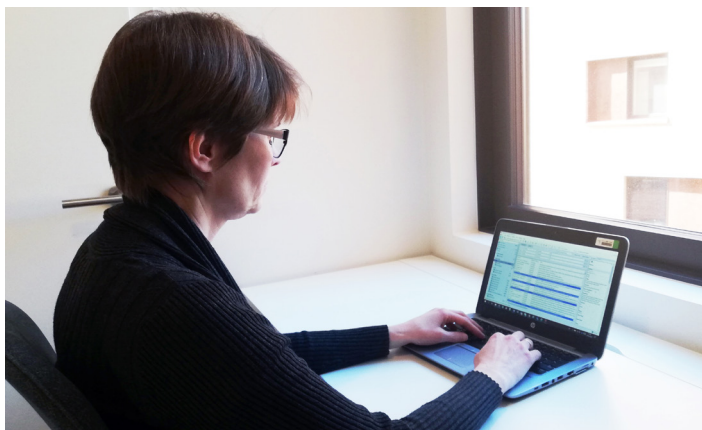# In search of COVID-19 publications

The Live map of COVID-19 evidence aims at including all relevant research. That requires extensive and qualified expert searches in an environment of fast-paced research and a rapidly increasing number of publications.

– When we ran our first PubMed searches on COVID-19, in the middle of March 2020, the search typically retrieved 80 new records a day. Eight weeks later, the numbers have more than quadrupled, says Elisabeth Hafstad, librarian and information specialist at the Norwegian Institute for Public Health. She is responsible for the literature searches that start the process of producing the Live map of COVID-19 evidence.

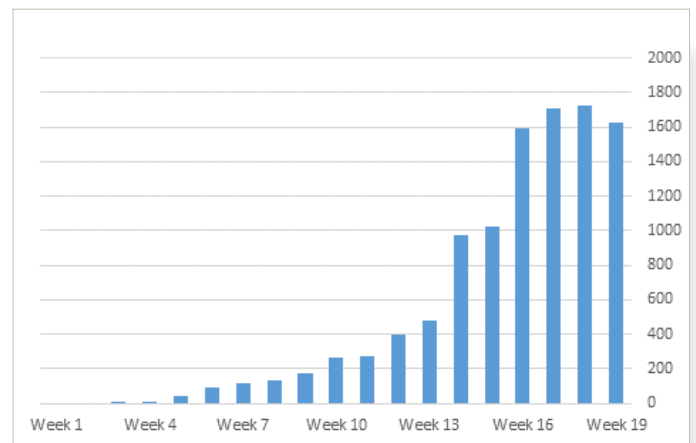### Repeated searches in multiple databases
– To be as comprehensive as possible, we make sure evidence is searched in multiple databases with all the relevant index terms and words for the virus. While the literature search for a regular systematic review is limited to answer a specific question, the Live map of COVID-19 evidence aims at including all published research on all aspects of the disease. A search for a specific question is normally performed once, but we need to search repeatedly and frequently, ideally daily.

Number of COVID-19 publications in PubMed in 2020

Elisabet Hafstad

To populate the map we now rely heavily on the Centers for Disease Control and Prevention (CDC) COVID-19 Research Articles Downloadable Database, says Elisabet. This database runs searches daily and contains references from comprehensive searches performed in more than 20 databases.

With sensitive search strategies which are run in a wide range of databases, the CDC has so far retrieved more

than 23 000 COVID-19 references. Included is research not only on the disease itself, but also journal articles on the social, economic, and political impacts of the disease outbreak as they appear in the literature.

How do we avoid duplications?
– Searching more than one database is necessary for a comprehensive approach, but inevitably retrieves many articles more than once. The overlap is often quite considerable, and we need to remove the duplicates from the search results. Reference management tools such as EndNote have algorithms to recognize duplicates, but they are not perfect, and we must check again manually for remaining duplicates, says Elisabet. This is time consuming work, done repeatedly, on an increasing number of records.

From search to screening to categorization
After removing duplicate records in EndNote, the new, hopefully unique records are exported to a bibliographic citation file. The researchers screen the references and assign different priority tiers. Prioritised articles are then categorised by two researchers independently, and eventually published in the map.

We are already using machine learning to increase effectiveness and precision. In the future, using artificial intelligence could also save information specialists and researchers a lot of work.

Newer studies rank higher on the evidence pyramid

As of 13 May 2020 the Live map of COVID-19 evidence contains 1779 publications categorised by topic, population, and publication type.

We have screened all 15 404 references retrieved in our searches. The map includes all systematic reviews, RCTs, non-randomised studies with control groups and method papers up to 4 May 2020. All other study designs published before 8 April are also on the map. Jan Himmels, a German medical doctor with a background in infectious diseases who is a member of the research team behind the map, explains how the team prioritises.

What publications are selected for inclusion?
– During our initial screening of all COVID-19 studies, we prioritise studies for the map and the categorisation process by study design and type of data into a three-tiered priority system, says Jan.

Highest priority is given to systematic reviews, randomised controlled trials (RCT) and non-randomised studies with control groups. Second tier are other study designs with primary data; followed in third tier by in vitro/vivo/silico studies and case reports. Publications without primary data go into our database without being visually depicted on the map, explains how the team prioritises.

Observational studies without controls still dominate
So far, non-randomised and observational studies without controls remain the most frequent in the map. We continue to see a growth in systematic reviews, with a nearly 50% increase in the last two weeks. This increase is an expected reaction to the numerous single studies, and is a start towards more summarised and weighted evidence. We also see more studies evaluating primary data from a new perspective. Similarly, there is an increase in studies looking beyond the clinical spectrum, investigating other issues and consequences.

The prior common approach to publish data via comments is reversing to its more traditional purpose of presenting insights and opinions.
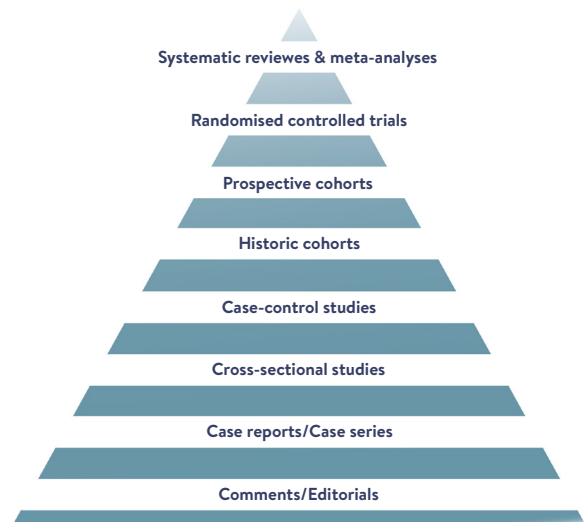
The pyramid of evidence

Higher on the evidence pyramid
– My personal impression is that newer studies tend to rank higher on the evidence pyramid, says Jan. The picture is certainly more differentiated; studies from China and other early victims of the pandemic are currently the most wide-ranging and data-rich. From these regions, we are also seeing more complex study designs (including RCTs) as well as studies with many participants.

Interestingly, the publication pattern from later affected regions, including many European countries, seem to parallel the development of earlier affected regions. Later affected regions still predominantly publish comments but are transitioning to publishing case reports and now also larger clinical studies. My impression is that it takes roughly two months from enrolling the first patient in a study to publication, says Jan. Hypothetically, this parallel shift may occur throughout all regions, promising an evidence rich future paralleling the amount of cases.

>> Live map of COVID-19 evidence

>> Subscribe to newsletter

RECENT RAPID REVIEWS
1. Saliva sample for testing SARS-CoV-2 infection – a rapid review
2. Transmission of SARS-CoV-2 via contact and droplets, 1st update – a rapid review
3. Immunity after SARS-CoV-2 infection, 1st update – a rapid review
4. COVID-19: Case fatality rate and infection fatality rate for serious COVID-19, 1st update – a rapid review