



STUDY PROTOCOL

A living systematic review protocol for COVID-19 clinical trial registrations [version 1; peer review: 2 approved]

Brittany J. Maguire ^{1,2}, Philippe J. Guérin^{1,2}

¹Infectious Diseases Data Observatory (IDDO), Oxford, UK

²Centre for Tropical Medicine and Global Health, Nuffield Department of Medicine, University of Oxford, Oxford, UK

v1 **First published:** 02 Apr 2020, 5:60 (<https://doi.org/10.12688/wellcomeopenres.15821.1>)
Latest published: 02 Apr 2020, 5:60 (<https://doi.org/10.12688/wellcomeopenres.15821.1>)

Abstract

Since the coronavirus disease 2019 (COVID-19) outbreak was identified in December 2019 in Wuhan, China, a strong response from the research community has been observed with the proliferation of independent clinical trials assessing diagnostic methods, therapeutic and prophylactic strategies. While there is no intervention for the prevention or treatment of COVID-19 with proven clinical efficacy to date, tools to distil the current research landscape by intervention, level of evidence and those studies likely powered to address future research questions is essential.

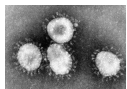
This living systematic review aims to provide an open, accessible and frequently updated resource summarising the characteristics of COVID-19 clinical trial registrations. Weekly search updates of the WHO International Clinical Trials Registry Platform (ICTRP) and source registries will be conducted. Data extraction by two independent reviewers of trial characteristic variables including categorisation of trial design, geographic location, intervention type and targets, level of evidence and intervention adaptability to low resource settings will be completed. Descriptive and thematic synthesis will be conducted.

A searchable and interactive visualisation of the results database will be created, and made openly available online. Weekly results from the continued search updates will be published and made available on the Infectious Diseases Data Observatory (IDDO) website ([COVID-19 website](#)).

This living systematic review will provide a useful resource of COVID-19 clinical trial registrations for researchers in a rapidly evolving context. In the future, this sustained review will allow prioritisation of research targets for individual patient data meta-analysis.

Keywords



Living systematic review, COVID-19, coronavirus, clinical trials, emerging infections




This article is included in the [Coronavirus \(COVID-19\)](#) collection.

Open Peer Review

Reviewer Status  

	Invited Reviewers	
	1	2
version 1 02 Apr 2020	 report	 report

- 1 **Julia C. Cutts** , Burnet Institute, Melbourne, Australia
- 2 **Carol H. Sibley**, University of Washington, Seattle, USA

Any reports and responses or comments on the article can be found at the end of the article.

Corresponding author: Philippe J. Gu  rin (philippe.guerin@iddo.org)

Author roles: **Maguire BJ:** Methodology, Project Administration, Writing – Original Draft Preparation, Writing – Review & Editing; **Gu  rin PJ:** Conceptualization, Writing – Review & Editing

Competing interests: No competing interests were disclosed.

Grant information: This work was supported by the Wellcome Trust through a Discretionary Award to PJG [203794]. This work is funded by the Bill & Melinda Gates Foundation (BMGF).

The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

Copyright:    2020 Maguire BJ and Gu  rin PJ. This is an open access article distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

How to cite this article: Maguire BJ and Gu  rin PJ. **A living systematic review protocol for COVID-19 clinical trial registrations [version 1; peer review: 2 approved]** Wellcome Open Research 2020, 5:60 (<https://doi.org/10.12688/wellcomeopenres.15821.1>)

First published: 02 Apr 2020, 5:60 (<https://doi.org/10.12688/wellcomeopenres.15821.1>)

Introduction

The urgency of the international response to the COVID-19 pandemic has challenged the research community's coordination and collaboration, resulting in hundreds of independent efforts to test and trial interventions. As new clinical trials are being registered every week, if not on a daily basis, a frequently updated resource is required to aid in distilling the many diagnostic methods, therapeutic and prophylactic strategies being assessed and to provide clarity around those trials that are well designed and powered to identify small benefits for promptly addressing critical research questions.

All countries share the common constraint of a finite budget and resources in combating pandemics, as is currently being witnessed with COVID-19¹. Yet not all have the same basic level of health infrastructure to deal with day-to-day health emergencies, let alone global health threats of this magnitude². To date, a comparatively small number of confirmed COVID-19 cases have been reported in regions with low resource settings (including Africa, Latin America and South Asia). However, as cases are expected to rise over the coming weeks those countries with resource constrained health care systems will be disproportionately affected³. If proven effective, readily implementable and scalable interventions are demanded. A means for researchers to rapidly categorise and identify priority trials assessing interventions that are affordable, readily available and adaptable particularly to low resource settings could assist this effort.

Furthermore, it is expected that resource limited countries will conduct research studies which will respond to their contexts and duplication of effort should be minimised as much as possible. While, to date, there is no available vaccine or drug with proven clinical efficacy, a method for describing ongoing trials as well as extracting pertinent information for each of them is essential within the current research landscape.

To address this need, a living systematic review⁴ will be established to continually update and incorporate new clinical trial registrations and relevant data as they become available. The primary objective of this living systematic review is to provide an open, accessible and frequently updated resource summarising the characteristics of COVID-19 clinical trial registrations.

Methods

The living systematic review protocol outlined herein was prospectively designed. Due to the time sensitivity of this project being undertaken during a pandemic, preliminary data extraction necessarily commenced before it could be formally registered with PROSPERO.

Rationale for use of living method

In the setting of a current pandemic with new clinical trials being registered every week, if not on a daily basis, there are limitations to conducting a systematic review at a single time point. The most substantial limitation being that systematic

reviews are time intensive. The average time to write and publish a systematic review is 67 weeks⁵. A living systematic review methodology permits minimal compromise to methodological rigour while allowing improvement in the currency, relevance, and usefulness of a systematic review⁶. Technology can be used to semi-automate arduous processes like data extraction. These tools can facilitate significantly faster extraction of relevant data, stimulating rapid and maintained synthesis of evidence for the benefit of researchers and policy makers⁵.

Eligibility criteria

All clinical trial registrations either planning to, or have enrolled patients of all ages diagnosed with COVID-19 will be eligible for inclusion in this review. Additional populations of interest include any trials enrolling healthy volunteers, healthcare workers or other patient populations where health related outcomes are assessed in the context of COVID-19. This review is not limited by intervention given the desire to capture all clinical trial registrations planning to or currently evaluating any COVID-19 diagnostic, prevention or treatment modality. Furthermore, the search strategy is not restricted by outcomes, animal studies will be excluded and no limitations on language or study design will be applied.

Information sources & Search strategy

The consistent information source for this living systematic review will be the [WHO International Clinical Trials Registry Platform \(ICTRP\)](#) and source registries⁷. The WHO ICTRP will be searched every week from the start of database records (to capture ongoing updates of existing records) to the present date for each search, without limitations using the following search terms ((*COVID-19*) OR (*coronav**) OR (**CoV-2*) OR (*nCoV**)). While many living systematic reviews are updated on a monthly basis⁶, a weekly update has been selected due to the rapidly evolving context of COVID-19 and due to scheduled WHO ICTRP updates occurring weekly⁷. For all included trials, the source clinical trial registry database will be searched and the related trial record identified in order to supplement data extraction. A number of clinical trial registry databases^a are only imported to WHO ICTRP on a monthly basis. This living systematic review protocol will be iteratively revised and manual searches of some databases on a weekly basis may supplement WHO ICTRP weekly searches. Grey literature searching will also be conducted for technical or research reports of planned, active or completed clinical trials from industry, international and government agencies, and scientific research groups. Furthermore, as part of the Infectious Diseases Data Observatory (IDDO) and International Severe Acute Respiratory and emerging Infection Consortium (ISARIC)⁸ collaborative networks, additional trials

^aBrazilian Clinical Trials Registry (ReBec), Clinical Trials Registry - India, Republic of Korea, Cuban Public Registry of Clinical Trials, German Clinical Trials Register, Iranian Registry of Clinical Trials, Japan Primary Registries Network, Pan African Clinical Trial Registry, Sri Lanka Clinical Trials Registry, Thai Clinical Trials Registry (TCTR), Peruvian Clinical Trials Registry (REPEC)

of relevance may be identified and included through communications with our global research partners and through participation in a coalition to accelerate research on the prevention and treatment of COVID-19 in low resource settings³.

Study records, data items and outcomes

Data for all eligible trial records will be extracted in a standardised, pre-piloted REDCap^{9,10} database. After each weekly search update, the search returns from WHO ICTRP will be exported into Trifacta¹¹ software, where a pre-piloted script will be run to wrangle the relevant variables and available data for extraction in alignment with the REDCap data dictionary before import to the REDCap database. This process will automate data entry of all available data fields from the WHO ICTRP export into the desired controlled terminology fields in the REDCap database. Additionally, it will aid in the de-duplication process and identify any updates to data fields in the records of existing clinical trial records.

Any newly imported clinical trial registration records following each weekly update will be screened by two blinded reviewers to assess eligibility for inclusion and a third reviewer used if discrepancies arise. Ineligible trial records will be deleted from the database, however any relevant trials that are cancelled after registration will be retained and marked accordingly. Following these processes, data entry of additional manual variables in REDCap will be completed by one reviewer and each variable cross-checked for quality control by a second reviewer. At least one of the two reviewers per record will be a medical doctor. Any discrepancies will be resolved by discussion and a third reviewer where necessary.

Among other study characteristic variables including trial design and geographical location, this review plans to classify and categorise interventions assessed, trial eligibility and patient characteristics, and planned outcome measures. Furthermore, a prioritisation system designed by a group of clinical research consultants will be used to clarify the research landscape by intervention, level of evidence and those studies likely powered to address future research questions. Moreover, this prioritisation system will include a categorisation of trials assessing affordable and readily available interventions for deployment in low resources settings that are feasibly adaptable to such health care systems.

Data synthesis

Given this review will identify clinical trial records prior to published results and outcome data availability, in addition to the anticipated heterogeneity of registration data, only descriptive and thematic analysis of study characteristics will be conducted and R statistical computing software will be used for synthesis where possible.

The REDCap database for this project will be locked on 3rd April 2020, and data from all eligible records will be included in the baseline review and initial synthesis of clinical trial registration characteristics.

A searchable and interactive visualisation of IDDO's COVID-19 clinical trial database will be created, made openly available

online and subsequently updated following the planned weekly search updates. Following each search update, data will be exported directly from the REDCap database and variables will be processed in accordance with a standard operating procedure, mapping coded categorical and binary terms to their associated descriptive terms for website display.

Risk of bias, Meta-biases & Confidence in cumulative evidence

This living systematic review is intended to provide a frequently updated and open resource for characterising COVID-19 clinical trial registrations. Specific clinical questions will not be addressed by this systematic review, and it will be conducted only so far as data extraction, descriptive analysis of trial characteristics and visualisation of clinical trial registry records. Accordingly, there is no plan to assess meta-biases or the strength of the body of evidence represented by included records. The risk of bias of individual studies will however, be assessed at the study level using the Oxford Centre for Evidence-Based Medicine 2011 Levels of Evidence¹².

Dissemination of information

Results of the baseline review will be published in an open source, peer-reviewed journal and weekly updates for the maintenance of this living systematic review will continue for the foreseeable future during 2020 on the Infectious Diseases Data Observatory (IDDO)¹³. The protocol for sustained updates will be revised monthly and adapted as necessary in accordance with the changing context of the COVID-19 pandemic. At a later stage, this living review will allow prioritisation of research targets for individual patient data meta-analysis and will support the COVID-19 Clinical Research Coalition efforts³.

As per the objectives of this systematic review and IDDO's commitment to the FAIR principles¹⁴, on completion of the baseline review, all materials related to this project will be made openly accessible on the IDDO COVID site¹³, including the study protocol, export of the REDCap database and associated variable and data dictionaries.

Study status

At the time of protocol submission the preliminary searches, piloting of the study selection process and formal searches for the baseline review results have been completed. The REDCap database has been established and the variable dictionary and data extraction is currently being piloted and tested.

Data availability

Underlying data

No data are associated with this article.

Extended data

Extended data related to this project including data dictionary, variable dictionary and custom scripts will be made available at the below DOI when finalised.

Reporting guidelines

Open Science Framework: PRISMA-P checklist for 'A living systematic review protocol for COVID-19 clinical trial registrations' <https://doi.org/10.17605/OSF.IO/9MDK8>¹⁵

References

1. Boswer AD: **Real-World Shortages Not Addressed in New COVID-19 Guidance.** *Medscape.* 20 March, 2020.
[Reference Source](#)
2. Davies SE, Kamradt-Scott A, Rushton S: **Disease Diplomacy: International Norms and Global Health Security.** John Hopkins University Press, Maryland, USA. 2015.
[Publisher Full Text](#)
3. **A coalition to accelerate research and prepare access on the prevention and treatment of COVID-19 in resource-limited settings.** COVID-19 Clinical Research Coalition. *Lancet.* 2020; In press.
4. Elliott JH, Turner T, Clavisi O, *et al.*: **Living Systematic Reviews: An Emerging Opportunity to Narrow the Evidence-Practice Gap.** *PLoS Med.* 2014; 11(2): e1001603.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
5. Schmidt L, Olorisade BK, McGuinness LA, *et al.*: **Data extraction methods for systematic review (semi)automation: A living review protocol [version 1; peer review: awaiting peer review].** *F1000Research.* 2020; 9: 210.
[Publisher Full Text](#)
6. Elliott JH, Synnot A, Turner T, *et al.*: **Living systematic review: 1. Introduction-the why, what, when, and how.** *J Clin Epidemiol.* 2017; 91: 23–30.
[PubMed Abstract](#) | [Publisher Full Text](#)
7. **WHO International Clinical Trials Registry Platform.**
[Reference Source](#)
8. **International Severe Acute Respiratory and Emerging Infection Consortium (ISARIC).**
[Reference Source](#)
9. Harris PA, Taylor R, Thielke R, *et al.*: **Research electronic data capture (REDCap) – a metadata-driven methodology and workflow process for providing translational research informatics support.** *J Biomed Inform.* 2009; 42(2): 377–81.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
10. Harris PA, Taylor R, Minor BL, *et al.*: **The REDCap consortium: Building an international community of software partners.** *J Biomed Inform.* 2019; 95: 103208.
[PubMed Abstract](#) | [Publisher Full Text](#)
11. **Trifacta Data Wrangling Software.**
[Reference Source](#)
12. OCEBM Levels of Evidence Working Group: **The Oxford 2011 Levels of Evidence.** Oxford Centre for Evidence-Based Medicine.
[Reference Source](#)
13. Infectious Diseases Data Observatory (IDDO). University of Oxford, UK: **COVID-19 Living Systematic Review.**
[Reference Source](#)
14. Wilkinson MD, Dumontier M, Aalbersberg IJ, *et al.*: **The FAIR Guiding Principles for scientific data management and stewardship.** *Sci Data.* 2016; 3: 160018.
[PubMed Abstract](#) | [Publisher Full Text](#) | [Free Full Text](#)
15. Maguire BJ: **A Living Systematic Review for COVID-19 Clinical Trial Registrations.** 2020.
<http://www.doi.org/10.17605/OSF.IO/9MDK8>

Open Peer Review

Current Peer Review Status:  

Version 1

Reviewer Report 07 April 2020

<https://doi.org/10.21956/wellcomeopenres.17353.r38328>

© 2020 Sibley C. This is an open access peer review report distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.



Carol H. Sibley

Department of Genome Sciences, University of Washington, Seattle, WA, USA

In the heat of the COVID-19 pandemic, many different potential treatments have been tried on small numbers of patients, and some results have been promising. However, the numbers of patients have been small, and the studies differ in many important details. Now, more formal trials with larger numbers of subjects are needed to solidly define potential treatments for patients and for possible preventive strategies, vaccines or drugs. Trials are being planned already by a number of groups; the [Coalition for Epidemic Preparedness Innovations](#) (CEPI), and the [SARS-CoV-2 Diagnostic Pipeline](#) are preparing to launch. The studies will be registered by the WHO in the global SOLIDARITY trials database. Clearly, things are moving fast. Having a single place to find the details from each study - the protocols used, patient characteristics, drugs or vaccines administered and, when finished, the outcomes would be extremely useful.

The paper by Maguire and Guérin proposes an organized system for creation and maintenance of exactly such a system. There will be two steps. First, basic information on the plans for all trials being registered with the WHO International Clinical Trials Registry Platform (ICTRP) will be identified. The weekly systematic review of all published literature on COVID-19 and the causative virus, CoV-2 will identify new entries. The source documents will be located and a defined decision system used to identify those that describe formal trials of COVID-19 patient treatment or prevention in populations at risk of infection.

The living database will then have a single organized place where the range of clinical trials of drugs or vaccines being undertaken can be accessed in detail at this early stage.

There is a strong agreement among researchers studying COVID-19 disease that data from these clinical trials will be shared openly when each trial is completed. The second step of the living reviews will then access the shared data and use rapid electronic data management tools to store details of the results in a data structure that is uniform. As trials are completed, this approach will assure that results from the various trials will be available in a common format, facilitating comparisons among trial outcomes in similar studies with a far larger number of subjects.

The living review is well planned, uses protocols designed to access and assess published studies in a

systematic, unbiased way. The result will be a very complete record of the outcomes of the numerous trials currently planned and already underway. The authors report that an initial baseline review has already identified 332 COVID-19 related studies that fulfill the established criteria for inclusion in the repository.

In this fast moving field, the weekly review will match this rapid growth and the additional relevant studies will provide a growing foundation of solid information collected worldwide. With this tool, protocols and outcomes on treatment and prevention of COVID-19 can be rapidly compared among large number of subjects from different locations. Safe and effective drugs for treatment and vaccines or drugs for prevention can be identified. Appropriate guidelines can be established to assure that treatments and prevention protocols can be effective and safe in people of all ages and health status wherever they live.

This virus is already found worldwide, and the treatments must be available and effective globally, as well. This database can establish a foundation for assuring that outcome.

Is the rationale for, and objectives of, the study clearly described?

Yes

Is the study design appropriate for the research question?

Yes

Are sufficient details of the methods provided to allow replication by others?

Yes

Are the datasets clearly presented in a useable and accessible format?

Not applicable

Competing Interests: I have published with the authors of this paper before, but I do not believe it has affected my ability to review impartially.

Reviewer Expertise: Clinical trials of Malaria drug efficacy and safety.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.

Reviewer Report 06 April 2020

<https://doi.org/10.21956/wellcomeopenres.17353.r38348>

© 2020 Cutts J. This is an open access peer review report distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.



Julia C. Cutts 

Burnet Institute, Melbourne, Australia

1. The study protocol by Maguire and Guerin clearly outlines the rationale and objectives for a living systematic review of COVID-19 clinical trial registrations. Briefly, the aim of the review is to provide

an open resource summarizing the characteristics of COVID-19 clinical trial registrations, which will be updated on a weekly basis.

2. The choice of a living systematic review design, which involves continual updates, is appropriate and has been well-justified by the authors. In particular, a living systematic review approach is highly warranted in the context of COVID-19 clinical research because it is an incredibly fast-evolving field, with new trials being registered on a daily to weekly basis. Importantly, the study protocol adheres to the PRISMA-P guidelines.
3. The methods were well-written and contained most of the detail necessary to allow replication by others. However, I would like to highlight the following areas that warrant further clarification:
 - a) Among COVID-19 those “trials” currently listed on the WHO International Clinical Trials Registry Platform (ICTRP) database (excel output) are studies classified as “observational studies” under the “Study type” variable. Will these studies be included or excluded from the systematic review? If trials listed on the ICTRP database are to be screened for inclusion against this or other criteria, then this should be specified.
 - b) How will missing data be handled? Can the authors confirm whether or not they plan to contact trial investigators to request missing information where it is incomplete or ambiguous on ICTRP database?

Additional minor points:

- The final line of the first paragraph of the abstract was a little unclear: “While there is no intervention for the prevention or treatment of COVID-19 with proven clinical efficacy to date, tools to distil the current research landscape by intervention, level of evidence and those studies likely powered to address future research questions is essential.” Do the authors mean we need tools to distill the current research landscape by intervention, level of evidence and by the likelihood that the study is powered to address the research question being addressed in the study.
- Similarly, in the section ‘Study records, data items and outcomes’ the authors specify that a prioritization system will be used to clarify the research landscape by intervention, level of evidence and those studies likely powered to address future research questions. What do the authors mean by ‘future research questions’ in this context? Do the authors mean research questions in addition to those being addressed in the registered trial?

Is the rationale for, and objectives of, the study clearly described?

Yes

Is the study design appropriate for the research question?

Yes

Are sufficient details of the methods provided to allow replication by others?

Partly

Are the datasets clearly presented in a useable and accessible format?

Not applicable

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Systematic reviews, immuno-epidemiology, acquired and innate immunity to malaria, clinical trial protocol development.

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard.
