

On the Occasion of the 12th "Days of AMNuBiH 2021" and "SWEP 2021" Conferences, Sarajevo, Bosnia and Herzegovina

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12th Days of the Academy of Medical Sciences of Bosnia and Herzegovina (AMNuBiH) this year were organized together with the International Academy of Sciences and Arts in Bosnia and Herzegovina (IANUBIH) in Sarajevo, Bosnia and Herzegovina on December 4th, 2021. The title of the symposium was "Scientometry, Citation, Plagiarism and Predatory Journals in the Scientific Publishing". The reasons for this title were very frequent cases in the academic and scientific publications about the four mentioned topics in the Bosnia and Herzegovina and other countries in the Balkan region, but also worldwide.

Authors of the presentations at the conference came from Bosnia and Herzegovina, Croatia, Serbia, North Macedonia, USA and Poland. Within presenters of their experiences in the scientific area covered by title of this conference were presented by some of the most influential scientists from Bosnia and Herzegovina, who are included between 2% of authors stored in the Stanford scientometric list, which was published several months ago. Also, some of the authors are former or current Editors-in-Chiefs of indexed biomedical journals in Bosnia and Herzegovina, Croatia, North Macedonia (Izet Masic, Asim Kurjak, Doncho Donev, Osman Sinanovic). Also, Sylwia Ufnalska and Izet Masic were members of the European Association of Science Editors (EASE) and they have great experiences about the topic of this conference. It was the reason that we decided to prepare and publish abstracts of the conference and make it visible for to other members of the academic community in our countries and countries in the world. Academic honesty means that the work a scientist submits, in whatever form, is original.

One of the greatest, and sadly too common, problems which participants in the academic process encountered are plagiarism and predatory publishing. In order to prevent this severest form of academic fraud, authors must give a credit to someone whose work has helped him/her by citing references correctly. Science that analyzes scientific papers and their citation in the scientific journals - called

scientometry -, day by day has become important for measuring scientific validity and quality of all kinds of publications deposited in the most important on-line scientific databases, like WoS, Scopus, Medline, PubMed Central, Embase, Hinari, etc., but also in academic platforms ResearchGate and Academia.edu.

Scioentometrics use the Impact and Echo factor for measuring the quality of publications in WoS journals, Scopus uses the h-Index, and the most common index one used in the last 10 years is Google Scholar index. All of them have advantages and disadvantages, and also positive and negative influences in the academic praxis.

Authors presented some of their experiences trying to help for improving some of the mentioned matters. This collection of abstracts (or "Proceedings" of the symposium "SWEP 2021") analyzed the major components of scientometrics, the basic mechanisms of citations in medical publications and plagiarism, as an opposition to the primary goal of scientific enterprise: search for truth.

One of the important disadvantages of the Stanford list is that this list included ONLY cited papers which are published in the journals indexed in Scopus.

A lot of authors have cited articles which are published in another indexed journals (PubMed, PMC, Embase, EBSCO, Hinari, etc.) and stogadered in ResearchGate and Academia.edu (not only papers, also books, monographs, PhD and Mmaster's thesis, etc) and they have even several thousands or several hundred READS. There is the question, how to validate these citations, maybe more scientific or professional databases, not only than papers deposited in Scopus.

Finally, what about papers which are published in Scopus index journals but with incorrect citations of references, because every paper with wrong citing of references in the list is excluded from the Stanford list. It is reason that some journals insisted that authors should to follow the rule written at the end of the article with the sentence " How to cite this article". We hope that this publication will contribute to solving many problems.

DAYS OF AMNUBIH 2021: "SCIENTOMETRICS, CITING AND PLAGIARISM IN THE SCIENTIFIC PUBLISHING"

ABSTRACT

True knowledge is gained through scientific research (1-4). The highest level of knowledge is the ability to investigate scientific problems. Fundamental components of scientific writing are accuracy, integrity, clarity, conciseness and honesty (1, 4). Thus, good scientific writing must be characterized by clear expression, conciseness, accuracy of what is being reported, and perhaps most importantly, honesty (1, 2).

Academic honesty means that the work scientist submits, in whatever form, is original. Scientometrics is part of scientology that analyzes scientific papers and their citation in the scientific journal selected sample (1). Scientometrics is the study of measuring features and characteristics of science and scientific research. In practice, scientometrics is often done using bibliometrics which is a measurement of the impact of scientific publications (5-23). Scientometric procedures are increasingly used to analyze developments and trends in science and technology. Modern scientometrics is mostly based on the work of Derek J. de Solla Price and Eugene Garfield (3). Garfield has been striving to mathematical representation developed several factors that allow the assessment value and importance of scientific publications, including the most important impact factor (IF) and the h-index (5, 8).

Recently published data in the scientometric list published by a group of authors from Stanford University in the USA, and based on the analyzed citation data of authors whose works are stored in the bibliographic database SCOPUS, used the interest of the BiH public, because among the most important 2% are academics from Bosnia and Herzegovina (24, 25). In order to better understand what and who it is about, it is necessary to briefly inform the scientific community on the following.

The basic part of scientometry is bibliometrics, which was introduced in the 1970s to mark quantitative research on communication processes by applying appropriate mathematical and statistical methods to published publications. In the seventies in the countries of the former Eastern bloc the name scientometry was introduced. More precisely, in 1969 the name scientometry was introduced which refers to the scientific field that deals with the study of science as an information process using quantitative (statistical) methods, and later Tibor Braun (in 1977 he founded

the international journal *Scientometrics*), and then the name Scientometry was introduced. The four key indicators in the scientometric analysis of citations of scientific articles and their authors are: Impact factor; Article citation; Journal citations; Number and order of authors in the published article. "Scientometry was defined by its creators (as Naukometriya in Russian) Nalimov and Mul'chenko (1969 and 1989) as "the application of those quantitative methods which are dealing with the analysis of science viewed as an information process," although the idea of keeping an index of citations originated in 1873 with Shepard's Citations, in the United States common law, which enabled previous court decisions to be looked up with ease (1, 5).

Citation provides guidelines for scientific work, because it stimulates scientists to deal with the most current areas of research, and organizes scientific article at the world level, or shapes and directs it. Citation is influenced by: article quality, understanding of the article, language in which the article is written, loyalty to a group of researchers, article type, etc. Most scientific are cited by inertia, because every scientist has a set of articles that author cites whenever he/she writes about a certain topic. Some articles are cited in order that author raise citation index, a third because it is required by a reviewer or editor of a journal. And finally, perhaps only every fifth or tenth article is cited because it should have been cited. These are the articles whose data the author uses directly or touches on the problems and solutions presented there. All persons listed as authors of the article must meet the following conditions: that they have significantly con-

Title	Type	SJR	H index	Total Docs. (2020)	Total Docs. (3years)	Total Refs. (2020)	Total Cites (3years)	Citable Docs. (3years)	Cites / Doc. (2years)	Ref / Doc. (2020)
1. Bosnian Journal of Basic Medical Sciences	journal	0.738	25	65	154	2702	458	152	3.05	41.57
2. Medicinski Arhiv	journal	0.315	24	96	285	0	393	281	1.05	0.00
3. Acta Informatica Medica	journal	0.267	20	35	166	1131	238	199	1.50	32.31
4. South East European Journal of Economics and Business	journal	0.266	13	20	52	1056	55	52	1.06	52.80
5. Periodicals of Engineering and Natural Sciences	journal	0.225	11	222	340	5154	421	340	1.16	23.22
6. Sport Science	journal	0.207	19	73	142	2010	69	141	0.47	27.53
7. Acta medica academica	journal	0.192	13	32	93	0	82	89	0.77	0.00
8. Medicinski Glasnik	journal	0.191	13	85	126	2378	118	126	0.99	27.98
9. Electronics	journal	0.128	10	10	32	328	14	28	0.60	32.80
10. Journal of Health Sciences	journal	0.112	3	31	54	865	10	54	0.19	27.90
11. Central European Journal of Paediatrics	journal	0.111	2	21	84	541	5	67	0.09	25.76
12. Acta Medica Salsiniana	journal	0.105	4	0	46	0	6	46	0.14	0.00

Figure 1. SCImago rank in 2020 of deposited BiH journals indexed in SCOPUS

Country	↓ Documents	Citable documents	Citations	Self-Citations	Citations per Document	H index
1 United States	13817725	11986435	384398099	168230420	27.82	2577
2 China	7454602	7229532	78201759	44817420	10.49	1010
3 United Kingdom	4039729	3347117	102878206	22808209	25.47	1618
4 Germany	3515309	3151775	81454056	19404148	23.17	1429
5 Japan	3074206	2895478	54130480	13573127	17.61	1118
6 France	2437589	2203243	55858552	11260558	22.92	1286
7 India	2128896	1946730	22218913	7526767	10.44	691
8 Italy	2072168	1840490	43760942	10035285	21.12	1135
9 Canada	2037509	1796688	52825596	8841600	25.93	1299
10 Australia	1638743	1423945	37937045	7501967	23.15	1115
11 Spain	1628362	1468464	32533936	6927908	19.98	1010
12 Russian Federation	1359443	1302809	11135903	3726592	8.19	652
13 South Korea	1307978	1249982	20238524	3782419	15.47	762
14 Brazil	1145853	1067185	14701837	4684306	12.83	649
15 Netherlands	1131975	998112	34385395	4970776	30.38	1133
16 Switzerland	845108	745124	26479916	3253687	31.33	1085
96 Bosnia and Herzegovina	15911	14633	125626	12086	7.90	118

Figure 2. SClango rank in 2020 of cited published papers in indexed journals in SCOPUS with h-Index - top 16 countries and in BiH (last one in presented table)

18096	Paola, C.	University of Minnesota Tw usa	172	1983	2021	18.095	1.227	18	12,5194	10	44	27	243	94	755	3,4073
18097	Castle, Philip E.	National Cancer Institute (N usa	445	1987	2021	18.096	2.783	23	9,4778	27	13	141	394	236	916	3,4072
18098	Sullivan, Matthew B.	The Ohio State University usa	114	2002	2021	18.097	2.997	29	10,2175	1	12	10	158	61	1,175	3,4072
18099	Fejer, Martin	Ginzton Laboratory usa	1,173	1981	2021	18.098	9.539	38	8,9573	11	9	29	109	399	569	3,4072
18100	Swain, Merrill	University of Toronto can	77	1974	2019	18.099	970	13	8,5125	13	128	29	452	65	825	3,4072
18101	Kuo, Shiao Wei	National Sun Yat-Sen Univeritwn	379	2001	2021	18.100	1.691	18	10,7310	6	30	57	282	231	1,080	3,4072
18102	Janzen, H. Henry	Lethbridge Research and Decan	188	1984	2021	18.101	1.372	18	8,8491	15	116	41	258	86	520	3,4072
18103	Salam, Gavin P.	University of Oxford gbr	147	1994	2021	18.102	5.736	25	9,9912	23	38	30	87	68	495	3,4072
18104	Daud, Adil	University of California, San usa	180	1988	2021	18.103	5.827	33	6,8320	12	6	33	345	87	1,123	3,4071
18105	Khan, M. Ijaz	Riphah International Univer pak	327	2005	2021	18.104	3.505	30	13,9361	0	0	90	1,004	108	1,117	3,4071
18106	Bartley, Tim	Washington University in St usa	31	2001	2021	18.105	429	14	10,7000	12	270	25	392	30	427	3,4071
18107	Zhang, Yuanbo	Fudan University chn	77	2005	2021	18.106	6.841	30	5,9352	0	0	9	1,323	22	3,787	3,4070
18108	Gruzeller, John H.	Goldsmiths, University of Legbr	248	1970	2020	18.107	861	16	9,7409	55	154	117	237	207	660	3,4070
18109	Tavernarakis, Nektarios	University of Crete Medical grc	231	1993	2021	18.108	4.022	27	12,5006	13	16	30	48	159	1,570	3,4069
18110	Djilbegovic, Benjamin	City of Hope National Med usa	372	1985	2021	18.109	4.013	22	7,7860	20	24	120	350	236	679	3,4069
18111	Inhorn, Marcia C.	Yale University usa	125	1986	2021	18.110	710	12	8,7659	53	167	96	608	117	667	3,4069
18112	Savitz, Jonathan B.	Laureate Institute for Brain usa	99	2003	2021	18.111	1.153	17	8,2951	3	92	50	464	63	576	3,4069
18113	Munn, Lance L.	Massachusetts General Hos usa	157	1993	2021	18.112	2.234	28	9,9565	4	42	17	118	62	623	3,4069
18114	Kindler, Hedy L.	The University of Chicago usa	249	1997	2021	18.113	3.529	25	6,7690	15	24	39	274	78	1,050	3,4069
18115	Boyer, Rod	RBTI Consulting usa	51	1972	2021	18.114	728	11	7,0873	8	392	26	517	36	601	3,4068
18116	Hetherington, Marc J.	The University of North Can usa	22	1996	2021	18.115	598	11	8,5000	8	285	18	576	21	593	3,4068
18117	Glynn, Peter W.	Rosenstiel School of Marine usa	122	1968	2021	18.116	764	12	8,3548	34	251	76	476	97	570	3,4068
18118	Dworkin, Shari L.	University of Washington-Busa	104	1997	2021	18.117	888	15	8,6706	6	144	34	379	74	654	3,4068
18119	Beckman, Joseph S.	Linus Pauling Institute usa	194	1977	2021	18.118	1.924	19	8,9549	10	32	28	417	100	822	3,4068
18120	Bray, Sarah J.	University of Cambridge gbr	110	1984	2021	18.119	758	12	7,5277	11	332	24	401	75	649	3,4068
18121	Tserkovnyak, Y.	University of California, Los usa	227	2001	2021	18.120	3.020	26	9,6190	2	5	42	469	137	1,343	3,4068
18122	Itzhaki, Ruth F.	University of Oxford gbr	154	1960	2021	18.121	736	15	8,8303	30	159	69	400	134	632	3,4067
18123	Bose, Souzato	University College London gbr	221	1996	2021	18.122	1.005	14	8,7713	8	131	44	362	155	767	3,4067

Figure 3. Screenshot of one of listed author presented in Stanford scientometric list

tributed to the planning and production of the article or analysis and interpretation of results and that they have participated in writing and correcting the article, and that they agree with the final version of the text. Persons who have not actively participated in the preparation of the article cannot be authors. The editor has the right to ask the author to explain the contribution of each of the co-authors, signing the relevant documents that are required when uploading the article to the journal's website. The contribution of one author is 1, and if the article was written by several authors, their contribution is 1/n. The contribution of each subsequent author is half less than the previous one. The order of the authors is determined by authors agreement. Unfortunately, all of the above has been significantly neglected in the last few years, especially since the intro-

duction of the Bologna concept of education, which disrupted the entire education system from primary schools to colleges and universities with a tendency to produce „troopers“ for degrees.

One of the accompanying consequences of this is the „forcible“ publication of articles and books and monographs (textbooks) that were needed to promote candidates for academic titles. This has seriously impaired the quality of education in the world, especially in the countries of the former Yugoslavia, and especially in Bosnia and Herzegovina. The problem has spread to other institutions in charge of science and scientific research, including academies.

One of the authors of this article belongs to scientists who embarked, or rather dared, to deal with this problem, and in the last ten years has published several studies

in the field of scientometrics, especially in biomedicine. Important study was the study of citations of members of four academies in Bosnia and Herzegovina existed in the past, and of the two more academies have been established in this year. Part of his research is cited in a study by Chicago professor Bolung Joseph, in which the author stated that the USA Academy had a Scopus h-index of 63, Africa 31, Brazil 23 and Bosnia and Herzegovina 12. The fact that only these 4 were evaluated the academy says how scalable and risky the field of scientometry is and many avoid it because every mistake puts authors on a platter to sanction it in some way. All this is stated in order to explain in some way the weight of the allegations that these and those academics, and these academies in Bosnia and Herzegovina are among the 2% of the most cited scientists in the world. Doesn't the fact that the h-Index 12, which is significantly small compared to the well-organized countries of the world with a high level of education and high-ranking journals, bring up the question about the credibility of the data in the media and that Stanford's list may have been misinterpreted. Therefore, this data must be analyzed more seriously and possibly argued for their accuracy and credibility.

The authors who created Stanford's scientometric list of the most cited authors from articles stored in the SCOPUS bibliographic database methodologically took into account whether someone was the first, last or only author, and the like, and did so in great detail. Unfortunately, they did not take into account the number of authors per article. Then, they looked at the number of citations according to SCOPUS, and half of our citations are missing there (there are almost twice as many on ResearchGate). By random sampling control, we found that many well-known scientists from the Balkans are not on the list-whether it is up to SCOPUS and the articles deposited in its database or whether some journals were omitted by mistake should be explored. The example of the journal *Folia Medica Facultatis Medicine Universitatis Sarevicensi*, which does not exist at all, because it is registered in the SCOPUS database as if it were published in Zagreb (Croatia), is one of the proofs of this claim. Apparently, the list is phallic in the segment that the main thing was left out, and that is to divide the number of citations for each author by the number of authors per article-only then it would be realistic, but then half the authors would drop out of the existing list.

Some of our colleagues who deal with the problems of scientometry as a team believe that the ranking that was made and applied for publishing Stafford's list of the most cited scientists is global, and based only on the analysis of published articles deposited in one of the world's databases, SCOPUS, dangerous to science in general. This list emphasizes the formal part and the citation, no matter what caused it. Especially ignorant or insufficiently versed in the essence of such „meta-analyzes“, mostly close to a very small circle of scientists who understand this problem (and almost 3 percent of authors who have published articles and are not close to this list), and who, especially journalists, or those more or less vicious, who seek exclusivity in this, will inevitably misuse the data

in the list without delving into its essence and the accuracy/inaccuracy of the data, and it is inevitable that there is. Because the list includes some well-known names in a very high position, and the content of their contribution to science is more than modest.

If we check SCImago rank list of citation number of published and stored papers in Scopus database written by authors from former Yugoslav countries we can see in the list that Slovenia is on the first place (1,824.243 citations, h-Index is 349), Croatia has 1,417.239 citations and h-Index 324, Serbia has 1,276.485 citations and h-Index 290, North Macedonia has 168.037 citations and h-Index 135, Bosnia and Herzegovina has 125.626 citations and h-Index 118, and last one is Montenegro with 45.225 citations and h-Index 74. For the same year in SCImago rank list three academicians of AMNuBiH, who work or live out of BiH, has been cited more times in 2020 year than all authors who were cited in Scopus database. *Sapientia sat.*

But, who and why are responsible for that it is serious question and matter for discussion with another topic. But, definitely science and conditions for scientists to make research and investigations in our country are in great crisis. No one is interested in the real state of affairs in such a chaotic state locally and globally, where everyone hunts in the dark, including science and scientists, because the value system has reached the bottom, especially when it comes to honesty, ethics and morality. It is not disputed that we have scientists with a high scientific rating in BiH and our experts in other countries, where they are employed in scientific institutions and who with their published are high on lists like the one that is currently being promoted.

In the future, we should find ways to evaluate the content - e.g., if someone did 200 experiments and showed something about an unresolved issue (whether the result is positive or negative). That work must be valued more than if someone published a secondary or tertiary publication, where he only listed and commented a little on the primary data that other people collected.

Key words: Scientometrics, Citation, Stanford scientometric list, Plagiarism.

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HOW TO CORRECTLY AND OBJECTIVELY ASSESS SCIENCE AND SCIENTIFIC VALIDITY OF SCIENTIFIC RESEARCH IN PRACTICE?

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ABSTRACT

It is very well known that science is world activity and that there is no good and bad work in the field of scientific research. Nowadays scientific productivity of the individuals, learned societies on regional or state level are measurable parameters. In most of the systems it does include the number of original scientific papers, quality of journals measured by impact factor and scientific citation index (1-4). There are also additional measurable parameters but for the purpose of this meeting we will avoid discussion about them. New field of scientometrics using the help of impartial and ruthless machines (computers) do help very significantly in evaluation of scientific productivity anywhere in the world. Unfortunately, there are many misused conclusions and interpretation on the data offered by computers. It is clear that some vital important changes are urgently needed. Today's conference should use rare opportunity having together experts in the field to discuss the problems visible now. This author intends to discuss facts and doubts in writing review articles and chapters in the book (5). Some important flexibility in citation, in particular self citation, should be analyzed. An illustrative examples from author's own experience will be shown and discussed at the meeting.

Keywords: Scientific research, scientific validity, assess of science.

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SCIENTOMETRICS AS A APPROPRIATE METHOD OF VALIDATION OF SCIENTIFIC CONTENTS

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ABSTRACT

Background: Fundamental components of scientific writing are accuracy, integrity, clarity, conciseness and honesty (1, 2). Academic honesty means that the work scientist submits, in whatever form, is original. Science that analyzes scientific papers and their citation in the scientific journals is called scientometrics. Citation provides guidelines for scientific work, because it stimulates scientists to deal with the most current areas of research, and organizes scientific article at the world level, or shapes and directs it. Citation is influenced by: article quality, understanding of the article, language in which the article is written, loyalty to a group of researchers, article type, etc. Scientific research is the only real way and method for the proliferation of true knowledge in all spheres of science, but also in academic institutions. The ability to study a scientific problem is the highest level of knowledge. Medical, and in a broader sense biomedical scientific research, is a process of systematic research of current and important health problems related to defined aspects of physical, mental or social well-being of

the population of local, regional or global character. **Objective:** The aim of this paper was to present the current tools available in scientometry for the evaluation of scientific validity of published articles. Explain the purpose and process of medical research and the concurrent preparation and publication of the obtained results. **Methods:** Author analyzed deposited papers within the topic scientometrics and used descriptive method of reviewing important facts about experiences with scientometrics in the scientific and academic practice, also, explained the process of medical research and BOMRAD form of preparation of article for publication in appropriate indexed journals. **Discussion:** The format of scientific articles can vary greatly from journal to journal. Nevertheless, many of them follow the IMRAD scheme, recommended by the International Committee of Medical Journal Editors (ICMJE) (3, 4). Scientometrics analyzes scientific articles and their citation in a selected sample of scientific journals. Bibliometrics was introduced in the 1970s to denote quantitative research of communication processes by applying appropriate mathematical and statistical methods to books and other communication media. Bibliometric methods are used for quantitative analysis of written materials. Bibliometrics is closely related to one broader term „informetry“. Informetry: In 1979, Otto Nacke introduced a new metric concept of informetry, which seeks to include part of the information sciences aimed at measuring the phenomenon of information, the application of mathematical methods in solving problems of disciplines, bibliometrics and information retrieval. Some of the indicators used in the evaluation of scientific work are: Impact factor; Citation of the article; Journal citations; Number and order of authors, etc. Impact Factor is the number of citations of articles published in the journal during the previous two years divided by the total number of articles published in the journal during the same period (5). Factor of influence depends on: the quality of the journal, the language on which it was printed, the area it covers, the journal distribution system. In order to be considered as significant scientific work, it is important to be carried out according to established rules and guided steps. Although scientific writing is a complex and arduous process, it should be clear, accurate, honest and concise. Since research in medicine can affect the improvement of clinical and public health practices, it is necessary to conduct them. In order to be considered a significant scientific work, it is important that they be conducted according to certain rules and guided by the steps presented in our work. Only quality research with exact results offers the scientific community new information about the examined problem, and the researcher personal satisfaction, the possibility of communicating and conducting scientific dialogue with other members of the academic community, and opening opportunities to receive critical review of those who have insight into the research. In this article we pointed that h-Index presents one of a set of valuable measures to determine scientific excellence (bibliometrics recognize also m-value as useful). Although the h-Index is a better measure than a citation impact factor (IF), it is still based

on the opinions of other authors. Google Scholar index is very common in academic practice, but there are different opinions of experts about its advantages and disadvantages if compare it with Scopus' h-Index quality. **Conclusion:** This paper analyzes the major components of scientometrics, the basic mechanisms of citations in medical publications, as an opposite to the primary goal of scientific enterprise.

Key words: Scientometrics, h-Index, Google Scholar index.

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INFLATION OF CO-AUTHORSHIP AS THE MAIN SOURCE OF SCIENTOMETRIC (NON) OBJECTIVITY

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Background: Co-authorship only partially reflects research collaboration; it is also the result of other phenomena besides collaboration, such as social relations, frequency of communications, financial and other (e.g. reputation) resources invested by principal author, etc (1-5). **Objective:** The aim of this article was to analyze bias introduced into scientometric indicators and benchmarking by publications with 30 or more co-authors. **Methods:** After identifying a subset of publications cited by PubMed with 30 or more co-authors, a sample of 100 publications was extracted randomly. One of the authors from each of the extracted publications was also chosen randomly, forming final study sample of 100 scientists. All citations of the chosen authors listed at their Google

scholar profiles were analyzed from the aspect whether they could be ascribed to publications with more than 30 authors, or not, and what was contribution of such publications to scientometric rank of the authors. **Results:** While publications with more than 30 authors make on average only 10.8% of all publications of analyzed authors, they contributed to 46.6% of their citations and to 48.4% of their Hirsh index values. This effect was more pronounced among authors with shorter scientific careers, whose Hirsh index was boosted with such publications. **Conclusion:** Publications with large (more than 30) number of co-authors are on average cited much more frequently. Citations of publications with large number of co-authors boost scientometric rank of an author disproportionately to his or her contribution to such publications: while it is obvious that the contribution is 1/n (where n is number of co-authors), he or she is credited with full number of citations of such publication (c), instead with c/n, which is logical and rightful. Using rankings of scientists without removing such obvious bias caused by multiple co-authorship may have long-term deleterious influence on development of science.

Keywords: co-authorship, scientometrics, bias, benchmarking.

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IMPACT OF THE COVID-19 PANDEMIC ON SCIENTIFIC RESEARCH IN THE BIOMEDICAL SCIENCES

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ABSTRACT

We will not know the long-term impact of the SARS-CoV-2 viral outbreak for some time yet, but many of scientists have already begun to feel the effects - not only on their daily lives but also on their scientific work in general context (1-4). With partial or complete institutional shutdowns in countries worldwide, the global COVID-19 health crisis has rapidly impacted the life science landscape, including their patterns of work. Some scientists were unable to carry out experiments because of COVID-19-related working restrictions, especially in the first year of pandemic and periods of pandemic worsening or because they need to look after children in connection with the closure of schools and kindergartens. This was a frightening feeling, especially for young scientist, who usually have short-term contracts and may worry about their future careers. Many basic research labs quickly tuned their priorities to study aspects of SARS-CoV-2. For example, recent advances in sequencing technology allowed researchers to rapidly compare viral genomes from patients at the early stages of the outbreak to trace its origin to bats — knowledge that could help prevent the future outbreak of another novel coronavirus. The COVID-19 pandemic has mobilised researchers worldwide on a scale and timeframe that have never been seen before for one specific disease. The number of COVID-19 manuscripts being submitted for peer review has also greatly increased. For instance, The Journal of the American Medical Association has indicated that more than 11 000 manuscripts were submitted between January 1 and June 1, 2020, whereas around 4000 manuscripts were submitted during the same period in 2019. Virtually the entire increase has been related to manuscripts focused on COVID-19, with about one-third representing original research (full-length manuscripts, brief reports, and research letters) and two-thirds representing opinion (Viewpoints, A Piece of My Mind) and reviews. Scientific journals have accelerated their peer review process to expedite the publications of studies for COVID-19. One analysis shows that the time between submission and publication of articles on COVID-19 has decreased on average by around 50%, from 117 days down to 60. This analysis also showed that the time to publication for research not related to COVID-19 has remained unaffected, but it is probable that the number of research articles unrelated to COVID-19 has dropped considerably, with COVID-19 predominating in receipt of funding and attention from the research community.

Keywords: COVID-19 pandemic, Impact, Scientific research, Biomedical sciences.

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AVOIDABLE AND UNAVOIDABLE RESEARCH WASTE IN (BIOMEDICAL) RESEARCH

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ABSTRACT

We live in an unprecedented time of scientific progress, which is increasingly dominated by a paradox: more money is spent on health care research, development and delivery, and yet health outcomes, quality of care and quality of research is by all measures considered sub-optimal. The efficiency of current research system increasingly undermines public trust in science, which ultimately leads to corrosive effect on societies' well-being, as witnessed during the COVID19 pandemic(1-4). The research system must improve. It is responsibility of scientific community to identify "good" from "bad" research practices and to weed out the latter. However, the public also needs to understand that 100% efficient research is not theoretically possible, remain skeptical about exaggerated claims ("hypes") as good science typically progresses incrementally. To realize these goals, this talk will review practices of avoidable and unavoidable research waste and call for establishing new metrics (index of research waste). To improve research system each country/organization should undertake regular audits of its research practice activities and make data publicly available. Collecting these data may inform development of research waste metrics to complement traditional scientometric indices that do not capture this important dimension of scientific activity (5-7).

Keywords: Biomedical research, Avoidable and Unavoidable Waste.

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INFLUENCE OF SCIENTOMETRY ON ACADEMIC PROMOTION AND RANKING OF UNIVERSITIES

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ABSTRACT

The product of scientific research is mainly information published in scientific journals and they are the basis for the dissemination of knowledge, as well as the basic criteria for academic and scientific evaluation, raising of funds for scientific research and career advancement. The key question, which has always remained elusive in science and higher education, is on the basis of which criteria the quality of research is measured, and how to ensure the fulfilment of standards so that all provide adequate quality of resulting competencies. Since scientific research through innovations, patents and publications can be much more accurately measured and evaluated, compared to educational and other activities of universities, these parameters often appear as predetermining measures in evaluating the quality of higher education. Significant financial resources are being invested in the formation of various international university ranking lists. The most prestigious ranking lists of universities in the world publish their results once or twice a year. Relevant university ranking lists consider various parameters, but for most universities (with the partial exception of the first 100) the number of publications and the impact that these publications achieve through citation are of the greatest importance in ranking. The competition to take a prestigious place on the world ranking list of top universities is increasingly heating up and taking on the characteristics of a battle for status and various kinds of domination of the most developed countries in the world. It is clear that numerous shortcomings can be found in the criteria for forming university ranking lists, but the ranking systems, whether we like it or not, are becoming part of the reality of the existence and work of thousands of universities in the world. The fact is that investments

in scientific research work affect the improvement of scientific production. However, without the introduction of internationally recognized scientific criteria in the evaluation of scientific research, and the coordination of academic progress in accordance with the criteria, even the current miserable investment in science is essentially a useless waste of taxpayers' money. The existence of an effective regulatory institution at the level of Bosnia and Herzegovina, which would establish unique criteria in higher education at the state level with the possession of competencies and mechanisms for effective supervision of their implementation, would contribute to improving the situation in science and higher education.

Keywords: internationally recognized criteria, academic community, education, ranking of universities.

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PREDATORY PUBLISHING AND PREDATORS – ALMOST UNSOLVABLE PROBLEM OF TODAY IN BIOMEDICAL SCIENCES

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ABSTRACT

Background. The number of predatory publishers and so-called hijacked or fraudulent journals is constantly increasing in the last more than ten years emphasizing the iceberg phenomenon of predatory publishing. Predatory journals can harm scientific practice and undermine scientific integrity, quality, and credibility, especially if

those journals penetrate prestigious databases. Scholarly communication is at serious risk and threats to the quality of published articles when scholars and authors submit and publish their manuscripts in predatory journals. **Objective:** To point out the problem of predatory publishing with causes and consequences, main characteristics and features of fake journals, and how to support and help authors to distinguish predatory journals from open access journals to prevent and avoid publishing in such journals. **Methods:** Exploring Beall's and Cabell's lists of predatory publishers and journals and review of the relevant published literature, as well as personal experience and observations of the author. **Results:** There is no unified and generally accepted definition in the literature on predatory publishers and fraudulent journals, as well as an efficient strategy for prevention, control, and solving the problem of predatory publishing. Jeffrey Beall, an American librarian and library scientist from Denver, University of Colorado, has drawn attention and initiated broad discussions in the scientific community in 2010 on predatory open access publishing. He composed and maintained widely known Beall's lists of potentially predatory publishers and open-access predatory journals. Predatory publishers and journals attract and recruit authors by false or misleading information and a lack of transparency. They prioritize self-interest with aggressive practices and accept submitted manuscripts for prompt publishing — along with authors' publication fees — without peer review and promised quality checks for issues such as plagiarism or ethical approval. Jeffrey Beall made a profound influence and the debate he initiated is continuing in the scientific community with an increased number of authors and published articles on this burning and unresolved issue in the scientific community. Specific recommendations are necessary to be continuously given to researchers, educational institutions, and prestigious databases advising them to review their working relations with predatory publishers and journals. Scientific societies and publishers (including Springer Nature) have helped to establish the 'Think. Check. Submit.' campaign to guide authors. **Conclusion:** Predatory publishers and hijacked journals are a global threat to the scientific community with deviation from best editorial and publication practices. Threats and consequences of fake journals are numerous and multidimensional. The main barriers to combating predatory publishing are the lack of an agreed definition and coherent strategy with efficient interventions. Awareness-raising in the scientific community and continuous education of authors about predatory publishers and journals on how to differentiate trustworthy-reliable journals and predatory ones and to avoid predatory journals is still the central point in the strategy toward solving the problem of predatory publishing. There are a large number of checklists to help authors to detect potential predators and guard, especially young scientists, against publishing in predatory journals. The academic and scientific community must set the criteria for scientific advancement by not recognizing and valuing the articles published in the predatory journals. Besides academic institutions and researchers in the sci-

entific societies, active contribution to combat predatory publishing is necessary by the publishing associations, research funders, policymakers, libraries, and other interested parties and stakeholders at local, national, and international levels.

Keywords: predatory publishing; Beall's lists; fraudulent, hijacked journals; Gold open access, pseudoscience.

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RELATIONSHIP BETWEEN EDUCATION AND FAMILY MEDICINE PRACTICE. WHAT DID WE LEARN IN COVID-19 PANDEMIC?

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ABSTRACT

Background: At the end of the last century Alma-Ata Declaration recommended strengthening primary health care. With the "health for all" statement, general practice and family medicine came into the focus. At the beginning of the 21st century, the reform of the health care system began with the reinforcement of general practice/family medicine (1-5). WONCA Europe definition sets educational criteria and standards in practice. The WHO and WONCA Association made recommendations for the development of academic departments in family medicine. Family medicine is implemented as an independent, academic and scientific discipline with specific educational and research content. **Objective:** The aim of this paper is to analyze the implementation of family medicine in Bosnia and Herzegovina according to EURACT educational agenda. The second goal is to assess how the acquired knowledge,

skills and learned competencies are applied in practice in reformed healthcare centers, particularly during the COVID-19 pandemic. **Methods:** The entire teaching system in undergraduate, postgraduate and continuing education in the Department of Family Medicine at University of Tuzla was evaluated through the Department's reports and published information, as well as professional papers and publications. Published papers in European journals during the 2020 and 2021 COVID-19 pandemic and the process of education and the Family medicine practice were analysed. **Results:** In Bosnia and Herzegovina, family medicine has been successfully implemented as a basic, academic and scientific discipline in the reformed system of Primary health care. According to the principles of the EURACT educational agenda academic and educational activities have been implemented. New educational methods and modules for acquiring skills of 6 key competencies have been introduced. For the successful application of "patient-oriented clinical practice" in their practical work, family medicine teams met the criteria for full accreditation. In the last 6 years, delays and obstacles in practical work have been registered, and the main factors of obstruction are at the level of politics, law and economy. The COVID-19 pandemic led to almost complete collapse of family medicine practice mostly because telemedicine principles were not applied (6-10). **Conclusion:** According to the recommendations of WHO, WONCA and EURACT, Family medicine has been implemented in Bosnia and Herzegovina as a major academic and scientific discipline in the reformed Primary health care system. New educational methods and models for acquiring skills of 6 key competencies had been introduced. In the last 6 years, there has been a stagnation in the further implementation of practical work. The main factors of obstruction are at the level of politics, law and economics. During the pandemic, the teaching process was significantly changed due to the difficulty of applying all the practical skills described in the definition of Family medicine. Telemedicine educational modules have not been introduced. A pandemic significantly changes the content and methods of learning.

Keywords: Family medicine, education, practice, telemedicine, COVID-19.

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WE NEED MORE EFFICIENT COMMUNICATION OF RESEARCH RESULTS: WHAT CAN WE DO TO IMPROVE IT?

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ABSTRACT

In October 2020, as a member of the EASE Council, I launched the campaign "Help scientists save time" (1, 2). It aimed to minimize editorial requirements for initial manuscript submission. This can be crucial for faster progress in scientific research, because many manuscripts are rejected and often must be reformatted before submission to another journal. That is why we promote simplification of the requirements and placing the EASE Quick-Check Table at the beginning of instructions for authors in each journal (3, 4). The Table makes it easier for scientists to search for basic information needed for manuscript submission. The table has already been translated into 15 languages. Communication of research results can be also improved by the use of EASE Guidelines for Authors and Translators of Scientific Articles (5). The main part of this useful, readable document is now freely available in 30 languages. The Italian Chapter of EASE has decided to translate also its appendices and additional information (pages e7-e16). This may facilitate further streamlining of the publishing process. Moreover, "Golden rules for scholarly journal editors" (6) and other helpful EASE publications for scientists, translators, and editors have been briefly presented in bilingual slides at a webinar for the Ukrainian Chapter of EASE (7). The slides have been translated also into Japanese (8), so other EASE Chapters can consider such a possibility like-

wise. Many authors have suggested interesting improvements, too. These include changing the IMRAD structure into BOMRAD (i.e. replacing Introduction by two sections: Background and Objectives), complete elimination of pre-submission formatting and cover letters (9, 10), creation of centralized websites that serve many journals, to allow swift resubmissions from one journal to the next (11), and publishing full-text scientific articles in HTML (not just PDF) to facilitate machine translation (12). All this can contribute to improving the efficiency of scientific communication worldwide and, consequently, to solving urgent problems, e.g. related to environmental pollution or the COVID-19 pandemic (13).

Keywords: EASE, Communication of research results, Science editing, Science publishing.

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