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Comparing bibliometric analysis using PubMed, Scopus, and Web of Science databases

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TITLE
Comparing Bibliometric Analysis using PubMed, Scopus, and Web of Science databases

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SHORT ABSTRACT
Literature databases are commonly used to assess publications in a certain subject, discipline, country, or region of the world, a practice known as bibliometric analysis. The current protocol details how to use PubMed, Scopus, and Web of Science databases to do bibliometric analysis.

LONG ABSTRACT
Literature databases (*i.e.*, PubMed, Scopus, and Web of Science) differ in terms of their coverage, focus, and the tool they provide. PubMed focuses mainly on life sciences and biomedical disciplines, whereas Scopus and Web of Science are multidisciplinary. The protocol described in the current study was used to search for publications from Jordanian authors in the years 2013-2017. In this protocol, how to use each database to conduct this type of search is explained in detail. A Scopus search resulted in the highest number of documents (11,444 documents), followed by a Web of Science search (10,943 documents). PubMed resulted in a smaller number of documents due to its narrower scope and coverage (4,363 documents). The results also show a yearly trend in: (1) the number of publications, (2) the disciplines that have the most publications, (3) the countries of collaboration, and (4) the number of open access publications. In contrast, PubMed has a sophisticated keyword optimization service (*i.e.*, Medical Subject Heading, or MeSH), while both Scopus and Web of Science provide search analysis tools that can produce representative figures. Finally, the features of each database are explained in detail and several indices that can be extracted using the search results are provided. This study provides a base for using literature databases for bibliometric analysis.

INTRODUCTION

Classically, researchers have used literature databases to perform literature review for their studies[1]. Another use of these literature databases arose at the end of the 19th century, where researchers analyzed the body of literature, a use that has slowly grown since[2]. In the last few decades, digitizing literature and the formation of online literature databases provided an opportunity to researchers to analyze the body of literature and research performance easily and efficiently. An example would be analyzing the research performance for a document[3], a subject[4], a discipline[5], a country[6], or even a region in the world[7]. This type of analysis is known as bibliometric analysis. Heartsill Young defined bibliometric analysis as the use of statistical methods to analyze a body of literature to reveal historical development[8]. In other words, bibliometrics is the quantitative study of published units on the basis of citation and text analysis[9].

Different databases are used to do bibliometric analysis and each database has different characteristics and can provide different services[10]. Currently, the most commonly used literature databases are the Web of Science and Scopus for almost all disciplines, both only available on a subscription basis[11], and PubMed for biomedical and life sciences, a freely available database[10]. There is also Google Scholar, which might be an easy tool to handle, but it should not be used as a bibliometric analysis tool currently due to some deficiencies such as its unclear scope and coverage, its lack of citation analysis tools, and its inclusion of non-peer reviewed non-scientific contents[12,13]. Moreover, Google Scholar lacks the tools for performing advanced search and keyword optimization[14].

Several previous studies have compared the features of the previously mentioned literature databases for literature review purposes[3,5,10,12,13,15-17]. However, in this study, the means by which PubMed, Scopus, and Web of Science databases are used to perform a bibliometric analysis will be provided, and the pros and cons for each of them will be compared. Bibliometric analysis can be used to analyze the research output in almost any discipline, so the target audience would be any researcher who intends to analyze publication trends. An example of analyzing a publication trend in Jordan as a country will be presented using each database. Jordan was chosen because doing a bibliometric analysis for a country (in contrast to a subject) is not very straightforward. In addition, Jordan, specifically, is poorly studied in a bibliometric way as it can be both an author name and a country name. We explain how to overcome such a challenge in the search.

PROTOCOL:

Note: The following are search methods and an example search for each method is provided. Note that the part related specifically to bibliometric analysis is also supplied.

1. PubMed

1.1. Choose **Advanced Search** from PubMed homepage (www.ncbi.nlm.nih.gov/pubmed).

1.2. Enter the desired search term in the search field. Choose the search terms from the medical subject heading (MeSH) database. The following example details how to assess research in "cancer".

1.2.1. Open the MeSH database: https://www.ncbi.nlm.nih.gov/mesh.

1.2.2. Enter the word "cancer" in the search field.

1.2.3. Ensure that the results show the word "neoplasms" at the top of the search, where it notes that using the word "neoplasms" is more suitable, as "neoplasms" is the word used to index relevant topics.

1.2.4. Further check other terms listed under the term "neoplasms" by clicking on it. The results will show other terms used to describe similar topics (*e.g.,* tumor), and will also list other subcategories (subheadings) under the term neoplasm.

1.2.5. Use the drop-down lists in the **Builder** section to specify the field of the article that PubMed will search for the term in. Note that the following search fields are available: all fields, title, abstract, authors, affiliation, conflict of interest, language, journal, publisher, publication type, grant number, ISBN, and MeSH terms.

1.2.6. Add as many fields as needed and choose the relation between these fields (AND, OR, or NOT). See **Table 1** for further details.

1.3. Click **Search**.

1.4. Refine the search results further in the results using different filters available as detailed in **Table 2**. Note that from now on, the final search done will be saved in the history of the **Advanced Search,** which was accessed in the first step. This means that the search can be paused at this step and resumed later.

1.5. Ensure that each new search is saved in the **Advanced Search** history screen where it will be assigned a number (*e.g.*, #2). Use this number in the search field above to subtract searched queries (*e.g.,* "#1 NOT #2" to subtract results in search #2 from results of search #1).

1.6. Export the results to further analyze them.

1.6.1. Use the FLink tool (https://www.ncbi.nlm.nih.gov/Structure/flink/flink.cgi) to export the results in a comma separated values (CSV) format, and choose PubMed from the **Please choose a database to start** drop-down list.

1.6.2. Choose **Input From Entrez History** from the input screen, and an advanced PubMed search history will appear at the drop-down list.

1.6.3. Choose the search performed in the previous steps at the PubMed advanced search and click **Submit**.

1.6.4. View the resulting report since it provides the option of exporting the search results in a CSV format file.

1.7. Perform the following steps to analyze Jordanian research output during a 5-year period between 1/1/2013 and 31/12/2017 using PubMed.

1.7.1. Open the **Advanced** search form in the document search form at the PubMed website (www.ncbi.nlm.nih.gov/pubmed).

1.7.2. Use **Jordan** as the search term and specify **Affiliation** as the search field. Note that PubMed interprets affiliation as all information related to the author (*i.e.,* author's name, address, affiliation), so exclude any document authored by an author named "Jordan" in which the affiliation country is not Jordan. Follow the steps below to avoid including such irrelevant results.

1.7.3. Type **Jordan** in another field and choose the field type **Author**.

1.7.4. Choose the operator **NOT** as the relation between the two fields and click on **Search**.

1.7.5. Specify **Publication Dates** from **1/1/2013** to **31/12/2017** in the results window, and choose **Journal Article** and **Review** from **Article Types**.

1.7.6. Open FLink (https://www.ncbi.nlm.nih.gov/Structure/flink/flink.cgi), and choose **PubMed** as the database.

1.7.7. Choose **Input From Entrez History** from the input screen, and choose the search from the drop-down list.

1.7.8. Click **Download CSV**.

Note: **Figure 1** details the PubMed search report with annotation for each section of the report.

2. Scopus

2.1. Register in order to access the full search capabilities of the Scopus database. Check if the local institution is already registered and has access to the database since academic institutions are usually registered in Scopus.

2.2. Go to the website (www.scopus.com) and by default, Scopus opens the document search form screen.

2.3. Enter the search term desired in the search field available.

2.4. Specify the fields in the article to be searched for. Note that the following search fields are available: all fields, title, abstract, keywords, authors, affiliations, funding information, language, references, conference, ISSN, CODEN, DOI, ORCID, and CAS number.

2.5. Add other fields to search for and indicate the relation between the newly added field and the other field already entered (AND, OR, or AND NOT). See (**Table 1**) for further details.

2.6. Use the **Limit** option to limit the search based on the options provided by Scopus, as detailed in **Table 2**. After executing the search, save the search and continue later if needed.

2.6.1. In this case, set an alert using the option **Set alert**, where an email will be sent when an article satisfying the searching criteria is added.

2.7. Refine the search results further from the results directly by choosing from the options provided by Scopus (**Table 2**), where Scopus shows the number of documents included for each option.

2.8. Choose to either analyze the results directly on the Scopus website (click **Analyze Search Results**), or to export the results in either zip or CSV formats after completing the search criteria.

2.9. Perform the following steps to analyze Jordanian research output during a 5-year period between 1/1/2013 and 31/12/2017 using Scopus.

2.9.1. Go to the website (www.scopus.com) and by default, Scopus opens the document search form screen.

2.9.2. Type **Jordan** as the searching term in the document search form.

2.9.3. Specify **Affiliation Country** as the search field.

2.9.4. Limit the search duration from 2013 to 2017. Note that from 2013 means from 1/1/2013, and to 2017 means to 31/12/2017.

2.9.5. Limit the document type to **Article or Review**, and then click **Search**.

Note: **Figure 2** details the Scopus search report with annotation for each section of the report.

3. **Web of Science**

3.1. Register in order to access the full search capabilities of the Web of Science database. Check if the local institution is already registered and has access to the database as academic institutions are usually registered in Web of Science.

3.2. Go to the Web of Science home page (www.webofknowledge.com). The website opens the basic search and includes the **Web of Science Core Collection** as the selected database for search.

3.3. Search for the fields as detailed in **Table 2**.

3.4. Add another field (if needed) to connect both fields by either AND, OR, or NOT. See **Table 1**.

3.5. Define the duration that is searched down to 1945. After completing the search, the results are saved in the history and can be returned to at any time. If needed, set an alert if any new document is added to the search report.

3.6. Sort the results according to either data, times cited, usage counts, or to other categories from the drop-down list provided.

3.7. Refine the search results further from the results directly by choosing from the options provided by Web of Science (**Table 2**), where Web of Science shows the number of documents included for each option.

3.8. View the results and analyze them via a tree map or bar graph. Note that there is a table showing the count in each category.

3.9. Download the results. Note that unlike Scopus and PubMed, Web of Science only allows the downloading of 5,000 records at a time (*e.g.,* a 10,000 result search is downloaded in two batches, the first batch for the first 5,000 records, and a second batch for the next 5,000 records).

3.10. Perform the following steps to analyze Jordanian research output during a 5-year period between 1/1/2013 and 31/12/2017 using Web of Science.

3.10.1. Type **Jordan** in the search field and specify **Address** as the search field.

3.10.2. Identify the duration of search between 2013 and 2017 and click **Search**.

3.10.3. Restrict the search using **Article** and **Review** filters.

3.10.4. Choose to analyze the results that are saved in **Search History** now or later.

3.10.5. Choose to analyze the results in the form of tables or visual tree map and bars.

Note: **Figure 3** details the Web of Science search report with annotation for each section of the report.

REPRESENTATIVE RESULTS:

Results from PubMed search

A total of 4,363 documents were retrieved based on the search conducted in this study. Free full text was available for 1767 documents (40.5%). In 2013, a total of 532 documents were published, 663 documents in 2014, 811 documents in 2015, 952 documents in 2016, and 1,405 documents in 2017.

The results reveal that 1008 (23.8%) documents discussed issues related to cancer, while only 53 (1.2%) documents discussed AIDS related topics. The results also show that 150 (3.5%) documents were published in dentistry related journals, while 275 (6.5%) documents were published in nursing journals.

Results from Scopus search

A total of 11,444 documents resulted from the search conducted in the current study, including 10,974 (95.9%) articles and 470 (4.1%) reviews. Only 652 (5.7%) of the documents were open access.

Figure 4 shows the yearly trend in Jordanian publications during the 5-year interval. According to the country of collaboration in the Scopus search (**Figure 5**), the United States of America (USA) is the most common country Jordanian researchers collaborate with (1,553 publications), followed by Saudi Arabia with 1,176 publications, and United Kingdom with 723 publications.

Figure 6 details the 10 most common disciplines Jordanians have published in. Based on the Scopus search, medicine is the most common discipline published in (2,441 publications), followed by engineering (1,837 publications), and social sciences (1,468 publications). The University of Jordan has contributed to 3,346 (29.3%) publications of the total five year publications, followed by Jordan University of Science and Technology with 2,396 publications (21.0%), and Hashemite University by 1,347 publications (11.8%).

Results from Web of Science search

A total of 10,943 documents were published in Jordan. 87 are highly cited papers and 14 are considered to be hot papers. The results show that 2,879 documents were Open Access, 2,547 documents were Gold open access, 170 documents were Green published, and 162 documents were Green accepted (manuscript deposited in repositories upon acceptance before publication).

Figure 7 shows the yearly trend in Jordanian publications during the 5-year interval. **Figure 8** details the country of collaboration. According to the Web of Science search, the USA is the most common country Jordanians collaborate with (929 publications), followed by France with 860 publications, and Austria with 429 publications. **Figure 9** details the 10 most common disciplines Jordanians published in. According to the Web of Science search, engineering is the most common discipline published in (1,315 publications), followed by mathematics (1,263 publications), and computer sciences (828 publications).

FIGURE AND TABLE LEGENDS:

Figure 1: The report for the PubMed search with color annotation for each section in the report.

Figure 2: The report for the Scopus search with color annotation for each section in the report.

Figure 3: The report for the Web of Science search with color annotation for each section in the report.

Figure 4: The yearly trend in publications in Jordan during the 5-years period, as extracted from Scopus.

Figure 5: The countries Jordanians tend to author publications with, as extracted from Scopus.

Figure 6: The disciplines Jordanian publications are generally about, as extracted from Scopus.

Figure 7: A bar chart showing the yearly publication trend in the years 2013-2017 in Jordan, as extracted from Web of Science.

Figure 8: A bar chart showing the countries Jordanians tend to collaborate with in the years 2013-2017, as extracted from Web of Science.

Figure 9: A tree map showing the 10 disciplines which most Jordanian publish in during the years 2013-2017, as extracted from Web of Science.

Table 1: **Operators to perform the specified functions for each database.** Operators in PubMed must be in upper case, unlike those for Scopus and Web of Science. ✕=not present.

Table 2: **Outcome measures and search filters that are available for each literature database**. Researchers may refer to each database's instructions for further details on using each filter.

Table 3: Comparing the characteristics of PubMed, Scopus, and Web of Science. Information in this table is based on this study's data and the information provided by each database[10,22-24].

DISCUSSION

In this study, the steps through which PubMed, Scopus, and Web of Science databases are used to perform a bibliometric analysis were provided. It was indicated that the friendliest and the easiest tool to use for bibliometric analysis services is Web of Science; however, its drawback is that its services are not available for free. PubMed is devoted for biomedical sciences and is affiliated with several other National Library of Medicine (NLM) tools that can help to optimize analysis of biomedical subjects. Medical Subject Heading (MeSH) is a professional indexing tool, where upon adding a new article to PubMed database, the article will be searched by experts for the main topics it discusses, and a list of MeSH will be assigned for each article. On the other hand, its main drawback is that it requires good knowledge on how to use it. Searching the Web of Science core collection will yield all articles that are published in journals indexed in the Science Citation Index Expanded (SCIE), the Social Science Citation Index (SSCI), the Arts and Humanities Citation Index (AHCI), and the newly added Emerging Source Citation Index (ESCI), where authors can choose the database within Web of Science to search in[18]. In addition, two other databases for books and conferences are also included[19]. Scopus is generally easy to use and has a database that covers more journals than the other two services[20], but it is still a paid service. **Table 3** further details and compares the characteristics of PubMed, Scopus, and Web of Science.

As shown in the results, each of Scopus and Web of Science database search provided different disciplines as the most common disciplines Jordanians publish in. The reasons behind these discrepancies were examined by analyzing the research area (discipline) classification for each database. It was found that Scopus search yielded 27 research areas, where publications are classified into one or more of them. On the other hand, Web of Science search yielded 140 research areas. However, Web of Science publications are classified into only one of them (no publication is classified into more than one research area). For example, the single research area “Medicine” in Scopus corresponds with 27 research areas in Web of Science, which are (numbers correspond to the contribution of each research area in the total 10,936 publications which resulted from Web of Science search):
Internal medicine (2.5%), neurology (2.2%), oncology (2.2%), surgery (1.4%), endocrinology (1.1%), pediatrics (1.1%), psychiatry (1%), experimental medicine (1%), cardiovascular system (0.9%), infectious diseases (0.9%), radiology (0.9%), orthopedics (0.7%), obstetrics and gynecology (0.7%), immunology (0.6%), rehabilitation (0.6%), hematology (0.6%), urology (0.5%), respiratory (0.4%), ophthalmology (0.3%), gastroenterology (0.3%), complementary medicine (0.3%), dermatology (0.2%), morphology (0.2%), rheumatology (0.2%), anesthesiology (0.2%), emergency medicine (0.1%), allergy (0.1%).

As explained earlier in the protocol, researchers may download search results in a CSV or XLSX format, where several tools are available to further analyze and map the results. These tools apply the concept of science mapping or bibliometric mapping, which is a spatial representation of how disciplines, fields, documents, or authors are related[24,25]:

- The Sci2 Tool (https://sci2.cns.iu.edu/user/index.php): A freely available tool to perform analysis on data extracted from Scopus, Web of Science, or even PubMed.
- BibExcel (http://homepage.univie.ac.at/juan.gorraiz/bibexcel/): A freely available tool that manages and builds maps for data extracted from different bibliometric software.
- CiteSpace (http://cluster.cis.drexel.edu/~cchen/citespace/): A freely available tool for visualizing and analyzing trends and patterns in scientific literature.

- UCINET (https://sites.google.com/site/ucinetsoftware/home): A subscription-based tool for the analysis of social network data and drawing visualized maps.
- Pajek (http://mrvar.fdv.uni-lj.si/pajek/): A freely available tool for the analysis and visualization of large networks.
- Leydesdorff' s Software (https://www.leydesdorff.net/software.htm): A freely available tool to analze output from bibliometric databases and to draw mappings of the results.
- Network Workbench Tool (http://nwb.cns.iu.edu): A freely available tool that provides specific algorithms to deal with publications data to construct and analyze bibliometric networks and maps.
- VintagePoint (https://www.thevantagepoint.com): A subscription-based tool to analyze and science map large volumes of structured text to discover patterns and relationships
- VOSviewer (http://www.vosviewer.com/download): A freely available tool specifically designed to construct and visualize bibliometric maps, paying special attention to the graphical representation of such maps.

In addition, researchers can use data obtained from the three databases (Pubmed, Scopus and Web of Science) and calculate several other valuable indices using data from other sources, including World Bank and the Organization for Economic Co-operation and Development (OECD). As yearly publications and the author's country of affiliation are available as outcome measurements in the three databases, the following indices can thus be measured:

- Population index
- Number of publications per million inhabitants, where populations can be obtained from World Bank database[26].
- Publications per gross domestic product (GDP)
- Number of publications per billion-dollar GDP, where GDP can be obtained from "World Development Indicators" from World Bank database[26].
- Annual scientific growth rate (Research productivity)
- (Publications in the year (n) – Publications in the year (n-1))/ Publications in the year (n-1)
- Publications per region

As the world is divided into 9 regions according to United Nations Statistical Year Book by the United Nations[27], these divisions are based on geographical, scientific, and economical considerations. These regions are: Western Europe, Eastern Europe, the United States of America (USA), Canada, Latin America and the Caribbean, Africa, Japan, Asia (excluding Japan), and Oceania.

Researchers aiming to do bibliometric analysis using the aforementioned databases should be aware of their limitations; journal coverage by Scopus and Web of Science in almost all disciplines does not reach half of the journals in Ulrich's periodicals dictionary[28]. This means that although Scopus and Web of Science indexed journals are based on quality, they do not cover all journals in any discipline. Moreover, non-English language journals are under-represented, as the focus of these databases are English-language journals[28]. One of the limitations one can encounter during the analysis is the unavailability of complete information about an article (*e.g.*, missing author's country of affiliation), which might lead to some sort of error in the results. This can be avoided by performing a manual search for the author. However, this issue was not discussed in the analysis conducted in this study since previous studies have estimated the missing information caused by this issue to be insignificant (less than 5%)[6].

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DISCLOSURES

All authors disclose no potential conflicts of interest.

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Figure 1

PubMed.gov
US National Library of Medicine
National Institutes of Health
PubMed
(Jordan[Affiliation]) NOT Jordan[Author]
Search
Create RSS
Create alert
Advanced
Help
Article types
Journal Article
Review
Customize ...
Text availability
Abstract
Free full text
Full text
Publication dates
clear
5 years
10 years
From 2013/01/01 to 2017/12/31
Species
Humans
Other Animals
Clear all
Show additional filters
Format: Summary
Sort by: Best Match
Per page: 20
Send to
Search results
Items: 1 to 20 of 4363
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Species
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Sex
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Journal categories
Ages
Search fields
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Figure 2

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Figure 3 Click here to download Figure Figure 3.ai

Figure 4

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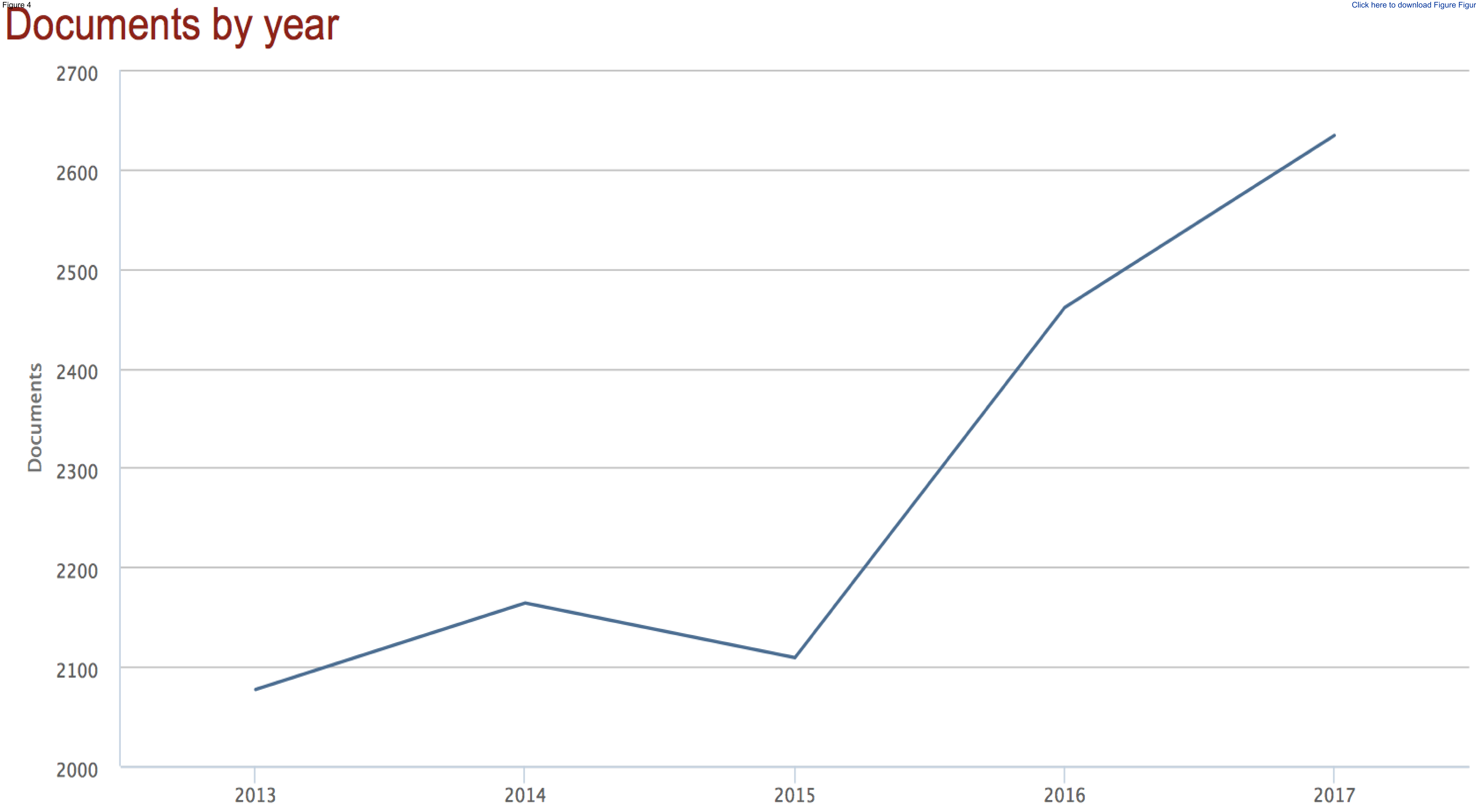

Figure 5

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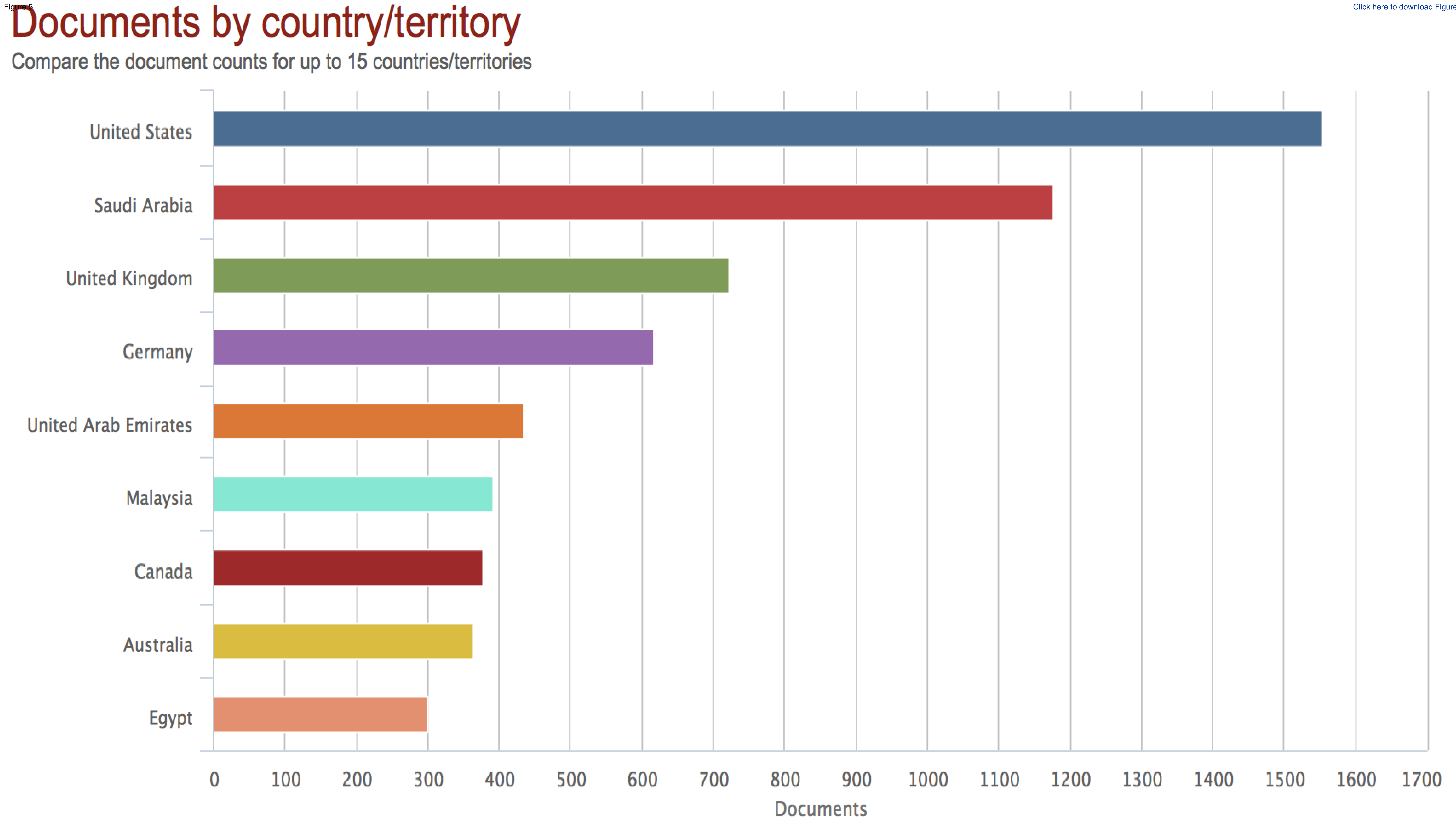

Figure 6

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Subject Area	Documents
Medicine	2441
Engineering	1837
Social Sciences	1468
Computer Science	1414
Mathematics	1177
Biochemistry, Genetics and Molecul...	1045
Agricultural and Biological Sciences	978
Chemistry	932
Environmental Science	875
Materials Science	827
Physics and Astronomy	810
Pharmacology, Toxicology and Phar...	741
Nursing	503
Business, Management and Accou...	490
Chemical Engineering	441
Arts and Humanities	437
Earth and Planetary Sciences	376
Energy	338
Economics, Econometrics and Fina...	234
Immunology and Microbiology	206
Dentistry	193
Decision Sciences	188
Health Professions	173
Psychology	158
Multidisciplinary	154
Veterinary	137
Neuroscience	120
Total	11445

Documents by subject area

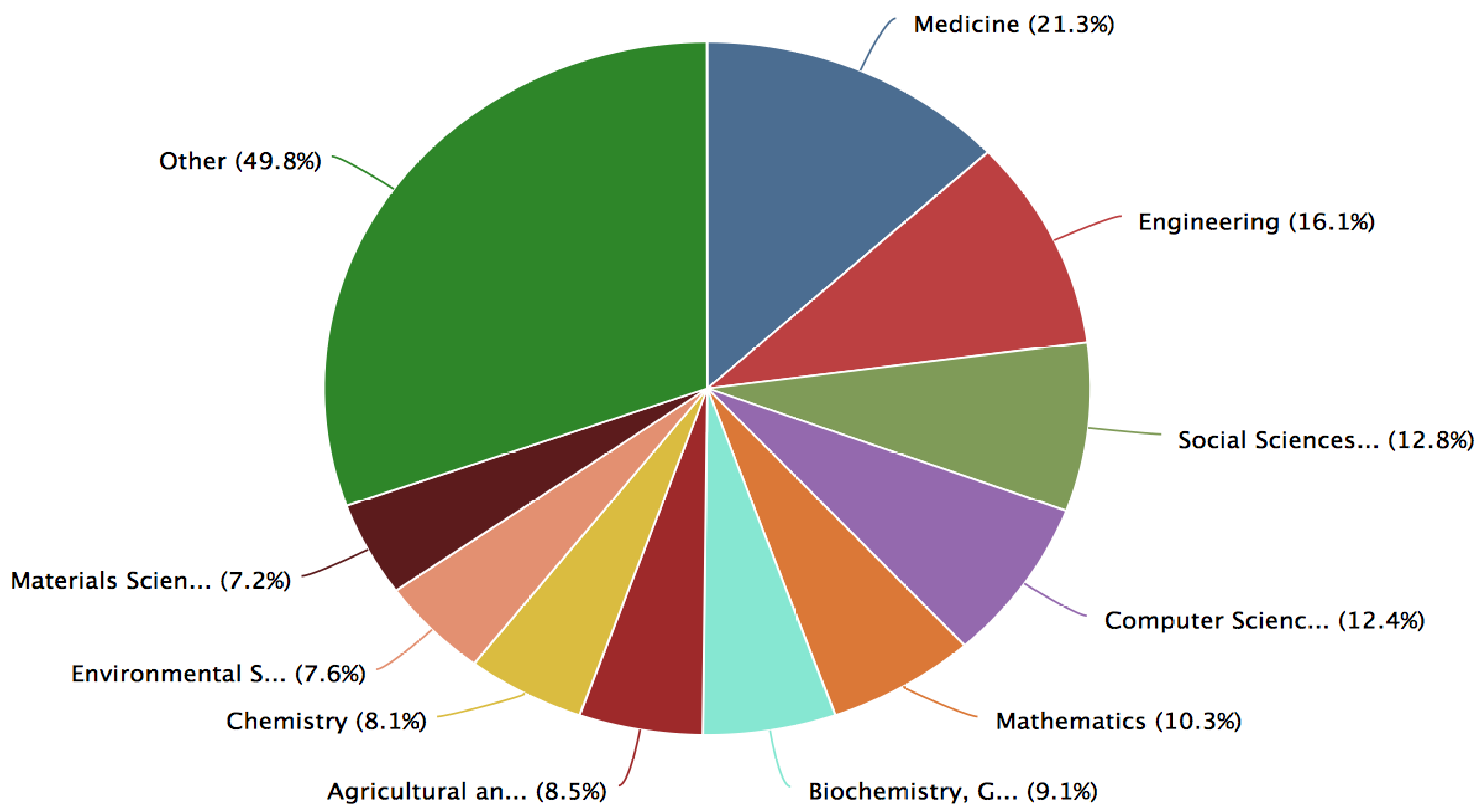

Figure 7

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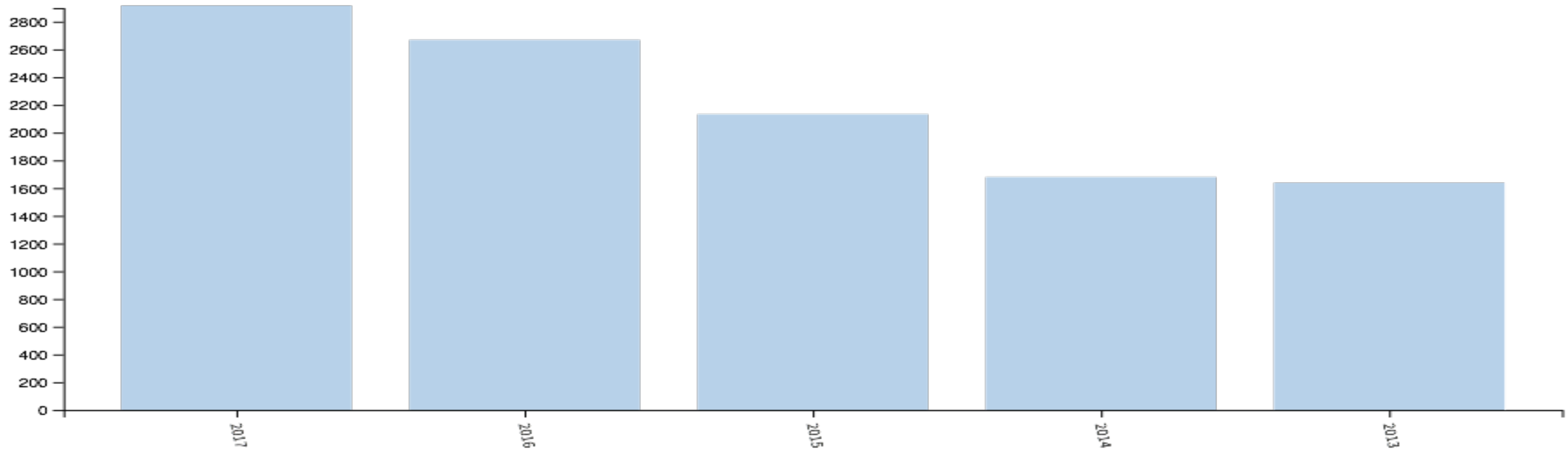

Figure 8

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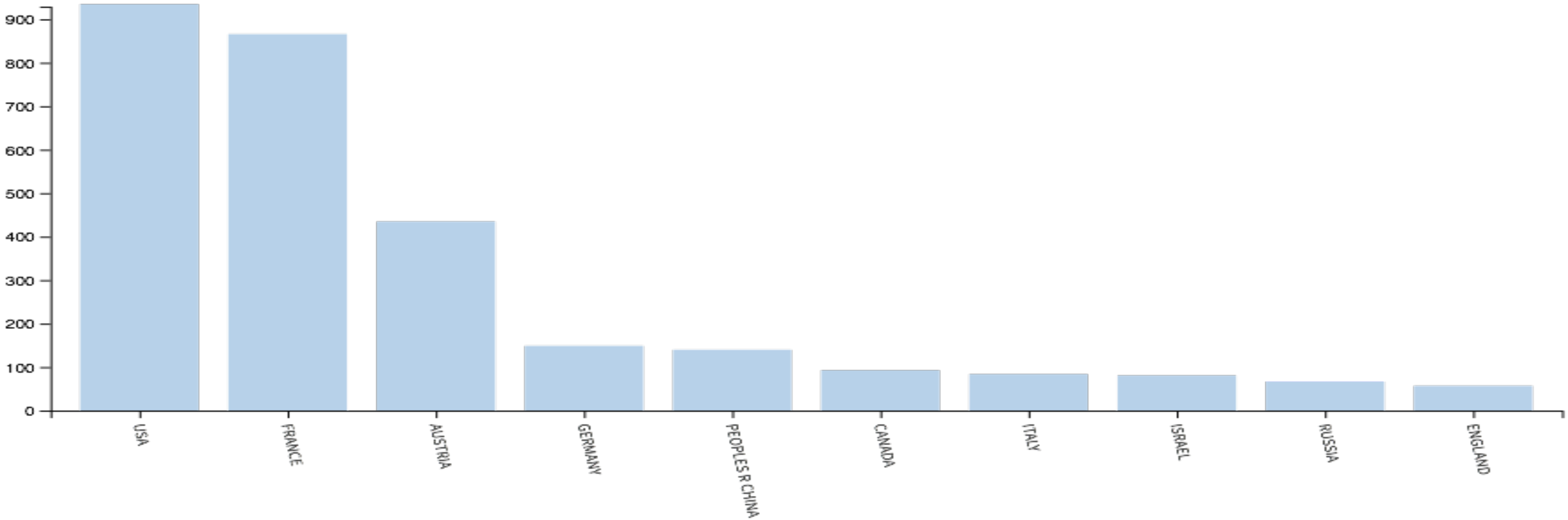

Figure 9

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Table 1

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Operator function	PubMed	Scopus	Web of Science
Both terms must appear	AND	AND	AND
At least one of the terms must appear	OR	OR	OR
The term after it must not appear	NOT	AND NOT	NOT
You want to find two words within an "n" distance from each other regardless of their order	✖	W/n	NEAR/n
You want to find a word within an "n" distance prior to the other word (order respected)	✖	Pre/n	✖
You want to find the words with the specified stem, regardless of the other part of the word	✖	* or ?	*
You want to find a word with the specified stem and with a maximum of just one more letter after it	✖	✖	$ or ?
Searches for the exact phrase within the quotation marks, will respect the meaning of any operators mentioned within the quotations	✖	""	""
Searches for the exact phrase within the quotation marks, without respecting the meaning of any operators mentioned within the quotations	✖	{}	✖

Example
Jordan W/2 Cancer → finding a result with the words "Jordan" and "Cancer" within 2 words from each other
Jordan Pre/2 Cancer → finding a result with the words "Jordan" is preceding "Cancer" by 2 words
Jordan* or Jordan? → will return also the results for “Jordanian”
Jordan$ or Jordan? → will give results for “Jordans” but not for "Jordanian"
“Cancer in Jordan?” → will search for “cancer in Jordan” or “cancer in Jordans”
{Cancer in Jordan?} → will search for “cancer in Jordan?” only, that is it will interpret the question mark as a question mark

Table 2 Click here to download Table Table 2.xlsx

Outcome measures	PubMed	Scopus	Web of Science
Documents each year	✔	✔	✔
Publications in specific Journal	✔	✔	✔
Publications per author	✔	✔	✔
Institutional affiliation	✔	✔	✔
Country of authors	✔	✔	✔
Number of open access publications (Golden OA)	✔	✔	✔
Number of open access publications (Green OA)	✖	✖	✔
Publications per each document type	✔	✔	✔
Subject area	✔	✔	✔
Publications in specific publishers	✔	✖	✖
Publications for specific MeSH terms	✔	✖	✔
Web of Science categories	✖	✖	✔
Funding agency	✖	✖	✔
Publications on specific gender	✔	✖	✖
Publications on specific age group	✔	✖	✖
Publications by a unique PubMed ID	✔	✖	✔
Publications managed by specific editor	✖	✖	✔
Highly cited papers: Papers in top 1% in each subject area in terms of highest citations in the last 10 years.	✖	✖	✔

Hot papers in the field: Papers that have been highly cited in the latest two months compared to the norm (average citations in peer papers).	✖	✖	✔

Table 3 Click here to download Table Table 3.xlsx

	PubMed	Scopus	Web of Science
Covered disciplines	Life sciences and biomedical disciplines	All disciplines	All disciplines
Focus	Life sciences and biomedical disciplines	Physical, health, life, and social sciences	Science, technology, social sciences, arts and humanities.
Covered period	1966	1970	1900*
Free/Paid	Free	Paid	Paid
Ownership	National Institute of Health	Elsevier	Clarivate
Professional term indexing	Yes	No	No
Associated data search	No	No	Yes
Old data coverage	No	No	Yes
Figure production	No	Yes	Yes
Open access assessment	Gold open access	Gold open access	Green and gold open access
Friendly interface	+	++	+++
Availability of operators	+	+++	++

* Coverage depend on institutional subscription

Name of Material/ Equipment	Company
	clarivate
	Elsevier

Catalog Number

N/A

N/A

Comments/Description

Web of Science provider, where the access was provided by the subscription made by the University of J

Scopus provider, where the access was provided by the subscription made by the University of Jordan.

ɔrdan.

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Author(s): ***Saif Aldeen S. AlRyalat, Lna W. Malkawi, Shaher M. Momani***

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Institution: *The University of Jordan*

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Changes to be made by the Author(s):
1. Please take this opportunity to thoroughly proofread the manuscript to ensure that there are no spelling or grammar issues. The JoVE editor will not copy-edit your manuscript and any errors in the submitted revision may be present in the published version.
Response: We sent our manuscript to English-literature department, The University of Jordan to review its English Language.

2. Please submit the figures as a vector image file to ensure high resolution throughout production: (.svg, .eps, .ai). If submitting as a .tif or .psd, please ensure that the image is 1920 pixels x 1080 pixels or 300dpi.
Response: We provided a .ai version of the figures.

3. Please ensure that the references appear as the following: [Lastname, F.I., LastName, F.I., LastName, F.I. Article Title. Source. Volume (Issue), FirstPage – LastPage (YEAR).] For more than 6 authors, list only the first author then et al.
Response: We amended the style of the included references as suggested.

4. Please remove the embedded Table from the manuscript. All tables should be uploaded separately to your Editorial Manager account in the form of an .xls or .xlsx file. Each table must be accompanied by a title and a description after the Representative Results of the manuscript text.
Response: We removed the tables from the text and uploaded them separately as a .xlx extension.

5. Please revise the text to avoid the use of any personal pronouns (e.g., "we", "you", "our" etc.).
Response: We amended as suggested.

6. Please ensure that all text in the protocol section is written in the imperative tense as if telling someone how to do the technique (e.g., “Do this,” “Ensure that,” etc.). The actions should be described in the imperative tense in complete sentences wherever possible. Avoid usage of phrases such as “could be,” “should be,” and “would be” throughout the Protocol. Any text that cannot be written in the imperative tense may be added as a “Note.” However, notes should be concise and used sparingly. Please include all safety procedures and use of hoods, etc.
Response: We amended as suggested.

7. Protocol: Please integrate the example with the general instructions instead of having it as two discrete sections.
Response: We integrated the example search with the protocol general instructions.

Reviewers' comments

Reviewer #1

Major Concerns:
I do not believe that this topic would be a good inclusion for Jove. Databases frequently change formats, so these specific protocols would be useful for long.
Response: We agree with the reviewer on the issue of "frequently changing formats", which is why we didn't get into the details of the database layout and format, but the general way of including articles in the databases and the codes used by each database to retrieve search results are fairly constant.

I also found the writing confusing, missing directions in areas, and in strong need of a native English speaker's review.
Response: We sent our manuscript to English-literature department, The University of Jordan to review its English Language.

The authors also seemed to imply that the use of databases for bibliometric analysis was new, when in fact it is not at all. I found it troubling that the researchers seemed to be totally unaware of this. While this use of databases may be new to them, this statement demonstrates a lack of awareness of this field, as librarians and other bibliometricians have been using databases (and print indices prior to this) for this type of research for many years. That they seemed to be totally unaware of this made me score them poorly regarding the "sufficient introduction" category.
Response: The idea we wanted to deliver from the beginning of introduction is not claiming that the use of databases for bibliometric analysis is "new", and we explicitly stated that the use of these databases "was recently changed". By this, we meant that digitalizing literature databases further stimulated and facilitated the ability of researchers to use these databases for bibliometric analysis. We rephrased the beginning of the study by a historic perspective with a further clarifications of what the reviewer pointed at.

Minor Concerns:
It would be quite rare for institutions to be able to afford to subscribe to Web of Science and Scopus since they are both very costly, and there is much overlap between these databases. PubMed however is free. Although I realize that this is not a requirement of this protocol, I think it is worth noting. If you chose to move forward with this protocol, I would recommend splitting these into separate protocols.
Response: We agree with the reviewer that Web of Science and Scopus are expensive products and it is difficult for institutions to subscribe to both, although our institution have access for both databases. We explicitly stated the differences in terms of cost and availability in (Table 3), and we further detailed this information in the introduction as the reviewer suggested. We already have a divided section for each database's protocol.

Reviewer #2:
Manuscript Summary:
This manuscript is for a video that instructs country search from three databases: PubMed, Web of Science and Scopus

Major Concerns:
1.You haven't explained how to download the results from Scopus and Web of Science, only for Pubmed.
Response: Both Scopus and Web of Science provide detailed result analysis functions that are not available in PubMed, where in PubMed, researcher needs to download the results and analyze them as explained in the manuscript. Moreover, we stated in the protocol search for Scopus and Web of Science that researcher can download the results in a CSV format.

You also failed to mention that both WoS and Scopus have advanced search options. You can use AFFILCOUNTRY in Scopus to search for publications from the specific country
In WoS you can use the CU modifier to search for publications from a specific country
Response: Thank you for the suggestion. In (Table 2), we detailed the available search options for each database, where functions the reviewer suggested are available. We added to the text that researchers may refer to instructions by each database for details on doing each function (as this may change with time, and it is difficult to summarize them in this protocol).

2. Would be better to present the results in tables or charts, and compare the data from the sources.
Response: The idea from the representative results are not the results themselves, but to provide and example on how to execute the protocol, so that separating the the graphs would be more suitable to show the graph produced by each database for each search.

You explain why there are less results from Pubmed, but what is the reason for the differences between WoS and Scopus?
Response: The results from PubMed are much lower than those from Scopus and Web of Science, as noted by the reviewer, where an explanation is warranted. But for the difference between Scopus and Web of Science, the difference is small and can be explained by the variability in the criteria adopted by each database to index journals and their publications.

3. Web of Science has data from 1900 and onwards. The start date depends on the subscription your institution has. I, for example, only have access from 1965.
Response: Thank you for the point, we added a notice in (Table 3) that the coverage is based on subscription.

4. Far too many mistakes/typos in English
Response: We sent our manuscript to English-literature department, The University of Jordan to review its English Language.

Minor Concerns:
1. The section on Web of Science, starts with:
The first step to access the full search capabilities of Scopus database, you need to register. Academic institutions usually registered in Scopus, so check if your institution already registered and have access to the database.
This is obviously a mistake.
Response: Thank you, we corrected this mistake.

2. Not everyone has the proceedings and the book indexes. And one can also exclude databases (like AH or SCIE) from a search.
Response: We explained that researchers can choose the database to search in during Web of Science search.

Reviewer #3:
Manuscript Summary:
This submission provides guidelines as to how to query different bibliographic databases for the purposes of analysis. The authors use the information to do some basic counts of records where a Jordanian author can be identified. This type of basic analysis is not bibliometrics: it is basic information.
Response:

Major Concerns:
--The English needs a good deal of work throughout, including subject/verb agreement, tense, and punctuation.
Response: We sent our manuscript to English-literature department, The University of Jordan to review its English Language.

--The definition of "bibliometrics" should be drawn from a more authoritative source such as "The Metrics of Science and Technology" by E. Geisler, or "The Challenge of Scientometrics" by L. Leydesdorff.
Response: The definition we used to define bibliometrics is described to be “serviceable”, and we believe it service the aim of our study. We added another definition, which we believe drawn from an authoritative study in bibliometric definition. We couldn’t access the definitions suggested by the reviewer.

--The fact that two of the databases are privately owned and subscription based should be noted. (Web of Science is owned by Clarivate and Scopus by Elsevier.). The PubMed database is public because it was created and is maintained by the National Institutes of Health Library of Medicine within the government of the United States. This should also be noted.
Response: In (Table 3), we detailed the cherecterestics of each database including its free/paid status. We added a row to the table detailing the ownership for each database to further deliver the reviewer's point of view.

--The additional data that the authors note as being available, such as R&D/GDP measures, are provided by the OECD, I believe, but this should be checked. Clarivate and Elsevier do not collect this information themselves. The additional information can be acquired for free from OECD or World Bank.
Response: We clarified that population, GDP, and world region divisions are not supported from the three databases, instead researchers can be obtain them from World Bank, OECD, and WHO (references for each them are provided).

--The Web of Science database does not allow downloading of more than 500 records at a time. This feature means that special steps must be taken to download results with more than 500 records. The authors should provide this information to the reader. (I am not sure what restrictions are placed on Scopus records.)
Response: No restrictions are present for Scopus, as the records can be downloaded at one time. For Web of Science, researchers need to download results several times with 5000 records each time (e.g. it would take only 2 times for 10,000 results). We clarified the point in the text.

--Neither the Web of Science nor Scopus claims to represent all of science. These services do not index local publications (that may be published within Jordan for regional scientists) or journals with a highly specialized readership. It appears that they publish no more than 50 percent of the published material. However, they can validate the materials they index - meaning that predatory journals are not included in these services. Readers may wish to know that fact. Both of the major indexing services have expanded their set of journals to include more materials from developing countries. This change in the list of included journals makes it difficult to do a long term comparison because the list of journals will change.
Response: Thank you for pointing to this issue. We agree that researchers need to be aware of this limitation. We added a paragraph explaining the above mentioned limitations of using databases for bibliometric analysis.

--Associated, free, software can be used with Web of Science or Scopus. Perhaps it is worth mentioning compatible services like Sci2, Pajek, and Ucinet.
Response: Thank you for this insight. We added a paragraph detailing the prominent software tools used to further analyze and visualize data extracted from bibliometric databases.

Minor Concerns:
Not sure what readership the authors have in mind for this work. Perhaps they could say who is their target audience.
Response: the target audience would be any researcher want analyze publication trend in any discipline. We clarified this in the introduction, and further more in the discussion.

The authors should say why they chose Jordan as the subject.
Response: We chose Jordan as it is not straightforward to do bibliometric analysis for a country (in contrast to a subject), and Jordan specifically is poorly studied in a bibliometric way and it can be an author name not only a country name, which will allow us to explain how to overcome this in the search. We added the explanation to the text.