim: *To develop practical exercise training recommendations for individuals with Long COVID, depending on the presence and severity of post-exertional malaise (PEM).*

8. Gorenshtein A, Liba T, Leibovitch L, et al. Intervention modalities for brain fog caused by Long-COVID: systematic review of the literature. *Neurological Sciences* 2024;45:2951-68. doi: https://dx.doi.org/10.1007/s10072-024-07566-w

Review aim: *To explore the effects of different intervention types on brain fog symptoms in those suffering from Long COVID.*

9. Maniaci A, Lavalle S, Masiello E, et al. Platelet-rich plasma (PRP) in the treatment of Long COVID olfactory disorders: a comprehensive review. *Biomedicines* 2024;12:05. doi: https://dx.doi.org/10.3390/biomedicines12040808

Review aim: *To evaluate the effectiveness of platelet-rich plasma (PRP) therapy in ameliorating olfactory dysfunction (OD), when associated with long-term COVID-19.*

10. Martins RL, Monteiro E, de Lima AMJ, et al. Effect of telerehabilitation on pulmonary function, functional capacity, physical fitness, dyspnea, fatigue, and quality of life in COVID-19 patients: a systematic review and metanalysis. *Telemedicine Journal & E Health* 2024;26:26. doi: https://dx.doi.org/10.1089/tmj.2023.0653

Review aim: *To demonstrate the technological means used to offer telerehabilitation and to evaluate the effect of physical exercise on the population affected by COVID-19.*
NB Section on Long COVID

11. Nantakool S, Sa-Nguanmoo P, Konghakote S, Chuatrakoon B. Effects of exercise rehabilitation on cardiorespiratory fitness in Long-COVID-19 survivors: a meta-analysis. *Journal of Clinical Medicine* 2024;13:20. doi: https://dx.doi.org/10.3390/jcm13123621

Review aim: *To systematically summarise and synthesise whether exercise rehabilitation improves cardiorespiratory fitness among Long-COVID-19 survivors.*

12. Ortiz-Ortigosa L, Galvez-Alvarez P, Vinolo-Gil MJ, et al. Effectiveness of pulmonary rehabilitation programmes and/or respiratory muscle training in patients with post-COVID conditions: a systematic review. *Respiratory Research* 2024;25:248. doi: https://dx.doi.org/10.1186/s12931-024-02857-4

Review aim: *To assess the effectiveness of pulmonary rehabilitation programmes and/or respiratory muscle training on respiratory sequelae in patients with post-COVID condition.*

13. Wu BQ, Liu DY, Shen TC, et al. Effects of hyperbaric oxygen therapy on Long COVID: a systematic review. *Life* 2024;14:26. doi: https://dx.doi.org/10.3390/life14040438

Review aim: *To investigate the clinical efficacy and utility of hyperbaric oxygen therapy (HBOT) for treating Long COVID.*

Treatment and prevention (n=1)

Standard systematic review

14. Sinopoli A, Sciurti A, Isonne C, et al. The efficacy of multivitamin, vitamin A, vitamin B, vitamin C, and vitamin D supplements in the prevention and management of COVID-19 and Long-COVID: an updated systematic review and meta-analysis of randomized clinical trials. *Nutrients* 2024;16:29. doi: https://dx.doi.org/10.3390/nu16091345

Review aim: *To evaluate the efficacy of any vitamin administration(s) in preventing and managing COVID-19 and/or Long COVID.*
NB Section on Long COVID

Prevention (n=2)

Standard systematic review

15. Gutfreund MC, Kobayashi T, Callado GY, et al. The effectiveness of the COVID-19 vaccines in the prevention of post-COVID conditions in children and adolescents: a systematic literature review and meta-analysis. *Antimicrobial Stewardship & Healthcare Epidemiology: ASHE* 2024;4:e54. doi: https://dx.doi.org/10.1017/ash.2024.42

Review aim: *To conduct a systematic literature review and meta-analysis on the effectiveness of COVID-19 vaccines to prevent post-COVID conditions in children and adolescents.*

16. Jiang J, Li Y, Jiang Q, et al. Early use of oral antiviral drugs and the risk of post COVID-19 syndrome: a systematic review and network meta-analysis. *Journal of Infection* 2024;89:106190. doi: https://dx.doi.org/10.1016/j.jinf.2024.106190

Review aim: *To determine the association of early use of oral antiviral drugs (including nirmatrelvir-ritonavir and molnupiravir) with the risk of post-COVID condition and compare the possible efficacy of nirmatrelvir-ritonavir and molnupiravir.*

Prevalence of symptoms and effects (n=7)

Standard systematic reviews

17. Barilaite E, Watson H, Hocaoglu MB. Understanding patient-reported outcome measures used in adult survivors experiencing long-term effects after COVID-19 infection: a rapid review. *Journal of Patient-Centered Research & Reviews* 2024;11:36-50. doi: https://dx.doi.org/10.17294/2330-0698.2041

Review aim: *To explore which patient-reported outcome measures (PROMs) are used in Long COVID patients and to discuss the psychometric properties of the PROMs.*

18. da Silva Brilhante M, de Almeida Corrêa Carla R, de Mattos M, et al. Síndrome pós-COVID-19: uma revisão integrativa. *Enfermagem Atual in Derme* 2024;98:1-18. doi: https://doi.org/10.31011/reaid-2024-v.98-n.1-art.2129

Review aim: *To identify the literature on post-COVID-19 syndrome, and describe its prevalence and main clinical manifestations*.

19. Martins WRM, Cardoso TV, Oliveira AL, et al. Long COVID-19 and mnemonic effects: an integrative literature review. *Revista Da Associacao Medica Brasileira* 2024;70:e20231211. doi: https://dx.doi.org/10.1590/1806-9282.20231211

Review aim: *To compose a core of integrated knowledge about the effects of Long COVID-19 on memory*.

20. Panagea E, Messinis L, Petri MC, et al. Neurocognitive impairment in Long COVID: a systematic review. *Archives of Clinical Neuropsychology* 2024;08:08. doi: https://dx.doi.org/10.1093/arclin/acae042

Review aim: *To investigate the cognitive profile of patients with Long COVID syndrome*.

21. Passos JDC, Borges YS, Laureano HA, et al. The long-term loss of smell and taste in COVID-19 patients - a systematic review and meta-analysis. *ABCS Health Sciences* 2024;49:e024302. doi: https://doi.org/10.7322/abcshs.2022057.2114

Review aim: *To synthesise and analyse the existing evidence on monitoring of loss of sense of smell and taste in COVID-19 patients, and for how long symptoms persist after the virus is no longer active in the organism*.

22. Tsampasian V, Androulakis E, Catumbela R, et al. Prevalence of abnormal cardiovascular magnetic resonance findings in athletes recovered from COVID-19 infection: a systematic review and meta-analysis. *Journal of Clinical Medicine* 2024;13:03. doi: https://dx.doi.org/10.3390/jcm13113290

Review aim: *To evaluate the prevalence of abnormal cardiovascular magnetic resonance (CMR) findings in elite athletes recovered from COVID-19 infection*.

23. Zuin M, Ojeda-Fernandez L, Torrigiani G, et al. Risk of incident atrial fibrillation after COVID-19 infection: a systematic review and meta-analysis. Heart Rhythm 2024;16:16. doi: https://dx.doi.org/10.1016/j.hrthm.2024.04.064

Review aim: *To assess the risk of incident atrial fibrillation (AF) in COVID-19 recovered patients by performing a systematic review and meta-analysis of the available data*.

Prevalence of symptoms or effects, and treatment or rehabilitation (n=2)

Standard systematic reviews

24. Chaitani H, Fabeck L, Koulischer S. Heterotopic ossification following COVID-19 infections: systematic literature review of case reports and case series. *BMC Musculoskeletal Disorders* 2024;25:421. doi: https://dx.doi.org/10.1186/s12891-024-07537-4

Review aim: *To study the clinical characteristics, diagnostic results, treatments, and outcomes in patients with heterotopic ossification following COVID-19 infection*.

25. Dhiman NR, Joshi D, Singh R, et al. Post-COVID-19 headache - NDPH phenotype: a systematic review of case reports. *Frontiers in Pain Research* 2024;5:1376506. doi: https://dx.doi.org/10.3389/fpain.2024.1376506

Review aim: *To discuss case reports of post-COVID-19 headache - new daily persistent headache (NDPH) phenotype - both after and in the course of COVID-19 infection.*

Risk factors with or without prevalence of symptoms or effects (n=4)

Review of reviews

26. Hua MJ, Butera G, Akinyemi O, et al. Biases and limitations in observational studies of Long COVID prevalence and risk factors: a rapid systematic umbrella review. *PLoS ONE* 2024;19:e0302408. doi: https://dx.doi.org/10.1371/journal.pone.0302408

Review aim: *To synthesise estimates of Long COVID prevalence and risk factors, as well as biases and limitations in the primary and review literatures.*

Standard systematic reviews

27. Austin TA, Thomas ML, Lu M, et al. Meta-analysis of cognitive function following non-severe SARS-CoV-2 infection. *Neuropsychology Review* 2024;12:12. doi: https://dx.doi.org/10.1007/s11065-024-09642-6

Review aim: *To describe objective cognitive impairment in individuals with non-severe (mild or moderate) SARS-CoV-2 cases in the post-acute stage of infection.*

28. Knapp SAB, Austin DS, Aita SL, et al. Neurocognitive and psychiatric outcomes associated with postacute COVID-19 infection without severe medical complication: a meta-analysis. *Journal of Neurology, Neurosurgery & Psychiatry* 2024;24:24. doi: https://dx.doi.org/10.1136/jnnp-2024-333950

Review aim: *To meta-analyse observational research comparing cross-sectional neurocognitive outcomes in adults with COVID-19 (without severe medical/psychiatric comorbidity) to healthy controls or norm-referenced data. A secondary aim was to explore potential psychiatric, fatigue and infection severity moderating variables.*

29. Muley A, Mitra S, Bhaliya B, et al. A systematic review and meta-analysis to identify risk factors for developing Long COVID-19. *Journal of the Association of Physicians of India* 2024;72:68-74. doi: https://dx.doi.org/10.59556/japi.72.0528

Review aim: *To identify the risk factors of long coronavirus disease 2019 (COVID-19) to provide insight for selecting cases for more aggressive monitoring and treatment after COVID-19 infection and reduce morbidity due to Long COVID-19.*

Risk factors with or without prevalence, and treatment (n=1)

30. Espina González C, Núñez Batalla F, Mackers Iglesias P, et al. Dysphonia and other voice alterations associated with COVID-19: Systematic review. *Acta Otorrinolaringologica Espanola* 2024;24. doi: https://dx.doi.org/10.1016/j.otoeng.2024.02.005

Review aim: *To establish which are the most frequent vocal manifestations among patients in both the acute phase of COVID-19 and in the sequelae phase or post-COVID-19 syndrome; secondly, to detail the subjective perception regarding voice changes in these patients; and thirdly, to study the causes derived from the disease itself, or from the treatments required to alleviate it, that have caused these vocal manifestations, as well as analysing the therapeutic options described in these patients.*

Pathobiology or mechanisms (n=3)

Review of reviews and Standard systematic review

31. Diar B, Smith N, Darbyshire JL, et al. Pathophysiological mechanisms in Long COVID: a mixed method systematic review. *International Journal of Environmental Research & Public Health* 2024;21:12. doi: https://dx.doi.org/10.3390/ijerph21040473

Review aim: *To conduct a review of reviews and a review of primary studies to understand the relationships between mechanisms and symptoms in Long COVID, to guide clinical management and identify potential treatment targets.*

Standard systematic reviews

32. Rusu EC, Monfort-Lanzas P, Bertran L, et al. Towards understanding post-COVID-19 condition: a systematic meta-analysis of transcriptomic alterations with sex-specific insights. *Computers in Biology & Medicine* 2024;175:108507. doi: https://dx.doi.org/10.1016/j.compbiomed.2024.108507

Review aim: *To shed light on the transcriptomic landscapes and sex-specific molecular dynamics intrinsic to the post-COVID condition.*

33. Silva-Passadouro B, Tamasauskas A, Khoja O, et al. A systematic review of quantitative EEG findings in fibromyalgia, chronic fatigue syndrome and Long COVID. *Clinical Neurophysiology* 2024;163:209-22. doi: https://dx.doi.org/10.1016/j.clinph.2024.04.019

Review aim: *To synthesise and appraise the literature on resting-state quantitative electroencephalography (qEEG) in Fibromyalgia Syndrome (FMS), Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS) and Long COVID, drawing on previous research on FMS and ME/CFS to help understand neuropathophysiology of the new condition Long COVID.*
NB Section on Long COVID

2) Protocols for ongoing reviews related to Long COVID (n=43)

Treatment or rehabilitation (n=11)

Standard systematic reviews

34. Cayrol and Viana. Effects of telemonitorized respiratory rehabilitation programs on health-related quality of life in adults with post-acute COVID-19 syndrome: systematic review. PROSPERO 2024 CRD42024533811 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024533811

Review question: How does telemonitored respiratory rehabilitation impact health-related quality of life on adults with post-COVID-19 syndrome?

35. Chakraverty, et al. Short and longer-term effects of adapted rehabilitation interventions in people with Long COVID: a systematic review. PROSPERO 2024 CRD42024535365

Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024535365

Review question: Is there a short- or long-term effect of adapted pulmonary rehabilitation for lung disease in Long COVID patients?

36. Choi, et al. Effectiveness of non-pharmacological interventions for Long-COVID among adolescents and young adults. PROSPERO 2024 CRD42024516016 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024516016

Review question: What non-pharmacological interventions are effective in managing symptoms of Long-COVID in adolescents and young adults (13-25 years)?

37. Ferrari, et al. Summarizing the effects of different physical training modalities on functional capacity, strength outcomes and quality of life in post-COVID-19 individuals: a systematic review of randomized controlled trials. PROSPERO 2024 CRD42024555521 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024555521

Review questions: What is the impact of different physical training modalities on functional capacity, i.e., peak oxygen uptake, outcomes related to cardiopulmonary exercise testing, and oxygen desaturation in individuals with post-COVID-19 syndrome? What is the impact of different physical training modalities on the functional health outcomes, quality of life, depression symptoms, and anxiety symptoms, of individuals with post-COVID-19 syndrome?

38. Li Y, et al. Efficacy and safety of hyperbaric oxygen therapy for Long COVID: a protocol for systematic review and meta-analysis. BMJ Open 2024;14:e083868. doi: 10.1136/bmjopen-2024-083868

Review question: The aim is to better investigate the overall efficacy and safety of hyperbaric oxygen therapy (HBOT) for Long COVID.

39. Liau and Nundy. A systematic review and meta-analysis of role of hyperbaric oxygen therapy (HBOT) in post COVID-19 neurocognitive dysfunction. PROSPERO 2024 CRD42024562496 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024562496

Review question: How effective is hyperbaric oxygen therapy (HBOT) in the treatment of neurocognitive dysfunction associated with post-COVID-19 complications?

40. Longlalerng and Khuna. The effects of exercise programs on cardiopulmonary function and signs and symptoms in patients with post-COVID-19: a systemic review and meta-analysis. PROSPERO 2024 CRD42024538786 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024538786

Review question: Can exercise programs or pulmonary rehabilitation programs improve cardiorespiratory function, reduce signs and symptoms, and enhance the quality of life in patients with post-COVID-19 compared to usual care or control?

41. Luo, et al. Efficacy of arts therapies in treating Long COVID-19 brain fog: a systematic review. PROSPERO 2024 CRD42024535851 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024535851

Review question: What is the effectiveness of arts therapies in alleviating symptoms of brain fog among patients with Long- COVID-19?

42. Sharma, et al. A systematic review of interventions for improving functional outcomes in Long COVID. PROSPERO 2024 CRD42024551634 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024551634

Review question: What are the characteristics of interventions for improving functional outcomes in people living with Long COVID?

43. Shu, et al. Impact of anti-fibrotic medications on post-COVID-19 pulmonary fibrosis: a systematic review and meta-analysis. PROSPERO 2024 CRD42024552847 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024552847

Review question: What is the therapeutic impact of anti-fibrotic drugs in pulmonary fibrosis caused by COVID-19 infection?

44. Silva dos Santos and dos Santos Oliveira. Effects of aromatherapy on olfactory dysfunction in post-COVID-19 patients: a systematic review. PROSPERO 2024 CRD42024551632 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024551632

Review question: What are the effects of Aromatherapy on olfactory dysfunction in post-COVID-19 patients?

Prevention (n=4)

Living review

45. Srisurapanont, et al. Association of nirmatrelvir–ritonavir treatment during acute SARS-CoV-2 infection with post-acute sequelae of COVID-19: a living systematic review and prospective meta-analysis. PROSPERO 2024 CRD42024555924 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024555924

Review question: To explore the association of nirmatrelvir–ritonavir treatment during acute SARS-CoV-2 infection with post-acute sequelae of COVID-19.

Standard systematic reviews

46. Anadon, et al. Potential protective effect of COVID-19 vaccines from new-onset autoimmune diseases following COVID-19 infection: a systematic review and meta-analysis. PROSPERO 2024 CRD42024545323 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024545323

Review questions: What is the pooled prevalence of new-onset autoimmune disease following COVID-19 infection? Are vaccines against COVID-19, administered before COVID-19 infection, effective to prevent new-onset autoimmune disease?

47. Luo, et al. Evaluating the efficacy of various vaccine technologies against Long-COVID: a systematic review and meta-analysis. PROSPERO 2024 CRD42024563671 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024563671

Review question: How do different types of COVID-19 vaccines (mRNA, viral vector, protein subunit) influence the incidence and severity of Long-COVID symptoms in vaccinated individuals compared to each other and unvaccinated controls?

48. Sun, et al. The efficacy of antivirals, corticosteroids, and mAbs as acute COVID treatments in reducing the incidence of Long COVID. PROSPERO 2024 CRD42024539836 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024539836

Review question: To assess whether there are relationships between acute COVID treatments of antivirals, corticosteroids, and monoclonal antibodies (mAbs) and Long COVID incidence, and to evaluate effects in different populations and individual symptoms, if there are any.

Prevalence of symptoms or effects (n=16)

Review of reviews

49. Zhu, et al. Association between COVID-19 and sexual health: an umbrella review. PROSPERO 2024 CRD42024411584 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024411584

Review question: This study used an umbrella meta-analysis to explore the relationship between COVID-19 and sexual activity, seeking to summarise the evidence from published studies on the impact of the COVID-19 pandemic on sexual activity and function.

Standard systematic reviews

50. Alghamdi, et al. Bone mineral density, bone biomarkers, and joints in acute, post, and Long COVID-19: systematic review. PROSPERO 2024 CRD42024540315 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024540315

Review questions: What is the impact of SARS-CoV-2 (COVID-19) on bone mineral density (BMD) and bone turnover markers in COVID-19 patients during the acute phase, post-COVID, and Long COVID? What is the impact of SARS-CoV-2 (COVID-19) on joints in COVID-19 patients during the acute phase, post-COVID, and Long COVID and their musculoskeletal ultrasonography presentation?

51. Ansah EW, et al. Prevalence and health effects of post-COVID-19 condition in Africa: a scoping review protocol. BMJ Open 2024;14:e082519. doi: 10.1136/bmjopen-2023-082519

Review questions: What is the prevalence of post-COVID-19 condition in Africa? What are the health effects of post-COVID-19 condition in Africa?

52. Canfora and Vardas. Impact of COVID-19 disease on the development of necrotizing osteomyelitis of jaws: a systematic review 2020-2024. PROSPERO 2024 CRD42024526257 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024526257

Review question: Is there a relationship between necrotizing osteomyelitis of jaws, and SARS-CoV-2 infection?

53. Crubelati, et al. Main cognitive and neurological consequences associated with Long-COVID syndrome. PROSPERO 2024 CRD42024440572 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024440572

Review question: What are the main cognitive and neurological consequences associated with Long-COVID syndrome?

54. Ferreira de Almeida e Borges, et al. Post-COVID-19 cholangiopathy: an updated systematic review and meta-analysis. PROSPERO 2024 CRD42024536442 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024536442

Review question: How does severe COVID-19 affect the development and progression of cholangiopathy, and what are the clinical outcomes associated with this condition compared to severe COVID-19 patients who did not develop cholangiopathy, based on observational studies?

55. Hadjivasilis, et al. Incidence of inflammatory bowel disease following COVID-19 infection. PROSPERO 2024 CRD42024534916 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024534916

Review question: Does the incidence of inflammatory bowel diseases change following COVID-19 infection?

56. Hu, et al. Integrated network analysis of clusters across follow-up of post-acute COVID-19 syndrome symptom burden. PROSPERO 2024 CRD42024537825 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024537825

Review question: This study aims to investigate the changing clinical symptoms associated with different follow-up timepoints of Long-COVID and explore their interrelations.

57. McGrath, et al. Balance impairment in post viral illness, including Long COVID: a systematic review and meta-analysis. PROSPERO 2024 CRD42024557404 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024557404

Review question: What is the impact of post viral fatigue syndrome (PVFS) and Long COVID on balance, compared with that of healthy adults?

58. Pereira and Gomes da Silva Ferreira. A systematic review on post-COVID-19 sequelae in healthcare workers. PROSPERO 2024 CRD42024558930 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024558930

Review question: What post-COVID-19 sequelae persist among healthcare professionals, who have recovered from COVID-19?

59. Pinto, et al. The clinical differences between post-acute sequelae of SARS-CoV-2 and post-acute infection syndromes by respiratory virus in adults and the elderly: a systematic review. PROSPERO 2024 CRD42024560894 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024560894

Review questions: What are the most prevalent sequelae caused by SARS-CoV-2 and how do they differ from other respiratory virus in adults? What are the differences in duration of the chronic symptoms caused by SARS-CoV-2 when compared to other respiratory virus in adults?

60. Procyk and Kasiak. COACH Study: COVID-19 influence on athletic cardiopulmonary health assessed as the change in VO2max: a systematic review and meta-analysis. PROSPERO 2024 CRD42024540430 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024540430

Review question: What is the impact of past COVID-19 infection on athletes' endurance capacity, considered as the VO2max?

61. Soto Guerrero, et al. Chronic Fatigue Syndrome in Long COVID. PROSPERO 2024 CRD42024557707 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024557707

Review question: What is the prevalence of persistent symptoms associated with Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS) in Long COVID (LC) patients?

62. Talanki AS, et al. Incidence, risk, and clinical course of new-onset diabetes in Long COVID: protocol for a systematic review and meta-analysis of cohort studies. JMIR Res Protoc 2024;13:e54853 doi: 10.2196/54853 PMID: 38833277

Review question: What is the incidence of new-onset diabetes in patients with Long COVID and the excess risk compared with individuals who tested negative for COVID-19.

63. Wang, et al. Incidence of Long COVID with the Omicron strain: a meta-analysis. PROSPERO 2024 CRD42024549666 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024549666

Review question: To further clarify the incidence of COVID-19 in patients infected with the Omicron strain and the difference in incidence among different groups.

64. Yoon, et al. Improvement of pulmonary function and chest computed tomography abnormalities after COVID-19: a meta-analysis. PROSPERO 2024 CRD42024555459 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024555459

Review question: The proportion of improvement in sequelae after recovery from COVID-19, as demonstrated by pulmonary function tests or chest CT scans.

Prevalence of symptoms or effects and Treatment (n=1)

Standard systematic reviews

65. Bobos, et al. The prevalence and impact of post-exertional malaise in post-COVID-19 condition recovery: a systematic review with meta-analysis. PROSPERO 2024 CRD42024516682 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024516682

Review questions: What is the prevalence of post-exertional malaise (PEM) in patients living with post-COVID-19 condition (PCC), and the incidence of PEM as a potential adverse event triggered by rehabilitation interventions in patients with PCC? How do patients living concurrently with PCC and PEM respond to rehabilitation interventions?

Risk factors with or without prevalence of symptoms or effects (n=6)

Standard systematic reviews

66. Dai and Huang. The persistence of SARS-CoV-2 in tissues and its association with Long COVID syndrome: a systematic review and meta-analysis. PROSPERO 2024 CRD42024554268 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024554268

Review question: What is the persistence of SARS-CoV-2 in patients with Long COVID, and the association between Long COVID symptoms and SARS-CoV-2 persistence?

67. Li, et al. The association between smoking and Long COVID: a systematic review with meta-analysis. PROSPERO 2024 CRD42024547323 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024547323

Review question: Is there any association between smoking and the prevalence, duration, and severity of Long COVID?

68. Monteiro S, Dessenne C, Perquin M. Long COVID cognitive sequelae 6 months postinfection and beyond: a scoping review protocol. BMJ Open 2024;14:e084798. doi: 10.1136/bmjopen-2024-084798

Review questions: The aim of this scoping review is to map out the persistent cognitive sequelae associated with Long COVID symptomatology in adults, six months or more after infection, including patterns over time, severity as a risk factor, and the tests used.

69. Mozafary Bazargany, et al. Prevalence and predictors of cardiovascular signs and symptoms of Long COVID-19: a systematic review and meta-analysis. PROSPERO 2024 CRD42024556206 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024556206

Review questions: What is the prevalence of cardiovascular signs and symptoms in Long COVID-19? What are the predictors of cardiovascular signs and symptoms in Long COVID-19?

70. Nguepou Tchopba, et al. Socio-demographical, clinical factors, and immune profile associated to Long-COVID: a protocol for systematic review and meta-analysis. PROSPERO 2024 CRD42024539914 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024539914

Review question: What are the socio-demographical, clinical, and immunological factors associated with individuals diagnosed with Long COVID?

71. Xu, et al. Meta-analysis of the incidence and risk factors of the Long COVID. PROSPERO 2024 CRD42024541384 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024541384

Review question: This study examines the incidence and factors influencing the incidence of Long COVID.

Pathobiology or mechanisms (n=1)

Standard systematic review

72. Baalbaki, et al. The omics landscape of Long COVID: a comprehensive systematic review to advance biomarker, target and drug discovery. PROSPERO 2024 CRD42024499281 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024499281

Review question: Does an examination of various 'omics' layers, in biological samples of Long COVID patients, contribute to the understanding of pathophysiological mechanisms and the identification of potential treatable traits, based on evidence from primary studies?

Pathobiology or mechanisms and Treatment or rehabilitation (n=1)

Standard systematic review

73. Kengni Ngueko, et al. Evaluation of biomarkers and their variability in people with post Long COVID-19, towards management of Long COVID-19 in sub-Saharan Africa: a systematic review and meta-analysis protocol. PROSPERO 2024 CRD42024533085 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024533085

Review question: What are the different biomarkers of Long COVID-19, their associated factors and how can these biomarkers contribute to optimise the management of Long COVID-19 in sub-Saharan Africa?

Experiences with or without prevalence of symptoms or effects (n=3)

Standard systematic review

74. George and Devakirupai. Lived experience of COVID-19 survivors: a meta-synthesis. PROSPERO 2024 CRD42024559906 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024559906

Review questions: What are the overall experiences and the coping strategies of COVID-19 survivors after being infected with COVID-19? What are the experiences of COVID-19 survivors

on the medical care and the relationship with the health care providers at the admitted facility? What was the quarantine experience of people after getting diagnosed with COVID-19? What are the experiences and perceptions related to social, spiritual and work-related dimensions of COVID-19 survivors during the infected period? What are the post-COVID concerns of COVID-19 survivors?

75. Potter, et al. The lived experience of accessing primary healthcare services in people living with Long COVID: a systematic review protocol. PROSPERO 2024 CRD42024562613 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024562613

Review questions: What kind of symptoms do Long COVID (LC) patients face, and which primary healthcare services are accessed by populations with LC (including self-reported populations with LC)? What are the views, experiences and perspectives of people with self-reported LC accessing primary care services for their LC symptoms?

76. Seesawang and Thongtaeng. Long COVID in older adults with chronic illness: a mixed methods systematic review. PROSPERO 2024 CRD42024555100 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024555100

Review questions: What is the situation of Long COVID in older adults with chronic illnesses? What are the experiences of older adults with chronic illnesses who have Long COVID?

Appendix 1: Search strategies

MEDLINE ALL

(includes: Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE Daily and Ovid MEDLINE)
via Ovid http://ovidsp.ovid.com/
Date range: 1946 to July 01, 2024
Date searched: 2nd July 2024
Records retrieved: 290

1 Post-Acute COVID-19 Syndrome/ (3504)
2 COVID-19 post-intensive care syndrome.mp. (6)
3 COVID-19/ or SARS-CoV-2/ (274168)
4 Syndrome/ (124188)
5 Survivors/ (31681)
6 4 or 5 (155745)
7 3 and 6 (1147)
8 1 or 2 or 7 (4561)
9 ((long adj (covid$ or covid-19 or covid19 or coronavirus)) or longcovid$).ti,ab,kf,ot,bt. (5634)
10 ((post adj (covid$ or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)) or postcovid$).ti,ab,kf,ot,bt. (11362)
11 ((post acute or postacute) adj2 (covid$ or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)).ti,ab,kf,ot,bt. (1139)
12 PASC.ti,ab,kf,ot,bt. (1016)
13 (sequela$ adj6 (covid$ or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)).ti,ab,kf,ot,bt. (3128)
14 (chronic adj2 (covid$ or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)).ti,ab,kf,ot,bt. (373)
15 ((long$ term or longterm) adj3 (covid$ or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)).ti,ab,kf,ot,bt. (2598)
16 (persist$ adj6 (covid$ or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)).ti,ab,kf,ot,bt. (4760)
17 ((post discharg$ or postdischarg$) adj5 (covid$ or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)).ti,ab,kf,ot,bt. (142)
18 ((long haul$ or longhaul$) adj6 (covid$ or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)).ti,ab,kf,ot,bt. (286)
19 (surviv$ adj3 (covid$ or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)).ti,ab,kf,ot,bt. (3400)
20 (after adj (covid$ or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)).ti,ab,kf,ot,bt. (10574)
21 ((ongoing or lasting or prolonged or fluctuat$ or residual$ or continu$ or linger$) adj6 (symptom$ or effect$ or complication$ or sequela$ or syndrome or illness$ or disorder$ or dysfunction$ or impair$ or impact$ or consequence$) adj6 (covid$ or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)).ti,ab,kf,ot,bt. (3273)
22 or/9-21 (34319)
23 8 or 22 (34834)
24 systematic review.mp,pt. (351610)
25 search:.tw. (706009)
26 meta analysis.mp,pt. (310624)
27 review.pt. (3347460)
28 24 or 25 or 26 or 27 (3911300)
29 23 and 28 (5616)

30 qualitative review$.ti,ab,kf,ot,bt. (1905)
31 realist synthes$.ti,ab,kf,ot,bt. (442)
32 realist review$.ti,ab,kf,ot,bt. (769)
33 (meta-synthes$ or metasynthes$).ti,ab,kf,ot,bt. (2381)
34 (living adj2 (review$ or map$)).ti,ab,kf,ot,bt. (820)
35 pooled analysis.ti,ab,kf,ot,bt. (13720)
36 or/30-35 (19830)
37 23 and 36 (74)
38 29 or 37 (5625)
39 (202404$ or 202405$ or 202406$ or 202407$).dt. (400041)
40 38 and 39 (292)
41 exp animals/ not humans.sh. (5236720)
42 40 not 41 (291)
43 preprint.pt. (26355)
44 42 not 43 (290)

CINAHL Plus
via Ebsco https://www.ebsco.com/
Date range: Inception to 20240702
Date searched: 2nd July 2024
Records retrieved: 239

S1	(MH "Post-Acute COVID-19 Syndrome")	1,414
S2	TI (long N1 (covid* or covid-19 or covid19 or coronavirus) or longcovid*) OR AB (long N1 (covid* or covid-19 or covid19 or coronavirus) or longcovid*)	1,692
S3	TI (post N1 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2) or postcovid*) OR AB (post N1 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2) or postcovid*)	1,886
S4	TI (("post acute" or post-acute or postacute) N3 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)) OR AB (("post acute" or post-acute or postacute) N3 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2))	402
S5	TI PASC OR AB PASC	120
S6	TI (sequela* N6 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)) OR AB (sequela* N6 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2))	657
S7	TI (chronic N2 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)) OR AB (chronic N2 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2))	294
S8	TI ((long* N1 term or long-term or longterm) N3 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)) OR AB ((long* N1 term or long-term or longterm) N3 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2))	1,157
S9	TI (persist* N6 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)) OR AB (persist* N6 (covid*	1,055

	or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2))	
S10	TI ((post N1 discharg* or post-discharg* or postdischarg*) N4 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)) OR AB ((post N1 discharg* or post-discharg* or postdischarg*) N4 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2))	52
S11	TI ((long N1 haul* or long-haul* or longhaul*) N6 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)) OR AB ((long N1 haul* or long-haul* or longhaul*) N6 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2))	90
S12	TI (surviv* N3 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)) OR AB (surviv* N3 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2))	1,136
S13	TI (after N1 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)) OR AB (after N1 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2))	4,667
S14	TI ((ongoing or lasting or prolonged or fluctuat* or residual* or continu* or linger*) N6 (symptom* or effect* or complication* or sequela* or syndrome or illness* or dysfunction* or disorder* or impair* or impact* or consequence*) N6 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)) OR AB ((ongoing or lasting or prolonged or fluctuat* or residual* or continu* or linger*) N6 (symptom* or effect* or complication* or sequela* or syndrome or illness* or dysfunction* or impair* or impact* or consequence*) N6 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2))	961
S15	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14	11,673
S16	(MH "Systematic Review")	136,269
S17	(ZT "systematic review")	161,707
S18	(ZT "meta analysis")	58,738
S19	(MH "Meta Analysis")	74,865
S20	TI (meta-analys* or metaanaly*) OR AB (meta-analys* or metaanaly*)	117,792
S21	TI systematic* N1 review* OR AB systematic* N1 review*	166,551
S22	S16 OR S17 OR S18 OR S19 OR S20 OR S21	275,942
S23	(ZT "review")	381,070
S24	AB systematic* or AB methodologic* or AB quantitative* or AB research* or AB literature* or AB studies or AB trial* or AB effective*	2,887,668
S25	(S23 AND S24)	171,277
S26	S22 OR S25	438,247
S27	S15 AND S26	718
S28	(MH "Meta Synthesis")	2,350
S29	TI qualitative N1 review* OR AB qualitative N1 review*	4,182
S30	TI (realist N1 (review* or synthes*)) OR AB (realist N1 (review* or synthes*))	622
S31	TI (meta-synthes* or metasynthes*) OR AB (meta-synthes* or metasynthes*)	1,992

S32	TI (living N2 (review* or map*)) AND (living N2 (review* or map*))	241
S33	TI pooled N1 analys* OR AB pooled N1 analys*	8,586
S34	S28 OR S29 OR S30 OR S31 OR S32 OR S33	16,257
S35	S15 AND S34	32
S36	S27 OR S35	730
S37	EM 202403-	78,019
S38	(ZD "in process")	1,767,355
S39	S37 OR S38	1,845,374
S40	S36 AND S39	239

Cochrane Database of Systematic Reviews (CDSR)
via Wiley http://onlinelibrary.wiley.com/
Issue: Issue 7 of 12, July 2024
Date searched: 2nd July 2024
Records retrieved: 1

ID	Search	Hits
#1	MeSH descriptor: [Post-Acute COVID-19 Syndrome] this term only	247
#2	MeSH descriptor: [COVID-19] this term only	7851
#3	MeSH descriptor: [SARS-CoV-2] this term only	3293
#4	MeSH descriptor: [Syndrome] this term only	6661
#5	MeSH descriptor: [Survivors] this term only	1808
#6	#2 or #3	8109
#7	#4 or #5	8463
#8	#6 and #7	106
#9	#1 or #8	329
#10	(long next (covid* or covid-19 or covid19 or coronavirus) or longcovid*):ti,ab,kw	499
#11	(post next (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2) or postcovid*):ti,ab,kw	831
#12	((post acute or postacute) near/2 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)):ti,ab,kw	1505
#13	PASC:ti,ab,kw	70
#14	(sequela* near/6 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)):ti,ab,kw	179
#15	(chronic near/2 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)):ti,ab,kw	44
#16	((long* term or longterm) near/3 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)):ti,ab,kw	897
#17	(persist* near/6 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)):ti,ab,kw	299
#18	((post discharg* or postdischarg*) near/5 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)):ti,ab,kw	1499
#19	((long haul* or longhaul*) near/6 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)):ti,ab,kw	708
#20	(surviv* near/3 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)):ti,ab,kw	212
#21	(after next (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)):ti,ab,kw	345
#22	((ongoing or lasting or prolonged or fluctuat* or residual* or continu* or linger*) near/6 (symptom* or effect* or complication* or sequela* or syndrome or illness* or dysfunction* or disorder* or impair* or impact* or consequence*)	197

	near/6 (covid* or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)):ti,ab,kw	
#23	{OR #10-#22}	2967
#24	#9 or #23 with Cochrane Library publication date Between Mar 2024 and Jul 2024, in Cochrane Reviews, Cochrane Protocols	1

Epistemonikos
https://www.epistemonikos.org/
Date searched: 2nd July 2024
Records retrieved: 259

1. (title:((title:("long covid" OR long-covid OR longcovid OR "long covid 19" OR long-covid-19 OR longcovid19 OR "long covid19" OR long-covid19 OR "longcovid 19" OR longcovid-19 OR "long coronavirus" OR long-coronavirus OR longcoronavirus) OR abstract:("long covid" OR long-covid OR longcovid OR "long covid 19" OR long-covid-19 OR longcovid19 OR "long covid19" OR long-covid19 OR "longcovid 19" OR longcovid-19 OR "long coronavirus" OR long-coronavirus OR longcoronavirus)) OR (title:("post covid" OR post-covid OR postcovid OR "post covid 19" OR post-covid-19 OR postcovid19 OR "post covid19" OR post-covid19 OR "postcovid 19" OR postcovid-19 OR "post coronavirus" OR post-coronavirus OR postcoronavirus OR "post SARS CoV 2" OR post-SARS-CoV-2 OR postSARSCoV2 OR "post SARS CoV2" OR "post-SARS CoV2" OR "postSARS CoV2" OR "post SARS-CoV2" OR post-SARS-CoV2 OR postSARS-CoV2 OR "post SARSCoV 2" OR "post-SARSCoV 2" OR "postSARSCov 2" OR "post SARSCoV-2" OR "post-SARSCoV-2" OR "postSARSCoV-2" OR PASC) OR abstract:("post covid" OR post-covid OR postcovid OR "post covid 19" OR post-covid-19 OR postcovid19 OR "post covid19" OR post-covid19 OR "postcovid 19" OR postcovid-19 OR "post coronavirus" OR post-coronavirus OR postcoronavirus OR "post SARS CoV 2" OR post-SARS-CoV-2 OR postSARSCoV2 OR "post SARS CoV2" OR "post-SARS CoV2" OR "postSARS CoV2" OR "post SARS-CoV2" OR post-SARS-CoV2 OR postSARS-CoV2 OR "post SARSCoV 2" OR "post-SARSCoV 2" OR "postSARSCov 2" OR "post SARSCoV-2" OR "post-SARSCoV-2" OR "postSARSCoV-2" OR PASC))) OR abstract:((title:("long covid" OR long-covid OR longcovid OR "long covid 19" OR long-covid-19 OR longcovid19 OR "long covid19" OR long-covid19 OR "longcovid 19" OR longcovid-19 OR "long coronavirus" OR long-coronavirus OR longcoronavirus) OR abstract:("long covid" OR long-covid OR longcovid OR "long covid 19" OR long-covid-19 OR longcovid19 OR "long covid19" OR long-covid19 OR "longcovid 19" OR longcovid-19 OR "long coronavirus" OR long-coronavirus OR longcoronavirus)) OR (title:("post covid" OR post-covid OR postcovid OR "post covid 19" OR post-covid-19 OR postcovid19 OR "post covid19" OR post-covid19 OR "postcovid 19" OR postcovid-19 OR "post coronavirus" OR post-coronavirus OR postcoronavirus OR "post SARS CoV 2" OR post-SARS-CoV-2 OR postSARSCoV2 OR "post SARS CoV2" OR "post-SARS CoV2" OR "postSARS CoV2" OR "post SARS-CoV2" OR post-SARS-CoV2 OR postSARS-CoV2 OR "post SARSCoV 2" OR "post-SARSCoV 2" OR "postSARSCov 2" OR "post SARSCoV-2" OR "post-SARSCoV-2" OR "postSARSCoV-2" OR PASC) OR abstract:("post covid" OR post-covid OR postcovid OR "post covid 19" OR post-covid-19 OR postcovid19 OR "post covid19" OR post-covid19 OR "postcovid 19" OR postcovid-19 OR "post coronavirus" OR post-coronavirus OR postcoronavirus OR "post SARS CoV 2" OR post-SARS-CoV-2 OR postSARSCoV2 OR "post SARS CoV2" OR "post-SARS CoV2" OR "postSARS CoV2" OR "post SARS-CoV2" OR post-SARS-CoV2 OR postSARS-CoV2 OR "post SARSCoV 2" OR "post-SARSCoV 2" OR "postSARSCov 2" OR "post SARSCoV-2" OR "post-SARSCoV-2" OR "postSARSCoV-2" OR PASC))))
Limits = added to database from 03/04/2024 onwards, broad synthesis = 6, SR = 54

2. (title:("post acute" OR post-acute OR postacute) OR abstract:("post acute" OR post-acute OR postacute)) AND (title:(covid OR covid-19 OR covid19 OR coronavirus OR "SARS CoV 2" OR

SARS-CoV-2 OR SARSCoV2 OR "SARS CoV2" OR SARS-CoV2 OR "SARSCoV 2" OR SARSCoV-2) OR abstract:(covid OR covid-19 OR covid19 OR coronavirus OR "SARS CoV 2" OR SARS-CoV-2 OR SARSCoV2 OR "SARS CoV2" OR SARS-CoV2 OR "SARSCoV 2" OR SARSCoV-2))
Limits = added to database from 03/04/2024 onwards, broad synthesis = 0, SR = 7

3. (title:("long haul" OR "long hauler" OR "long haulers" OR long-haul* OR longhaul*) OR abstract:("long haul" OR "long hauler" OR "long haulers" OR long-haul* OR longhaul*)) AND (title:(covid OR covid-19 OR covid19 OR coronavirus OR "SARS CoV 2" OR SARS-CoV-2 OR SARSCoV2 OR "SARS CoV2" OR SARS-CoV2 OR "SARSCoV 2" OR SARSCoV-2) OR abstract:(covid OR covid-19 OR covid19 OR coronavirus OR "SARS CoV 2" OR SARS-CoV-2 OR SARSCoV2 OR "SARS CoV2" OR SARS-CoV2 OR "SARSCoV 2" OR SARSCoV-2))
Limits = added to database from 03/04/2024 onwards, broad synthesis = 0, SR = 2

4. (title:(sequela*) OR abstract:(sequela*)) AND (title:(covid OR covid-19 OR covid19 OR coronavirus OR "SARS CoV 2" OR SARS-CoV-2 OR SARSCoV2 OR "SARS CoV2" OR SARS-CoV2 OR "SARSCoV 2" OR SARSCoV-2) OR abstract:(covid OR covid-19 OR covid19 OR coronavirus OR "SARS CoV 2" OR SARS-CoV-2 OR SARSCoV2 OR "SARS CoV2" OR SARS-CoV2 OR "SARSCoV 2" OR SARSCoV-2))
Limits = added to database from 03/04/2024 onwards, broad synthesis = 0, SR = 8

5. (title:("chronic covid" OR "chronic covid-19" OR "chronic covid19" OR "chronic coronavirus" OR "chronic SARS CoV 2" OR "chronic SARS-CoV-2" OR "chronic SARSCoV2" OR "chronic SARS CoV2" OR "chronic SARS-CoV2" OR "chronic SARSCoV 2" OR "chronic SARSCoV-2") OR abstract:("chronic covid" OR "chronic covid-19" OR "chronic covid19" OR "chronic coronavirus" OR "chronic SARS CoV 2" OR "chronic SARS-CoV-2" OR "chronic SARSCoV2" OR "chronic SARS CoV2" OR "chronic SARS-CoV2" OR "chronic SARSCoV 2" OR "chronic SARSCoV-2"))
Limits = added to database from 03/04/2024 onwards, broad synthesis = 0, SR = 0

6. (title:("long term" OR "longer term" OR long-term OR longer-term) OR abstract:("long term" OR "longer term" OR long-term OR longer-term)) AND (title:(covid OR covid-19 OR covid19 OR coronavirus OR "SARS CoV 2" OR SARS-CoV-2 OR SARSCoV2 OR "SARS CoV2" OR SARS-CoV2 OR "SARSCoV 2" OR SARSCoV-2) OR abstract:(covid OR covid-19 OR covid19 OR coronavirus OR "SARS CoV 2" OR SARS-CoV-2 OR SARSCoV2 OR "SARS CoV2" OR SARS-CoV2 OR "SARSCoV 2" OR SARSCoV-2))
Limits = added to database from 03/04/2024 onwards, broad synthesis = 10, SR = 42

7. (title:(persist*) OR abstract:(persist*)) AND (title:(covid OR covid-19 OR covid19 OR coronavirus OR "SARS CoV 2" OR SARS-CoV-2 OR SARSCoV2 OR "SARS CoV2" OR SARS-CoV2 OR "SARSCoV 2" OR SARSCoV-2) OR abstract:(covid OR covid-19 OR covid19 OR coronavirus OR "SARS CoV 2" OR SARS-CoV-2 OR SARSCoV2 OR "SARS CoV2" OR SARS-CoV2 OR "SARSCoV 2" OR SARSCoV-2))
Limits = added to database from 03/04/2024 onwards, broad synthesis = 4, SR = 27

8. (title:("post discharge" OR post-discharge OR postdischarge) OR abstract:("post discharge" OR post-discharge OR postdischarge)) AND (title:(covid OR covid-19 OR covid19 OR coronavirus OR "SARS CoV 2" OR SARS-CoV-2 OR SARSCoV2 OR "SARS CoV2" OR SARS-CoV2 OR "SARSCoV 2" OR SARSCoV-2) OR abstract:(covid OR covid-19 OR covid19 OR coronavirus OR "SARS CoV 2" OR SARS-CoV-2 OR SARSCoV2 OR "SARS CoV2" OR SARS-CoV2 OR "SARSCoV 2" OR SARSCoV-2))
Limits = added to database from 03/04/2024 onwards, broad synthesis = 0, SR = 2

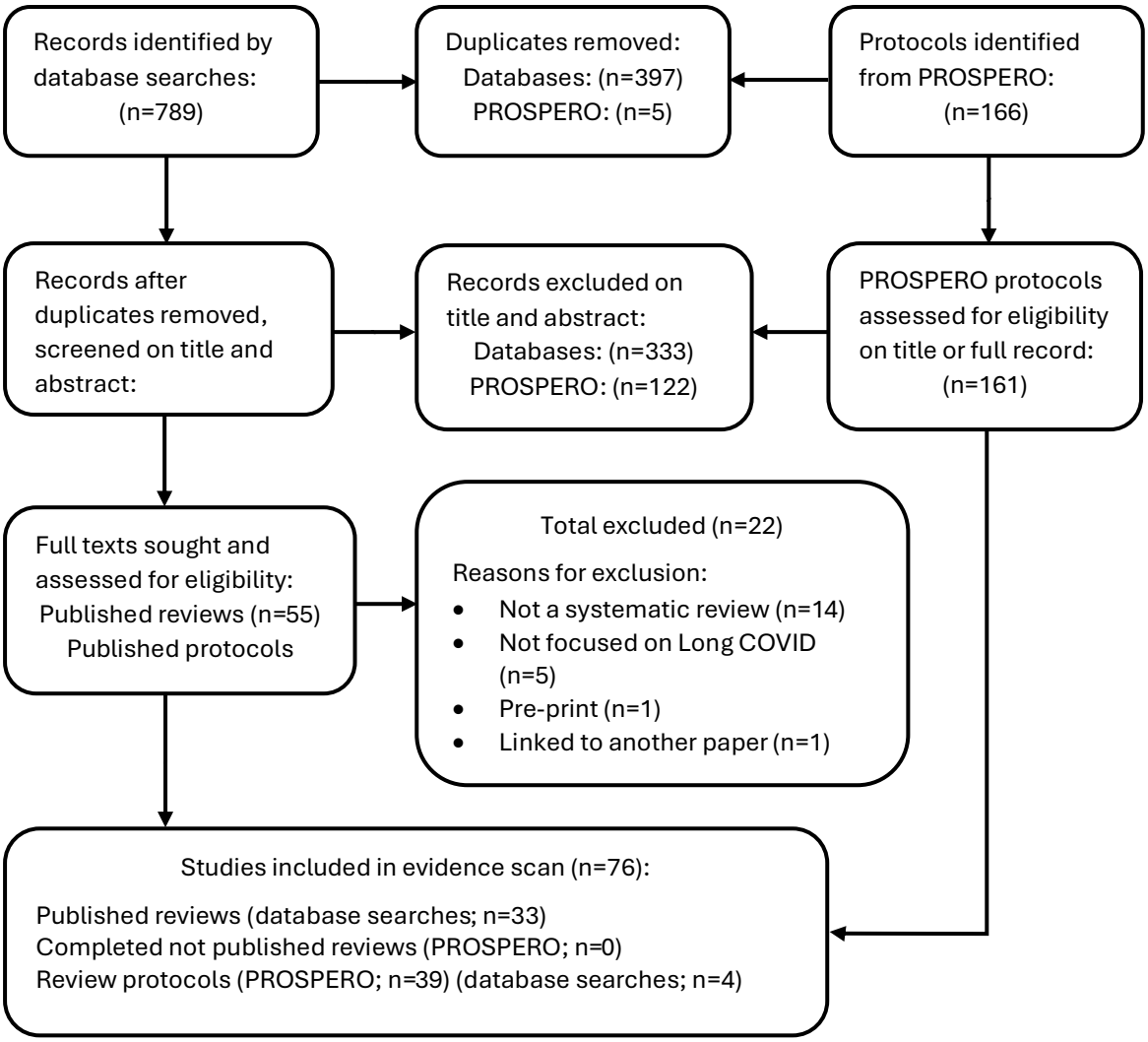
9. (title:(survivor* OR survived) OR abstract:(survivor* OR survived)) AND (title:(covid OR covid-19 OR covid19 OR coronavirus OR "SARS CoV 2" OR SARS-CoV-2 OR SARSCoV2 OR "SARS CoV2" OR SARS-CoV2 OR "SARSCoV 2" OR SARSCoV-2) OR abstract:(covid OR covid-19 OR covid19 OR coronavirus OR "SARS CoV 2" OR SARS-CoV-2 OR SARSCoV2 OR "SARS CoV2" OR SARS-CoV2 OR "SARSCoV 2" OR SARSCoV-2))
Limits = added to database from 03/04/2024 onwards, broad synthesis = 0, SR = 10

10. (title:(ongoing OR lasting OR prolonged OR fluctuat* OR residual* OR continu* OR linger*) OR abstract:(ongoing OR lasting OR prolonged OR fluctuat* OR residual* OR continu* OR linger*)) AND (title:(symptom* OR effect* OR complication* OR sequela* OR syndrome OR illness* OR disorder* OR dysfunction* OR impair* OR impact* OR consequence* OR manifest*) OR abstract:(symptom* OR effect* OR complication* OR sequela* OR syndrome OR illness* OR disorder* OR dysfunction* OR impair* OR impact* OR consequence* OR manifest*)) AND (title:(covid OR covid-19 OR covid19 OR coronavirus OR "SARS CoV 2" OR SARS-CoV-2 OR SARSCoV2 OR "SARS CoV2" OR SARS-CoV2 OR "SARSCoV 2" OR SARSCoV-2) OR abstract:(covid OR covid-19 OR covid19 OR coronavirus OR "SARS CoV 2" OR SARS-CoV-2 OR SARSCoV2 OR "SARS CoV2" OR SARS-CoV2 OR "SARSCoV 2" OR SARSCoV-2))
Limits = added to database from 03/04/2024 onwards, broad synthesis = 10, SR = 77

PROSPERO search strategy
https://www.crd.york.ac.uk/prospero/
Searched from 4th April to 3rd July, 2024
Records identified: 166

#1	long COVID OR post COVID OR PASC NOT Animal DB WHERE CD FROM 04/04/2024 TO 03/07/2024	88
#2	persisting OR persistent OR long term OR ongoing OR prolonged OR lingering OR dysfunction OR recovered OR survivors OR long haul OR long hauler OR long haulers OR post discharge OR postdischarge OR sequela OR sequelae OR chronic OR post-acute NOT Animal DB WHERE CD FROM 04/04/2024 TO 03/07/2024	5020
#3	COVID OR COVID-19 OR COVID19 OR coronavirus OR SARS-CoV-2 OR SARS-CoV2 OR SARSCoV2 OR SARSCoV-2 OR 2019-nCoV NOT Animal DB WHERE CD FROM 04/04/2024 TO 03/07/2024	373
#4	#2 AND #3	127
#5	#1 OR #4	166

Appendix 2: Flow of studies through the review



Appendix 3: Summary of reports and updates

Table 2: Summary of reviews (November 2021 to July 2024)

Report date	**July 2024**	**Apr 2024**	**Jan 2024**	**Oct 2023**	**July 2023**	**Apr 2023**	**Jan 2023**	**Oct 2022**	**July 2022**	**Apr 2022**	**Nov 2021**
Period searched **Primary focus by review type**	Apr to Jul '24	Jan to Apr '24	Oct '23 to Jan '24	Jul to Oct '23	Apr to Jul '23	Jan to Apr '23	Oct '22 to Jan '23	Jul to Oct '22	Apr to Jul '22	Nov '21 to Apr '22	Up to Nov '21
Published reviews	**33**	**36**	**42**	**46**	**31**	**37**	**50**	**29**	**28**	**54**	**51**
Treatment[1]	13	5	7	11	5	5	5	5	3	11	3
Treatment[1] and prevention	1			1	1	2		2			
Treatment[1] and pathobiology[4]				1							
Treatment,[1] prevention and prevalence[2]				1							
Prevention	2	1	3			1	2	1			1
Prevalence[2]	7	21	18	20	16	21	31	19	22	38	47
Prevalence[2] and treatment[1]	2	1	2		1						
Prevalence[2] and pathobiology[4]					1	1					
Prevalence,[2] treatment[1] and economics				1							
Prevalence,[2] treatment,[1] and pathobiology[4]		1									
Risk factors[3]	4	5	9	1	6	3	8		3		
Risk factors[3] and treatment[1]	1		1				1	1			
Risk factors[3] and prevention							1				
Pathobiology[4]	3	2	2	6	1	3	2				
Risk factors[3] and pathobiology[4]				2						5	
Health and social or economics				1				1			
Public, patient involvement				1							
Treatment,[1] prevention, prevalence,[2] pathobiology[4] and diagnosis						1					
Completed not published		**1**	**1**	**3**	**1**	**5**		**2**		**5**	**9**
Treatment[1]		1			1	2				1	1
Prevalence[2]			1	2		3		2		4	7
Risk factors[3]				1							

Experiences[5]											1
Ongoing reviews (protocols)	**43**	**62**	**41**	**41**	**52**	**68**	**56**	**63**	**59**	**73**	**77**
Treatment[1]	11	20	13	8	26	27	33	24	12	17	15
Treatment[1] and prevention				1		1		4			
Prevention	4	3	2	2	2		1		2	4	
Prevalence[2]	16	24	14	22	12	18	13	30	31	47	59
Prevalence[2] and treatment[1]	1		3		1		1				
Prevalence[2] and pathobiology[4]				1							
Risk factors[3]	6	8	7	6	6	13	4		10		
Risk factors[3] and treatment[1]			1								
Risk factors[3] and prevention		2					1				
Pathobiology[4]	1	4	1		3	4	3		3		
Pathobiology[4] and treatment[1]	1										
Risk factors[3] and pathobiology[4]					1			4		5	
Diagnosis or monitoring						3					
Health and social or economics		1		1	1	1		1	1		3
Experiences[5]	3					1					

1. Treatment = treatment or rehabilitation. 2. Prevalence = prevalence of symptoms or effects. 3. Risk factors = risk factors with or without prevalence of symptoms or effects. 4. Pathobiology = pathobiology or mechanisms. 5. Experiences = experiences with or without prevalence of symptoms or effects.

NB: Caution is required in drawing direct comparisons across time. Records for the October 2022 and subsequent updates were identified using a more comprehensive search strategy and a different combination of databases, compared with the April and July 2022 reports. Pre-prints and early online versions of reviews were also included in the April and July 2022 reports. The November report searched the COVID-19 living map, as the main source, and covered a longer period than other reports.

The NIHR Policy Research Programme Reviews Facility aims to put the evidence into development and implementation of health policy through:

- Undertaking policy-relevant systematic reviews of health and social care research
- Developing capacity for undertaking and using reviews
- Producing new and improved methods for undertaking reviews
- Promoting global awareness and use of systematic reviews in decision-making

The Reviews Facility is a collaboration between the following centres:
EPPI Centre (Evidence for Policy and Practice Information Centre),
UCL Institute of Education, University College London;
CRD (Centre for Reviews and Dissemination), University of York;
and the London School of Hygiene and Tropical Medicine.

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