# Hyperprolific authors in the top 2% scientists of the world

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**Abstract**

Scientific publication metrics are commonly used to assess the quality of scientific publications and works. These metrics can be used to assess the caliber and significance of a scientific publication as well as the productivity and accomplishment of a scientist's study. Citation metrics and the quantity of papers are closely associated, notwithstanding the importance of citations. Studies suggest many scientists are capable of publishing a scientific publication in just five days. This study critically investigates these so-called hyper prolific authors using the Stanford top 2% world scientists database. The findings clearly show that certain authors publish, on average, 100–200 publications annually, even those with a single author. A closer inspection uncovers this top 2% database's weakness and the fact that these authors from the field of medicine are actually journalists. Even Nobel laureates were ranked lower than some of these journalists. Subsequent inquiry reveals certain related researchers who publish more than 100 articles in environmental sciences per year and set records for the most highly cited papers ever. In order to ensure that the process of publishing a paper is carried out honestly and that the search of knowledge is not hampered by personal interests, it is decided that the scientific community has to develop ethical norms and procedures regarding the number of publications.

*Keywords: citation, highly cited researchers, impact factor, citation network.*

## Introduction

Scientific research papers publication is an important way for scientists to share their work and contribute to the advancement of knowledge in their field. Publishing scientific papers can be crucial for career growth and professional recognition, as it can assist scientists build their reputations and knowledge in their fields [1,2].

Publishing papers is widely seen as a crucial sign of a researcher's productivity and effect in academic and research contexts. For research funding, teaching positions, and other chances, researchers with a high volume of publications or publications in high impact journals are frequently considered as more qualified and competitive.[3].

It is crucial to stress that publishing papers is not the only indicator of a researcher's accomplishments or contributions. When assessing a researcher's career, other elements including the research's quality and impact may also be significant. Citation metrics are used to gauge a publication, author, or research group's influence and impact. They are frequently employed in academic settings to assess the relevance and quality of research, to compare the relative importance of various publications or researchers, and to spot trends and patterns in the field. To assess the significance and effect of research, citation metrics are frequently combined with other measures of study quality, such as peer review. However, they are not infallible and are susceptible to bias and manipulation. They ought to be employed cautiously and in conjunction with other tools for assessing the caliber of study as a result.

The quantity of papers is closely related to citation metrics. The number of highly cited publications increases with the number of papers a researcher produces, according to one study [2]. The desire to publish as many articles as possible is a motivation for seasoned researchers. A researcher can publish more articles and become more well-known and acquire more citations as a result.

One can publish two or three papers a week by expanding the scale of the publication, for instance by working with a network of researchers within the field. As a result of the joint publication with coauthors from this network, this method can increase one's citations. A high citation count is highly advantageous, as evidenced by the need to get in the Top 2% Scientists at Stanford University and achieve the highly acclaimed Highly Cited Researchers list by Clarivate [3,4].

This raises the question how much is too much. Hyperprolific authors are scientists who produce a very large volume of work in a relatively short period of time. These authors may write 2 or 3 or 4 papers per week. Some hyperprolific authors are able to produce so much work that they are considered to be among the most productive writers in history. But is it possible?

Recently, a new ranking from Stanford University features the world's top 2% most influential scientists [3,4]. This list, led by Professor John PA Loannidis, is compiled using Scopus citation information. This list also offers an analysis of possible hyperprolific authors and their contribution.

Ioannidis et al. [1] wrote "Authorship is the coin of scholarship — and some researchers are minting a lot." A research in biomedical journals reveals a nepotistic behaviour, papers by the most prolific authors were more likely to be accepted for publication within 3 weeks of their submission [5]. Few authors, often members of the editorial board, were responsible for a disproportionate number of publications. Prof Ioannidis further mentioned hyperprolific authors publish a paper every five days. This study aims to discover hyperprolific authors in the top 2% list.

# Methods

This paper uses the database "Updated science-wide author databases of standardized citation indicators" by Ioannidis [6] available at https://elsevier.digitalcommonsdata.com/datasets/btchxktzyw [4, 6].

The database of top-cited scientists contains standardized information on citations along with career-long and, recent year impact for 22 scientific fields. The selection is based on the top 100,000 scientists by c-score or a percentile rank of 2% or above in the sub-field. The version of this database is based on the Sept 1, 2022 snapshot from Scopus [6].

# Results and Discussion

## Most productive researchers

The database contains 195,605 authors from 1834 until 2022. This study only focuses on authors who are productive and thus only select authors whose first publication was post 1990. The number of papers published per year was calculated for each author: np/[2022 – first year publication]. The distribution is heavily skewed ranging from 0.01 to 220. According to [1], authors who had published more than 72 papers per year is considered implausibly prolific. Because the total number of papers per year is averaged over a long period, this study considers an average 30 papers per year as implausibly prolific. There are only 894 authors (or 0.46% of the database) that exceed publishing an average 30 papers per year,

Table 1 produces top 20 most productive authors. It is impressive to note that some authors who wrote 70-220 papers over the length of their careers. A deeper analysis reveals that some of the authors (Table

1) are editors from journals. The most prolific author is Elisabeth Mahase, a news reporter at The BMJ, and Scopus considers the news article as "peer review" articles and she has topped most authors in scientific output. Other authors from BMJ include Gareth Iacobucci from BMJ, Abi Rimmer, etc. Most productive non journalist author is Viroj Wiwanitkit who managed to pump out, on average, 146 papers per year. Two prolific authors who have a high c rank are from Aalborg university, Gregory Lip with 116 papers per year and Frede Blaabjerg at 89 papers per year. Other prolific authors came from various countries, including USA, Saudi Arabia, and India.

While not in the top 20, Table 1 includes John P.A. Ioannidis, who has critically published about hyperprolific authors. Ioannidis himself, on average since 1994, publishes 45 papers per year. According to Scopus, in 2016-2021, Ioannidis published 52-80 papers paper year, or on average 1 paper over 5 days, "a figure that many would consider implausibly prolific" [1, 7].

Table 1. Most productive researchers according to the Stanford database.

| |
|---|
| authfull |
| inst_name |
| np6021 |
| firstyr |
| rank (ns) |
| h21 (ns) |
| np/years |
| sm-field |
| Mahase, Elisabeth |
| BMJ |
| 661 |
| 2019 |
| 33363 |
| 24 |
| 220.3 |
| Clinical Medicine |
| Wiwanitkit, Viroj |
| Dr. D. Y. Patil Vidyapeeth, Pune |
| 3366 |
| 1999 |
| 30078 |
| 25 |
| 146.3 |

Clinical Medicine

Iacobucci, Gareth

BMJ

1364

2012

95467

15

136.4

Clinical Medicine

McCarthy, Michael

Seattle

790

2012

142232

13

131.7

Clinical Medicine

Rimmer, Abi

BMJ

864

2014

236367

11

123.4

Clinical Medicine

Lip, Gregory Y.H.

Aalborg University

3484

1992

208

146

116.1

Clinical Medicine

Huang, Wei

Northwestern Polytechnical University

2676

1996

12966

127

102.9

Enabling & Strategic Technologies

Sahebkar, Amirhossein

Mashhad University of Medical Sciences

1369

2008

7099

71

97.8

Clinical Medicine

Hayat, T.

Quaid-i-Azam University

2583

1995

4545

89

95.7

Engineering

Li, Qiang

Beijing Forestry University

1100

2010

40004

52

91.7

Enabling & Strategic Technologies

Blaabjerg, Frede

Aalborg University

2750

1991

639

131

88.7

Engineering

Wise, Jacqui

Kent

1231

2007

80007

16

82.1

Clinical Medicine

Alsaedi, Ahmed

King Abdulaziz University

1393

2005

41277

73

81.9

Physics & Astronomy

Asiri, Abdullah M.

King Abdulaziz University

2034

1997

10200

106

81.4

Chemistry

Chen, Jie

Shanghai University

878

2002

84289

39

79.8

Information & Comm.Technologies

Hoecker, A.

European Organization for Nuclear Research

2127

1994

123556

111

76.0

Physics & Astronomy

Aad, G.

Aix Marseille Université

1054

2008

26672

84

75.3

Physics & Astronomy

Sayyed, M. I.

Isra University

428

2016

103163

30

71.3

Physics & Astronomy

Chen, Ming

Yangzhou University

1693

1998

25524

56

70.5

Information & Comm. Technologies

Lange, D.

Princeton University

1812

1996

33999

100

69.7

Physics & Astronomy

Ioannidis, John P.A.

Stanford University School of Medicine

1264

1994

32

157

45.1

Clinical Medicine

authfull : author name; inst_name: institution name; firstyr: year of first publication; np6021: # papers 1960-2021; rank (ns): rank based on composite score c, self-citations excluded; h21 (ns) h-index as of end-2021; np/years: # papers per year; sm-field: scientific field.

The number of research papers that a scientist can write in a year depends on many factors, including their research focus, the amount of time they have available to devote to writing, and the complexity of the research being conducted. Some scientists may write several papers in a year, while others may write only one or two. In general, scientists who are actively conducting research and publishing their findings can be expected to write several papers per year, not a paper every week. In addition, scientists who are also teaching or working on administrative tasks may have less time available for writing papers.

It is also important to note that the quality of research papers is more important than the quantity. A scientist who produces a few well-written, high-impact papers may have a greater impact on their field than a scientist who produces a larger number of papers of lower quality.

This study further investigates most prolific authors who have written a paper solely him/herself. Table 2 presents the results. What is more amazing that these authors are all from Clinical Medicine abd can single-handedly write over 72 papers per year. But most of these authors are journalists from BMJ and other news outlets. The exception is Viroj Wiwanitkit from Dr. D. Y. Patil Vidyapeeth, a University in Pune who published, on average, 74 papers per year, and Romina Brignardello-Petersen from McMaster University, Canada who published 53 papers per year.

This result highlights the deeply fundamental flaw of the so-called "databases of standardized citation indicators" which do not recognize if an author is a journalist and the articles are news articles [3]. This standardized indicator place value on single-authored and first-author papers made a journalist Elisabeth Mahase who can write a one-page news article every two days has a c rank of #33363, much higher than scientists from MIT, Stanford or any scientist that had to do hard work in experimental research. Journalist Bridget M. Kuehn, according to the Stanford list, is ranked #17026, much higher than 2021 2021 Nobel laureatte in Medicine Ardem Patapoutian who has a c rank #28519, and 2022 Nobel Prize winner in physics Alain Aspect, who is ranked #20486. This c rank can be easily misused.

Table 2. Most productive authors with single-authored papers.

| authfull | inst_name | nps | rank (ns) | h21 (ns) | nps/years | sm-field |
|---|---|---|---|---|---|---|
| Mahase, Elisabeth | BMJ | 653.0 | 33363 | 24 | 217.7 | Clinical Medicine |
| Iacobucci, Gareth | BMJ | 1344.0 | 95467 | 15 | 134.4 | Clinical Medicine |
| McCarthy, Michael | Seattle | 790.0 | 142232 | 13 | 131.7 | Clinical Medicine |
| Rimmer, Abi | BMJ | 848.0 | 236367 | 11 | 121.1 | Clinical Medicine |
| Wise, Jacqui | Kent | 1228.0 | 80007 | 16 | 81.9 | Clinical Medicine |
| Wiwanitkit, Viroj | Dr. D. Y. Patil Vidyapeeth, Pune | 1714.0 | 30078 | 25 | 74.5 | Clinical Medicine |
| Brignardello-Petersen, Romina | McMaster University | 580.0 | 198767 | 32 | 52.7 | Clinical Medicine |
| Hawkes, Nigel | London | 861.0 | 184183 | 11 | 50.6 | Clinical Medicine |
| Kuehn, Bridget M. | | 985.0 | 17026 | 28 | 49.3 | Clinical Medicine |
| Burki, Talha Khan | | 685.0 | 61453 | 19 | 48.9 | Clinical Medicine |
| Kmietowicz, Zosia | BMJ | 1269.0 | 102462 | 15 | 48.8 | Clinical Medicine |
| Torjesen, Ingrid | BMJ | 777.0 | 169388 | 12 | 48.6 | Clinical Medicine |

| | | | | | | |
|---|---|---|---|---|---|---|
| Abbasi, Jennifer | Univ California, San Francisco | 287.0 | 192207 | 13 | 47.8 | Clinical Medicine |
| Mayor, Susan | London | 1210.0 | 101026 | 14 | 46.5 | Clinical Medicine |
| O'Dowd, Adrian | BMJ | 757.0 | 309276 | 9 | 44.5 | Clinical Medicine |
| Bateman, Chris | BMJ | 723.0 | 332782 | 8 | 40.2 | Clinical Medicine |
| Dyer, Owen | BMJ | 600.0 | 150574 | 14 | 40.0 | Clinical Medicine |
| Collier, Roger | CMAJ | 429.0 | 147600 | 14 | 39.0 | Clinical Medicine |
| Randall, T. | American Medical Association | 112.0 | 236744 | 13 | 37.3 | Clinical Medicine |
| Traynor, Kate | Bay Medical Center, Panama City | 814.0 | 225003 | 11 | 37.0 | Clinical Medicine |

authfull : author name; inst_name: institution name; nps: number of single authored papers; rank (ns): rank based on composite score c; h21 (ns) h-index as of end-2021; nps/years: # single authored papers per year.

Science journalists play an important role in communicating scientific ideas, discoveries, and research to the general public. They report on the latest developments in science and technology, explaining complex scientific concepts in a way that is easy to understand for a non-expert audience. In addition to reporting on scientific topics, science journalists may also write feature articles, conduct interviews with scientists, and produce multimedia content such as videos and podcasts. However they should not be considered as top 2% scientists of the world as widely promoted. In this case of standardized database, Ioannidis [6] wrote "Citation metrics are widely used and misused", this is such a misuse.

## Most productive field of science

It is generally difficult to determine which field of science is the most productive, as different fields have made significant contributions to our understanding of the world and have had a significant impact on society. Some fields, such as physics and chemistry, have a long history and have played a crucial role in the development of modern technology and medicine. Other fields, such as computer science and biotechnology, have emerged more recently and have had a significant impact on the way we live and work.

However, based on number of research papers published, Table 3 identifies the relative productivity of the field of science based on the median and maximum number of papers per year. Clinical medicine is the most productive with a record maximum of 220 papers per year. As discussed above, this is related to news article, a flaw in the database. This is followed by technologies, engineering, physics, chemistry, mathematics, biology and environmental sciences. The least productive authors are in Historical Studies, Philosophy & Theology, and Visual & Performing Arts.

This result is different from previous research who found that the vast majority of hyperprolific authors are in physics [1]. But it is important to note that the contributions of different fields are interconnected and often build upon one another. The Covid-19 pandemic indeed has boosted the number of hyperprolific authors in medicine [7,8,9].

Table 3. Most productive field of science, number of papers per year.

| Field | Median np/year | Maximum np/year |
|---|---|---|
| Clinical Medicine | 6.9 | 220.3 |
| Enabling & Strategic Technologies | 7.1 | 102.9 |
| Engineering | 6.2 | 95.7 |
| Physics & Astronomy | 6.5 | 81.9 |
| Chemistry | 6.6 | 81.4 |
| Information & Communication Technologies | 5.9 | 79.8 |
| Mathematics & Statistics | 4.8 | 61.6 |
| Biology | 4.4 | 50.5 |
| Earth & Environmental Sciences | 5.5 | 49.8 |
| Economics & Business | 3.0 | 41.6 |
| Agriculture, Fisheries & Forestry | 4.8 | 39.1 |
| Biomedical Research | 5.0 | 38.1 |
| Public Health & Health Services | 4.8 | 34.1 |
| Psychology & Cognitive Sciences | 4.5 | 28.3 |
| Social Sciences | 2.7 | 26.6 |
| Built Environment & Design | 4.8 | 23.8 |
| Communication & Textual Studies | 2.0 | 12.7 |
| Historical Studies | 1.9 | 11.1 |
| Philosophy & Theology | 2.2 | 8.2 |
| Visual & Performing Arts | 1.5 | 5.6 |

## Case Study: Most productive authors in Earth & Environmental Sciences

As the analysis presented in the previous sections reflect average number of papers, it is essential to dig deep the analysis of number of papers published in particular years. We take the case study in Earth & Environmental Sciences, where the top most prolific authors are listed in Table 4. It is important to note, out of these authors, only 4 were awarded highly cited researcher by Clarivate in 2022: Yong Sik Ok, Cao Jun Ji, and Hafiz M.N. Iqbal.

Table 4. Most productive authors in Earth & Environmental Sciences

| authfull | inst_name | np6021 | rank (ns) | h21 (ns) | np/years |
|---|---|---|---|---|---|
| Peng, Yongzheng | Beijing University of Technology | 996 | 86590 | 62 | 49.8 |
| Huang, Gordon | University of Regina | 1396 | 17927 | 59 | 46.5 |
| Ok, Yong Sik | Korea University | 714 | 65797 | 82 | 39.7 |
| Cao, Jun Ji | Chinese Academy of Sciences | 747 | 34711 | 76 | 35.6 |
| Iqbal, Hafiz M.N. | Tecnologico de Monterrey | 422 | 203470 | 45 | 35.2 |

| | | | | | |
|---|---|---|---|---|---|
| Sillanpää, Mika | University of Johannesburg | 929 | 8002 | 82 | 34.4 |
| Chen, Yangkang | Bureau of Economic Geology | 305 | 42533 | 40 | 33.9 |
| Gao, Baoyu | Shandong University | 737 | 89670 | 70 | 33.5 |
| Mahvi, Amir Hossein | Tehran University of Medical Sciences | 592 | 40372 | 48 | 32.9 |
| Rizwan, Muhammad | Government College University Faisalabad | 327 | 181217 | 48 | 32.7 |
| Tsang, Daniel C.W. | Hong Kong Polytechnic University | 516 | 133686 | 61 | 32.3 |


| authfull | inst_name | np6021 | rank (ns) | h21 (ns) | np/years |
|---|---|---|---|---|---|
| Peng, Yongzheng | Beijing University of Technology | 996 | 86590 | 62 | 49.8 |
| Huang, Gordon | University of Regina | 1396 | 17927 | 59 | 46.5 |
| Ok, Yong Sik | Korea University | 714 | 65797 | 82 | 39.7 |
| Cao, Jun Ji | Chinese Academy of Sciences | 747 | 34711 | 76 | 35.6 |
| Iqbal, Hafiz M.N. | Tecnologico de Monterrey | 422 | 203470 | 45 | 35.2 |
| Sillanpää, Mika | University of Johannesburg | 929 | 8002 | 82 | 34.4 |
| Chen, Yangkang | Bureau of Economic Geology | 305 | 42533 | 40 | 33.9 |
| Gao, Baoyu | Shandong University | 737 | 89670 | 70 | 33.5 |
| Mahvi, Amir Hossein | Tehran University of Medical Sciences | 592 | 40372 | 48 | 32.9 |
| Rizwan, Muhammad | Government College University Faisalabad | 327 | 181217 | 48 | 32.7 |
| Tsang, Daniel C.W. | Hong Kong Polytechnic University | 516 | 133686 | 61 | 32.3 |


Table 5. Number of papers published by most prolific authors in Earth and Environmental Sciences from 2015-2022 (data from Scopus, November 2022).

| Year | Ok | Tsang | Peng | Huang | Iqbal |
|---|---|---|---|---|---|
| 2015 | 30 | 8 | 66 | 75 | 5 |
| 2016 | 63 | 12 | 81 | 85 | 15 |
| 2017 | 107 | 49 | 60 | 82 | 42 |
| 2018 | 97 | 97 | 46 | 81 | 52 |
| 2019 | 116 | 102 | 82 | 70 | 63 |
| 2020 | 103 | 135 | 103 | 65 | 89 |
| 2021 | 75 | 77 | 79 | 96 | 127 |
| 2022 | 86 | 54 | 90 | 82 | 177 |


| Year | Ok | Tsang | Peng | Huang | Iqbal |
|---|---|---|---|---|---|
| 2015 | 30 | 8 | 66 | 75 | 5 |
| 2016 | 63 | 12 | 81 | 85 | 15 |
| 2017 | 107 | 49 | 60 | 82 | 42 |
| 2018 | 97 | 97 | 46 | 81 | 52 |
| 2019 | 116 | 102 | 82 | 70 | 63 |
| 2020 | 103 | 135 | 103 | 65 | 89 |
| 2021 | 75 | 77 | 79 | 96 | 127 |
| 2022 | 86 | 54 | 90 | 82 | 177 |

Table 5 displays further information on 4 prolific authors: Yong Sik Ok from Korea University, Daniel Tsang from Hong Kong Polytechnic University, Yongzheng Peng from Beijing University of Technology, Gordon Huang from University of Regina, and M.H.N. Iqbal from Tecnologico de Monterrey. These authors, in general publish more than 72 papers per year (the definition of hyperprolific author). In particular Ok, Tsang, Iqbal and Huang have published more than 100 papers per year.

It ia argued that "productivity does not equal usefulness" [10] however some stragegies can make it work. There are several strategies that scientists can use to be more productive in their research, and the most important one is collaborating with other scientists can help to expand your knowledge and expertise, and can also help to speed up the research process. In addition, one can use technology effectively: There are many tools and resources available that can help scientists to be more productive, such as software for data analysis and project management.

A curious case is Yong Sik Ok from Korea University and his close collaborator Daniel CW Tsang from Hong Kong Polytechnic University, both have published more than 100 papers a year in 2019 and 2020. Together they have co-authored more than 180 papers. Both of them recieved boosted citations. According to Web of Science, currently (in November 2022) Yong Sik Ok has 91 highly cited papers and Daniel Tsang has 87 highly cited papers (hcp). Among those, Ok has 28 hcp published in 2019 and 21 hcp for papers in 2020. This means that in 2018 and 2019, Ok published 2 papers every week (fully peer-reviewed and publsihed). And incredibly, every 2 weeks, those papers got highly cited. This assume working at 365 days a year. An impressive but implausible achievement. Ok and Tsang continuously publish 90 to 120 papers per year, and Clarivate has awarded Ok and Tsang have been rewarded Highly Cited Researcher in multiple fields. Another interesting fact, according to public data at Publons, Daniel Tsang reviews 20–30 papers per month in 2020-2021. Thus he writes a paper every 2 days, and still have time to review 1 paper everyday, including weekends and holidays.

This begs the question, can one write a paper in 2–3 days and get highly cited within 2 weeks? Ioannidis et al. (2018) further wrote that the reasons are: "hard work; love of research; mentorship of very many young researchers; leadership of a research team, or even of many teams; extensive collaboration; working on multiple research areas or in core services; availability of suitable extensive resources and data; culmination of a large project; personal values such as generosity and sharing; experiences growing up; and sleeping only a few hours per day."

# Conclusions

The number of research papers that a scientist can write in a year depends on several factors, including the scientist's research productivity, time commitments, and the availability of funding and resources. Some scientists may be able to write several papers in a year, while others could write more than 100 papers per year. The number of papers that a scientist writes may also depend on the field they are working in and the specific requirements of the journals they are submitting to.

A hyperprolific author is a scientist or researcher who has an extremely high number of publications in a given time period, typically compared to their peers. This could be in the form of research papers, book chapters, or conference papers.

Hyperprolific authors are often highly productive and dedicated to their research, and may be able to publish many papers in a year due to their ability to work efficiently and effectively. However, it is also possible that some hyperprolific authors may engage in questionable practices, such as betwork citation, self-plagiarism, salami slicing (splitting a single study into multiple papers), or other forms of misconduct. It is important for scientists to ensure that their work is conducted ethically and in accordance with best practices in order to maintain the integrity of the scientific enterprise [1].

Backscratching, also known as reciprocity, can occur in any professional field, including the scientific community. This refers to the practice of people helping or promoting each other in order to receive some benefit in return. In the scientific community, backscratching could involve scientists promoting each other's work through co-authorship, citing each other's papers, or collaborating on research projects, being editors in journals. While some level of collaboration and mutual support is normal and expected in science, it is important for scientists to ensure that their actions are motivated by the pursuit of scientific knowledge and not by personal gain or the desire to receive favors in return [10].

It is also important to note that the scientific community has established ethical guidelines and practices to ensure that research is conducted with integrity and that the pursuit of knowledge is not compromised by personal or financial interests. These guidelines include the requirement for researchers to disclose any conflicts of interest, such as financial ties or personal relationships, that could influence the interpretation or reporting of their research. Scientists are also expected to follow best practices for research design, data collection, and analysis, and to report their results transparently and accurately. By following these guidelines, scientists can help to maintain the integrity and credibility of the scientific enterprise.

This paper also reveals that the so-called standardized database of the top 2% world scientists is flawed. It includes many science journalists who publish an article twice every week and rank them much higher to any scientist who have to do hard experimental work.

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