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Web 2.0 Applications In Medicine : Trends And Topics In The Literature

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Background and objectives

Over the past two decades, the world wide web has changed researchers' habits. These changes were further extended when “web 2.0” appeared in 2005, bringing tools and platforms facilitating user collaboration, user-generated content and data sharing. These tools have gradually influenced the world of research, especially in medicine. Bibliometrics is a helpful and widely used tool for describing patterns of publication and interpreting temporal evolutions and the geographical distribution of research in a given field. Few studies employing bibliometrics, however, have been carried out on the correlative nature of scientific literature and web 2.0. The aim of this bibliometric analysis was to provide an overview of web 2.0 implications in the field of Medicine. The objectives were to assess growth rate of literature, key journals, authors and country contributions, and to evaluate whether the various web 2.0 applications are expressed within this biomedical literature, and, if so, how.

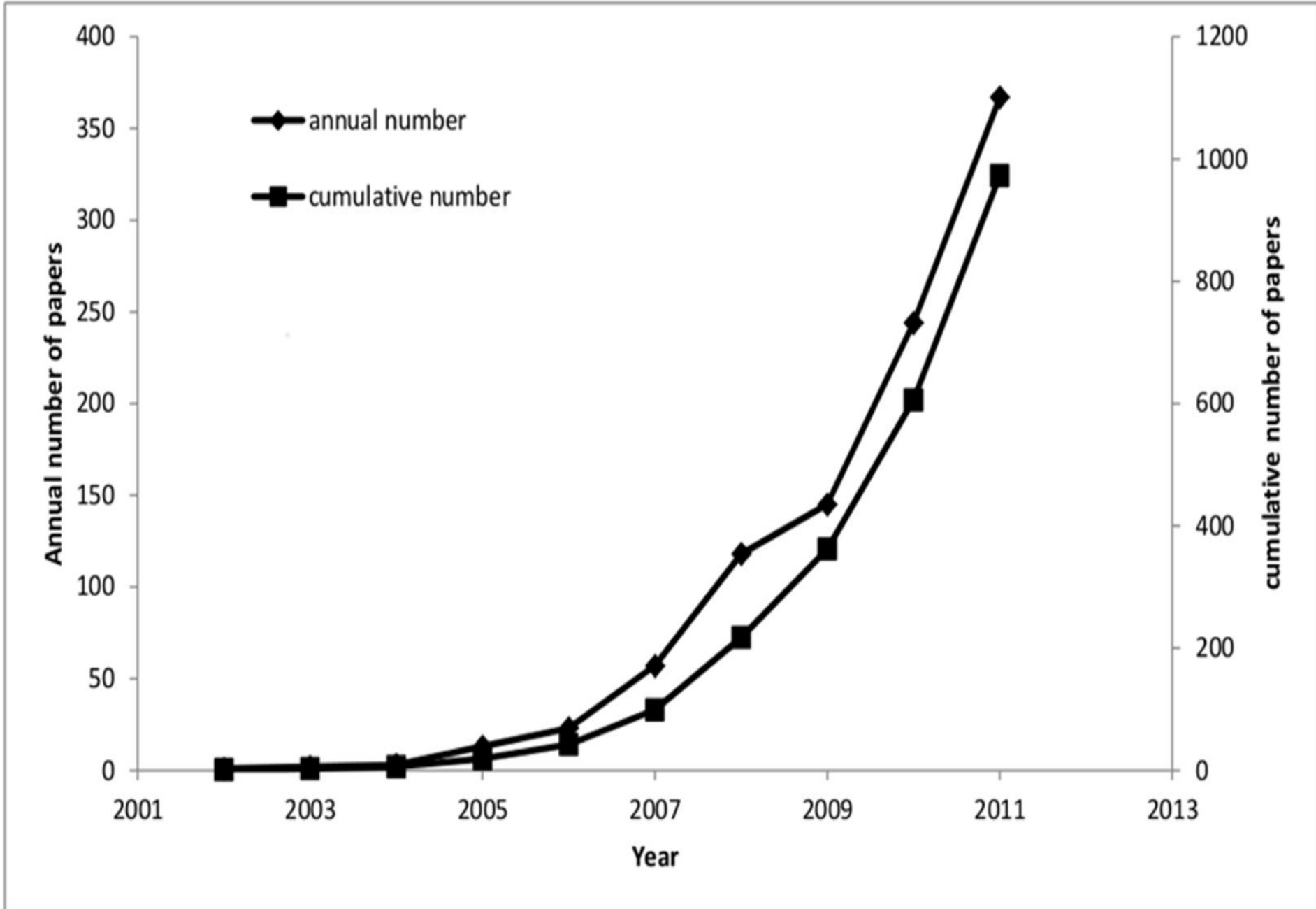
Methods

A specific query with keywords chosen to be representative of web 2.0 applications has been built for PubMed database. Articles dealing with web 2.0 were downloaded in XML and were processed through developed PHP scripts, then were imported to Microsoft Excel 2010 (Microsoft) for data processing.

Results

Growth of literature

1347 articles were included in this study. The number of articles dealing with web 2.0 has been increasing since 2002 (average annual growth rate was 106.30 % with a maximum of 333 % in 2005)



Growth of literature (annual number and cumulative number)

Journals

614 journals were identified during this analysis. Table 1 presents the top 10 most productive journals over the period studied producing articles related to web 2.0 .

Journal	Number of papers	Percentage of articles
Studies in health technology and informatics	53	3.9
Journal of medical Internet research	36	2.7
Nucleic acids research	35	2.6
Cyberpsychology, behavior and social networking	33	2.5
AMIA. Annual Symposium proceedings / AMIA Symposium. AMIA Symposium	24	1.8
BMC Bioinformatics	21	1.6
Medical reference services quarterly	21	1.6
Medical teacher	20	1.5
Nurse educator	19	1.4
PLoS One	17	1.3

Geographical repartition of authors (country contributions)

United States was by far the predominant country, in terms of author country. Europe came globally second whereas Africa and South America were very poorly represented.

Country	Number of articles	Percentage of articles
United States	514	54
United Kingdom	87	9.1
Australia	44	4.6
Canada	41	4.3
China	40	4.2
Germany	34	3.6
Spain	26	2.7
Netherlands	21	2.2
France, Italy	14	1.5
Greece, Japan	11	1.2
New Zeland, Switzerland	10	1.1
India, Israel	9	1
Norway, Sweden	8	0.8
Portugal	6	0.6
Belgium, Ireland	4	0.4
Austria, Brazil, Bulgaria, Egypt, Romania, Turkey	3	0.3
Luxembourg, South Africa	2	0.2
Argentina, Czech Republic, Poland, Singapore, Slovakia	1	0.1

Core population of authors related to web 2.0

4209 authors were found for the 1347 articles retained. Distribution of number of articles per author shows that the great majority of authors (n=3444; 91.54 %) wrote only one article, whereas 73 (1.9 %) wrote three or more. Thus, the core population of researchers working on web 2.0 in the biomedical field can be estimated to approximately 75.

Words frequency analysis

274 words in the field of web 2.0 were found after manual sorting of the 15878 words belonging to title and abstract fields of articles. Word frequency analysis reveals the word “blog” as the most recurrent, followed by “wiki”, “web 2.0”, “social media”, “Facebook”, “social networks”, “blogger”, “cloud computing”, “Twitter” and “blogging”. All categories of web 2.0 applications were found, indicating the successful integration of web 2.0 into the biomedical field. Blog was the predominant category of any web 2.0 application, followed by social networks and wiki (respectively 1279, 1199 and 824 occurrences). Micro-blogging, cloud computing, social bookmarking/document sharing and syndication were much less represented with respectively 332, 227, 183 and 175 occurrences. Remarkably, apart from wikis, applications specifically developed for science, biology or medicine were rare (e.g. PatientLikeMe,) or not represented (e.g. researchblogging.org for blogs, Researchgate and Academia for social networks).

Conclusions

This study shows that the biomedical community is engaged in the use of web 2.0 and confirms its high level of interest for these tools. Therefore, changes in the ways researchers use information, generated by the arrival of the world wide web and web 2.0, seem far from over.