

Chapter 7

Visualizing Zika Virus Research Literature Through Bibliometric Mapping

Usharani Munuswamy

Tamil Nadu State Forensic Sciences Department, India

J. John Jeyasekar

Tamil Nadu State Forensic Sciences Department, India

ABSTRACT

This study outlines a significant relationship between a spurt of research activity in the field and the outbreak of the Zika disease, for the purpose of visualizing the phenomenon. By using bibliographic research, it is possible to correlate data with this disease. To identify the hotspots of research the data is evaluated using the following parameters: literature growth since 1975; most prolific authors and their contributions; top contributing institution, country, and journal; identify co-authorship clusters of the authors and institutions; and finally, to create and examine co-word maps of the keywords. It is also found that under-developed countries like Senegal and Zambia have contributed to Zika research along with the USA, France and Germany. Forty-five per cent of the contributions are concentrated in six journals.

INTRODUCTION

Viruses are infectious micro-organisms, which replicate inside the living cells of other organisms. Viruses can infect all types of life forms (Koonin et al., 2006). Viruses are found wherever there is life and have probably existed since living cells first evolved (Iyer et al., 2006). The Zika virus belongs to the family *Flaviviridae* and the genus *Flavivirus*. It is usually spread by the two *Aedes* mosquitoes, *A. aegypti* and *A. Albopictus* (Malone, et al., 2016). This virus was first isolated in 1947 from the monkeys found in the Zika Forest of Uganda. Zika virus is related to dengue, yellow fever, Japanese encephalitis, and West Nile viruses (Sikka et al., 2016).

DOI: 10.4018/978-1-5225-3457-0.ch007

The Zika disease caused by zika virus which affects the public health is emerging as a global threat. The disease though existed several years before, the term zika gained popularity only after its outbreaks in early 2015. The symptoms of zika fever are similar to that of dengue fever (Malone, et al., 2016) and often cause misdiagnosis. Zika fever was first found in the 1950s in a narrow equatorial belt from Africa to Asia. Later the virus was found spreading eastward across the Pacific Ocean. In the years 2013 and 2014, zika virus outbreaks occurred in Oceania to French Polynesia, New Caledonia, the Cook Islands, and Easter Island. In 2015 it has reached a pandemic level in Mexico, Central America, the Caribbean, and South America (Chastain, 2016). As of now, no medications or vaccines are available for its prevention. This virus is also found to spread from a pregnant woman to her baby. Microcephaly, Guillain-Barré Syndrome and other severe brain problems are found to be the result of zika (Rasmussen, 2016; CDC, 2016).

Scientometrics is the quantitative study of science and technology. It is the study of quantitative aspects of science as a discipline or economic activity (Tague-Sutcliffe, 1992). Scientometric techniques have wide applications in identifying the author productivity, authorship pattern, core periodicals, research trends in a subject, research collaboration and impact of research, etc. Hence it is of great use to identify the emerging research areas within a given subject. Science mapping or bibliometric mapping is a spatial representation of how disciplines, fields, specialties, and individual authors or documents are related to one another (Small, 1999). Science maps are useful tools to understand the state-of-the-art disciplinary structure within an academic field as well as to analyse the emergence of research networks among institutions and authorship collaborations.

REVIEW OF LITERATURE

Bibliometric mapping which is performed using available bibliographic information deposited at major journals and bibliographic databases helps to understand the existing scientific knowledge about the disease, the level of research and its impact on scientific community at different levels. Scoping reviews apart from bibliometric analysis, also plays a vital role in addressing broad, policy driven research questions by identifying all the relevant evidence concerning the issue and producing summaries of the findings (Levac et al., 2010; Colquhoun et al., 2014). These reviews follow a structured protocol for the identification and characterization of the literature in a manner that is both reproducible and updateable (Young et al., 2014; Colquhoun et al., 2014). The scoping review is also well-suited for the identification of evidence on a broad-topic, but does not include a quality assessment or in-depth data extraction stage that would be required for meta-analysis of studies. However, an important aspect of this review is the identification of where evidence is lacking or non-existent to help direct future research and use of resources (Waddell and Greig, 2016).

A bibliometric study conducted using indexing databases such as Science Citation Index (*SCI*), *Scopus* and *Medline* reviewed the current impact of zika virus on global scientific production. The study for its search strategy used the term 'zika' as a main operator to retrieve data on indexed articles from the databases (Martinez-Pulgarin et al., 2016). A scoping review was conducted in response to zika virus outbreaks and changes in its epidemiology, capturing all published literature addressing the aspects of zika virus infection in humans, zika virus pathogenesis, transmissions, molecular mechanisms, prevention strategies of zika virus infections, control of zika virus harbouring vectors etc. The same review has identified epidemiological studies examining risk factors for mosquito abundance, human exposure to

11 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage:
www.igi-global.com/chapter/visualizing-zika-virus-research-literature-through-bibliometric-mapping/199967

Related Content

Creating a Support Structure for Academic Writing and Publication Support: The Rationale and Lessons Learned

Tonette S. Rocco, Lori Ann Gionti, Cynthia M. Januszka, Sunny L. Munnand Joshua C. Collins (2015). *Handbook of Research on Scholarly Publishing and Research Methods* (pp. 21-37).
www.irma-international.org/chapter/creating-a-support-structure-for-academic-writing-and-publication-support/120330

Alternative Dissertation Formats: Preparing Scholars for the Academy and Beyond

Doris L. Watson and Kimberly Nehls (2016). *Contemporary Approaches to Dissertation Development and Research Methods* (pp. 43-52).
www.irma-international.org/chapter/alternative-dissertation-formats/156929

How Can Human Resource Management Help the Theory of Constraints

Brian J. Galli (2019). *International Journal of Strategic Engineering* (pp. 1-13).
www.irma-international.org/article/how-can-human-resource-management-help-the-theory-of-constraints/219320

Sydney Metro and Melbourne Metro Rail Stochastic Comparison and Review: Scrutiny of AI

Koorosh Gharehbaghi, Kathryn M. Robson, Neville Hurstand Matt Myers (2021). *International Journal of Strategic Engineering* (pp. 28-38).
www.irma-international.org/article/sydney-metro-and-melbourne-metro-rail-stochastic-comparison-and-review/279644

Professional Development Needs of Distance Education Staff: A Mixed-Methods Explanatory Sequential Study

Jennifer Joyce Roberts (2022). *Handbook of Research on Mixed Methods Research in Information Science* (pp. 602-628).
www.irma-international.org/chapter/professional-development-needs-of-distance-education-staff/291212