Big data confirms mental health was studied more than the virus during the pandemic

September 10 2024, by Fran Molloy

Credit: Macquarie University

More than four years after the COVID-19 pandemic turned the world upside down, a major analysis of the research response by the global scientific community has found mental health was the number one issue under the microscope.

Analysis of COVID-19-related scientific literature published in English

from January 2020 to April 2023, covering the entire World Health Organization–recognized active period of the COVID-19 pandemic, collated every keyword mentioned in 809,000 article abstracts.

It found the most cited research topic was not virology or medical treatments, but mental health.

"Mental health—including anything related to sentiment, anxiety or depression—was the most frequently expressed concern in the papers," says author and data scientist Professor Longbing Cao, distinguished chair in artificial intelligence at Macquarie University School of Computing.

His book "Global COVID-19 Research and Modeling: A Historical Record," published by Springer Nature, is a comprehensive exploration of the massive global research effort, providing insights into how scientists worldwide responded to the pandemic.

The study found the top five research keywords explored in COVID-19-related literature were mental health, pandemic, vaccination, second waves and lockdowns.

Professor Cao says the focus on mental health in the research canon shows both the wide-ranging impacts of the pandemic and the multidisciplinary nature of the scientific response.

Painstaking research

The book represents three-and-a-half years of painstaking research into articles written by 2.3 million researchers from 184 countries and regions, covering 27 subject areas.

Professor Cao and his team used techniques including advanced natural

language processing, machine learning, big data analytics and visualization to crawl, process and examine this vast dataset.

"Collecting the data was a huge challenge," says Professor Cao.

"We looked through a range of major academic libraries including ACM, IEEE, Elsevier, Springer and many more; verifying papers, checking for consistency and assessing impact factors as well as verifying affiliations and first authorship."

Collaboration and productivity

The results of this monumental effort offer insights into the global scientific response to the pandemic.

One of the most striking findings was the level of international collaboration, particularly between China and the United States. Despite well-publicized political tensions between the two countries during this period, scientists maintained strong collaborative relationships.

The U.S., China, the United Kingdom, Italy and India ranked top five globally in publication quantity and cumulative impact, while the top five in research productivity were the Netherlands, Switzerland, the U.K., France and the U.S.

"Among G20 countries, Argentina, South Korea and Australia were less productive in COVID-19 research than expected," Professor Cao says.

The U.S. led the way in overall contributions, accounting for 14.81% of total publications. The European Union was close behind at 14.66%, while China contributed 6.02%.

Quality concerns

While the scale and speed of the scientific response to COVID-19 was impressive, Professor Cao's analysis revealed limitations in the research approach used in some cases.

"We identified that very classic, conventional methodologies were overwhelmingly applied," he says. "For example, basic regression, machine learning models and multivariate statistics were mostly used in medical science, social science and computer science for quantifying and modeling COVID-19."

Professor Cao estimates that about 90% of papers on quantifying COVID-19 used these basic techniques, despite the potential for more advanced AI and deep learning approaches to address such a significant global challenge.

His book also critiques the rapid publication process that emerged during the pandemic, noting many researchers rushed to publish their results, but used basic analytical techniques to process newly-available data.

"Many papers were turned around quickly, possibly because people felt pressured to share information or they were very excited about early results," Professor Cao says.

"Some of these papers got very high citation counts because they were first to publish, but when we looked at the actual papers, some of the analysis was really very naive."

Despite the limitations, the overall picture that emerges from Professor Cao's analysis is one of an unprecedented global scientific effort.

"I think this book serves as a historical archive for the whole scientific

community," Professor Cao says.

"It shows that problem-driven research and international collaboration are critical for us to address global challenges such as a worldwide pandemic."

More information: Global COVID-19 Research and Modelling: A Historical Record: link.springer.com/10.1007/978-981-99-9915-6

Provided by Macquarie University

Citation: Big data confirms mental health was studied more than the virus during the pandemic (2024, September 10) retrieved 11 September 2024 from https://medicalxpress.com/news/2024-09-big-mental-health-virus-pandemic.html