EXPLORING THE ROLE OF MEDICAL DECISION MAKING IN BIOTECHNOLOGY FIELD THROUGH SCIENCE MAPPING

THE 2020 INTERNATIONAL CONFERENCE ON DECISION AID SCIENCES AND APPLICATIONS (DASA'20)

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1. INTRODUCTION

CONTEXT

- Biotechnology is known as a science that uses living organisms, or biological materials, to develop products that benefits humans and their environment or to solve a specific problem.
- For the biotechnology, the management and organization of information is essential for a good investigation. Nowadays there are several companies and organizations that are involved in the elaboration of databases of nucleic acids sequences, proteins sequences, microarrays, molecular markers, cell lines, scientific articles, etc.

OBJECTIVE

- The main aim of the present research is to explore the role of Medical Decision Making in Biotechnology field through science mapping from 1993 to 2020 using Scopus.
- The analysis is developed using VOSviewer.

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2. METHODOLOGY

SOFTWARE TOOL

VOSviewer was employed to develop a conceptual science mapping analysis based on co-words bibliographic networks.

METHODOLOGY STAGES

1. **Performance analysis.** Relative contribution of the research themes to the whole research field: number of published documents, number of citations, and different types of bibliometric indicators (h-index).
2. **Detection of the research themes.** Co-word analysis, followed by a clustering of keywords to topics/themes.
3. **Visualizing research themes and cluster.** Science Map and Cluster Network (occurrences and links). Research themes mapped in a two-dimensional conceptual science map and clustered (Figure 1).

2. METHODOLOGY

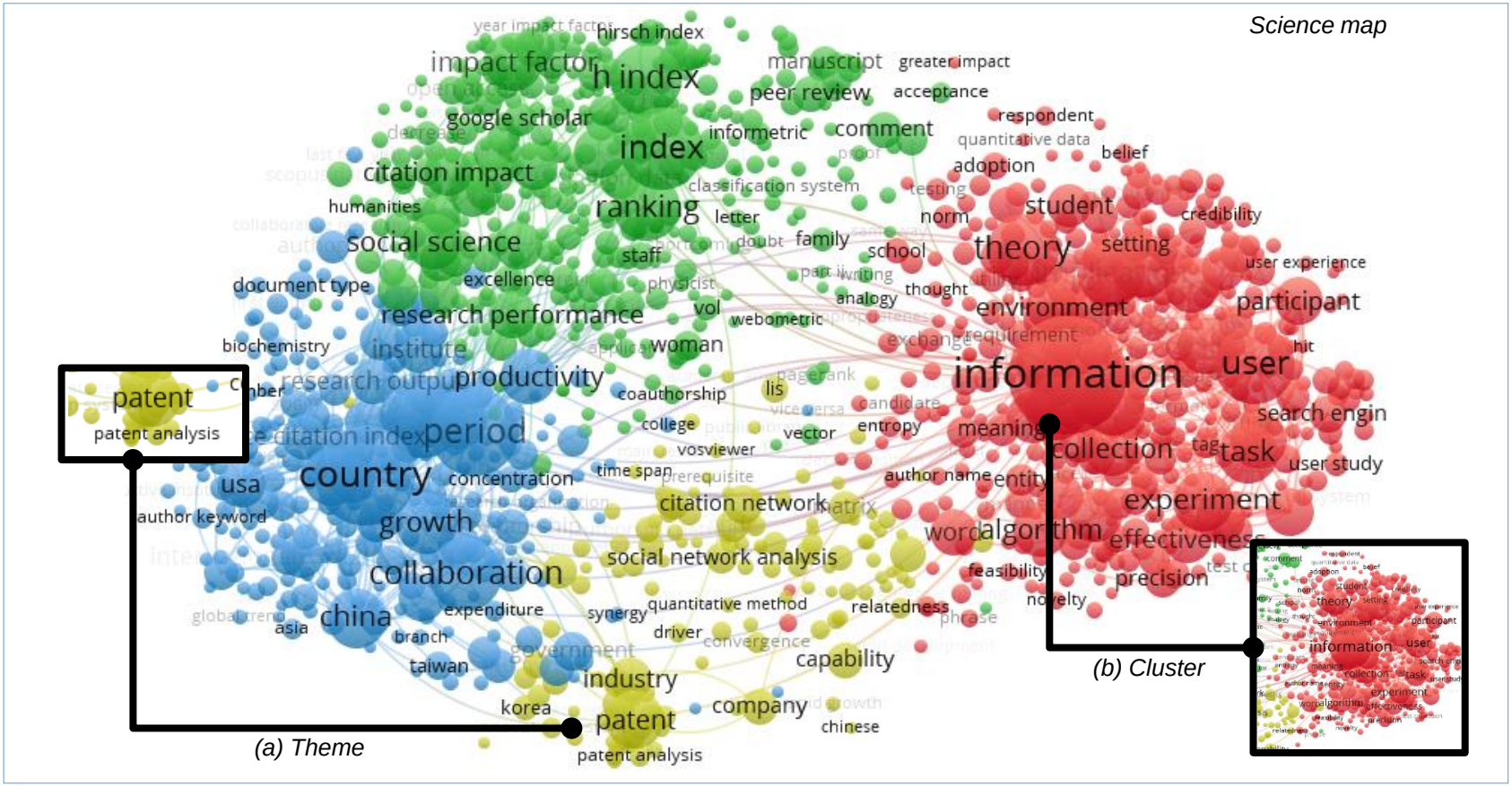

Figure 1: Science Map. (a) Research theme and (b) Cluster

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3. DATASET

CORPUS AND DATABASE

Articles, Review and Proceeding papers related to (i) Medical Decision Making and (ii) Biotechnology from 1993 to 2020 in Scopus.

QUERY

TITLE-ABS-KEY(“medical decision mak” AND “biotech*”)*

TIME PERIOD

The corpus was evaluated in a single period from 1993 to 2020.

CORPUS SIZE

- 151 documents (articles), 3,211 cites and 5,149 keywords (citations count up to 7th September 2020).
- 1993-2012: 122 documents, 2,789 cites and 3,980 keywords
- 2013: 6 documents, 70 cites and 130 keywords.
- 2014: 4 documents, 265 cites and 172 keywords.
- 2015: 3 documents, 9 cites and 118 keywords.
- 2016: 7 documents, 65 cites and 274 keywords.
- 2017: 2 documents, 4 cites and 60 keywords.
- 2018: 1 documents, 4 cites and 64 keywords.
- 2019: 1 documents, 1 cites and 54 keywords.
- 2020: 6 documents, 8 cites and 274 keywords. (* on going)

DOCUMENTS AND CITATIONS BY YEAR

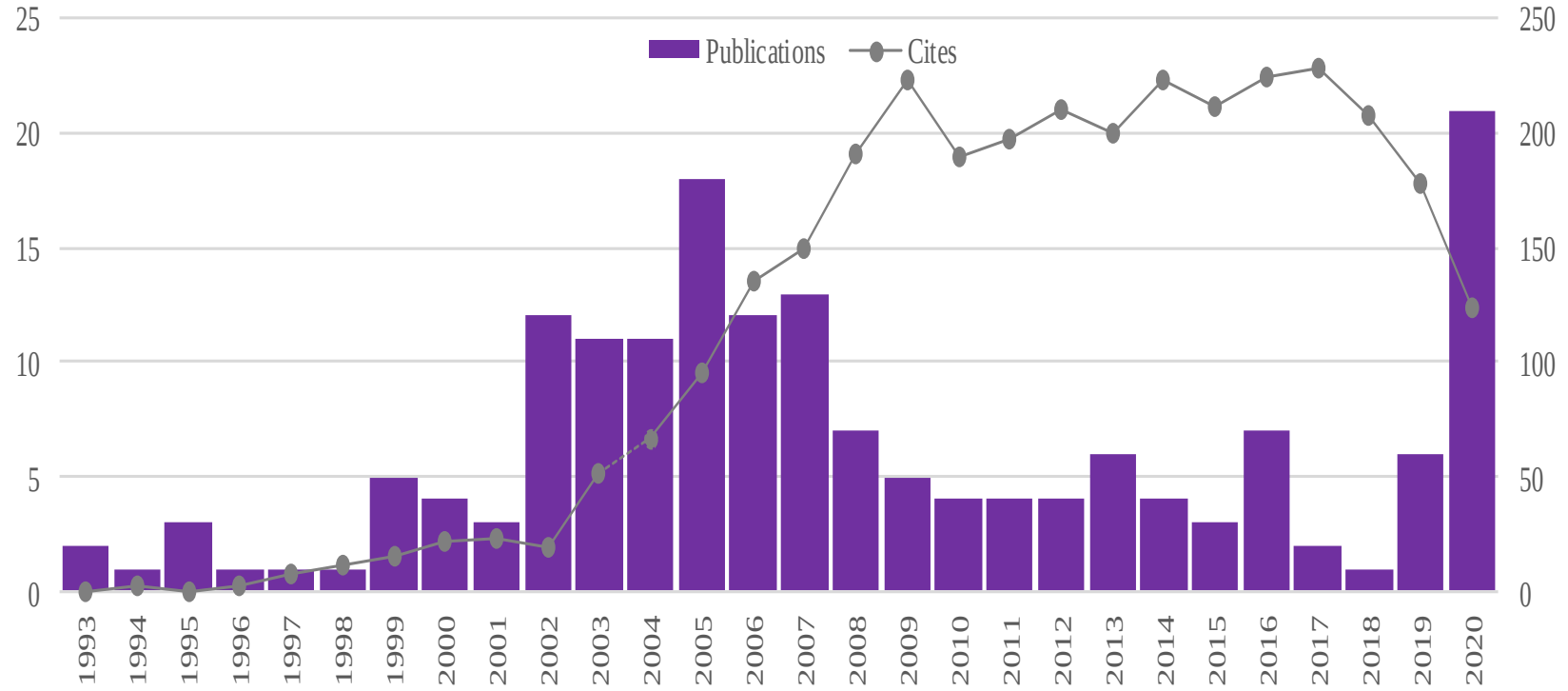

Figure 2: Distribution of publications and cites

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4. CONCEPTUAL ANALYSIS

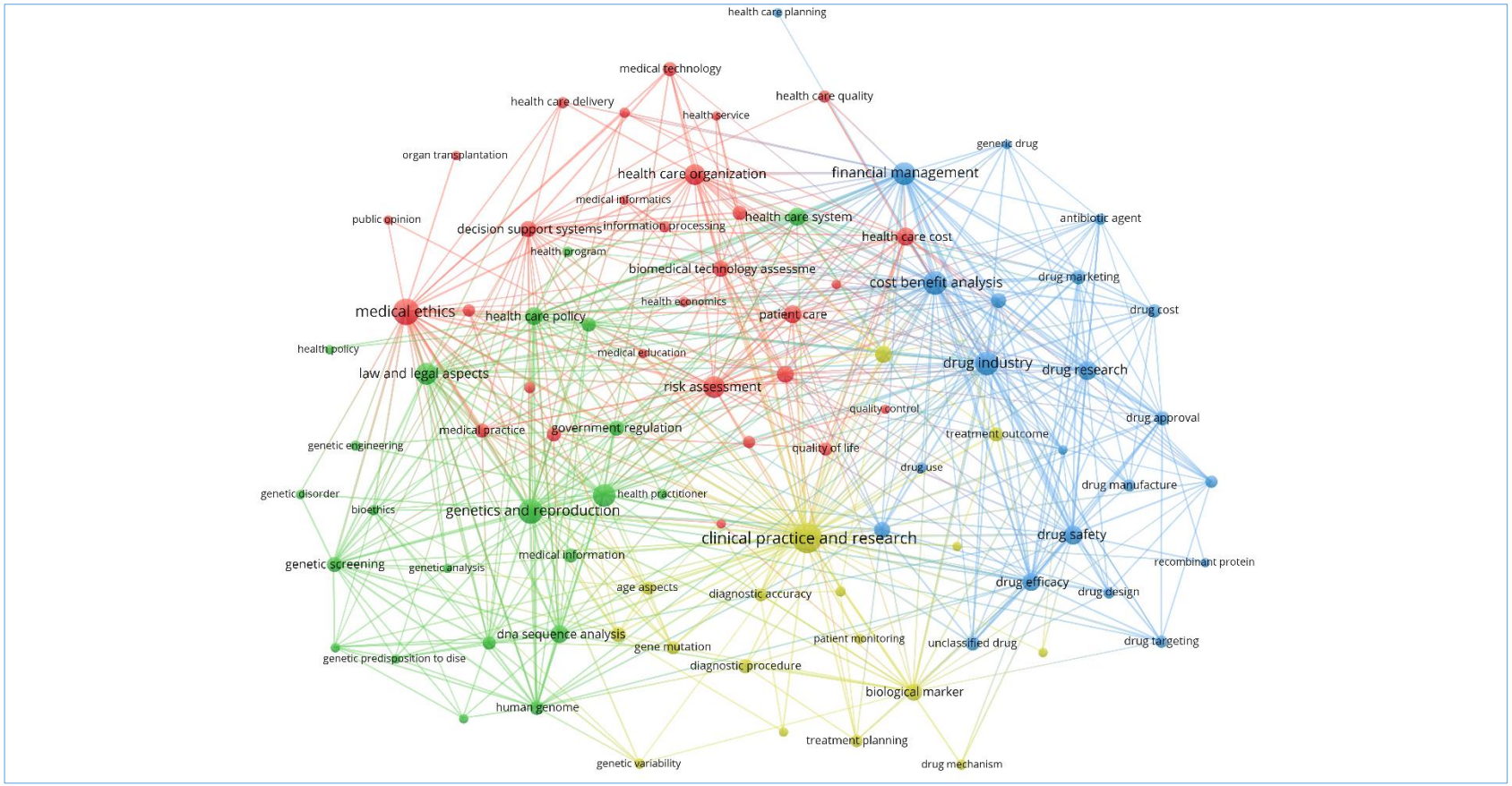

Figure 3. Network visualization map of Medical Decision Making and biotechnology field and the most productive themes

4. CONCEPTUAL ANALYSIS

Cluster	Themes (the most productive)	Weight	Total link strength	Occurrences
Medical Decision Support Systems	medical ethics	55	208	35
	risk assessment	53	143	24
	health care organization	24	154	22
	health care cost	26	135	17
	patient care	60	136	17
	biomedicine	37	91	14
	biomedical technology assessment	27	88	13
	decision support systems	36	98	13
	medical practice	48	83	11
	evidence based medicine	33	70	10
Genetics and Reproduction	genetics and reproduction	30	245	31
	medical research	54	180	26
	law and legal aspects	30	173	24
	dna sequence analysis	58	139	17
	health care policy	36	163	17
	health care system	31	136	16
	genetic screening	13	116	12
	government regulation	54	116	12
	human genome	30	131	11
	public health service	15	108	11
Drug Industry	cost benefit analysis	20	204	27
	drug industry	49	246	27
	financial management	50	222	26
	drug safety	21	162	19
	drug research	56	141	18
	drug efficacy	43	141	16
	pharmacogenomics	60	112	13
	food and drug administration	17	132	12
	drug marketing	16	112	11
	unclassified drug	32	78	11
Clinical Practice and Research	decision support systems	40	292	46
	behavioral research	52	98	14
	economic and social effects	45	116	14
	management information systems	54	67	12
	internet	17	81	10
	electronic commerce	49	67	10
	transportation management	60	45	9
	mathematical models	36	72	9
	information management	34	79	9
	travel behavior	55	54	8

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CONCLUSIONS

SUMMMARY

- An amount of 151 documents (articles) were retrieved from the Scopus. This articles achieved 3,211 cites and 5,149 keywords.

- The corpus was evaluated in a single twenty-seven years period.
  - 151 documents (articles), 3,211 cites and 5,149 keywords (citations count up to 7th September 2020).
  - 1993-2012: 122 documents, 2,789 cites and 3,980 keywords
  - 2013: 6 documents, 70 cites and 130 keywords.
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- The impact achieved is summarized in the following indicators:
  - Average citations per publication: 10.94
  - h-index: 28 publications

CONCLUSIONS

MAIN CONCLUSION

- Despite the fact that biotechnology is considered a new science, the reality is that it has accompanied humans for many years. With the exponential advances that science has had, special attention has been paid to biotechnology.
- The main research themes related to Medical Decision Making and biotechnology field are: medical ethics, risk assessment, health care organization, health care cost, patient care, genetics and reproduction, medical research, law and legal aspects, dna sequence analysis, health care policy, cost benefit analysis, drug industry, financial management, drug safety, drug research, decision support systems, behavioral research, economic and social effects, management information systems and internet.

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THANK YOU

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