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[caption id="attachment_1006" align="aligncenter" width="891"]



Emerging research on Coronavirus and COVID19[/caption]

For those in a hurry...

[See map here](#)

[See database of research here](#)

Introduction

On 31 December 2019, the Wuhan Health Commission reported atypical pneumonia to the World Health Organisation (WHO) in patients who had been experiencing symptoms since mid-December. Those first patients appeared to be linked to a single wet market in Wuhan city in the Hubei Province. Shortly thereafter a new RNA virus, with similarity to a coronavirus usually seen in bats, was confirmed as SARS-CoV-2. This novel virus causes a range of clinical problems from a mild flu like illness to an overwhelming, often fatal, Severe Acute Respiratory Syndrome (SARS) from which its name derives. The RNA virus has now been fully sequenced and there is a concerted research drive by hundreds of teams worldwide to better understand the virus, its biology and the associated disease now called COVID-19. Many are either developing or working towards the production of specific anti-viral agents and of course a vaccine.

While the original transmission was likely zoonotic (animal to human), the precipitous spread is now caused by human-to-human transmission. As of the 26 March 2020, there have been 467 710 confirmed cases and 20 947 deaths (European Centre for Disease Prevention and Control [figures](#)) and is a matter of global concern.

There is much uncertainty on how the pandemic will end. Some hope that all human-to-human transmissions are successfully interrupted and the virus will disappear. That was what effectively eradicated severe acute respiratory syndrome-related coronavirus (SARs-CoV) in 2003 ([source](#)). Others believe that COVID-19 might act like Middle East respiratory syndrome coronavirus (MERS-CoV) which has recurred sporadically since it was first reported in Saudi Arabia in 2012 ([source](#)). Or, some predict the worst outcomes, where it may take root in communities and countries and rapidly deplete populations for many years to come as was the case with the 1918 Spanish influenza ([source](#)).

Most experts agree that as the global spread of COVID-19 continues to grow, disease control will be challenging and this requires collaborative solutions and cooperative spirit from all groups.

The role of Evidence Synthesis specialists

Public concern and panic have risen due to a combination of factors. Rumours and conjecture about this new virus and disease has often spread through social and mainstream media, exacerbated by an inconsistent and non-standardised global healthcare response. Much of this is because scientific knowledge is incomplete but rapidly changing with respect to the virus biology, the disease, its outcomes and potential treatment. This changing environment needs rapid knowledge synthesis and dissemination.

Evidence Synthesis specialists understand the importance of employing systematic and transparent methods to locate the available data in an unbiased way.

Evidence Synthesis specialists understand the importance of employing systematic and transparent methods to locate the available data in an unbiased way. In many ways, COVID-19 research is easy to find. First, Information retrieval specialists can be confident that only research from December 2019 will be directly relevant to this novel Coronavirus. Second, the novel disease SARS-CoV-2, has not had an explosion of terminology used to describe it, and so at this point relevant information can be located with a good balance of precision and sensitivity using readily available search strategies.

However, difficulties have also been clear. First, the need for information has meant that publishers have relaxed some of their strict peer review guidelines. This has made quality appraisal more difficult and studies have been widely published without sufficient peer review. Second, because of the global impact of COVID-19 across all sectors of society (political, economic, personal liberties and freedom for example), research is being produced in large volumes across all disciplines which can make it difficult to categorise.

Nevertheless, various experts are keeping up with the research and providing Evidence Syntheses which are summarised next.

An overview of Current Systematic Reviews and Meta-analyses

Teams of Evidence Synthesis experts have been working on various topics across the globe, as of 25 March, eighteen Systematic Reviews or Meta-Analyses exist (see them [here](#)). These reviews largely but not exclusively focus on medical aspects. Thus far these include the epidemiology (spread) and clinical characteristics (including risk factors and comorbidities) of patients with covid-19, diagnostic features (laboratory and imaging results) and potential treatments and outcomes for patients.



[caption id="attachment_1020" align="alignright" width="200"]
Several potential risk factors which may aggravate the effects of covid-19 have been investigated.[/caption]

Sun and colleagues ([2020](#)) have provided a comprehensive picture of the clinical characteristics of covid-19 patients by reviewing relevant studies and performing a single-arm meta-analyses to assess the incidence of fever (89% [0.818,0.945]), cough (72% [0.657,0.782]), muscle soreness or fatigue (43% [0.213,0.652]), acute respiratory distress syndrome (15% [0.046,0.296]), an abnormal chest CT (97% [0.921,0.993]), development of a critical condition (18% [0.127,0.243]) and death (4%; [0.027,0.061]).

Several potential risk factors which may aggravate the effects of covid-19 have been investigated. Yang and colleagues ([2020](#)) have conducted a systematic review and meta-analysis of the prevalence of comorbidities in covid-19 patients. They found that the most common comorbidities were hypertension (17% [14% – 22%]), diabetes (8% [6% - 11%]), cardiovascular diseases (5% [4% - 7%]) and respiratory system diseases (2% [1% - 3%]). Patients with severe symptoms of covid-19 were more likely to have a co-morbidity of hypertension (Odds Ratio (OR) 2.36 [1.46-3.83]), respiratory system disease ,(OR 2.46 [1.76-3.44]) or cardiovascular disease (OR 3.42 [1.88-6.22]). A review of political and sociological studies of epidemics by Kaporiri and colleagues (2020) emphasised that disease outbreaks disproportionately affect vulnerable and marginalised communities. Notably, Ludvigsson (2020) reviewed 45 prevalence studies and found that children account for between 1% and 5% of cases and that their experience of the disease is much milder than that of adults.

There have been few completed intervention studies of treatments for covid-19. While some have reviewed treatments for similar disease such as SARS and MERS ([Zhang et al., 2020](#)), others have concluded that there are currently no pharmacological treatments for covid-19 with high-level evidential support ([Jiang, 2020](#)).

The birth of a semi-automated evidence gathering bot



[caption id="attachment_1018" align="alignleft" width="150"]
bot[/caption]

The twitter

Dr Damian Fogarty is a senior physician and former researcher at Queen's University and the UK Renal Registry. He is widely published and more recently been heavily involved with social media dissemination of medical and scientific information.

Damian realised early on in the pandemic that the information around COVID19 required rapid knowledge synthesis and dissemination. He contacted Ciara Keenan, an information retrieval specialist for Campbell UK and Ireland, who quickly built an automated aggregating twitter feed www.twitter.com/@COVID_Evidence.

This twitter account is the one of the few sources at present which exists with a focus on evidence acquisition on COVID19. It produces a diverse range of real-time, peer-reviewed/soon to be reviewed research and commissioned reports directly on a feed using the RSS sources from a range of science and medical databases. These include at present PubMed, F1000 research, BMC, bioRxiv, medRxiv, clinicaltrials.gov, Nature, Cell and Science. The search strategy includes terms such as: coronavirus, "corona virus", "2019 coronavirus", "corona virus disease", "novel coronavirus", "wuhan coronavirus", "Coronavirus 2", "COVID-19" "SARS-CoV2". The developers intend to add databases and improve the search strategy based on the needs and requests from the public and in particular from academic partners.

The creation of the map

Ciara noted early on that the research like the disease had a patten reflecting the spread of knowledge. With colleagues she developed an interactive geographical [map](#) reflecting emerging evidence sources (e.g. articles and resources) collated from sources such as the WHO database and the automated aggregating Twitter feed. The intention of this map is to geolocate where emerging research takes place to aid networking between research groups working across the world. This geolocation reflects the affiliation of researchers and not necessarily the geographic locations that are under study.

This [database](#) of emerging research includes a number of different resource types including:

- Case studies/case reports
- Guidance documents including clinical and normative practice guidance
- Reviews including narrative and systematic reviews
- Research reports including comparative studies, epidemiological studies, and translational research, as well as corrections and retractions
- Opinion pieces including editorials

This map covers any COVID-19 related resources including all aspects of clinical research, public health, economics, social aspects, etc. It does *not* include news articles, nor resources about other coronaviruses (e.g. Middle East Respiratory Syndrome (MERS), Severe Acute Respiratory Syndrome (SARS)). The interactive geographic map is powered by [EviAtlas](#), an open access platform for visualizing synthesis data. As the situation is rapidly evolving and resources continue to emerge, this map and database is continually being updated.

How to use the map

The intention of this map is to aid research groups identify others who are engaged in research in their region in order to promote networking and collaboration. This map is also intended to be a resource for users to search and explore emerging resources on COVID-19.

However, this map *only* serves to collate existing resources, it does *not* assess the reliability of included resources. Thus, the resources included in this map should be carefully examined for their rigour, reliability, and transparency along with careful interpretation of results.

Collaboration with China

Howard White, CEO of the Campbell Collaboration, engaged Professor Kehu Yang, Director of Lanzhou University's [Evidence Based Medicine Centre](#) in China. Professor Kehu Yang has pledged his support for the map and has kindly provided a team of seven researchers *pro bono publico*. This team will check the database for omissions of research only available in the Chinese language, translate these to English and add these sources. This team of researchers have expertise in both health and Evidence Synthesis and have now collated over 1,000 studies published in Chinese journals and completed bibliometric analysis.

Map team

This map is built and updated through a collaborative effort coordinated by Ciara Keenan. The map team is comprised of evidence synthesis and health science experts from around the world who have volunteered their time to collate and classify emerging resources into the database and build the infrastructure for the interactive map.

Dr. Ciara Keenan is a research fellow at Queen's University in Belfast with an established international reputation in evidence synthesis methodology, with a series of systematic review projects and expertise in the intersecting areas of health, social welfare, disability and education.

Michael Haddaway is a retired Medical Physicist, with 40 years' experience in Medical Imaging in the NHS at a specialist Orthopaedic Hospital in Shropshire. Mike has [publications](#) in Medical Imaging and Bone Densitometry and has extensive experience in MRI safety and Radiation Protection.

Dr. Chris Noone is a lecturer at the School of Psychology in NUI Galway. He has contributed to research on a range of topics broadly related to health and wellbeing. He is also a board member and chair of the research sub-committee for the National LGBT Federation in Ireland.

Dr. Samantha (Sam) Cheng is a biodiversity scientist at the Center for Biodiversity and Conservation at the American Museum of Natural History. She is an interdisciplinary conservation scientist whose work focuses on the link between nature and human health and well-being and builds tools and assessments for evidence-based conservation decisions. She runs Colandr (www.colandrapp.com), an open-access machine-learning assisted platform for evidence synthesis research efforts.

Dr. Neal Haddaway is a senior research fellow at the Stockholm Environment Institute. His main research interests are around the production and use of environmental evidence in decision-making, by improving the transparency, efficiency and reliability of evidence synthesis as a methodology. He is the co-creator of [ROSES](#) (RepORting standards for Systematic Evidence Syntheses), a set of rigorous standards for reporting the conduct of systematic reviews and maps in environmental topics, and the co-creator of [PredicTER](#), a tool for estimating the time requirements of systematic reviews and maps.

Kyle Hamilton is a fifth-year Ph.D. student in the Psychological Sciences program at the University of California, Merced and is advised by Dr. Linda Cameron. His research interests include the development of health communications, perceptions of electronic cigarettes, addressing follow-up bias in pilot studies, and evidence synthesis. Kyle has authored several meta-analytic related R packages including MAVIS, metadat, and the Jamovi module MAJOR. www.kylehamilton.com

Robin Parker is a health sciences librarian and PhD candidate at Dalhousie University in Nova Scotia, Canada where she supports evidence synthesis projects and teaches evidence-based practice. Robin has experience working on many types of reviews and has done research study classifications for Cochrane Crowd projects.

Beth Hall is an Academic Support Librarian at Bangor University (Wales, UK) supporting staff and students in Environmental Sciences and Engineering. Beth previously worked for NHS Evidence and Warwick Evidence and has maintained her connections with healthcare research while at Bangor, supporting researchers carrying out systematic reviews and realist reviews.



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