MEDINFO 2007
HISA Ltd Australia
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The Convergence of Bioinformatics and Medical Informatics : Bibliometric analysis of health informatics research, 1991-2005

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Keywords:
bibliometric, SCI, bioinformatics, medical informatics, biomedical informatics

Introduction

The field of biomedical informatics sits at the crossroads of biology science, medical science, computer science, information science, and cognitive science. The convergence of bioinformatics and medical informatics to biomedical informatics will provide a much broader view of the composition of health information soon became the mainstream in these domains. Shortliffe and Cimino pointed the evolution in the field of biomedical informatics in 2006. Our purpose was to study the biomedical informatics research performance based on 7830 documents published in Science Citation Index (SCI)-indexed periodicals between 1991 and 2005. These documents were analyzed and evaluated according to publication distribution and were used to determine the quantitative characteristics of the research.

Methods

Documents used in this study were based on the databases of the *SCI* which was accessed from the ISI *Web of Science*, 'bioinformatics', 'medical informatics' and 'biomedical informatics' were used as keywords to search titles, abstracts, and keywords. Parameters analyzed included type of document, page count, authorship, journal, author keywords and country of publication.

Results

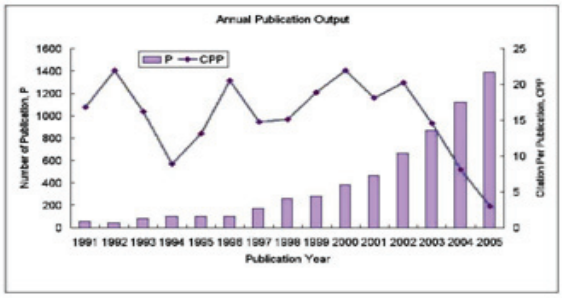

Figure 1 - Annual publication output

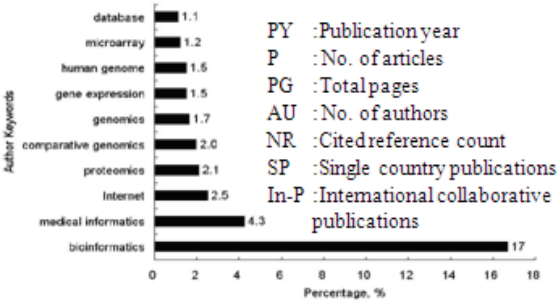

Figure 2 - Ten most used author keywords

Table 1 - Major characteristics of the research

PY	P	PG	PG/P	AU	AU/P	NR	NR/P
1991	56	441	7.9	178	3.2	842	15
1992	47	376	8.0	156	3.3	934	20
1993	80	591	7.4	223	2.8	1128	14
1994	100	771	7.7	324	3.2	1324	13
1995	99	786	7.9	301	3.0	1848	19
1996	99	780	7.9	321	3.2	1966	20
1997	171	1316	7.7	570	3.3	3799	22
1998	259	2165	8.4	834	3.2	5539	21
1999	282	2218	7.9	938	3.3	6669	24
2000	384	3093	8.1	1540	4.0	9477	25
2001	463	3856	8.3	1932	4.2	12127	26
2002	662	5625	8.5	2829	4.3	19853	30
2003	866	7978	9.2	4384	5.1	27022	31
2004	1122	10539	9.4	5711	5.1	36452	32
2005	1392	13111	9.4	6732	4.8	46078	33

Table 2 - Publication activity of top ten countries

Country	SP	SP%	CP	CP%	TP	TP%
U.S.A.	2063	41	579	59	2642	43
U.K.	489	9.8	239	24	728	12
Germany	312	6.3	197	20	509	8.4
Japan	287	5.8	56	5.7	343	5.6
France	200	4.0	110	11	310	5.1
Canada	172	3.5	137	14	309	5.1
Peoples R China	200	4.0	69	7.0	269	4.4
Australia	105	2.1	79	8.1	184	3.0
Italy	111	2.2	69	7.0	180	3.0

Sweden	90	1.8	37	3.8	127	2.1

Conclusions

- The results show an increasing number of articles since 1997 and author numbers, article pages and cited reference count numbers indicate a continuous growth of biomedical informatics community.
- The five most author used keywords were bioinformatics, medical informatics, internet, proteomics and comparative genomics.
- Fifteen document types were found in the total of 7830 documents. 78 percent of all documents are articles.
- The USA was the leader and dominated the most publications followed by UK, Germany, Japan, France ,Canada.
- The production came from many countries, denoted the devotion to this research in different area around the world.