


# BMJ Open Prevalence of COVID-19 infection in black people in primary health care, hospital units and intensive care units: a protocol for a systematic review and meta-analysis

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## ABSTRACT

**Introduction** COVID-19 pandemic has affected people all over the world. In this context, health disparities are already evident in becoming ill and dying from this condition, further accentuating historical racial inequalities.

**Methods and analysis** This protocol will be developed based on the recommendations of Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocols. For this, searches will be carried out in PubMed, Web of Science, Scopus, Lilacs and ScienceDirect databases searching for cross-sectional studies that assessed the prevalence of black people with COVID-19 at different levels of complexity. All cross-sectional studies that analysed the prevalence of COVID-19 in black people assisted in primary care, hospital wards and intensive care units will be included. The research will be carried out by two independent researchers who will identify the articles; they will exclude duplicate studies. Through blind evaluation, they will select the articles using the Rayyan QCRI application. The instrument proposed by Downs and Black will be used to assess the risk of bias. The meta-analyses will be performed according to the data conditions included.

**Ethics and dissemination** For this study's development, there is no need for an ethical appraisal considering that it is a systematic review that will use secondary studies. This study's findings will be disseminated through peer-reviewed publications, conference presentations and condensed summaries for main stakeholders and partners in the field. The database search is expected to begin on 1 February 2021. It is expected to complete the entire review process by 30 October 2021

**Trial registration number** CRD42020209079.

## INTRODUCTION

Since December 2019, after discovering SARS-CoV-2 and the emergence of COVID-19, was observed the spread of this new disease worldwide. The rapid spread of this condition has triggered economic, social and

## Strengths and limitations of this study

- Share the synthesis of COVID-19 evidence in different racial groups.
- The review will include prevalence studies conducted worldwide with race as its determinant.
- Researchers will conduct the review, extract data on different bases and assess the risk of bias.
- Full articles will be selected, and grey literature will be excluded.
- This review and meta-analysis aim to combine and compute the results of different studies with comparable effect sizes; however, the risk of obtaining only a limited number of studies with small samples is recognised.

health impacts. One of the highlights is the emergence of social markers of race, class and gender, revealing conditions that make several population groups vulnerable. Therefore, it is necessary to discuss these markers to understand and overcome the gaps that permeate between this scenario.<sup>1</sup>

In countries with social disparities in their historical process, this pandemic presents itself in a racialised way. For example, in the USA, African-Americans represent the population of more significant illness and death from the COVID-19. In Michigan, African-Americans represent 14% of the people, and of these, 30% tested positive for COVID-19, and more than 40% died. In Chicago, 29% of the population is African-Americans, and 70% of deaths by COVID-19 were recorded in this population.<sup>2,3</sup>

These discrepancies concerning illness and death due to COVID-19 result from structural inequalities that place blacks at greater

susceptibility to contagion and the development of the severe form of the disease.<sup>4</sup>

It is noteworthy that this group is among those who have a lower income, higher poverty rate and less access to health services, leading them to seek health services in the most advanced stages of the disease, sometimes requiring more complex services in hospitals.

It should also be noted that approximately 90% of severe cases of COVID-19 involve persons with chronic diseases such as hypertension and diabetes, and these diseases are more prevalent in black people, which further increases the risk of death.<sup>5</sup>

The National Health Survey conducted in Brazil reports that the worst health self-assessment rates are among black people, pointing out that the black population has a higher prevalence of hypertension (44.2%) and diabetes (12.7%) when compared with the white people (22.1% and 6.2%, respectively), overcoming the national prevalence of both comorbidities. This also occurs in heart disease (7.0%), asthma (8%) and neglected diseases, such as tuberculosis. It is also worth mentioning the higher prevalence of sickle cell disease in black persons compared with non-blacks.<sup>6</sup>

In the context of the COVID-19 pandemic, it appears, therefore, that black people are at greater risk of contamination by SARS-CoV-2 in view of the aspects already reported, and there is a more significant increase in this risk when considering elderly black people, or those with immunosuppressive or hematopoietic diseases, or even people who need intensive care.<sup>7</sup>

During this pandemic, it is possible to observe the equity gap of marginalised groups before society, especially the black community, which, as noted, is the population with the highest morbidity and mortality rates due to COVID-19 when compared with people of other races.<sup>8</sup> Even if the virus affects everyone, there is a disproportionately negative impact on black people and is also most notable in the extremely high mortality rate experienced in black populations. Reports from US cities that were most severely affected by the virus revealed stark disparities.<sup>9</sup>

A systematic review and meta-analysis identified that black and Asian and Hispanic patients are more likely to become infected with the COVID-19 virus than white patients. The authors associate with the highest risk of admission to intensive care units and death in the most affected groups, suggesting that factors such as lack of ease in timely access to health resources, structural racism and occupational risk underlying racial inequalities are associated with this outcome.<sup>10</sup>

Another point to be considered is occupational exposures. It is already known that certain occupations and industries present a greater risk for COVID-19, especially those employed in health and other essential industries.<sup>11 12</sup> These differences are related to the characteristics inherent to the occupation employed, including exposures to nearby infections with other people.<sup>13</sup> As a result of this occupational segregation, people of colour are often employed in occupations that present a higher risk of injury to the environment and other diseases.<sup>14</sup> A study by Hawkins<sup>15</sup> showed that black

workers were more likely to be employed in essential sectors. Black and Asian workers were more likely to work in the health and social care sectors and hospitals. Besides, black and Hispanic workers were twice as likely to be employed in the animal processing and slaughtering industry, where there were notable outbreaks of COVID-19, suggesting that part of the racial and ethnic variability in COVID-19 risk may also be due to occupational segregation.

Thus, this review protocol will seek to identify the prevalence of black people affected by COVID-19 in primary healthcare, hospital wards or intensive care units.

## METHODS AND ANALYSIS

### Protocol and registration

This systematic review was recorded in the International prospective register of systematic reviews (PROSPERO) on 15 September 15 2020, under protocol CRD42020159968. Available at: [https://www.crd.york.ac.uk/prospero/display\\_record.php?ID=CRD42020209079](https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42020209079)

### Electronic searches

The design and development of this systematic review and meta-analysis will follow the statement of Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocols (PRISMA-P).<sup>16</sup> Initially, the articles' identification will be carried out in the electronic databases: PubMed, Lilacs, Web of Science, Scopus and Science Direct. The search strategy will be duly modified for each one to carry out the appropriate search in each database. Two reviewers will carry it out in a double-blind manner to identify the eligible studies.

This pair of independent researchers will carry out the search, and publications considered to be potentially relevant will be included in the review if they meet all the inclusion criteria. Consensus meetings will be held at each stage; there is no consensus the third reviewer will participate.

The reference list of possible studies included will be selected manually to identify other relevant publications. In case of disagreement, it will be resolved by a third reviewer.

Figure 1 shows the flowchart adapted from PRISMA-P<sup>16</sup> containing all the steps for selecting the studies for this review.

### Search strategy

The search strategy is shown in table 1.

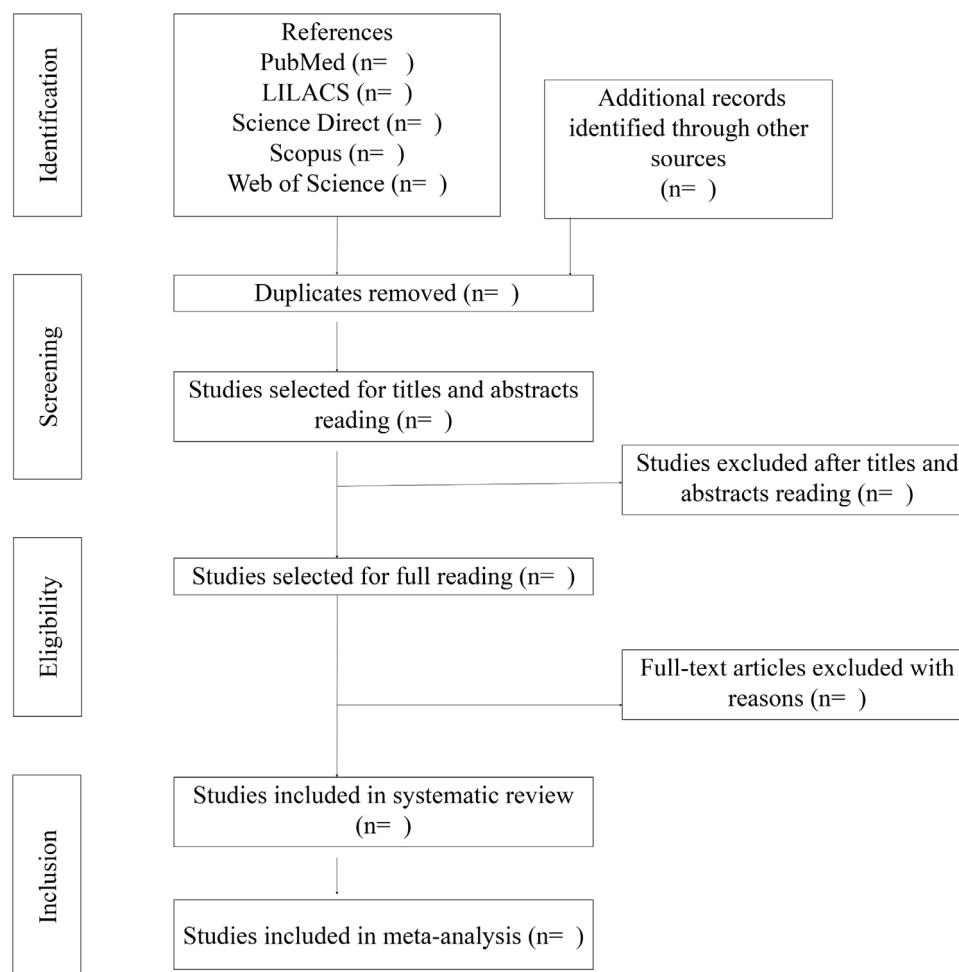
### Inclusion criteria

For this review, articles that meet the eligibility criteria based on the study Population, Exposition, Comparison and Outcome (PECO) will be included, as described in table 2.

Studies will be eligible for further analysis if the following inclusion criteria are met: all cross-sectional studies that analysed the prevalence of COVID-19 in black people assisted in primary healthcare, hospital units or intensive care units.

### Exclusion criteria

Articles whose studies do not show the race variable as a social determinant, cohort and case-control studies, case



**Figure 1** Flow diagram. Adapted from PRISMA-P. PRISMA-P, Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocols.

reports, reviews and randomised clinical trials and qualitative studies will be excluded

### Selection of studies

For the selection of studies, based on the inclusion criteria, the following steps will be performed: (1) exclusion of duplicate articles; (2) reading the title and abstract of all the remaining articles and finally, (3) reading the studies selected in the previous step. Rayyan QCRI Software<sup>17</sup> will be used to perform these steps.

Two independent researchers will conduct the selection phase of the studies, and in case of disagreement between the researchers, even after the consensus meeting, the third researcher will be involved.

Mendeley Software will be used to format the references.<sup>18</sup>

### Data extraction

The characteristics of the study (author, publication date, study design, period and study location) and study population (race, sex and age group of participants) will be extracted from all included studies. We will identify peer-reviewed publications that include the following criteria: patients with COVID-19 (participants); black

patients (exposition); white and other races patients with COVID-19 (comparison); prevalence of black people with COVID-19 in primary healthcare, hospital units and intensive care units (outcome).

The Review Manager software (RevMan 2010) will be used to perform the statistical analysis.

### Risk of bias assessment

The evaluation of the studies' methodological quality included in the review will be conducted according to the quality index for randomised and observational studies proposed by Downs and Black, which has a checklist of 26 items. The index has five subscales (reports; external validity; internal validity—bias; internal validity—confused and power) whose items are scored from 0 or 1, except for one item in the report subscale, scored from 0 to 2 and the single power item scored from 0 to 5. The maximum total score of the methodological quality assessment index is 32 points.<sup>19</sup>

Two authors will independently assess each published article, and if there are any differences in the assigned scores, a third author will be consulted.

**Table 1** Search strategy

Search items	Keywords
1.	2019 novel coronavirus disease
2.	COVID19
3.	COVID-19 pandemic
4.	SARS-CoV-2 infection
5.	COVID-19 virus disease
6.	2019 novel coronavirus infection
7.	2019-nCoV infection
8.	coronavirus disease 2019
9.	coronavirus disease-19
10.	2019-nCoV disease
11.	COVID-19 virus infection
12.	<b>OR 1/11</b>
13.	African Americans
14.	African-Americans
15.	African-American
16.	Skin Color
17.	Color, Skin
18.	Colors, Skin
19.	Skin Colors
20.	Negroid Race
21.	Negroid Races
22.	Race, Negroid
23.	Races, Negroid
24.	Blacks
25.	Negroes
26.	Negro
27.	<b>OR 13/26</b>
28.	Primary Care
29.	Care, Primary
30.	Hospital Units
31.	Hospital Unit
32.	Unit, Hospital
33.	Units, Hospital
34.	Intensive Care Units
35.	Care Unit, Intensive
36.	Care Units, Intensive
37.	Intensive Care Unit
38.	Unit, Intensive Care
39.	Units, Intensive Care
40.	<b>OR 28/39</b>
41.	<b>12 AND 27 AND 40</b>

### Data synthesis

Results will be expressed as prevalence with 95% CI. Fixed-effects or random-effects models will be chosen depending on whether there is an absence or presence of heterogeneity between studies. The  $I^2$  statistic will assess statistical heterogeneity (<25%, no heterogeneity;

**Table 2** PECO description

Abbreviation	PICO	Elements
P	Participants	Patients with COVID-19
E	Exposition	Black patients
C	Comparison	White and other races patients with COVID-19
O	Outcome	Prevalence of black people with COVID-19 in primary healthcare, hospital wards and intensive care units

25%–50%, moderate heterogeneity; and >50%, strong heterogeneity).

When a significant heterogeneity exists across the included studies ( $I^2 > 50\%$ ), a random-effects model will be used for the analysis; otherwise, the fixed-effects model will be used.

All tests will be performed using Review Manager (RevMan V.5.3.0) software, and a two-sided p-value < 0.05 will be considered statistically significant.

### Confidence in cumulative evidence

The Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach will be used to assess the quality of evidence that will be included in this review

### Ethics and dissemination

The study will be conducted following this protocol, which was approved by PROSPERO in September 2020. The database search will start on 1 February 2021, and it is expected to complete the entire review process on 30 October 2021. The results will be published in peer-reviewed journals and annals of local and national, and international conferences.

### Patient and public involvement

No patient involved

### DISCUSSION

The COVID-19 pandemic has increasingly accentuated the social inequities that exist in countries with historical inequalities. In addition to its impact on health and the dynamics of social structure, this pandemic also had a debilitating effect on many families worldwide. Studies show that black people have increased rates of COVID-19 infection and mortality, which is related to racial and ethnic disparities characterised in the financing of healthcare, access, quality and service provision. Primary healthcare is supporting most of the cases of COVID-19 and has quickly adjusted to the needs of consultations that are not in person. Black people have more significant social vulnerability related to poverty, less access to health services, unemployment and lower-income. Thus, these factors can lead to a late search for the disease's treatment, resulting in the worsening of and search for more complex services, placed at greater risk of death.



There are still no studies that summarise the care provided to people affected by COVID-19 concerning different healthcare levels. Therefore, this systematic review will help improve and implement existing public health policies and contribute to the development of new policies that guarantee greater access to health services by black people. This way, it is expected that the conclusion of this systematic review will produce results that make it possible to understand the care process offered to this population group and to identify whether racial disparities are factors that can increase the risk of illness and death in the context of the COVID-19 pandemic. The results can also help define strategies that can control and prevent transmission of COVID-19 and propose health-care and self-care recommendations in the pandemic and post-pandemic periods.

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**Competing interests** None declared.

**Patient and public involvement** Patients and/or the public were not involved in the design, or conduct, or reporting or dissemination plans of this research.

**Patient consent for publication** Not required.

**Provenance and peer review** Not commissioned; externally peer reviewed.

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