

# Clinical and socioeconomic characteristics of older adults with COVID-19: A protocol for a rapid systematic review

 Maycon Sousa Pegorari<sup>1</sup>  
 Areolino Pena Matos<sup>1</sup>  
 Natalia Camargo Rodrigues losimuta<sup>1</sup>  
 Vânia Tie Koga Ferreira<sup>1</sup>  
 Daniela Gonçalves Ohara<sup>1</sup>  
 Elane Priscila Rosa Santos<sup>1</sup>  
 Caroline de Fátima Ribeiro Silva<sup>1</sup>  
 Nara Loren Oliveira dos Santos<sup>1</sup>  
 Aline Pereira Rocha<sup>2</sup>  
 Álvaro Nagib Atallah<sup>2</sup>  
 Ana Carolina Pereira Nunes Pinto<sup>1,2</sup>

**1.** Universidade Federal do Amapá - Unifap, Macapá, AP, Brasil  
**2.** Universidade Federal de São Paulo - Unifesp, São Paulo, SP, Brasil

<http://dx.doi.org/10.1590/1806-9282.66.S2.118>

## SUMMARY

The aim of this rapid systematic review is to analyze the prevalence of clinical, socioeconomic, and demographic characteristics, laboratory and imaging findings, diagnostic tests, and treatment information of older adults with COVID-19. To conduct this systematic review, the Cochrane Handbook recommendations will be followed. Patients aged 60 years or older with a confirmed diagnosis of SARS-CoV-2 infection will be included. A comprehensive literature search will be performed in the following databases: MEDLINE via PubMed, Embase, Cochrane Central Register of Controlled Trials (CENTRAL), Latin American and Caribbean Health Sciences Literature (LILACS), Spanish Bibliographic Index on Health Sciences (IBECS) and Epistemonikos COVID-19 L-OVE platform. No language restrictions will be applied. To assess the methodological quality of the included studies and the certainty of the evidence, the Newcastle-Ottawa Scale, and the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach will be used. The meta-analysis will be performed using R software. We believe this rapid systematic review will be able to summarize the currently available evidence on clinical, socioeconomic characteristics, and management of COVID-19 in older adults. Therefore, it will help implement adequate strategies to fight the pandemic and assist in understanding the clinical profile of older patients with COVID-19, providing data with due scientific support upon which to base future choices of procedures and interventions.

**KEYWORDS:** Aged. Coronavirus Infections. Health of the elderly.

DATE OF SUBMISSION: 09-Jun-2020

DATE OF ACCEPTANCE: 12-Jun-2020

CORRESPONDING AUTHOR: Maycon Sousa Pegorari

Departamento de Ciências Biológicas, Curso de Graduação em Fisioterapia, Universidade Federal do Amapá (Unifap)

Rodovia Juscelino Kubitschek, Km – 02, Jardim Marco Zero, Macapá – AP

CEP 68903-419 - Campus Marco Zero - Tel: (+55 96) 4009-2944

E-mail: mayconpegorari@yahoo.com.br

## INTRODUCTION

In the last months, the world has been facing a pandemic unprecedented in human history<sup>1</sup>. Initially identified in China in December 2019, the novel coronavirus (SARS-CoV-2) has high transmissibility and is the cause of Coronavirus Disease 19 (COVID-19), a potentially deadly acute respiratory infection<sup>2</sup>. There are several clinical symptoms of COVID-19, but they resemble those of simple flu. The patients can have mild, moderate, severe, or critical illness<sup>3</sup>. Data from a large case series have shown that nearly 10-15% of patients have the severe form of the disease, and 5% have the critical form of the disease and require treatment in intensive care units (ICU)<sup>4</sup>.

Older age and clinical comorbidities, such as hypertension, diabetes, and obesity are factors associated with evolution to the severe form of COVID-19 and death<sup>3</sup>. However, comorbidities are much more prevalent in older adults than in the general population<sup>5</sup>. Therefore, it is not well established whether chronological age alone would be a good predictor of worse outcomes or if comorbidities would have a stronger impact on the prognosis of patients with COVID-19.

Of note, as a diagnostic test for COVID-19 depends on the dynamics of the immunological response, it has been questioned whether the sensitivity of the current diagnostic tests is affected by age<sup>6</sup>. Additionally, as age is accompanied not only by changes in the immune response but also by multimorbidity and polypharmacy, it has also been suggested that the treatment of COVID-19 in older adults should be carefully evaluated<sup>7</sup>.

Although there is a large number of reviews on COVID-19<sup>8-10</sup>, to our knowledge, none of them have investigated several features specifically of the elderly population with COVID-19. Therefore, an accurate synthesis of the currently available evidence pointing out clinical, socioeconomic, demographic characteristics, and information on efficient diagnostic tests and specific treatments for COVID-19 in older adults is crucial and can help health professionals face the health emergency we are currently experiencing.

Thus, the purpose of this rapid systematic review is:

- To estimate the prevalence of clinical characteristics and comorbidities in older people with COVID-19;
- To analyze the prevalence of socioeconomic and demographic characteristics in older adults with COVID-19;

- To determine the prevalence of laboratory and imaging findings in older people with COVID-19;
- To analyze which diagnostic tests and treatments are most frequently used in older adults with COVID-19.

## METHODS

To conduct a rapid systematic review, we will employ abbreviated systematic review methods. Therefore, we will not perform independent screenings of abstracts, nor will we search grey literature<sup>11</sup>.

## ELIGIBILITY CRITERIA

### Types of studies

We will include clinical studies on COVID-19 that have included older adults and with availability of clinical, socioeconomic, and demographic characteristics, laboratory and imaging findings, diagnostic tests, or treatment information.

### Types of participants

Patients aged 60 years or older with a confirmed diagnosis of SARS-CoV-2 infection.

### Outcome measures

We aim to determine the prevalence of the following outcomes in older adults diagnosed with COVID-19:

Clinical characteristics: fever, cough, sore throat, difficulty breathing, diarrhea, nausea/vomiting, headache, runny nose, irritability/confusion, adynamia, pharyngeal exudate, seizure, conjunctivitis, coma, dyspnea/tachypnea, abnormal lung sounds, delirium, loss of taste or smell, chest pain or pressure, muscle pain; and previous characteristics or comorbidities: smoking status, cardiovascular disease, hypertension, diabetes, liver disease, chronic neurological or neuromuscular disease, immunodeficiency, HIV infection, kidney disease, chronic lung disease, neoplasia (solid or hematological tumor), or any other clinical characteristics and/or comorbidities reported in the primary studies.

Socioeconomic and demographic characteristics: such as gender, age, income, education, marital status, housing arrangement, country or continent, hospital, clinic, community, or long-term care institutions for the older people.

Laboratory findings: e. g. serum creatinine, platelets, hemoglobin, blood albumin, procalcitonin,

c-reactive protein, white blood cells, aspartate transaminase, alanine transaminase, ferritin, interleukins, international normalized ratio – INR; and imaging findings: chest x-ray and computed tomography abnormalities (multiple lobe lesion, single lobe lesion).

Most frequently used diagnostic tests: such as nucleic acid amplification tests (RT-PCR), serological tests for IgA, IgM, and/or IgG anti-SARS-CoV-2 antibodies, using ELISA, chemiluminescence or immunochromatographic methods, immunochromatographic test to search for viral antigens in upper respiratory tract samples.

Most frequently used treatments: such as oxygen therapy, mechanical ventilation (non-invasive and invasive), antiviral treatment, glucocorticoids, immunoglobulin, traditional Chinese medicine, antibiotics, thymopentin, continuous renal replacement therapy, immunobiologics, or any other treatment reported in the primary studies.

#### Data sources and searches

A comprehensive literature search will be performed in the following databases:

- MEDLINE via PubMed;
  - Embase;
  - Cochrane Central Register of Controlled Trials (CENTRAL);
  - Latin American and Caribbean Health Sciences Literature (LILACS);
  - Spanish Bibliographic Index on Health Sciences (IBECS);
  - Epistemikos COVID-19 L-OVE platform.
- To identify potentially relevant studies, appropriate

descriptors and synonyms will be used, adapting the search to the specifications of each database. We will also search the trials registry ClinicalTrials.gov. Studies published since December 2019 will be included and no language restrictions will be used in the selection. Finally, we will apply the technique of snowballing, searching the lists of references of the included studies.

#### Search strategy

We will use the terms related to the problem of interest, the intervention, and filter the date of publication. The search strategy in Medline via Pubmed is shown in Table 1.

#### Study selection

Two authors (E.P.R.S. and N.L.O.S.) will screen the studies retrieved during the searches and select them for inclusion in this review. If studies are found in more than one database, only one of them will be considered for inclusion. If reports using the same participants but different outcome measurements are found, both reports will be included, but they will be considered as parts of only one study.

After removing duplicated studies, the titles and abstracts will be read and those that clearly do not fulfill the eligibility criteria will be excluded. The remaining studies will then be fully read and assessed for inclusion in the review. Disagreements regarding the inclusion of studies will be solved by consulting a third author (C.F.R.S.). The reasons for any full-text paper exclusions will be documented. Rayyan application<sup>12</sup> will be used for the screening and selection of studies.

**TABLE 1.** SYSTEMATIC REVIEW SEARCH STRATEGY

Number	Combiners	Terms
1	Population of interest	Coronavirus[MeSH Terms] OR Coronaviridae[MeSH Terms] OR Coronavirus Infections[MeSH Terms] OR coronavirinae OR COVID-19 OR COVID OR COVID19 OR "severe acute respiratory syndrome coronavirus 2" OR SARS-CoV-2 OR SARS2 OR SARSCov2 OR ncov* OR betacoronavirus[MeSH Terms] OR Coronavirus* OR 2019-nCoV OR (Corona virus*)
2		Aged[MeSH Terms] OR Geriatrics[Mesh Major Topic] OR geriatric* OR gerontolog* OR older OR aging OR senior OR old OR elder* OR Aged, 80 and over[Mesh Terms] OR centenarian* OR nonagenarian* OR octogenarian* OR pensioner OR veteran* OR Health Services for the Aged[Mesh Terms] OR Homes for the Aged[Mesh Terms] OR (nursing home) OR (retirement home) OR old-age
	Filters	Publication date: 2019 - 2020
3		#1 AND #2 AND #3

The abovementioned search strategy will be used in Medline via Pubmed and will be adapted to the specifications of each database.

## Data extraction

Two authors (E.P.R.S. and N.L.O.S.) will independently extract relevant data. Discrepancies in the data extraction will be solved by a third author (C.F.R.S.). To extract data from included studies, a pre-defined form will be used with the following information: (I) Demographic and clinical characteristics of the participants; (II) Socioeconomic characteristics of the participants; (III) Laboratory findings; (IV) Imaging findings; (V) Tests used to confirm diagnosis; (VI) Treatment; (VII) Sources of funding; (VIII) Possibility of conflict of interests.

## Assessment of methodological quality in included studies and certainty of the body of evidence

The Newcastle-Ottawa Scale for assessing the methodological quality of observational studies will be used<sup>13</sup>. The certainty of evidence will be assessed with the Grading of Recommendations Assessment, Development and Evaluation (GRADE)<sup>14</sup> using GRADE profiler software<sup>15</sup>. An assessment of risk of bias and of the certainty of evidence will be performed by two authors (E.P.R.S. and N.L.O.S.), and all disagreements will be solved through discussion or, if required, by consulting with a third author (C.F.R.S.).

## Data Synthesis and Analysis

When at least two studies are found assessing the same clinical, epidemiological, or treatment characteristics of COVID-19 in older adults, we will assess the possibility of pooling the data into a meta-analysis. To perform the meta-analysis, R software<sup>16</sup> with the “meta” package (version 4.9–6), the “metaprop” function for proportion data, and the “metamean” function for continuous data will be used. We will present pooled results of proportion with their respective 95% confidence intervals (CI) by using the inverse variance method with a random-effects model. For continuous data, we will present pooled results of means with their respective 95% CI by the inverse variance method with a random-effects model. Heterogeneity will be assessed by Cochran’s Q test considering a statistically significant value for  $p < 0.1$  and Higgins  $I^2$ .

## Reporting Characteristics

This rapid systematic review protocol was reported following the preferred reporting items for systematic

review and meta-analysis protocols (PRISMA-P) guidance<sup>17</sup> and was registered in the Prospective Register of Systematic Reviews (PROSPERO) platform (CRD42020190951).

## DISCUSSION

Our rapid systematic review planned with this protocol aims to estimate, analyze, and determine the sociodemographic, clinical, laboratory, and imaging findings, as well as the diagnostic tests and treatments of older adults with COVID-19. Since the first reports of COVID-19 cases in Wuhan, China, studies have shown that older adults are at a higher risk of complications when infected by SARS-CoV2<sup>2,3</sup>, especially those with frailty and comorbidities. Of note, most publications have considered their results in the adult populations without providing specific information regarding older adults. As a huge amount of publications have addressed COVID-19, an updated synthesis compiling the best available evidence is critical and can help guideline developers and front-line health professionals create strategies to assist patients with due scientific support.

To ensure the methodological quality of this review, we will follow the Cochrane Handbook of the Systematic Reviews recommendations<sup>18</sup>, search the largest electronic databases, assess the risk of bias of included studies using the Newcastle-Ottawa Scale<sup>13</sup>, and, finally, evaluate the certainty of evidence with GRADE<sup>14</sup>. We believe this rapid systematic review will be able to summarize the currently available studies on the clinical profile and management of older adults with COVID-19. Therefore, it will not only guide future research but also help implement adequate strategies to fight the pandemic and provide critical data upon which future choices of procedures and interventions can be based.

## Conflict of interest

There was no conflict of interest.

## Author's Contributions

MSP, APM, NCRI, VTKE, DGO, APR, ANA, and ACPNP contributed to the study conception and design, article writing, and editing. EPRS, CFRS, and NLOS contributed to the article writing. All authors read and approved the final version of the article to be published.

## APPENDIX

### Search Strategy

#### EMBASE

#1 'coronavirinae'/exp OR coronavirinae OR 'COVID-19'/exp OR 'COVID-19' 'COVID-19' OR covid OR COVID-19 OR 'coronavirus'/exp OR coronavirus\* OR 'corona virus\*' OR 'coronaviral infection' OR 'coronaviridae'/exp OR coronaviridae OR 'coronavirus infection'/exp OR 'coronavirus infection' OR 'sars-cov-2' OR SARSCov2 OR ncov\* OR coronaviruses OR 'severe acute respiratory syndrome coronavirus 2' OR 'SARS coronavirus'/exp OR 'SARS coronavirus' OR 'SARS-related coronavirus'/exp OR 'SARS-related coronavirus' OR 'betacoronavirus'/exp OR betacoronavirus

#2 'aged'/exp OR aged OR elder\* OR 'geriatrics'/exp OR geriatric\* OR 'geriatric patient'/exp OR gerontolog\* OR 'geriatric care'/exp OR older OR old OR aging OR senior OR senium OR 'very elderly'/exp OR 'very elderly' OR centenarian\* OR nonagenarian\* OR octogenarian\* OR pensioner OR veteran\* OR 'nursing home' OR 'home for the aged'/exp OR 'retirement home' OR old-age

#3 #1 AND #2

#4 #3 AND [embase]/lim NOT ([embase]/lim AND [medline]/lim) AND [1-12-2019]/sd

#### LILACS AND IBICS VIA PORTAL BVS

mh:"Coronavirus" OR mh:"Infecções por Coronavirus" OR mh:"Coronaviridae" OR mh:"Betacoronavirus" OR mh:"Severe Acute Respiratory Syndrome" OR COVID-19 OR COVID-19 OR (COVID-19) OR 2019-ncov OR sars-cov-2 OR "Novo Coronavirus" OR mh:b04.820.504.540\* OR "Coronavirus Infections" OR "novel coronavirus"

AND

mh:"Idoso" OR aged OR anciano OR Idosos OR (Pessoa Idosa) OR (Pessoa de Idade) OR (Pessoas Idosas) OR (Pessoas de Idade) OR (População Idosa) OR mh:"Idoso de 80 Anos ou mais" OR Centenários OR Nonagenários OR Octogenários OR Velhíssimos OR mh:"Instituição de Longa Permanência para Idosos" OR Ancianatos OR ILPI OR (Instituição Asilar) OR (Instituições Geriátricas de Longa Permanência) OR mh:"Geriatria" OR Geriatrics OR Geriatria OR Gerontologia

Filter: Year 2019-2020

#### COCHRANE

#1 MeSH descriptor: [Coronavirus] explode all trees

#2 MeSH descriptor: [Coronaviridae] explode all trees

#3 MeSH descriptor: [Coronavirus Infections] explode all trees

#4 MeSH descriptor: [Betacoronavirus] explode all trees

#5 coronavirinae OR COVID-19 OR COVID OR COVID-19 OR "severe acute respiratory syndrome coronavirus 2" OR Coronavirus\* OR "2019-nCoV" OR nCoV\* OR "SARS-CoV-2" OR SARS2 OR SARSCov2 OR "Corona virus\*\*"

#6 #1 or #2 or #3 or #4 or #5

#7 MeSH descriptor: [Aged] explode all trees

#8 MeSH descriptor: [Geriatrics] explode all trees

#9 MeSH descriptor: [Aged, 80 and over] explode all trees

#10 MeSH descriptor: [Health Services for the Aged] explode all trees

#11 MeSH descriptor: [Homes for the Aged] explode all trees

#12 geriatric\* OR gerontolog\* OR older OR aging OR senior OR old OR elder\* OR centenarian\* OR nonagenarian\* OR octogenarian\* OR pensioner OR veteran\* OR (nursing home) OR (retirement home) OR old-age

#13 #7 OR #8 or #9 or #10 or #11 or #12

#14 #6 AND #13

Filter: Year 2019-2020

#### EPISTEMONIKOS

<https://app.iloveevidence.com/loves/5e6fdb9669c00e4ac072701d>  
Primary Studies  
Reporting results

#### CLINICAL TRIALS

<https://clinicaltrials.gov/ct2/results?cond=COVID-19>  
Filters:  
-Age 18-65  
-Age: (65+)  
-With results

## RESUMO

O objetivo desta rápida revisão sistemática é analisar a prevalência de características clínicas, socioeconômicas e demográficas, achados laboratoriais e de imagem, testes de diagnóstico e informações de tratamento de idosos com COVID-19. Para conduzir esta revisão sistemática, serão seguidas as recomendações do Manual Cochrane. Pacientes com 60 anos ou mais com diagnóstico confirmado de infecção por Sars-CoV-2 serão incluídos. Uma pesquisa bibliográfica abrangente será realizada nas seguintes bases de dados: Medline via PubMed, Embase, Cochrane Central Register of Controlled Trials (Central), Literatura Latino-Americana e do Caribe em Ciências da Saúde (Lilacs), Índice Bibliográfico Espanhol em Ciências da Saúde (Ibecs) e Epistemonikos Plataforma COVID-19 L · OVE. Nenhuma restrição de idioma será aplicada. Para avaliar a qualidade metodológica e a certeza das evidências dos estudos incluídos, serão utilizadas a Escala Newcastle-Ottawa e a abordagem Grading of Recommendations Assessment, Development and Evaluation (Grade). A meta-análise será realizada no software R. Acreditamos que esta revisão sistemática rápida será capaz de resumir as evidências atualmente disponíveis sobre as características clínicas, socioeconômicas e sobre o manejo de idosos com COVID-19. Portanto, ajudará a implementar estratégias adequadas para combater a pandemia e ajudará a entender o perfil clínico de pacientes idosos com COVID-19, fornecendo dados com o devido apoio científico sobre o qual basear futuras escolhas de procedimentos e intervenções.

**PALAVRAS-CHAVE:** Idoso. Infecções por coronavírus. Saúde do idoso.

## REFERENCES

1. World Health Organization. Coronavirus disease (COVID-19) outbreak situation. Geneva: World Health Organization; 2020.
2. Sun H, Ning R, Tao Y, Yu C, Deng X, Zhao C, et al. Risk factors for mortality in 244 older adults with COVID-19 in Wuhan, China: a retrospective study. *J Am Geriatr Soc.* 2020;68(6):E19-E23.
3. Jain V, Yuan JM. Predictive symptoms and comorbidities for severe COVID-19 and intensive care unit admission: a systematic review and meta-analysis. *Int J Public Health.* 2020;1-14.
4. Wu Z, McGoogan JM. Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: summary of a report of 72 314 cases from the Chinese Center for Disease Control and Prevention. *JAMA.* 2020. doi: 10.1001/jama.2020.2648.
5. Pereira DS, Nogueira JAD, Silva CAB. Quality of life and the health status of elderly persons: a population-based study in the central sertão of Ceará. *Rev Bras Geriatr Gerontol.* 2015;18(4):893-908.
6. Lithander FE, Neumann S, Tenison E, Lloyd K, Welsh TJ, Rodrigues JCL, et al. COVID-19 in older people: a rapid clinical review. *Age Ageing.* 2020;afaa093. doi: 10.1093/ageing/afaa093.
7. Lauretani F, Ravazzoni G, Roberti MF, Longobucco Y, Adorni E, Grossi M, et al. Assessment and treatment of older individuals with COVID-19 multi-system disease: clinical and ethical implications. *Acta Biomed.* 2020;91(2):150-68.
8. Singhal T. A review of coronavirus disease-2019 (COVID-19). *Indian J Pediatr.* 2020;87(4):281-6.
9. Aminjafari A, Ghasemi S. The possible of immunotherapy for COVID-19: a systematic review. *Int Immunopharmacol.* 2020;83:106455.
10. Sanders JM, Monogue ML, Jodlowski TZ, Cutrell JB. Pharmacologic treatments for coronavirus disease 2019 (COVID-19): a review. *JAMA.* 2020. doi: 10.1001/jama.2020.6019.
11. Garrity C, Gartlehner G, Kamel C, King VJ, Nussbaumer-Streit B, Stevens A, et al. Cochrane rapid reviews: interim guidance from the Cochrane Rapid Reviews Methods Group. [cited 2020 Jun 1]. Available from: <https://methods.cochrane.org/rapidreviews/cochrane-rr-methods>
12. Ouzzani M, Hammady H, Fedorowicz Z, Elmagarmid A. Rayyan-a web and mobile app for systematic reviews. *Syst Rev.* 2016;5(1):210.
13. Wells GA, Shea B, O'Connell D, Robertson J, Peterson J, Welch V, et al. The Newcastle-Ottawa Scale (NOS) for assessing the quality of nonrandomized studies in meta-analysis. 2014.
14. Atkins D, Best D, Briss PA, Eccles M, Falck-Ytter Y, Flottorp S, et al; GRADE Working Group. Grading quality of evidence and strength of recommendations. *BMJ.* 2004;328(7454):1490.
15. GDT G. Grade's software for summary of findings tables, health technology assessment and guidelines 2015.
16. R Core Team. R: a language and environment for statistical computing. Vienna: R Foundation for Statistical Computing; 2013.
17. Moher D, Shamseer L, Clarke M, Ghersi D, Liberati A, Petticrew M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Syst Rev.* 2015;4(1):1.
18. Higgins JPT, Thomas J, Chandler J, Cumpston M, Li T, Page MJ, et al. Cochrane handbook for systematic reviews of interventions version 6.0 (updated July 2019). Oxford: Cochrane; 2019. [cited 2020 May 23]. Available from: [www.training.cochrane.org/handbook](http://www.training.cochrane.org/handbook)

