Chapter 64
Scientometric Analysis of Bioinformatics Literature

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ABSTRACT

The study analyses the bioinformatics literature during 2007-2017. For this study, a total of 83,904 publications were analysed. This chapter evaluated 11 years of bioinformatics publications with the aid of scientometric tools to find out the year-wise distribution, prolific authors, subject-wise distribution, type of document, top 10 titles, top 10 institutions, country-wise distributions, and language-wise distribution. The findings revealed that a maximum of 10,821 publications were published in 2017. Among the prolific authors, Martens, L. is ranked 1. In the document type, journal articles occupied the first position, which contributed 44,515 records. Among the prolific titles, Lecture Notes in Bioinformatics has the highest contribution of publications (6,814). In the institution-wise distribution, Chinese Academy of Sciences is placed in first position, having contributed 1,576 publications. The majority of the publications (81,555) were published in English language only.

INTRODUCTION

Bioinformatics is an interdisciplinary subject which develops methods for storing, organizing, retrieving and evaluating biological data. Databases and information systems are used to store and organize biological data. The research is analysing biological data may involve algorithms in artificial intelligence, image processing, data mining, and soft computing. The algorithms in turn depend on theoretical foundations such as discrete mathematics, control theory, system theory, information theory, and statistics. Bioinformatics uses many subjects such as computer science, statistics, mathematics and engineering to process biological data. The most important activity in bioinformatics is to develop software tools to generate useful biological knowledge. Bioinformatics is a different science from biological computation, the latter being a subfield of computer engineering using bioengineering and biology to build biological computers, whereas bioinformatics simply uses computers to better understand biology. Bioinformatics

is similar to computational biology and has similar aims to it but differs on scale: whereas bioinformatics works with basic biological data (e.g. DNA bases), i.e. it works on the small scale paying attention to details, computational biology is a subfield of computer science which builds large scale general theoretical models of biological systems seeking to expand our understanding of them from an abstract point of view, just as mathematical biology does with mathematical models. Bioinformatics as a science can provide input to all previously mentioned scientific fields, as the recording and processing of detailed biological data is the first step towards doing something with them.

REVIEW OF LITERATURE

A Scientometric study on the research publications from Webology as the source journal during 2004 to 2012. Majority of the publications were contributed by single author 55(54.55%) followed by two authors 32 (31.68%) (Sudharani & Nagaraju, 2013). . The degree of collaboration was 0.45. Among the country wise distribution, the majority of the contributions were from both India and Iran 11 (10.89%). The authorship pattern of spacecraft's Research output during the year 2000-2014. In this study, a total of 2,58,861 articles were analysed . The average number of the authors per publication was 4.14 (Viswanathan & Tamizhchelvan, 2016). The Scopus Citation Database has been used to retrieve the data for 10 years (1999-2008) by searching the keywords (AIDS; Acquired Immune Deficiency Syndrome; Acquired Immunodeficiency Syndrome; HIV; Human Immuno Deficiency virus; Immunodeficiency virus, Human; Immuno deficiency syndrome, acquired; Immunologic deficiency syndrome, acquired; virus, Human immunodeficiency) in the combined Title, Abstract and keywords fields. To compare the profile of Indian research output with China, South Africa and Brazil, the study downloaded the data on these countries using the Affiliation field of this database. India ranks at 12th position among the top 20 countries and its global publication share (2.07%) is higher than Brazil (1.74%), but lower than China (2.24%) and South Africa (2.52%) (Gupta Adarsh Bala & Har Kaur, 2011) .

Studies related to Latin America focused on overall Latin America & Caribbean by Macias-Chapula, Rodea- Castro & Narvaez-Berthelemot (1998) and Macias-Chapula, Sotolongo-Aquilar & Magde (1999) and Mexico .There have also been a few studies relating to Asia, on India by Patra & Chand (2007) and China by Tian, Steinmann, Chen & Zhou (2009). Among analysis of content specific studies, Onyanchla and Ocholla studied the relatedness of AIDS-defining diseases in persons with documented HIV infections to AIDS/HIV by measuring their strength and association. Onyanchla and Ocholla (2009) by using co-word and multidimensional scaling techniques analyses MEDLINE-extracted AIDS/ HIV records. The study five lists of terms to investigate the relatedness of various factors and diseases to AIDS/HIV. Among content specific studies, Onyancha & Ocholla (2009) studied the relatedness of AIDS-defining diseases in persons with documented HIV infections to AIDS/HIV by measuring their strength and association. A total of 2477 papers were identified in the Web of Science database.

The study reveals that most of the researchers preferred to publish their research results in the form of journals articles and 82.8% of articles were published in journals. More numbers of articles were published in the year 2015.Theauthorship trend shows that, out of total 2477 publication published, 95% of the publications were published under the joint authorship. This study also identifies that Relative growth rate, Doubling Time, Degree of collaboration. Central South University with 268 (10.8%) publication tops in the institutional wise publications productivity. The study also identifies bibliographic coupling of the institution, language distribution, keyword distribution, geographical distribution of the literature

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