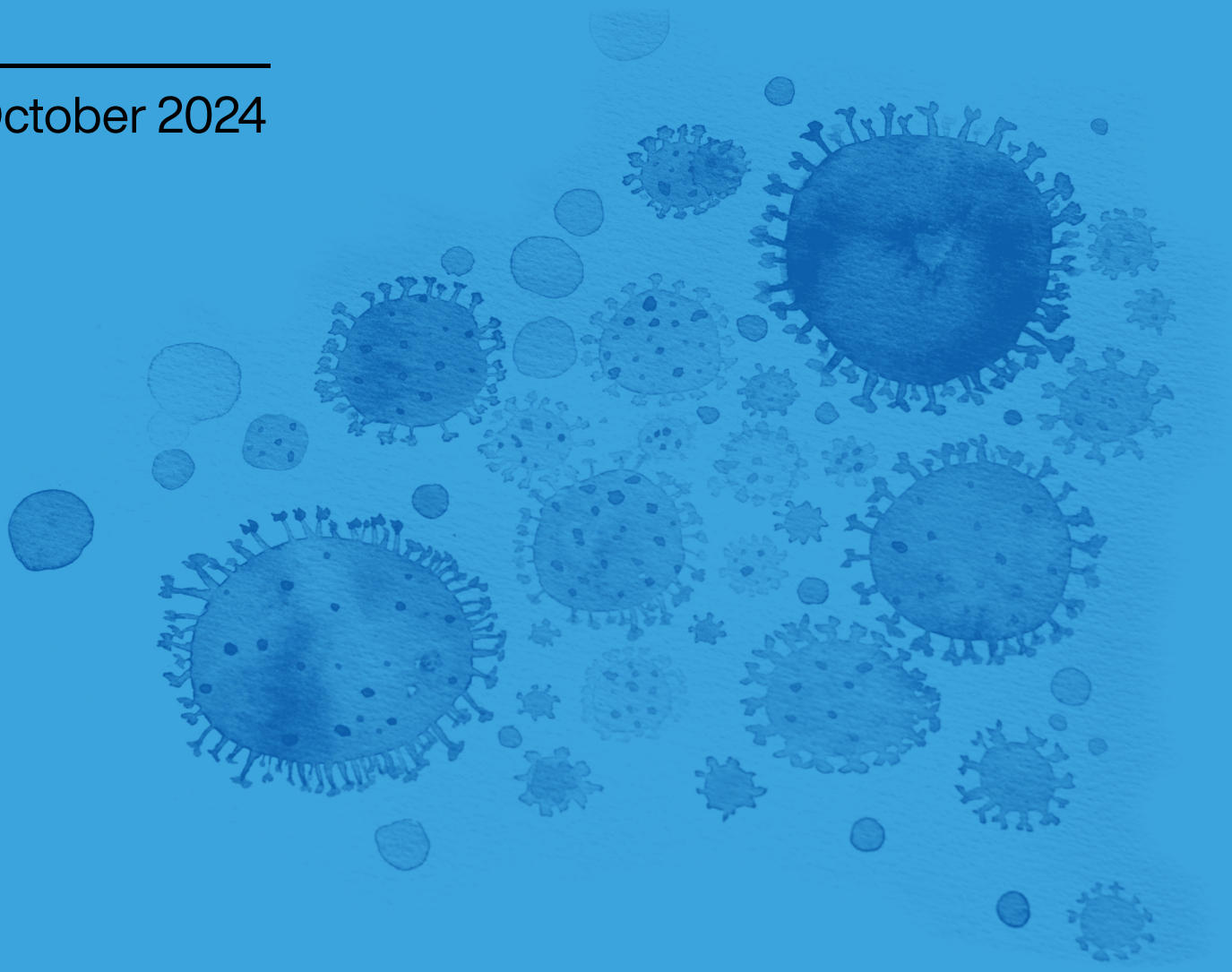
NIHR Policy Research Programme Reviews Facility

Supporting national policy development and implementation

Reviews on Long COVID

A scope of the literature: update

October 2024



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

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October 2024

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Summary

- For this update, we identified 38 published reviews and 35 review protocols for Long COVID.
- The number of reviews (n=38) is more than July 2024 (n=33) and April 2024 (n=36), but fewer than January 2024 (n=42) and October 2023 (n=46).
- As in many of the previous reports, the largest category of reviews focused on symptoms or effects (14/38) and the second largest was on treatment or rehabilitation (11/38).
- We identified eight reviews on risk factors with or without prevalence, three on pathobiology or mechanisms, one on prevention, and one on diagnosis or monitoring tools.
- The number of protocols (n=35) is fewer than in every previous report.
- As in previous reports, the largest two categories of protocols focused on the prevalence of symptoms or effects (13/35), and treatment or rehabilitation (10/35).
- We identified six protocols focused on risk factors with or without prevalence; five on pathobiology or mechanisms; and one on diagnosis or monitoring tools.

Introduction

This is the eleventh update (twelfth 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 April to July 2024.[1]

For the current update, we identified systematic reviews and review protocols focused on Long COVID that were published between early July and early October 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 3rd October, 2024 and were limited by date to capture those records added to the databases since the last searches in July 2024. No language restrictions were applied. A further search of PROSPERO was undertaken, by the review team, up to the 3rd October, 2024 to 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

[1] Khouja C, Raine G, Harden M, Sutcliffe K, Sowden A (2024) Reviews on Long COVID: A scope of the literature. Update July 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.

against the limited time available for screening. The search strategies can be found in Appendix 1 (page 21).[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, 874 records were identified in total, and after duplicates were removed, 444 records were screened in EPPI-reviewer.[5] From PROSPERO, we identified and screened 180 records. We included **38 published reviews and 35 protocols for ongoing reviews**. The flowchart of studies is shown in Appendix 2, page 28. 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 9 to 14, and for the protocols on pages 14 to 20. Table 2 (Appendix 3, page 29) provides a summary of the reviews identified across all 12 reports we have produced to date.

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

Review status Primary focus	Systematic review	Review of reviews	Review update
Published reviews (n=38)			
Treatment or rehabilitation	11		
Prevention	1		
Prevalence of symptoms or effects	13	1*	1*
Risk factors +/- prevalence	8		
Pathobiology or mechanisms	3		
Diagnosis or monitoring tools	1		
Protocols - ongoing reviews (n=35)			
Treatment or rehabilitation	10		
Prevention			
Prevalence of symptoms or effects	13		
Risk factors +/- prevalence	5		1
Pathobiology or mechanisms	5		
Diagnosis or monitoring tools	1		

* One publication was both a review of reviews and an update

Published reviews

For this update, we identified 38 published reviews, which was more than in the previous two updates (July 2024; 32 and April 2024; 36), but fewer than in January 2024 (n=42), and the same

[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.

quarter last year, October 2023 (n=46). All these reports were based on the same databases and search strategy. As in previous reports, most of the published reviews focused on prevalence of symptoms or effects (n=14) or treatment or rehabilitation (n=11). Eight reviews were focused on risk factors with or without prevalence, and the other five were on pathobiology or mechanisms (n=3), prevention (n=1), or diagnosis or monitoring tools (n=1).

Treatment or rehabilitation (n=11)

Eleven reviews focused solely on treatment or rehabilitation. While this is two fewer than in our previous report (July 2024; 13), it is the second largest number across all reports, matching October 2023 and April 2022 (both n=11).

Three reviews focused on treatments. These were non-invasive brain stimulation (#5 Markser, et al., 2024); topical platelet-rich plasma for olfactory dysfunction (#1 Bae, et al., 2024); and anakinra for cardiac problems in children with multisystem inflammatory syndrome associated with COVID-19 (#9 Shabil, et al., 2024). Anakinra is an interleukin-1-receptor antagonist, commonly used to treat rheumatoid arthritis.

Six reviews were on rehabilitation. Three focused on physical activity (#4 Jia and Su, 2024); exercise (#2 Cheng, et al., 2024); or respiratory muscle training (#10 Xavier, et al., 2024). The other three were on in-person rehabilitation for older people with Long COVID (#3 Deng, et al., 2024); telerehabilitation (#11 Yang, et al., 2024); or telerehabilitation versus in-person rehabilitation, specifically pulmonary rehabilitation for physical function and quality of life (#6 Martinez-Pozas, et al., 2024).

The last two reviews covered both treatment and rehabilitation interventions. One limited inclusion to randomised controlled trials of any treatments or rehabilitation for Long COVID (#8 Motilal, et al., 2024). The other concentrated on any intervention for cognitive impairment, in Long COVID patients (#7 Melillo, et al., 2024).

Prevention (n=1)

One review focused solely on prevention and the role of antivirals, corticosteroids, and monoclonal antibodies, in preventing Long COVID, when given as treatments for COVID-19, in various populations (#12 Sun, et al., 2024). The number of reviews on prevention, across previous reports, has ranged from none (October 2023, July 2023 and 2022, and April 2022) to three (January 2024).

Prevalence of symptoms or effects (n=14)

Fourteen reviews had a primary focus on the prevalence of symptoms or effects. This is the largest category of published reviews in this update, as was the case in all previous updates except July 2024 (7/33). Despite being the largest category in this update, it is the second fewest reviews on prevalence across all previous reports (range 7 to 47).

Five reviews were on any Long COVID symptoms or effects. One was an update to a review of reviews on Long COVID prevalence (#13 Gutzeit, et al., 2024). Another assessed the prevalence of Long COVID worldwide (#19 Sk Abd Razak, et al., 2024). The third compared symptom prevalence with the prevalence of the same symptoms in the general population (#22 Xu, et al., 2024). The fourth assessed any long-term symptoms in children who had been hospitalised for COVID-19 (#18 Silva, et al., 2024). The fifth review was on the effect of Long COVID symptoms on the ability to work (#16 Ottiger, et al., 2024).

The other nine reviews focused on specific symptoms or effects. Two were on sperm or semen parameters (#14 Chen, et al., 2022, #21 Wen, et al., 2024); and two, with the same first author, were on osteonecrosis (#23 Za, et al., 2024) and knee osteonecrosis (#24 Za, et al., 2024). The review on knee osteonecrosis had a slightly later search date (six months) and included one additional study (five in total) compared with the general osteonecrosis review. The remaining five reviews were on physical exercise symptoms (#25 Zheng, et al., 2024); respiratory symptoms after hospitalisation for acute respiratory distress (#20 Triantafyllaki, et al., 2024); cognitive decline and dementia in older adults (#17 Shrestha, et al., 2024); liver injury or hepatic diseases (#15 Lebbe, et al., 2024); and the incidence of diabetes (#26 Zhou, et al., 2024).

Risk factors with or without prevalence of symptoms or effects (n=8)

Eight reviews focused on risk factors for Long COVID and its prevalence, or just risk factors. This is more than in our previous two reports (July 2024, n=4; and April 2024, n=5), but one fewer than in January 2024 (n=9). Across reports that used the same search strategy (October 2022 onwards), the number of reviews on risk factors has ranged from none (October 2022) to nine (January 2024).

Two reviews investigated any risk factors and Long COVID symptoms in healthcare workers (#28 Dempsey, et al., 2024) or in people with human immunodeficiency virus (HIV; #34 Yang, et al., 2024). Three reviews had a focus on cardiovascular disease. One was on cardiovascular disease and hypertension as both risk factors and symptoms (#27 Daodu, et al., 2024). The second was on the disease as a risk factor for Long COVID (#33 Sha'ari, et al., 2024); and the third was on the prevalence of cardiovascular disease symptoms, investigating severity of COVID-19 infection as a risk factor (#32 Romero, et al., 2024). The remaining three reviews were on the prevalence and risk factors for fatigue in Long COVID (#31 Hu, et al., 2024); psychological risk factors for Long COVID (#29 Engelmann, et al., 2024); and gender as a risk factor for neurological symptoms of Long COVID (#30 Gorenshtein, 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 three reports (July 2024, n=3; April 2024, n=2; and January 2024, n=2), but fewer than the same quarter last year (October 2023, n=6).

One review was on blood biomarkers for Long COVID (#37 Thomas, et al., 2024). The other two reviews were on immune activation and immune-associated neurotoxicity in Long COVID (#35 Almulla, et al., 2024); and autoantibodies in Long COVID (#36 Notarte, et al., 2024).

Diagnosis or monitoring tools (n=1)

One review was on diagnosis or monitoring tools, investigating the accuracy of lung ultrasound in identifying lung parenchymal damage and fibrotic changes, compared with computed tomography (CT) scans, in Long COVID patients (#38 Boccatonda, et al., 2024).

Protocols - ongoing reviews (n=35)

We identified 35 protocols for ongoing reviews, which was the fewest across all reports to date. Across reports using the same search strategy (since October 2022), the number of protocols has ranged from 41 in January 2024 and October 2023, to 68 in April 2023. Most of the protocols in this update focused on the prevalence of symptoms or effects (n=13), or treatment or rehabilitation (n=10). The other 12 protocols were on risk factors (n=6), pathobiology or mechanisms (n=5), or diagnosis or monitoring tools (n=1). We identified no protocols on prevention for this update.

Treatment or rehabilitation (n=10)

Ten protocols for ongoing reviews were on treatment or rehabilitation. This was a similar number to the previous report (July 2024, n=11), but the second fewest across all previous reports. The number of protocols on treatment or rehabilitation has ranged from eight (October 2023) to 33 (January 2023).

Two protocols were on physical rehabilitation. One was for physiotherapy (#40 Gartmann, et al., 2024) and the other was for physical activity and exercise as rehabilitation for Long COVID (#45 Pintanel Freitas, et al., 2024).

Six protocols were on various treatments. Two were on acupuncture for insomnia or sleep disturbances (#42 Jin and Chen, 2024; #48 Zhong, et al., 2024). One was on thermal therapy, which involved the use of thermal water or climate-based treatments, such as hydrotherapy (#39 Ferrara, et al., 2024). One was on cognitive rehabilitation interventions for physical function and quality of life (#41 Jacobson-Cherry, et al., 2024). The remaining two were on vortioxetine for physical and cognitive symptoms (#44 Padhi, et al., 2024); and pirfenidone for pulmonary fibrosis (#47 Zhang and Wang, 2024), in Long COVID patients.

Two protocols covered both rehabilitation and treatment. One was on Long COVID in children and adolescents (#43 Lau and Tso, 2024); and the other included randomised controlled trials of respiratory muscle training, exercise, brain stimulation, olfactory training, telerehabilitation, or drugs for various symptoms (#46 Tan, et al., 2024).

Prevalence of symptoms or effects (n=13)

Thirteen protocols were for reviews of the prevalence of symptoms or effects. This is fewer than in the previous four reports, in July 2024 (n=19), April 2024 (n=24), January 2024 (n=14), and October 2023 (n=22).

Five protocols were on any Long COVID symptoms, in specific populations or over time. One was on the challenges and complications of Long COVID (#59 Shannawaz, et al., 2024). One was on the prevalence globally and by region (#61 Zhang, et al., 2024), while another focused on the prevalence in Australia (#49 Cysique, et al., 2024). One concentrated on the prevalence at least three years after infection (#57 Rahmati, et al., 2024). The last one focused on the prevalence of Long COVID, by COVID-19 variant, up to one year, one to two years, or over two years after infection (#51 Lugtu, et al., 2024).

Eight protocols focused on specific Long COVID symptoms, groups of symptoms or diagnoses. Three of these were on cognitive or neurological effects (#56 Polania and Erben, 2024; #49 Acharya, et al., 2024; and #51 Elboraay, et al., 2024). Two were on heart problems – one on cardiac structure and function (#58 Seboka, et al., 2024), and the other on arrhythmia in Long COVID (#54 Morovatdar, et al., 2024). The other three were on pulmonary fibrosis (#55 Peroba Araujo, et al., 2024); Creutzfeldt-Jakob disease (#53 Mohamed, et al., 2024); and maternal health outcomes during and after pregnancy (#60 Stan-Labo and Blank, 2024), in Long COVID patients.

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 a similar number to the last four reports (July 2024, n=6; April 2024, n=8; January 2024, n=7; October 2023, n=6).

Two protocols had a general focus on any Long COVID symptoms and risk factors. One had a global perspective (#62 Akalu, et al., 2024), and the other focused on Long COVID in patients with HIV, and HIV as a risk factor (#63 Bobos, et al., 2024).

The other four protocols focused on specific symptoms or conditions. These were the incidence or exacerbation of chronic conditions, with severity of COVID-19 as a risk factor (#64 Gaudet, et al., 2024); cardiac structure and function, with severity as a risk factor (#66 Seboka, et al., 2024); and any risk factors for pulmonary fibrosis (#65 Lai, et al., 2024); or post-traumatic stress disorder (#67 Wege, et al., 2024), in Long COVID patients.

Pathobiology or mechanisms (n=5)

Five protocols were on pathobiology or mechanisms of Long COVID. Across previous reports with the same search strategy, the number of protocols on pathobiology has ranged from none (October 2022 and 2023), to four (April 2023 and 2024).

Two of the five protocols were on mechanisms of anosmia and ageusia (#68 Augusto, et al., 2024) and of neuroinflammation and neurodegeneration (#72 Soares, et al., 2024). The other three were on inflammatory markers for neurocognitive dysfunction (#68 Akoodie and Lentoor, 2024); changes in the central nervous system (#70 Ferreira, et al., 2024); and biomarkers for Long COVID, compared with myalgic encephalomyelitis (ME) and chronic fatigue syndrome (CFS; #71 Lynch, et al., 2024).

Diagnosis or monitoring tools (n=1)

One protocol was on diagnosis or monitoring tools, comparing exercise intolerance measured by functional assessment or by cardiopulmonary exercise testing (#73 Fernandes, et al., 2024).

1) Published Reviews (n=38)

Treatment/rehabilitation (n=11)

Standard systematic reviews

1. Bae A, Kim D, Hwang S. Efficacy of platelet-rich plasma in the treatment of persistent olfactory impairment after COVID-19: a systematic review and meta-analysis. *Journal of Rhinology* 2024 doi: https://dx.doi.org/10.18787/jr.2024.00006

Review aim: *To evaluate the impact of topical platelet-rich plasma (PRP) injection on persistent refractory olfactory dysfunction after COVID-19 infection*

2. Cheng X, Cao M, Yeung WF, et al. The effectiveness of exercise in alleviating Long COVID symptoms: a systematic review and meta-analysis. *Worldviews on Evidence Based Nursing* 2024;01:01. doi: https://dx.doi.org/10.1111/wvn.12743

Review aim: *To summarise the overall effects of exercise on treating Long COVID symptoms and to evaluate the effect of different exercise types*

3. Deng J, Qin C, Lee M, et al. Effects of rehabilitation interventions for old adults with Long COVID: a systematic review and meta-analysis of randomised controlled trials. *Journal of Global Health* 2024;14:05025. doi: https://dx.doi.org/10.7189/jogh.14.05025

Review aim: *To comprehensively summarise the pattern and effectiveness of current rehabilitation interventions for old adults with Long COVID*

4. Jia G, Su CH. Tailored physical activity interventions for Long COVID: current approaches and benefits - a narrative review. *Healthcare* 2024;12:03. doi: https://dx.doi.org/10.3390/healthcare12151539

Review aim: *To explore the role of physical activity in managing long-term COVID-19 symptoms and improving patient outcomes*

5. Markser A, Vockel J, Schneider A, et al. Non-invasive brain stimulation for post-COVID-19 conditions: a systematic review. *American Journal of Medicine* 2024;30:30. doi: https://dx.doi.org/10.1016/j.amjmed.2024.07.007

Review aim: *To summarise the evidence for the effectiveness of non-invasive or minimally invasive brain stimulation techniques in reducing symptoms of post-COVID-19*

6. Martinez-Pozas O, Corbellini C, Cuenca-Zaldivar JN, et al. Effectiveness of telerehabilitation vs. face-to-face pulmonary rehabilitation on physical function and quality of life in people with post COVID-19 condition: a systematic review and network meta-analysis. *European Journal of Physical & Rehabilitation Medicine* 2024;05:05. doi: https://dx.doi.org/10.23736/S1973-9087.24.08540-X

Review aim: *To compare face-to-face pulmonary rehabilitation or telemedicine to usual care for patients with post-COVID-19 condition*

7. Melillo A, Perrottelli A, Caporusso E, et al. Research evidence on the management of the cognitive impairment component of the post-COVID condition: a qualitative systematic review. *European Psychiatry* 2024;67:e60. doi: https://dx.doi.org/10.1192/j.eurpsy.2024.1770

Review aim: *To provide an updated overview of the existing evidence on the efficacy of treatments for post-COVID cognitive impairment*

8. Motilal S, Rampersad R, Adams M, et al. Randomized controlled trials for post-COVID-19 conditions: a systematic review. *Cureus* 2024;16:e67603. doi: https://dx.doi.org/10.7759/cureus.67603

Review aim: *To systematically review all interventional studies on post-acute COVID syndrome, assess their quality, and synthesise their findings*

9. Shabil M, Khatib MN, Banda GT, et al. Effectiveness of early anakinra on cardiac function in children with multisystem inflammatory syndrome of COVID-19: a systematic review. *BMC Infectious Diseases* 2024;24:847. doi: https://dx.doi.org/10.1186/s12879-024-09581-w

Review aim: *To evaluate the effectiveness of early anakinra administration on cardiac outcomes in children with multisystem inflammatory syndrome in children (MIS-C) associated with SARS-CoV-2*

10. Xavier DM, Abreu RAL, Correa FG, et al. Effects of respiratory muscular training in post-COVID-19 patients: a systematic review and meta-analysis of randomized controlled trials. *BMC Sports Science, Medicine and Rehabilitation* 2024;16:181. doi: https://dx.doi.org/10.1186/s13102-024-00954-x

Review aim: *To elucidate the effectiveness of controlled respiratory muscle training in post-COVID-19 patients*

11. Yang J, Li H, Zhao H, et al. Effectiveness of telerehabilitation in patients with post-COVID-19: a systematic review and meta-analysis of randomised controlled trials. *BMJ Open* 2024;14:e074325. doi: https://dx.doi.org/10.1136/bmjopen-2023-074325

Review aim: *To assess the effects of telerehabilitation on clinical symptoms, physical function, psychological function and quality of life in patients with post-COVID-19*

Prevention (n=1)

Standard systematic review

12. Sun G, Lin K, Ai J, et al. The efficacy of antivirals, corticosteroids, and monoclonal antibodies as acute COVID-19 treatments in reducing the incidence of Long COVID: a systematic review and meta-analysis. *Clinical Microbiology & Infection* 2024;14:14. doi: https://dx.doi.org/10.1016/j.cmi.2024.07.006

Review aim: *To assess the relationship between acute COVID-19 treatments of antivirals, corticosteroids, and monoclonal antibodies and Long COVID incidence, and their effects in different populations and individual symptoms*

Prevalence of symptoms and effects (n=14)

Review of reviews update

13. Gutzeit J, Weis M, Nurnberger C, et al. Definitions and symptoms of the post-COVID syndrome: an updated systematic umbrella review. *European Archives of Psychiatry & Clinical Neuroscience* 2024;25:25. doi: https://dx.doi.org/10.1007/s00406-024-01868-y

Review aim: *To assess whether recent research has converged on clearer definitions of post-COVID syndrome, and whether functional impairments have received more recognition, as well as to review the symptoms of Long COVID and how COVID-19 was diagnosed.*

Standard systematic reviews

14. Chen X, Ding J, Liu M, et al. A systemic review and meta-analysis of the effect of SARS-CoV-2 infection on sperm parameters. *Research* 2022;2022:9835731. doi: https://dx.doi.org/10.34133/2022/9835731

Review aim: *To investigate the effect of SARS-CoV-2 infection on sperm quality in COVID-19-positive and COVID-19-negative male participants*

15. Lebbe A, Aboulwafa A, Bayraktar N, et al. New onset of acute and chronic hepatic diseases post-COVID-19 infection: a systematic review. *Biomedicines* 2024;12:10. doi: https://dx.doi.org/10.3390/biomedicines12092065

Review aim: *To identify and analyse the reported cases of severe and long-term parenchymal liver injury post-COVID-19 infection*

16. Ottiger M, Poppele I, Sperling N, et al. Work ability and return-to-work of patients with post-COVID-19: a systematic review and meta-analysis. *BMC Public Health* 2024;24:1811. doi: https://dx.doi.org/10.1186/s12889-024-19328-6

Review aim: *To assess the impact of post-COVID-19 on work ability and return-to-work of individuals previously infected with SARS-CoV-2*

17. Shrestha A, Chen R, Kunasekaran M, et al. The risk of cognitive decline and dementia in older adults diagnosed with COVID-19: a systematic review and meta-analysis. *Ageing Research Reviews* 2024;101:102448. doi: https://dx.doi.org/10.1016/j.arr.2024.102448

Review aim: *To describe the impact of COVID-19 on cognition in COVID-19 patients with and without pre-existing dementia or cognitive impairment*

18. Silva MMD, Benites MN, Castro YM, et al. Prevalence of symptoms of post-COVID-19 condition (Long COVID) in children hospitalized with COVID-19: a systematic review of observational studies. *Pediatric Pulmonology* 2024;16:16. doi: https://dx.doi.org/10.1002/ppul.27257

Review aim: *To investigate the prevalence of symptoms of post-COVID-19 condition (Long COVID), in children hospitalised with COVID-19*

19. Sk Abd Razak R, Ismail A, Abdul Aziz AF, et al. Post-COVID syndrome prevalence: a systematic review and meta-analysis. *BMC Public Health* 2024;24:1785. doi: https://dx.doi.org/10.1186/s12889-024-19264-5

Review aim: *To systematically review and determine the pooled prevalence of post-COVID syndrome worldwide*

20. Triantafyllaki P, Charalampopoulos M, Papageorgiou D, et al. Follow up in patients with respiratory disability after ARDS related to COVID-19: a systematic review. *International Journal of Caring Sciences* 2024;17:1066-71.

Review aim: *To investigate the pulmonary function in COVID-19-related acute respiratory distress syndrome (ARDS) survivors after hospitalisation*

21. Wen L, Tian H, Huang X, et al. Effect of SARS-CoV-2 on semen parameters: a meta-analysis of 39 articles from 15 countries. *Journal of Global Health* 2024;14:05021. doi: https://dx.doi.org/10.7189/jogh.14.05021

Review aim: *To evaluate the effects of SARS-CoV-2 on semen parameters*

22. Xu Z, Wang W, Zhang D, et al. Excess risks of Long COVID symptoms compared with identical symptoms in the general population: a systematic review and meta-analysis of studies with control groups. *Journal of Global Health* 2024;14:05022. doi: https://dx.doi.org/10.7189/jogh.14.05022

Review aim: *To evaluate the association between coronavirus disease 2019 (COVID-19) infection and various long-term symptoms*

23. Za P, Papalia GF, Gregori P, et al. Osteonecrosis as a manifestation of Long-COVID syndrome: a systematic review. *Musculoskeletal Surgery* 2024;01:01. doi: https://dx.doi.org/10.1007/s12306-024-00854-w

Review aim: *To analyse cases of osteonecrosis after COVID-19, to understand if a correlation is possible between SARS-CoV-2 infection and the onset of osteonecrosis*

24. Za P, Papalia GF, Russo F, et al. Knee osteonecrosis after SARS-CoV-2 infection: a systematic case-based review. *Annals of Joint* 2024;9:31. doi: https://dx.doi.org/10.21037/aoj-23-67

Review aim: *To analyse cases of knee osteonecrosis after SARS-CoV-2 infection and their main demographic, clinical and imaging findings*

25. Zheng C, Chen JJ, Dai ZH, et al. Physical exercise-related manifestations of Long COVID: a systematic review and meta-analysis. *Journal of Exercise Science & Fitness* 2024;22:341-49. doi: https://dx.doi.org/10.1016/j.jesf.2024.06.001

Review aim: *To systematically assess physical exercise-related symptoms of post-acute sequelae of SARS-CoV-2 infection (PASC or Long COVID) in coronavirus disease 2019 (COVID-19) survivors*

26. Zhou J, Wang Y, Xu R. Association of COVID-19 infection and the risk of new incident diabetes: a systematic review and meta-analysis. *Frontiers in Endocrinology* 2024;15:1429848. doi: https://dx.doi.org/10.3389/fendo.2024.1429848

Review aim: *To determine the risk of new incident diabetes after COVID-19 infection*

Risk factors with or without prevalence of symptoms or effects (n=8)

Standard systematic reviews

27. Daodu TB, Rugel EJ, Lear SA. Impact of Long COVID-19 on health outcomes among adults with preexisting cardiovascular disease and hypertension: a systematic review. *CJC Open* 2024;6:939-50. doi: https://dx.doi.org/10.1016/j.cjco.2024.03.003

Review aim: *To summarise the impact of Long COVID on the health of adults with preexisting cardiovascular disease and hypertension*

28. Dempsey B, Madan I, Stevelink SAM, et al. Long COVID among healthcare workers: a narrative review of definitions, prevalence, symptoms, risk factors and impacts. *British Medical Bulletin* 2024;151:16-35. doi: https://dx.doi.org/10.1093/bmb/ldae008

Review aim: *To review the literature on Long COVID in healthcare workers (HCWs) and describe the definitions used, prevalence, symptoms, risk factors and impact on HCWs*

29. Engelmann P, Reinke M, Stein C, et al. Psychological factors associated with Long COVID: a systematic review and meta-analysis. *eClinicalMedicine* 2024;74 doi: https://dx.doi.org/10.1016/j.eclinm.2024.102756

Review aim: *To synthesise the current evidence on psychological factors potentially associated with Long COVID and condition-relevant outcomes like quality of life*

30. Gorenshtein A, Leibovitch L, Liba T, et al. Gender disparities in neurological symptoms of Long COVID: a systematic review and meta-analysis. *Neuroepidemiology* 2024:1-15. doi: https://dx.doi.org/10.1159/000540919

Review aim: *To investigate the discrepancies in neurological symptoms between genders in Long-COVID cases*

31. Hu W, Tang R, Gong S, et al. The prevalence and associated factors of post-COVID-19 fatigue: a systematic review and meta-analysis. *Cureus* 2024;16:e63656. doi: https://dx.doi.org/10.7759/cureus.63656

Review aim: *To identify the prevalence of post-COVID-19 fatigue, and to explore the factors associated with fatigue, to help identify groups at high risk, to reduce the occurrence of this symptom by intervening in the factors associated with fatigue and reducing the severity of fatigue*

32. Romero S, Kaboth P, Rath N, et al. Cardiovascular disease risk after a SARS-CoV-2 infection: a systematic review and meta-analysis. *Journal of Infection* 2024;89:106215. doi: https://dx.doi.org/10.1016/j.jinf.2024.106215

Review aim: *To investigate whether persons with a COVID-19 infection have an increased risk of myocardial infarction, ischaemic or haemorrhagic stroke, pulmonary embolism, and arterial thrombosis compared to those without a COVID-19 infection. Also, to quantify this risk by time since the SARS-CoV-2 infection and by COVID-19 disease severity*

33. Sha'ari NI, Ismail A, Abdul A, et al. Cardiovascular diseases as risk factors of post-COVID syndrome: a systematic review. *BMC Public Health* 2024;24:1846. doi: https://dx.doi.org/10.1186/s12889-024-19300-4

Review aim: *To identify cardiovascular disease as a risk factor for post-COVID syndrome development*

34. Yang X, Shi F, Zhang H, et al. Long COVID among people with HIV: a systematic review and meta-analysis. *HIV Medicine* 2024;10:10. doi: https://dx.doi.org/10.1111/hiv.13708

Review aim: *To evaluate the association between HIV infection and Long COVID and the prevalence and characteristics of and risk factors for Long COVID among people with HIV*

Pathobiology or mechanisms (n=3)

Standard systematic reviews

35. Almulla AF, Thipakorn Y, Zhou B, et al. Immune activation and immune-associated neurotoxicity in Long-COVID: a systematic review and meta-analysis of 103 studies comprising 58 cytokines/chemokines/growth factors. *Brain, Behavior, & Immunity* 2024;122:75-94. doi: https://dx.doi.org/10.1016/j.bbi.2024.07.036

Review aim: *To explore the immune inflammatory response system (IRS) and the compensatory immunoregulatory system (CIRS) profiles in Long COVID patients, the individual cytokines, chemokines, growth factors, along with C-reactive protein (CRP) and immune-associated neurotoxicity*

36. Notarte KI, Carandang T, Velasco JV, et al. Autoantibodies in COVID-19 survivors with post-COVID symptoms: a systematic review. *Frontiers in Immunology* 2024;15:1428645. doi: https://dx.doi.org/10.3389/fimmu.2024.1428645

Review aim: *To identify, appraise, and synthesize current evidence on the presence of autoantibodies in patients with post-COVID-19 condition*

37. Thomas C, Faghy MA, Chidley C, et al. Blood biomarkers of Long COVID: a systematic review. *Molecular Diagnosis & Therapy* 2024;28:537-74. doi: https://dx.doi.org/10.1007/s40291-024-00731-z

Review aim: *To consolidate the current knowledge of blood biomarkers associated with the prevalence of Long COVID on the basis of the World Health Organisation (WHO) clinical definition of this condition*

Diagnosis or monitoring tools (n=1)

Standard systematic review

38. Boccatonda A, D'Ardes D, Tallarico V, et al. Role of lung ultrasound in the detection of lung sequelae in post-COVID-19 patients: a systematic review and meta-analysis. *Journal of Clinical Medicine* 2024;13:21. doi: https://dx.doi.org/10.3390/jcm13185607

Review aim: *To evaluate the diagnostic accuracy of lung ultrasound in identifying lung parenchymal damage, particularly fibrotic-like changes, following COVID-19 pneumonia, comparing its performance to that of computed tomography (CT)*

2) Protocols for ongoing reviews related to Long COVID (n=35)

Treatment or rehabilitation (n=10)

Standard systematic reviews

39. Ferrara, et al. Efficacy and safety of thermal therapy for Long COVID-19 symptoms: a systematic review and meta-analysis. PROSPERO 2024 CRD42024592036 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024592036

Review question: *What is the efficacy and safety of thermal therapy in managing symptoms of Long COVID-19 in adult patients?*

40. Gartmann, et al. Physiotherapy interventions in post- and Long-COVID-19: a scoping review protocol. *BMJ Open* 2024;14:e077420. doi: https://dx.doi.org/10.1136/bmjopen-2023-077420

Review question: *What is the evidence of physiotherapy interventions documented in the scientific literature, specifically focusing on hands-on therapy?*

41. Jacobson-Cherry, et al. Examining changes in functional recovery and quality of life after cognitive rehabilitation for Long COVID symptoms. PROSPERO 2024 CRD42024580416 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD420245804167

Review question: *How do functional recovery and quality of life change following cognitive rehabilitation treatment for Long COVID?*

42. Jin and Chen. Is acupuncture effective and safe in treating insomnia during recovery period of COVID and Omicron. PROSPERO 2024 CRD42024596218 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024596218

Review question: *Is acupuncture effective and safe in treating insomnia during the recovery period of COVID and Omicron?*

43. Lau and Tso. Efficacy of treatments for Long COVID in children and adolescents. PROSPERO 2024 CRD42024595619 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024595619

Review question: *What is the efficacy of various treatments for long-term COVID-19 in children and young people?*

44. Padhi, et al. Does vortioxetine improves physical and cognitive symptoms post-COVID-19? A systematic review and meta-analysis. PROSPERO 2024 CRD42024592871 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024592871

Review question: *Does vortioxetine improve physical and cognitive symptoms in post-COVID-19 patients?*

45. Pintanel Freitas, et al. Effectiveness of different physical activity and exercise protocols in individuals with Long COVID: a systematic review and meta-analysis. PROSPERO 2024 CRD42024574866 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024574866

Review question: *What is the effectiveness/benefits of exercise and physical activity on adults living with Long COVID?*

46. Tan, et al. Treatment for Long COVID: a meta-analysis of randomized controlled trials. PROSPERO 2024 CRD42024591704 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024591704

Review questions: *(1) To investigate the effect of respiratory muscle training for Long COVID-19 patients on cardio-pulmonary function, fatigue, anxiety and depression, strength and function of respiratory muscle (2) To investigate the effect of integrated exercise programmes for Long COVID-19 patients on living quality, cardio-pulmonary function, fatigue, anxiety and depression and agility (3) To investigate the effect of transcranial direct current stimulation for Long COVID-19 patients on fatigue (4) To investigate the effect of olfactory training for Long COVID-19 patients on dysosmia caused by COVID-19 (5) To investigate the effect of telerehabilitation for Long COVID-19 patients on living quality, cardio-pulmonary function, fatigue (6) To investigate the effect of three drugs for Long COVID-19 patients*

47. Zhang and Wang. Efficacy and safety of pirfenidone for pulmonary fibrosis response in COVID-19 patients: a meta-analysis. PROSPERO 2024 CRD42024569389 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024569389

Review question: *To objectively evaluate the efficacy and safety of pifenidone for the treatment of pulmonary fibrosis response in COVID-19*

48. Zhong, et al. Efficacy and safety of acupuncture for sleep disturbances from COVID-19 sequelae: a protocol for systematic review and meta-analysis. PROSPERO 2024 CRD42024592745 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024592745

Review question: *To investigate the acupuncture treatment effect on sleep disorders after COVID-19*

Prevalence of symptoms or effects (n=13)

Standard systematic reviews

49. Acharya, et al. A systemic review and quantitative analysis of neurological clinical profile and management of Long COVID. PROSPERO 2024 CRD42024582311 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024582311

Review question: *What is the prevalence of long-term neurological effects associated with COVID-19?*

50. Cysique, et al. The Australian Partnership for Preparedness Research on Infectious Disease Emergencies (APPRISE) Long COVID initiative mapping project. PROSPERO 2024 CRD42024571708 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024571708

Review questions: *1. Conduct a retrospective Long COVID systematic review to identify all existing Australian (current & completed) prospective cohorts (and nested cross-sectional studies) and describe outcomes including which Long COVID definition was used and how it was operationalised 2. Perform a quality assessment of each cohort study and their Long COVID definition 3. Undertake embedded late follow-up of Long COVID cases in adults and children in partnership with cohort investigators using the APPRISE Long COVID research case definition in the high-quality rated studies*

51. Elboraay, et al. Long-term neurological effects of COVID-19: a systemic review and meta-analysis. PROSPERO 2024 CRD42024576237 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024576237

Review question: *What is the prevalence of neurological effects in patients after at least six months of recovery from COVID-19?*

52. Lugtu, et al. A meta-analysis on the prevalence of post-COVID symptoms across SARS-CoV-2 variants: stratification by follow-up periods. PROSPERO 2024 CRD42024566180 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024566180

Review question: *To provide an updated appraisal and compilation of current evidence regarding the prevalence of lingering post-COVID symptoms (PCS) across different major variants of concerns (VoC), stratified by three follow-up periods: less than 1 year, 1 to 2 years, and more than 2 years*

53. Mohamed, et al. Assessing the association between Creutzfeldt–Jakob Disease and COVID-19 (SARS-CoV-2): a systematic review of case reports. PROSPERO 2024 CRD42024581268 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024581268

Review questions: *Could the novel SARS-COV-2 virus & COVID-19 contribute to an increased susceptibility to Creutzfeldt-Jakob Disease? What is the case presentation of those previously/concomitantly diagnosed with COVID-19 & Creutzfeldt-Jakob Disease? What are the laboratory findings of those previously/concomitantly diagnosed with COVID-19 & Creutzfeldt-Jakob Disease? What are the MRI findings of those previously/concomitantly diagnosed with COVID-19 & Creutzfeldt-Jakob Disease? What are the neuropathological findings of those previously/concomitantly diagnosed with COVID-19 & Creutzfeldt-Jakob Disease? What are the EEG findings of those previously/concomitantly diagnosed with COVID-19 & Creutzfeldt-Jakob*

Disease? What are the Lumbar puncture findings of those previously/concomitantly diagnosed with COVID-19 & Creutzfeldt-Jakob Disease? What is the time frame between COVID-19 diagnosis and Creutzfeldt-Jakob disease diagnosis?

54. Morovatdar, et al. Increased arrhythmia risk in Long COVID: a systematic review and meta-analysis. PROSPERO 2024 CRD42024587028 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024587028

Review questions: *Is the risk of arrhythmias increased in patients after COVID-19 infection in the long term? How does Long COVID-19 affect the risk of different types of arrhythmias?*

55. Peroba Araujo, et al. Is COVID-19 a risk factor for pulmonary fibrosis? Systematic review of observational studies on the association between Long COVID and tomographic changes associated with pulmonary fibrosis. PROSPERO 2024 CRD42024572100 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024572100

Review question: *How strong is the association between COVID pneumonia and associated tomographic changes to pulmonary fibrosis indicated by current scientific evidence?*

56. Polania and Erben. Neuroimaging changes and cognitive decline associated to COVID-19 infection. PROSPERO 2024 CRD42024567493 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024567493

Review question: *What is the prevalence between SARS-COV-2 infection and neurocognitive decline in adult patients with current or previous confirmed SARS-COV-2 infection that had any radiological imaging study of the head and brain and objective cognition testing?*

57. Rahmati, et al. Long-term sequelae of COVID-19 3-year after SARS-CoV-2 infection: a systematic review and meta-analysis. PROSPERO 2024 CRD42024581975 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024581975

Review question: *What are the symptoms beyond three years after SARS-CoV-2 infection?*

58. Seboka, et al. The impact of COVID-19 infection on cardiac structure and function: a systematic review and meta-analysis. PROSPERO 2024 CRD42024573041 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024573041

Review questions: *1. What is the impact of COVID-19 infection on cardiac function, as assessed by echocardiography and cardiac MRI/CT, and how does this vary across different patient demographics and disease severities? 2. What is the association between COVID-19 infection and changes in cardiac function, including myocardial injury, heart failure, and arrhythmias, as observed through clinical assessments such as echocardiography and cardiac biomarkers? 3. What are the differences in cardiac function among individuals during the acute phase, recovery phase, and long-term phase of COVID-19? 4. In patients hospitalised with COVID-19 infection and no history of CVD/heart disease, does the structure and function of the heart differ?*

59. Shannawaz, et al. Challenges and complications faced by people with Long COVID. PROSPERO 2024 CRD42024578106 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024578106

Review question: *What are the challenges and complications faced by people having Long COVID?*

60. Stan-Labo and Blank. Understanding the impact of Long COVID on maternal health outcomes during and after pregnancy: a systematic review. PROSPERO 2024 CRD42024568140 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024568140

Review questions: *What evidence is there of the impacts of Long COVID on maternal health outcomes during and after pregnancy? What evidence is there for how pregnant and post-partum women can best be supported?*

61. Zhang, et al. Global prevalence of post COVID-19 condition (Long COVID): a meta-analysis and systematic review. PROSPERO 2024 CRD42024585173 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024585173

Review question: *What is the global prevalence of Long COVID-19? Are there significant differences between regions?*

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

Standard systematic reviews

62. Akalu, et al. Prevalence and risk factors of long-term sequelae among survivors of COVID-19 patients. PROSPERO 2024 CRD42024588938 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024588938

Review questions: *1. What is the global burden of long-term sequelae among COVID-19 survivors? 2. What are the risk factors of long-term sequelae among COVID-19 survivors?*

63. Bobos, et al. Risk of Long COVID in people living with HIV. A systematic review with meta-analysis. PROSPERO 2024 CRD42024577616 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024577616

Review question: *We will investigate whether adults living with HIV have increased odds of developing Long COVID compared to people living without HIV; and assess the prevalence of Long COVID in adults living with HIV*

64. Gaudet, et al. Associations between SARS-CoV-2 infection and incidence or exacerbations of chronic conditions: protocol for a systematic review update. PROSPERO 2024 CRD42024585278 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024585278

Review question: *What are the associations between SARS-CoV-2 infection and the incidence of new diagnoses or exacerbations of chronic conditions in groups based on age and severity of infection?*

NB – review update

65. Lai, et al. Prevalence and risk factors of post-COVID pulmonary fibrosis: a meta-analysis among patients with COVID-19. PROSPERO 2024 CRD42024575495 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024575495

Review question: *The aim of this meta-analysis study is to explore the prevalence and risk among individuals with post-COVID-19 pulmonary fibrosis*

66. Seboka, et al. The impact of Long COVID-19 on cardiac structure and function – a systematic review and meta-analysis. PROSPERO 2024 CRD42024577867 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024577867

Review questions: *1. What is the impact of Long COVID-19 infection on cardiac function, as assessed by echocardiography and cardiac MRI/CT, and how does this vary across different patient demographics and disease severities? 2. What are the common cardiac structural changes observed in individuals with Long COVID-19? 3. How does Long COVID-19 affect cardiac function in terms of ejection fraction, cardiac output, and other key functional parameters? 4. Are there differences in cardiac outcomes between individuals with Long COVID-19 who were hospitalised versus those who were not? 5. How do demographic factors (such as age, sex, and comorbidities) influence the cardiac effects of Long COVID-19?*

67. Wege, et al. Prevalence and determinants of posttraumatic stress disorder after COVID-19 infection: a meta-analysis. PROSPERO 2024 CRD42024586623 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024586623

Review questions: *Do symptoms of SARS-CoV-2 infections that required medical treatment (either outpatient or inpatient) and related intensive medical treatments present a risk for developing PTSD? Which factors potentially moderate the risk of developing PTSD after a SARS-CoV-2 infection?*

Pathobiology or mechanisms (n=5)

Standard systematic reviews

68. Akoodie and Lentoor. SARS-CoV-2 induced neuro-cognitive dysfunction and the role of inflammatory markers: a systematic review. PROSPERO 2024 CRD42024588683 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024588683

Review question: *What is the association between inflammatory markers and the neurological and cognitive outcomes of COVID-19?*

69. Augusto, et al. Physiological aspects of anosmia and ageusia in Long COVID: a systematic review. PROSPERO 2024 CRD42024591283 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024591283

Review question: *In patients with Long COVID, what are the physiological mechanisms underlying anosmia and ageusia, and how are these chemosensory disruptions associated with other persistent symptoms such as dyspnoea, fatigue, and cough?*

70. Ferreira de Moraes, et al. Functional and morphological changes in the central nervous system after COVID-19 - a systematic review. PROSPERO 2024 CRD42024554862 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024554862

Review question: *What neuro-functional and morphological changes in the nervous system do patients with Long COVID present?*

71. Lynch, et al. Comparison of vascular/circulatory biomarkers between myalgic encephalomyelitis/chronic fatigue syndrome and Long COVID – a systematic review and meta-analysis. PROSPERO 2024 CRD42024575030 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024575030

Review questions: *1: What potential vascular/circulatory biomarkers for (a) Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS) and/or (b) Long COVID (LC) exist in the literature and what are their efficacy/quality? 2: What similarities and differences are there between the potential vascular/circulatory biomarkers for ME/CFS and LC? 3: Which biomarkers would we identify as (a) diagnostic markers for long-term fatigue generally (either ME/CFS or LC); (b) (if (a) is achieved) can a biomarker or biomarker pattern be identified to distinguish ME/CFS from LC?*

72. Soares, et al. Mechanisms underlying neuroinflammation and neurodegeneration in COVID-19: a systematic review. PROSPERO 2024 CRD42024579392 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024579392

Review question: *How does SARS-CoV-2 infection contribute to neuroinflammation and neurodegeneration in the acute phase and long-term aftermath of the disease?*

Diagnosis and monitoring tools (n=1)

Standard systematic reviews

73. Fernandes, et al. Functional assessment in patients with Long COVID. Functional tests versus cardiopulmonary exercise testing. A systematic review of the literature. PROSPERO 2024 CRD42024594043 Available from: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024594043

Review question: *Does the performance in functional tests without direct measurement of field O_2 consumption compare with the Cardiopulmonary Exercise Test in patients with Long COVID in the analysis of exercise intolerance?*

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 October 02, 2024
Date searched: 3rd October 2024
Records retrieved: 287

1 Post-Acute COVID-19 Syndrome/ (3776)
2 COVID-19 post-intensive care syndrome.mp. (6)
3 COVID-19/ or SARS-CoV-2/ (282609)
4 Syndrome/ (124561)
5 Survivors/ (31926)
6 4 or 5 (156362)
7 3 and 6 (1195)
8 1 or 2 or 7 (4877)
9 ((long adj (covid$ or covid-19 or covid19 or coronavirus)) or longcovid$).ti,ab,kf,ot,bt. (6181)
10 ((post adj (covid$ or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)) or postcovid$).ti,ab,kf,ot,bt. (12154)
11 ((post acute or postacute) adj2 (covid$ or covid-19 or covid19 or coronavirus or SARS-CoV-2 or SARS-CoV2 or SARSCoV2 or SARSCoV-2)).ti,ab,kf,ot,bt. (1232)
12 PASC.ti,ab,kf,ot,bt. (1111)
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. (3320)
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. (397)
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. (2725)
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. (5022)
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. (147)
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. (292)
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. (3526)
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. (11079)
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. (3426)
22 or/9-21 (36207)
23 8 or 22 (36737)
24 systematic review.mp,pt. (364318)
25 search:.tw. (723209)
26 meta analysis.mp,pt. (319808)
27 review.pt. (3393035)
28 24 or 25 or 26 or 27 (3969808)
29 23 and 28 (5910)

30 qualitative review$.ti,ab,kf,ot,bt. (1955)
31 realist synthes$.ti,ab,kf,ot,bt. (467)
32 realist review$.ti,ab,kf,ot,bt. (802)
33 (meta-synthes$ or metasynthes$).ti,ab,kf,ot,bt. (2465)
34 (living adj2 (review$ or map$)).ti,ab,kf,ot,bt. (847)
35 pooled analysis.ti,ab,kf,ot,bt. (14043)
36 or/30-35 (20358)
37 23 and 36 (77)
38 29 or 37 (5919)
39 (202407$ or 202408$ or 202409$ or 202410$).dt. (410876)
40 38 and 39 (288)
41 exp animals/ not humans.sh. (5263854)
42 40 not 41 (288)
43 preprint.pt. (30349)
44 42 not 43 (287)

CINAHL Plus
via Ebsco https://www.ebsco.com/
Date range: Inception to 20241003
Date searched: 3rd October 2024
Records retrieved: 247

S1	(MH "Post-Acute COVID-19 Syndrome")	1,542
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*)	1,818
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*)	1,998
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))	421
S5	TI PASC OR AB PASC	125
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))	683
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))	304
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))	1,194
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*	1,096

	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))	55
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))	1,171
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))	4,863
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))	993
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	12,213
S16	(MH "Systematic Review")	138,254
S17	(ZT "systematic review")	164,216
S18	(ZT "meta analysis")	59,644
S19	(MH "Meta Analysis")	75,784
S20	TI (meta-analys* or metaanaly*) OR AB (meta-analys* or metaanaly*)	120,837
S21	TI systematic* N1 review* OR AB systematic* N1 review*	170,524
S22	S16 OR S17 OR S18 OR S19 OR S20 OR S21	281,431
S23	(ZT "review")	383,119
S24	AB systematic* or AB methodologic* or AB quantitative* or AB research* or AB literature* or AB studies or AB trial* or AB effective*	2,900,081
S25	(S23 AND S24)	172,368
S26	S22 OR S25	444,780
S27	S15 AND S26	748
S28	(MH "Meta Synthesis")	2,360
S29	TI qualitative N1 review* OR AB qualitative N1 review*	4,260
S30	TI (realist N1 (review* or synthes*)) OR AB (realist N1 (review* or synthes*))	629
S31	TI (meta-synthes* or metasynthes*) OR AB (meta-synthes* or metasynthes*)	2,013

S32	TI (living N2 (review* or map*)) AND (living N2 (review* or map*))	244
S33	TI pooled N1 analys* OR AB pooled N1 analys*	8,699
S34	S28 OR S29 OR S30 OR S31 OR S32 OR S33	16,470
S35	S15 AND S34	32
S36	S27 OR S35	760
S37	EM 202406-	76,658
S38	(ZD "in process")	1,826,724
S39	S37 OR S38	1,903,382
S40	S36 AND S39	247

Cochrane Database of Systematic Reviews (CDSR)
via Wiley http://onlinelibrary.wiley.com/
Issue: Issue 10 of 12, October 2024
Date searched: 3rd October 2024
Records retrieved: 0

ID	Search	Hits
#1	MeSH descriptor: [Post-Acute COVID-19 Syndrome] this term only	278
#2	MeSH descriptor: [COVID-19] this term only	8133
#3	MeSH descriptor: [SARS-CoV-2] this term only	3484
#4	MeSH descriptor: [Syndrome] this term only	6768
#5	MeSH descriptor: [Survivors] this term only	1818
#6	#2 or #3	8393
#7	#4 or #5	8580
#8	#6 and #7	106
#9	#1 or #8	360
#10	(long next (covid* or covid-19 or covid19 or coronavirus) or longcovid*):ti,ab,kw	557
#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	897
#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	1631
#13	PASC:ti,ab,kw	78
#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	194
#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	963
#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	317
#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	1616
#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	776
#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	216
#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	361
#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*)	205

	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}	3141
#24	#9 or #23 with Cochrane Library publication date Between Jun 2024 and Oct 2024, in Cochrane Reviews, Cochrane Protocols	0

Epistemonikos
https://www.epistemonikos.org/
Date searched: 3rd October 2024
Records retrieved: 340

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 02/07/2024 onwards, broad synthesis = 7, SR = 74

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 02/07/2024 onwards, broad synthesis = 0, SR = 13

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 02/07/2024 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 02/07/2024 onwards, broad synthesis = 1, 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 02/07/2024 onwards, broad synthesis = 0, SR = 3

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 02/07/2024 onwards, broad synthesis = 3, SR = 46

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 02/07/2024 onwards, broad synthesis = 5, SR = 40

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 02/07/2024 onwards, broad synthesis = 0, SR = 0

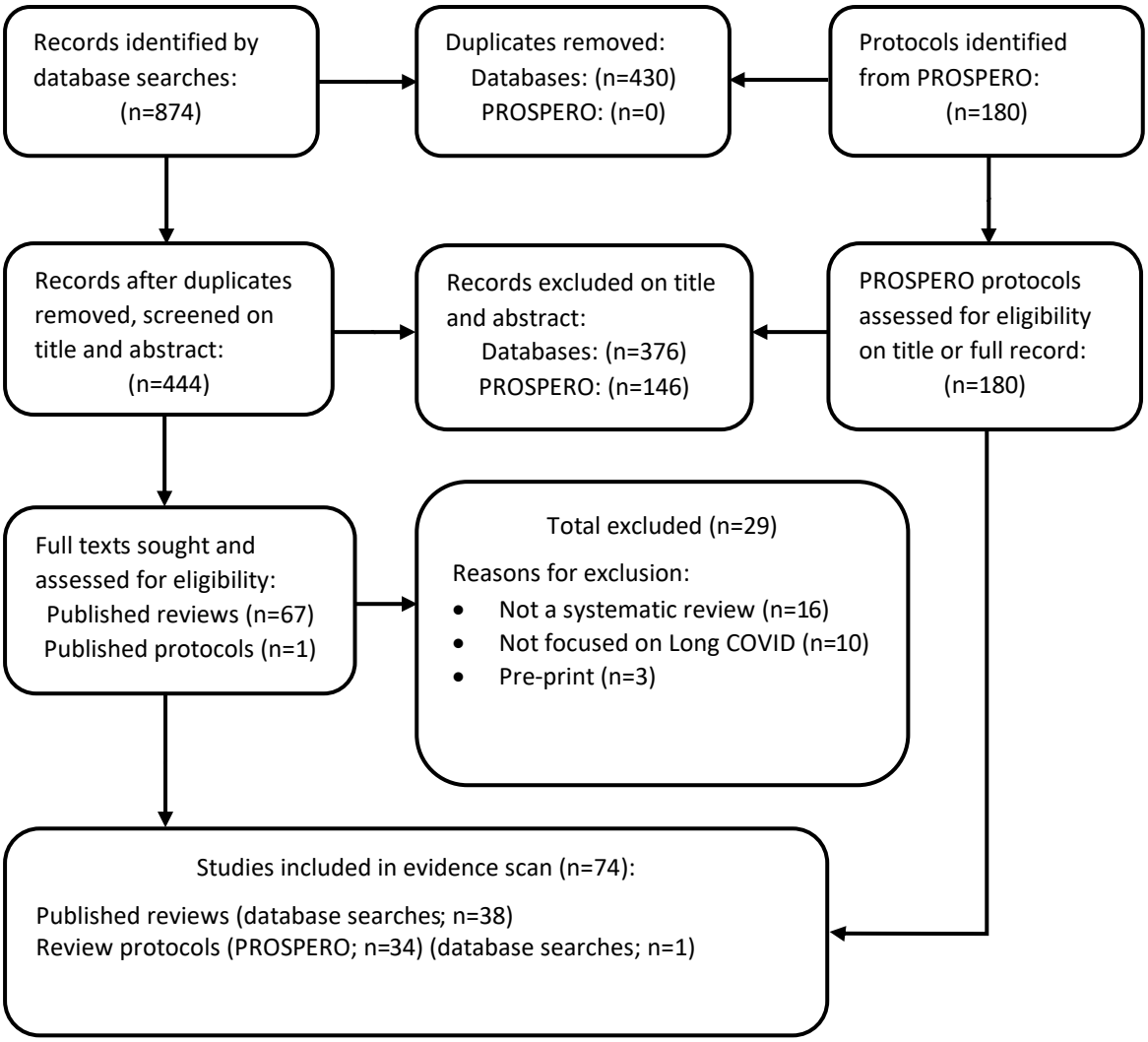
9. (title:(survivor* OR survived) OR abstract:(survivor* OR survived)) AND (title:(covid OR covid-19 OR covid19 OR coronavirus OR "SARS CoV 2" OR SARS-CoV-2 OR SARSCoV2 OR "SARS CoV2" OR SARS-CoV2 OR "SARSCoV 2" OR SARSCoV-2) OR abstract:(covid OR covid-19 OR covid19 OR coronavirus OR "SARS CoV 2" OR SARS-CoV-2 OR SARSCoV2 OR "SARS CoV2" OR SARS-CoV2 OR "SARSCoV 2" OR SARSCoV-2))
Limits = added to database from 02/07/2024 onwards, broad synthesis = 1, SR = 9

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 02/07/2024 onwards, broad synthesis = 18, SR = 101

PROSPERO search strategy
https://www.crd.york.ac.uk/prospero/
Searched from 3rd July to 3rd October, 2024
Records identified: 180

#1	long COVID OR post COVID OR PASC NOT Animal DB WHERE CD FROM 03/07/2024 TO 03/10/2024	75
#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 03/07/2024 TO 03/10/2024	5945
#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 03/07/2024 TO 03/10/2024	374
#4	#2 AND #3	148
#5	#1 OR #4	180

Appendix 2: Flow of studies through the review



Appendix 3: Summary of reports and updates

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

Report date	**Oct 2024**	**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**	Jul to Oct '24	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	**38**	**33**	**36**	**42**	**46**	**31**	**37**	**50**	**29**	**28**	**54**	**51**
Treatment[1]	11	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	1	2	1	3			1	2	1			1
Prevalence[2]	14	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]	8	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	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							
Diagnosis or monitoring tools	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)	**35**	**43**	**62**	**41**	**41**	**52**	**68**	**56**	**63**	**59**	**73**	**77**
Treatment[1]	10	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]	13	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	6	8	7	6	6	13	4		10		
Risk factors[3] and treatment[1]				1								
Risk factors[3] and prevention			2					1				
Pathobiology[4]	5	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 tools	1						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.

The NIHR Policy Research Programme Reviews Facility collaboration has grown out of a previous 'reviews facility' in Health Promotion and Public Health based at the EPPI Centre, and has been funded by the Department of Health and Social Care since 1995.

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