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Is this really the end of Brazil's patent backlog?

Joaquim Eugenio Goulart and Bernardo Marinho Fontes Alexandre of Danneman Siemsen discuss the country's recent efforts



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There is nothing new under the sun

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hat has been is what will be, and what has been done is what will be done, and there is nothing new under the sun."¹ It is tempting to doubt the truth of this statement by King Solomon, a leading innovator and thought-leader nearly three thousand years ago, but to grasp his wisdom and warning with an open and understanding mind might be more rewarding.

The first, Spring wave of the 1918 influenza pandemic, the "Spanish flu", was relatively mild, in comparison with the second, Autumn wave, which resulted in a pandemic of viral origin claiming an unprecedented number of lives. There is no clear explanation for this difference: both a shift in the nature of the virus and the subsequent pneumonia in an immunologically depressed population might have contributed². In the early days of 1918, many disputed it was such a deadly plague, and a delay in taking non-pharmaceutical interventions, such as social distancing, wearing masks, quarantine, good personal hygiene, the use of disinfectants, and limiting public gatherings³ exacerbated the situation in many places⁴.

The uncanny resemblance between the reactions to the Spanish flu and the reactions to the COVID-19 pandemic is hard to unsee.

While to forget the lessons learned from the Spanish flu is just human, believing that one's results or invention concerning COVID-19 have no antecedence only because it is a new field of science is naiveté, to say the least.

Scientists know very well their results are not created out of thin air and do their literature research as meticulously as their lab work; still, the importance of relying on the most up-todate scientific and technical knowledge, i.e. the state of the art, is hard to over-emphasize. It is even more important when the race towards a solution is as fierce as it is in the case of COVID-19. One should also be aware of the fact, easily ignored by the scientific community, that a



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large part of the technical information on any scientific issue is contained exclusively within patent documents. The problem with patent applications is that they are typically not published earlier than 18 months after their first priority date. During this time, the invention and hence the useful scientific information is invisible to the public, unless the inventor has published it elsewhere. Thus, a literature search should include both scientific and patent literature one more reason to do it more effectively and specifically.

Luckily, information providers also recognized the necessity of rapid and effective information gathering and exchange. Several of them considered improving the availability of the latest research results in the field.

Elsevier, for example, created a free information center in January 2020 to bring together the latest clinical research results on the novel coronavirus available in English and Mandarin⁵ and sought to provide "full access to its content on its COVID-19 Information Center for PubMed Central and other public health databases to accelerate fight against coronavirus" by March⁶. A quick search with a pre-created guery7 to collect COVID-19 related content in this database gives nearly 40 thousand hits; however, advanced search options are available and, once you sign in, further features are enabled. Elsevier also provide studies and infographics published in the scientific literature to the media and health educators, useful for informing the public, including decision makers, about trends. These two approaches have been applied by other information service providers as well.

Those who work in the field of development of vaccines against the SARS-COV-2 virus need to pinpoint specific pieces of information from a fast-growing haystack. They need a useful tool to expedite their search. Below we review further initiatives to provide such improved search tools. An option to increase database-mining efficiency is to build a secondary database based on the literature. Such a secondary database should be updated regularly to maintain its usefulness. To the present authors, it appears that a work of this kind is primarily useful for a limited circle of scientists working on a special field; typically, in-house in a company or research laboratory⁸.

Another option more useful for the broader scientific community is essentially what Elsevier did - i.e. "tune-up" an existing database and preoptimize it for COVID-19 searches.

While Elsevier is one of the most significant providers of scientific information, other providers have made their contribution. In fact, PubMed, a top-level search facility in medical literature, is able to refer to the Elsevier collection whilst offering their own pre-compiled search queries giving a different circle but similar number of articles⁹. An even more complete "tuned" database has been developed with the support of the US National Institute of Health's intramural research program, based on the PubMed background. LitCovid¹⁰ uses a broader set of papers and a less detailed query¹¹. In a second round, search results are humanreviewed, relevant articles are identified and curated with assistance from an automated machine-learning and text-classification algorithm, and irrelevant search results are discarded. The aim is to capture all COVID-19 relevant articles in PubMed

To collect every piece of information you need to thoroughly validate the novelty of your ideas is a cumbersome task. To address this need, Dimensions, a recently established database integrates, using machine learning, research articles, books, and conference proceedings, as well as patents, and even awarded grants, clinical trials, policy documents and altmetric data . Dimensions seeks to make available all COVID-19-related articles, preprints, datasets, grants, patents, clinical trials, and policy documents by elaborating a special guery and providing the results in a daily-updated file¹³. Comparing coverage of COVID-19-related information in a range of scholarly sources, Dimensions provided the broadest result¹⁴.

Collecting every COVID-related piece of information in one place is certainly useful; you should, however, be sure to find the most important publications, and this may not be easy.

Contrary to *Dimensions*, Chemical Abstract Service (CAS) uses significant human contribution to build up their database. CAS argues that getting big data enrichment still requires human intelligence¹⁵. In line with this, CAS, a for-profit organization, has built an open source dataset Collecting every COVIDrelated piece of information in one place is certainly useful.

Résumés Ádám Svingor

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- ¹ Ecclesiastes 1, verse 9, English Standard Version
- Patterson, K. David; Pyle, Gerald F. (1991). "The Geography and Mortality of the 1918 Influenza Pandemic". Bulletin of the History of Medicine. 65 (1): 4–21. JSTOR 44447656. PMID 2021692.
- ³ The 1918 Flu Pandemic: Why It Matters 100 Years Later, Public Health Matters Blog, CDC, May 14, 2018 by Blog Administrator (https://blogs.cdc.gov/
- ⁴ History.com editors, History.com "Spanish flu" Original: October 12, 2010, Updated: May 19, 2020 (https://www.history.com/topics/world-war-i/1918-flu-pandemic)
- ⁵ https://www.elsevier.com/about/press-releases/clinical-solutions/elsevier-createsfree-information-center-to-bring-together-latest-clinical-research-on-novelcoronavirus-2019-ncov
- ⁶ https://www.elsevier.com/about/press-releases/corporate/elsevier-gives-fullaccess-to-its-content-on-its-covid-19-information-center-for-pubmed-central-andother-public-health-databases-to-accelerate-fight-against-coronavirus
- ⁷ "COVID-19" OR Coronavirus OR "Corona virus" OR Coronaviruses OR "2019-nCoV" OR "SARS-CoV" OR "MERS-CoV" OR "Severe Acute Respiratory Syndrome" OR "Middle East Respiratory Syndrome"
- ⁸ Machuca-Martinez et al. Coronaviruses: A patent dataset report for research and development (R&D) analysis Data in Brief 30 (2020) 105551
- ⁹ ((wuhan|All Fields] AND ("coronavirus"[MeSH Terms] OR "coronavirus"[All Fields])) AND 2019/12[PDAT] : 2030[PDAT]) OR 2019-nCoV[All Fields] OR 2019nCoV[All Fields] OR COVID-19[All Fields] OR SARS-CoV-2[All Fields]
- ¹⁰ Chen, Q et al. Keep up with the latest coronavirus research. Nature 579, 193 (2020) doi: 10.1038/d41586-020-00694-1 https://www.nature.com/articles/d41586-020-00694-1
- ¹¹ "coronavirus"[All Fields] OR "ncov"[All Fields] OR "cov"[All Fields] OR "2019-nCoV"[All Fields] OR "COVID-19"[All Fields] OR "SARS-CoV-2"[All Fields]
- ¹² Hook et al. Dimensions: Building Context for Search and Evaluation. frontiers in Research Metrics and Analytics, 2018. Vol 3, Article 23, doi: 10.3389/frma.2018.00023
- ¹³ "2019-nCoV" OR "COVID-19" OR "SARS-CoV-2" OR "HCoV-2019" OR "hcov" OR "NCOVID-19" OR "severe acute respiratory syndrome coronavirus 2" OR "severe acute respiratory syndrome corona virus 2" OR (("coronavirus" OR "corona virus") AND (Wuhan OR China OR novel))
- ¹⁴ Kousha, K and Thelwal, M. COVID-19 publications: Database coverage, citations, readers, tweets, news, Facebook walls, Reddit posts. Quantitative Science Studies 2020. https:// doi.org/10.1162/qss_a_00066
- ¹⁵ Toussant, M. The importance of human-curated data enrichment | CAS Blog March 22, 2018.

including known anti-viral candidate compounds and made it available for data mining.

While these databases also comprise some data on patents, searching patent publications may be necessary to find data relevant to any research and patenting strategy. It appears, however, that only a few patent offices have developed or educated their search facility to prepare it for COVID-19 searches.

The Word Intellectual Property Organization (WIPO) has created a new COVID-19 search tool to provide information on technologies to help the global fight against COVID-19.

This new PATENTSCOPE search facility has defined a number of international patent classification codes which define main fields ¹⁶ relevant to the detection, prevention and treatment of COVID-19, and within those fields are more technological areas; additionally, special keywords and combined queries are offered¹⁷.

The European Patent Office has applied a slightly different approach for processing Espacenet database data in order to facilitate COVID-19 research. They have identified a large number of specific fields and assigned queries to each of them. Once we scroll through these subjects, each of them finally directs us to a continuously updated search list in the Espacenet database. A clever design. However, due to special language and terminology, the search query cannot be conveniently refined by beginners.

This refining of the query is easier in PatentLens, a free patent search tool service of Cambia, who have made just a small number of pre-designed queries in a few general fields of the coronavirus research; however, these queries are easily accessible and can be re-written or adapted to your needs. Such a secondary database should be updated regularly to maintain its usefulness.

⁶⁶ Artificial respiration, Diagnostics, Disinfection, Informatics, Medical Equipment, Medical Facilities and Transport, Medical Treatment, Medical treatment/ Prophylactic, Medical treatment/Therapeutic, Personal protective equipment

https://patentscope.wipo. int/search/en/covid19.jsf Professional searchers often rely on professional database collections. Interestingly, these providers may have not developed their search tools in a COVID-specific way. It is true, however, that their search options are usually much more detailed and versatile.

Using these COVID-19-optimized or "tunedup" search tools may be quite effective once you have found those tools that meet your needs. Moreover, you may tailor them further by learning from the pre-made search queries and adapting them to the database collection you wish to use or which you have access to.

Fighting against the COVID-19 pandemic requires several approaches, among which perhaps scientific research to find appropriate medicament, repurposing existing ones, and to develop vaccines either based on existing vaccine platforms or by creating new ones, is the most powerful. So that innovation can be successful, efficient searching of the state of the art is a must for at least two reasons: to give an impetus to your research and to define your IP or patent protection to ensure that it meets patentability requirements. Probably, we have better tools than ever to discover what has existed in the past - it is up to you to utilize them efficiently since you should not forget: there is nothing new under the sun. At least, nothing entirely new.

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