

## СОЦІАЛЬНІ КОМУНІКАЦІЇ

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### **A BIBLIOMETRIC ANALYSIS OF UKRAINIAN RESEARCH ARTICLES ON SARS-CoV-2 (COVID-19) IN COMPLIANCE WITH THE STANDARDS OF CURRENT RESEARCH INFORMATION SYSTEMS**

*This article demonstrated bibliometric analysis of electronic information resources, with the publishing activity of Ukrainian scientists in the field of research on the virus COVID-19.*

**Keywords:** *scientometrics, COVID-19, scientific metrics, modern scientific electronic information electronic systems, open science, scientific cooperation.*

These days in Ukraine Open Science dramatically develops for the sake of scientists of all branches, providing an opportunity to take a more close look on the studies by foreign scientists, as well as to deliver own scientific data to national and international journals. However, when it comes to generalization of data on science activities by Ukrainian scientists, these data are often integrated into E-systems that operate inconsistent and barely related information sources. In order to resolve these issues developed countries productively use E-systems, designed to store and manage research data, such as Current Research Information Systems (CRIS-systems) that enable combining uncompiled data obtained from different sources [1]. The studies concerning the adoption of national data E-systems gain exceptional currency these days for Ukrainian scientists in case of any health emergencies as global pandemics: avian influenza, H5N1 (2004), swine influenza, H1N1 (2009-2010), Zika virus (2009), cholera (2010), MERS-CoV (2012), Ebola hemorrhagic fever (2014-2016), measles (2018) and the virus causing COVID-19, SARS-CoV-2 (2019) currently being spread worldwide. Many countries created unrelated electronic information centers for COVID-19 research taking into account the standards of CRIS systems containing all the research data collected by scientists from all over the world; the following served as such centers: Centre for Disease Control and Prevention, The New England Journal of Medicine, JAMA Network, Lancet, Cell Press Coronavirus Resource Hub, BMJ, Nature, Science, Elsevier, Oxford, Wiley, medRxiv. It is complicated so far in Ukraine to make a search for COVID-19

research articles of Ukrainian scientists and cover the entire data set as articles are inconsistent and duplicated that limits the applicability of research.

Currently, Ukrainian scientists initiated the study on resolving the integration matters of data on science activity into information E-systems using the FAIR data principles (Findability, Accessibility, Interoperability and Reusability) in order to make data available, compatible, which in turn will allow for legal reusability and simplify information retrieval.

Thus, the next important step for the integration of national science is the creation and adoption of the National scientific electronic information system URIS in Ukraine by sticking to the standards of CRIS systems in Ukraine, the task of which is to link with national information systems of Ukrainian libraries, containing interrelated databases that include data on research articles of both Ukrainian and foreign scientists, research providers, scientists and research projects, grants, etc. Due to extremely fast spread the global scientific community is now focused on slowing down, controlling and ending the spread of this disease. It demands concerted efforts of researchers and practitioners in various related fields, bringing up the issue, anytime in such circumstances, of which studies to be carried out, priorities to be set, how to coordinate studies and whom to engage [2].

The study objective was to conduct bibliometric analysis of electronic information systems in compliance with standards of CRIS systems using quantitative assessment of documents in Scopus and Web of Science (WoS) databases.

An algorithm for selecting SARS-CoV-2 research articles was designed, by means of which

we collected the set of papers published by Ukrainian scientists and uploaded by August 1, 2020. Resulting metadata (document type, open access status, citation count, h-index, most cited documents, international research funding, author counts, bibliographic relationship of journals) were taken from Scopus and Web of Science databases.

The study also considered the info from COVID-19/SARS-CoV-2-related documents published from December 2019 to September 2020, directly from documents published by authors depending on territorial affiliation to Ukraine. These databases enabled to get the necessary information for bibliometric analysis and necessary

details: copyright, which may not be available in other databases (e.g., Science Direct). Search criteria and results for each online database were considered according to the WHO classification of the virus and the disease, caused by this virus [4], and represented (Table 1). First we identified 89 research papers that provided us with the final data set after consolidation and removing duplication, however only 56 papers were used for the analysis. The total number of documents by results (Table 1) from the WoS database came out at 21641 documents (48 affiliated to Ukraine among them) in the Scopus database came out at 32478 documents (41 affiliated to Ukraine among them).

Table 1

**Search results for research articles of Ukrainian scientists by search algorithms in Scopus and Web of Science**

| No     | Search category   | Search results in Scopus | Search results in Web of Science |
|--------|---|--------------------------|----------------------------------|
| 1      | TS = ("COVID-19") AND (LIMIT-TO (AFFILCOUNTRY, "Ukraine"))  | 27                       | 33                               |
| 2      | TS = ("2019 novel coronavirus") AND (LIMIT-TO (AFFILCOUNTRY, "Ukraine"))                          | 0                        | 0                                |
| 3      | TS = ("2019-nCoV") AND (LIMIT-TO (AFFILCOUNTRY, "Ukraine"))                                       | 0                        | 4                                |
| 4      | TS = ("severe acute respiratory syndrome coronavirus 2") AND (LIMIT-TO (AFFILCOUNTRY, "Ukraine")) | 8                        | 6                                |
| 5      | TS = ("SARS-CoV-2") AND (LIMIT-TO (AFFILCOUNTRY, "Ukraine"))                                      | 6                        | 5                                |
| Total: |   | 41                       | 48                               |

*[the invention created using the method [3]]*

According to the publication activity of Ukrainian scientists the following areas prevailed: Education, educational research (9 documents, 20.58%); Social Sciences, interdisciplinary (6 documents, 11.76%) and Economics (4 documents, 8.82%). The highest publication activity by institution types was reported in the Ministry of Education and Science of Ukraine (it's percent of published scientific papers equals 36% or 7 documents), Danylo Halytsky Lviv National Medical University goes next (5 documents, 15%) and P. L. Shupyk National Medical Academy of Postgraduate Education (4 documents, 12%).

Basically, research activities by Ukrainian scientists were funded by 5 entities: Belgian Development Cooperation, the National Institutes of Health (NIH, U.S.), The United States Department of Health & Human Services, grant from the Whitney and Betty MacMillan Center for International and Area Studies at Yale, grant from

the Yale Women Faculty Forum. Based on the results of the analysis, we obtained a set of published articles and preprints to be assessed on the variety of features in upcoming studies, including citation count, most cited documents, bibliographic relationship of journals, reference linking. Further research on the development of the national scientific E-database continues using brand new analytical methods.

When it comes to bibliometric analysis of COVID-related research papers by Ukrainian scientists, these papers are not concerted and published on different scientific platforms bringing about the analysis with imprecise resulting data in this research area. Currently, Ukraine requires the adoption of the National scientific electronic information system in order to unify the studies and make data available, compatible that in turn will simplify the information search for Ukrainian scientists.

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*Аугунас С.*

БІБЛІОМЕТРИЧНИЙ АНАЛІЗ УКРАЇНСЬКИХ ДОСЛІДЖЕНЬ ВІРУСА SARS-COV-2 (COVID-19) З ВИКОРИСТАННЯМ СТАНДАРТІВ CURRENT RESEARCH INFORMATION SYSTEMS

*У статті продемонстрований бібліометричний аналіз електронних інформаційних ресурсів і публікаційну активність українських вчених за напрямком досліджень вірусу COVID-19.*

**Ключові слова:** наукометрія, COVID-19, наукові метрики, сучасні електронні науково-інформаційні системи, відкрита наука, наукова співпраця.

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БИБЛИОМЕТРИЧЕСКИЕ АНАЛИЗ УКРАИНСКИХ ИССЛЕДОВАНИЙ ВИРУСА SARS-COV-2 (COVID-19) С ИСПОЛЬЗОВАНИЕМ СТАНДАРТОВ CURRENT RESEARCH INFORMATION SYSTEMS

*В статье продемонстрирован библиометрический анализ электронных информационных ресурсов и публикационной активностью украинских ученых в области исследований вируса COVID-19.*

**Ключевые слова:** наукометрия, COVID-19, научные метрики, современные электронные научно-информационные системы, открытая наука, научное сотрудничество.