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## SPECIAL ARTICLE

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# Journal Citation Metrics

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### ABSTRACT

Journal citation metrics are the journal ranking indicator measured by how many times of a journal article is cited by other articles, books, or authors. There have many journal citation metrics for evaluation of journal ranking. The examples of journal citation metrics include journal impact factor, CiteScore, SCImago Journal Rank, *h*-index and Quartile journal ranking. Thai Journal Obstetrics and Gynaecology is the official journal of The Royal Thai College of Obstetricians and Gynaecologists. Thai Journal Obstetrics and Gynaecology has been accepted for inclusion in the Scopus database since July 2019. Thai Journal Obstetrics and Gynaecology also received the Q4 journal rankings (SJR score 0.12) in Obstetrics and Gynaecology category from Scimago Journal & Country Rank 2020.

**Keywords:** journal impact factor, CiteScore, SCImago Journal Rank, *h*-index, Quartile journal ranking

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Journal citation metrics are the journal ranking indicator measured by how many times of a journal article is cited by other articles, books, or authors<sup>(1)</sup>. It is usually used as an indicator for the relative importance of a journal within its field. Higher citation metrics scores journals are given status of being more important, or carry more prestige in their respective fields, than journals with lower scores. It is used by an institute to give a promotion or hiring. It is also used by authors in guiding which journal to publish in. There have many journal citation metrics for evaluation of journal ranking. In this article, some citation metrics are described.

## Type of citation metrics

### 1. Impact factor (IF)

IF is the last two-year average ratio of citations to articles published in each journal. It is indexed by Clarivate's Web of Science<sup>(2)</sup>.

IF was originated by Eugene Garfield, the founder of the Institute for Scientific Information (ISI) in Philadelphia. IF started from year 1975 for journals listed in the Journal Citation Reports (JCR). ISI was obtained by Thomson Scientific and Healthcare in year 1992, and it was known as Thomson ISI. In year 2018, Thomson-Reuters sold ISI to Onex Corporation and Baring Private Equity Asia. And they founded a new

corporation, Clarivate, which is now the publisher of the JCR<sup>(3)</sup>.

IF of a journal is calculated by dividing the

number of current year citations to the source items published in that journal during the previous two years (Fig. 1).

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$$\begin{aligned}
 X &= \text{total citations in year 2020} \\
 Y &= \text{year 2020 citations to articles published in year 2018-2019} \\
 Z &= \text{number of articles in year 2018-2019} \\
 \text{Year 2020 impact factor} &= Y/Z
 \end{aligned}$$


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**Fig. 1.** Journal impact factor calculation.

For example, one journal had 637 and 565 citations in year 2018 and 2019, respectively, and had 38 and 39 articles in year 2018 and 2019, respectively. Thus, the calculation of impact factor of this journal is as follows:

$$IF = (637 + 565) / (38 + 39) = 15.61$$

## 2. CiteScore (CS)

CS is a measurement of an academic journal indicating the yearly average number of citations to recent articles published in the journal. CS was started

to use in December 2016 by Elsevier as an alternative to the generally used JCR IF. CS is based on the citations that indexed in the Scopus database. CS is collected for articles published in the previous 4 years. CS is calculated from the number of citations, received in that year and past 3 years, for articles published in the journal during that 4-year period, divided by the total number of published documents (articles, book chapters, reviews, data papers, and conference papers) in that journal during the same 4-year period<sup>(4)</sup>. (Fig. 2).

$$CS_{2020} = \frac{\text{Citation}_{2020} + \text{Citation}_{2019} + \text{Citation}_{2018} + \text{Citation}_{2017}}{\text{Publications}_{2020} + \text{Publications}_{2019} + \text{Publications}_{2018} + \text{Publications}_{2017}}$$

**Fig. 2.** Journal impact factor calculation.

For example, Thai Journal of Obstetrics and Gynaecology had 6 citations during 2017-2020 and 59 published articles during 2017-2020. Thus, CS<sub>2020</sub> of

Thai Journal of Obstetrics and Gynaecology was 0.1. The differences between IF and CS are shown in Table 1.

**Table 1.** The difference between Impact Factor and CiteScore<sup>(5)</sup>.

	Impact Factor	CiteScore
Total years of evaluation	2	4
Database	Journal Citation Reports	Scopus
Company	Clarivate's Web of Science	Elsevier
Evaluated publications	Articles and reviews	All

## 3. SCImago Journal Rank (SJR)

SJR is originated by Scimago Lab. It was

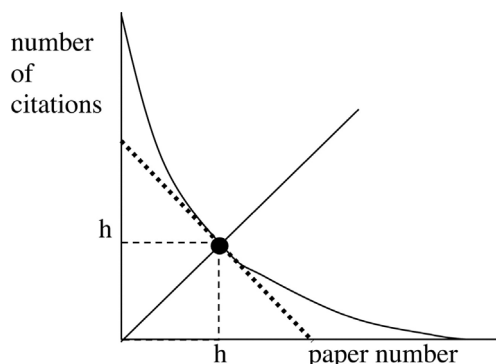
launched from a research group at University of Granada. SJR is a measurement of the scientific influence of

scholarly journals that accounts for both the number of citations received by a journal and the prestige or importance of the journals where the citations come from. It is indexed in Scopus database (Elsevier). A SJR is a numeric score indicating the average number of weighted citations received during a selected year per article published in that journal during the past 3 years. Higher scores indicate greater journal prestige. Journals can be grouped by subject area (27 major thematic areas), subject category (313 specific subject

categories) or by country. Citation data is drawn from over 34,100 titles from more than 5,000 international publishers and country performance metrics from 239 countries worldwide<sup>(6)</sup>.

#### 4. *h-index*

The *h-index* is defined as the maximum value of *h* such that the journal/given author has published at least *h* articles that have each been cited at least *h* times (Fig. 3)<sup>(7)</sup>.



**Fig. 3.** The *h-index*<sup>(7)</sup>.

The *h-index* was originated in 2005 by Jorge E. Hirsch, a physicist at UC San Diego. It was used as a tool for ascertaining theoretical physicists' relative quality. It is sometimes called the Hirsch number or Hirsch index<sup>(7)</sup>. Hirsch purposed the *h-index* to address the main disadvantages of other bibliometric indicators. The total number of articles metric does not account for the quality of scientific publications. The total number of citations metric can be heavily affected by participation in a single publication of major influence (for example, methodological articles proposing new techniques or methods, which can create a lot of citations). The *h-index* is aimed to measure simultaneously the quantity and quality of scientific output<sup>(7)</sup>. Currently, the *h-index* has been used in many databases such as ISI Clarivate's Web of Science, Scopus database from Elsevier, and Google Scholar.

For example, Thai Journal of Obstetrics and

Gynaecology has an *h-index* of 1. It means 1 articles of this journal have more than 1 number of citations.

#### 5. *Quartile journal ranking*

Quartile journal ranking is another type of measurement used for evaluation of journals. Quartile is used by ISI Clarivate's Web of Science, and Scopus database from Elsevier.

The quartiles journal ranking rank the journals from highest to lowest based on their impact factor or impact index. There are four quartiles: Q1, Q2, Q3 and Q4 (Table 2). The most prestigious journals within a subject area are those occupying the first quartile, Q1<sup>(8)</sup>.

For example, Thai Journal Obstetrics and Gynaecology was in the 153<sup>rd</sup> order of 181 journal in Obstetrics and Gynaecology category from Scimago Journal & Country Rank 2020. Thus, Thai Journal Obstetrics and Gynaecology was in Q4 journal rankings.

**Table 2.** Quartile journal ranking<sup>(8)</sup>.

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Q1 is occupied by journals in the top 25% group
Q2 is occupied by journals in the 25 to 50% group
Q3 is occupied by journals in the 50 to 75% group
Q4 is occupied by journals in the 75 to 100% group

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## Citation metrics of Thai Journal of Obstetrics and Gynaecology

The Association of Obstetricians and Gynecologists of Thailand was approved to register as a legal association on March 5, 1970. The Association of Obstetricians and Gynecologists of Thailand was changed to the Thai College of Obstetricians and Gynaecologists in 1987, and has been received in the royal patronage as the Royal Thai College of Obstetricians and Gynaecologists (RTCOG) since 1993. This year is 50 years anniversary of founding of RTCOG. Thai Journal Obstetrics and Gynaecology is the official journal of RTCOG. First issue of Thai Journal of Obstetrics and Gynaecology (Volume 1) was published in June 1989. Thai Journal of Obstetrics and Gynaecology had 2 issues in the first year of

publication. Thai Journal Obstetrics and Gynaecology was indexed in Index Medicus from Institute De L' Informatifque Et Technique from 1989 to 1997. Currently, Thai Journal Obstetrics and Gynaecology has 6 issues per year and on volume 29 in year 2021. Thai Journal Obstetrics and Gynaecology has been indexed in the Thai Journal Citation Index (TCI), the ASEAN Citation Index (ACI), the directory of open access journals (DOAJ), EuroPub, and Google Scholar<sup>(9)</sup>.

Thai Journal of Obstetrics and Gynaecology has already been accepted for inclusion in the Scopus database since July 2019. Thai Journal of Obstetrics and Gynaecology also received the Q4 journal rankings (SJR score 0.12) in Obstetrics and Gynaecology category from Scimago Journal & Country Rank 2020<sup>(10)</sup> (Fig. 4).



**Fig. 4.** Scimago Journal & Country Rank 2020 of Thai Journal of Obstetrics and Gynaecology<sup>(11)</sup>.

## Conclusion

In conclusion, journal citation metrics are the journal ranking indicator measured by how many times of a journal article is cited by other articles, books, or

authors. Journal citation metrics are used to compare the impact of journal. It is usually used by authors to find the journal for publication. There have many journal citation metrics for evaluation of journal ranking. Each

journal citation metric has different methods of evaluation.

## Potential conflicts of interest

The author declares no conflicts of interest.

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