

COVID-19 Search on *Ovid MEDLINE(R) All 1946 to Present*

Adapted for Ovid MEDLINE by expert searchers at Ovid January 21-22, 2020.

Updated March 27, 2020

Updated April 14, 2020 (added SARSCoV2 and ncov*)

Updated April 14, 2020 COVID-19 search on *Ovid MEDLINE(R) All 1946 to present*. The search is further optimized to achieve greater balance of sensitivity and specificity. Conceptually, several search actions taken: 1) geographic search terms (except Wuhan) removed, which broadens search and retrieves many irrelevant results. 2) irrelevant results mitigated with the addition of carefully curated terms used with exclusion (NOT) search strings, 3) specificity with terms added, via the identification of additional synonyms for COVID-19 or SARS-CoV-2 used in the titles, abstracts, or author supplied keywords of published articles, and 4) new, manually curated articles.

SCOPE: The search is performed on “Ovid MEDALL” which is a database that includes “*Ovid MEDLINE® All 1946 to present,*” and is equivalent in content coverage to NLM’s PubMed®. Ovid’s MEDALL contains records with the following possible record status: MEDLINE, Publisher supplied records (sometimes called PaP or Publish ahead of Print), In-Data-Review, In-Process and PubMed-not-MEDLINE records from NLM. For more details on ‘record status’ see the Ovid “MEDLINE® 2020 Database Guide”

<http://ospguides.ovid.com/OSPguides/medline.htm>

Ovid MEDALL does NOT include preprints (non-peer reviewed literature) from the preprint services like bioRxiv, *until and unless NLM adds them to PubMed*.

YEARS: This search is limited in line 13 to articles with a record Create Date (DT) from 1 December 2019 forward. The sensitive/broad part of the search on lines 1 through 3 is limited on line 4 to include articles with an ‘Electronic Date of Publication’ (EP) or ‘Date of Publication’ (DP) from 2019 to present. This date was selected based on the date of initial reports of a virus in Wuhan.

MeSH®: The Medical Subject Headings (MeSH) thesaurus is a controlled and hierarchically-organized vocabulary produced by the National Library of Medicine and used in MEDLINE. This search uses MeSH terms along with keyword (non-MeSH terms).

The SARS-CoV-2 virus, is a ‘supplementary concept’ term in MeSH, and in searching maps to search the MeSH term ‘Betacoronavirus.’ In MeSH, the ‘Betacoronavirus’ can INCLUDE many other coronaviruses besides SARS-CoV-2 such as Rat Coronavirus, Bovine Coronavirus, Middle Eastern Respiratory Syndrome Coronavirus, Murine hepatitis virus and SARS Virus.

COVID-19 is the disease, and a ‘supplementary concept’ term in MeSH, and in searching maps to search the MeSH terms ‘Pneumonia, Viral,’ ‘Coronavirus Infections.’ and ‘Pandemics.’

Upon consultation with a clinical expert (nurse/epidemiologist) the search is optimized to include not only COVID-19 but other human coronaviruses with respiratory transmission. It is optimized to remove most of the MERS articles, except when MERS is also included with a COVID-19 or SARS-CoV-2 article; or, relevant broadly to coronaviruses and clinical care. We are thus optimizing the search for specificity to find COVID-19 and SARS-CoV-2 and human coronavirus. More information can be found about these concepts on the CDC “Coronavirus” web page <https://www.cdc.gov/coronavirus/types.html> and “UpToDate Coronaviruses” topic <https://www.uptodate.com/contents/coronaviruses> and “UpToDate COVID-19” topic [COVID-19” https://www.uptodate.com/contents/coronavirus-disease-2019-covid-19?search=COVID-19&source=search_result&selectedTitle=9~134&usage_type=default&display_rank=9](https://www.uptodate.com/contents/coronavirus-disease-2019-covid-19?search=COVID-19&source=search_result&selectedTitle=9~134&usage_type=default&display_rank=9)

Keyword searching: Additionally, keyword searching is used to retrieve articles that are not indexed with MeSH terms, such as newly published articles, publisher supplied, or In-Data-Review. Searching broad keywords like COVID or coronavirus finds relevant citations that could be missed otherwise, but also finds

a large quantity of irrelevant results like: Covidence, Covidien, and animal coronaviruses for equine, hedgehog/erinaceus, feline, porcine, bat, bovine, avian etc.

Lines 5 through 7 therefore are specific keywords for COVID-19 or SARS-CoV-2 and identified in published articles and used as synonyms for either concept.

In lines 5 and 6, the selected keywords are searched using the (MP) 'multi-purpose' field in Ovid MEDLINE as follows: title (ti), abstract (ab), original title (ot), name of substance word (nm), subject heading word (hw), floating sub-heading word (fx), keyword heading word (kf), organism supplementary concept word (ox), protocol supplementary concept word (px), rare disease supplementary concept word (rx), unique identifier (ui), synonyms (sy). The MP fields are typically highly relevant for keyword searching. In line 7 select fields from MP are used.

SEARCH EXCLUSION TERMS: Therefore the search carefully manually curates irrelevant concepts resulting from both broad MeSH and broad keyword searches and adds terms to exclude in lines 10 and 11. Most of these exclusions are for animal coronaviruses. *Nonetheless there are a few articles in the search covering excluded terms for various search/syntax reasons.*

Manual curation for relevant articles: There are two manual curation methods used in this search.

Line 8 includes the following. First, as part of this curation, we have continued to review the results in the NLM LitCovid search <https://www.ncbi.nlm.nih.gov/research/coronavirus/> to be sure this search was not excluding concepts and results used by NLM. To date we have identified only a handful of such results not captured by this hedge on April 10th 2020. These results are falling into categories we excluded. The following Ovid MEDLINE search provides the small list of LitCovid references not found on 9 April 2020 for example: (32267139 OR 32169616 OR 32267499 OR 32173381 OR 32185863 OR 32221979 OR 32213260 OR 32205350 OR 32188728 OR 32196032 OR 32188729 OR 32088947 OR 32007621 OR 32199076 OR 32145185 OR 32245150 OR 32105468 OR 32179788 OR 32152361 OR 32140676 OR 32053580 OR 32121543 OR 32199076 OR 32127714 OR 32047315 OR 32020111).ui. Some of these articles were manually curated for inclusion by their 'Unique Identifier' (UI). Irrelevant articles are excluded.

Secondly, as part of this curation we have searched the term 'pandemic' as a keyword in newly published and unindexed articles from major journals like *NEJM*, *JAMA*, *BMJ*, *The Lancet* etc. We have identified articles where 'pandemic' was used in the title and relevant to the search but where COVID-19 or SARS-CoV-2 terms were included in the title. These articles would be extremely difficult to find in a broader keyword search for 'pandemic' due to the missing specific search terms and the many other types of pandemics. These articles are thus manually curated and included into the search by their 'Unique Identifier' (UI).

SEARCH OPTIMIZATION OUTCOME: It is believed this search will help clinicians and librarians with efficiency in finding relevant research for clinical use regarding COVID-19 and SARS-CoV-2. The Ovid search is eliminating hundreds of irrelevant results and finding hundreds more relevant articles that may not be found by LitCovid or others. The search therefore is optimized to achieve greater balance of sensitivity (through lines 1-4), and specificity (lines 5-9), and removes the unwanted records (e.g. noise) (lines 10 and 11 unless they are also about COVID-19 or SARS-CoV-2) and for date currency (lines 4 and 13). It also removes duplicate records.

The following is the search strategy details using the **Ovid feature** *where search notes are provided in brackets [] and therefore not searchable text.*

Search Strategy Detail:

- 1 exp Coronavirus/ [Lines 1 through 14 are a search hedge for COVID-19 (disease) or SARS-Cov-2 (virus) in articles with clinical application or practice. Search may include basic biological aspects of either but not optimized for that purpose]
- 2 exp Coronavirus Infections/
- 3 (coronavirus* or corona virus* or OC43 or NL63 or 229E or HKU1 or HCoV* or ncov* or covid* or sars-cov* or sarscov* or Sars-coronavirus* or Severe Acute Respiratory Syndrome Coronavirus*).mp.
- 4 (or/1-3) and ((2019* or 202*).dp. or 20190101:20301231.(ep).) [This set is the sensitive/broad part of the search with limits to date of publication or electronic publication to include 2019 to current]
- 5 ((pneumonia or covid* or coronavirus* or corona virus* or ncov* or 2019-ncov or sars*).mp. or exp pneumonia/) and Wuhan.mp.
- 6 (2019-ncov or ncov19 or ncov-19 or sars-cov2 or sars-cov-2 or sarscov2 or sarscov-2 or Sars-coronavirus2 or Sars-coronavirus-2 or coronavirus-19 or covid19 or covid-19 or covid 2019 or "2019-novel Cov" or ((novel or new or nouveau) adj2 (CoV or nCoV or covid or coronavirus* or corona virus or Pandemi*2)) or (coronavirus* and pneumonia)).mp.
- 7 COVID-19.rx,px,ox. or severe acute respiratory syndrome coronavirus 2.os.
- 8 ("32240632" or "32236488" or "32268021" or "32267941" or "32169616" or "32267649" or "32267499" or "32267344" or "32248853" or "32246156" or "32243118" or "32240583" or "32237674" or "32234725" or "32173381" or "32227595" or "32185863" or "32221979" or "32213260" or "32205350" or "32202721" or "32197097" or "32196032" or "32188729" or "32176889" or "32088947" or "32277065" or "32273472" or "32273444" or "32145185" or "31917786" or "32267384" or "32265186" or "32253187" or "32265567" or "32231286" or "32105468" or "32179788" or "32152361" or "32152148" or "32140676" or "32053580" or "32029604" or "32127714" or "32047315" or "32020111" or "32267950" or "32249952" or "32172715").ui. [Manually curated articles relevant to COVID-19 or SARS-CoV-2 where pandemic is synonym and relevant to this topic, to account for typographical error in article titles and for articles not completely or properly indexed]
- 9 or/5-8 [Lines 5 through 8 are specific to COVID-19 or closely related]
- 10 4 not (SARS or SARS-CoV or MERS or MERS-CoV or Middle East respiratory syndrome or camel* or dromedar* or equine or coronary or coronal or cvidence* or covidien or influenza virus or HIV or bovine or calves or TGEV or feline or porcine or erinaceus or BCoV or PED or PEDV or PDCoV or FIPV or FCoV or canine or CCoV or zoonotic or avian influenza or H1N1 or H5N1 or H5N6 or IBV or murine corona*).mp. [line 10 removes the noise in the search results]

11 9 and (SARS or SARS-CoV or MERS or MERS-CoV or Middle East respiratory syndrome or camel* or dromedar* or equine or coronary or coronal or covidence* or covidien or influenza virus or HIV or bovine or calves or TGEV or feline or porcine or erinaceus or BCoV or PED or PEDV or PDCoV or FIPV or FCoV or canine or CCov or zoonotic or avian influenza or H1N1 or H5N1 or H5N6 or IBV or murine corona*).mp. [line 11 KEEPS the noise IF record is also about COVID-19 or SARS-Cov-2]

12 or/9-11

13 12 and 20191201:20301231.(dt). [limits search to Dec 1 2019 to current, using the Create Date (DT) field that contains the date when record was added to PubMed]

14 remove duplicates from 13

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