LEXICON

- ESI: Essential Science Indicators
- JCR: Journal Citation Reports
- JIF: Journal Impact Factor
- WoS: Web of Science

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Existing versions of JCR and ESI can be accessed from:

• http://esi.webofknowledge.com/

• http://webofknowledge.com/JCR/

Getting more help

Training videos on ESI: http://wokinfo.com/training_support/training/essential-science-indicators/

Training videos on JCR: http://wokinfo.com/training_support/training/journal-citation-reports/

Summary

This Course is designed to give you an overview of the Journal and Highly Cited Data on Thomson Reuters' InCites platform. We will cover the data and the key features available in the Journal Citation Reports as well as the Essential Science Indicators.

Prior to attending this session, we ask you to watch the quick tour videos that will give you a general overview on these services.
1. ESI quick tour: http://youtu.be/ZxxKl30I_QI
2. JCR quick tour: http://youtu.be/IIfF5jvowSM

Training material is available from: **http://bit.ly/1qtF1SI**
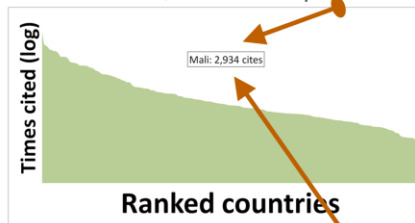
This session will be divided in 3 parts:
1. **ESI data**, citation benchmarks, research fronts
2. **JCR data**, Impact Factor (JIF), associated metrics
3. **Some practical examples**: using ESI and JCR for evaluation and benchmarking
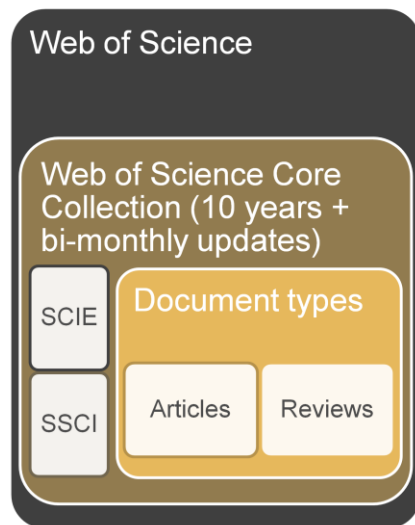
ESI Data (included records)

•Science and Social Science journal indexes from the Web of Science Core collection. Journals are given a single ESI Subject Area.

•Selected records: published in a 10 year window (eg 2004-2013) + 6 updates each year (eg, 1st 2014 update = Jan 2004-Feb 2014).

•Citations are calculated from the same selected source records.

ESI thresholds (entities filters)

•A citation threshold is the minimum number of citations obtained by ranking papers in a research field in descending order by citation count and then selecting the top fraction or percentage of papers.

•Entities (countries, journals, authors, institutions) are ranked by decreasing values of times cited. Entities that attract more citations than the value indicated in Citation Thresholds > ESI Thresholds will be kept in the Subject Area rankings.

•EX: Institutions that receive 1,658 or more cites in clinical medicine are the top 50% institutions and will be listed in ESI for Clinical Medicine.

2.1.2 Citation benchmarks

Highly Cited papers

- A paper that belongs to the top 1% of papers by number of citations in a research field (ESI subject area) published in a specified year.
- Highly Cited Thresholds

Hot papers

- *A paper published in the past 2 that received a number of citations in the most recent two-month period that places them in the top 0.1% of papers in the same research field (ESI subject area) .*
- Hot Papers Thresholds

RESEARCH FIELDS ▲	2004	2005	2006	2007	2008	2009	2010
AGRICULTURAL SCIENCES	113	98	85	73	50	45	36
BIOLOGY & BIOCHEMISTRY	229	206	177	158	136	108	80
CHEMISTRY	174	162	144	128	115	97	80
CLINICAL MEDICINE	207	195	167	142	120	97	72

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ESI provides a series of citation metrics:

•Times cited

•Cites/paper

•Number of Highly cited papers

•Number of Hot papers

•Number of Top Papers (Highly Cited + Hot papers)

Highly Cited papers

•The 1% is determined by the highly cited threshold calculated for the research field in the specified year.

•Highly cited threshold can be obtained in Citation Thresholds > Highly Cited Thresholds and reveals the minimum number of citations received by the top 1% of papers from each of 10 database years.

•EX: papers published in clinical medicine in 2007 need 142 cites to be Highly Cited papers, 72 for papers published in 2010.

Hot papers

•Hot paper threshold can be obtained in Citation Thresholds > Hot Papers Thresholds and reveals the minimum number of citations received during the most recent two-month period by the top 0.1% of papers from the past two years.

2.1.3 Research fronts

- A research front is a cluster of highly cited papers - referred to as "***core papers***" - in a specialized topic defined by a cluster analysis.
- Clusters are formed by selecting all Highly Cited papers that can be linked together by a specified co-citation threshold.
- Research fronts offer an alternative classification scheme for highly cited papers since the assignment of papers to a research front is not based on classification schemes.

An example of papers in co-citation clusters (each dot represents a paper, each colour a different colour).

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Research Fronts

•A measure of association between highly cited papers is used to form the clusters. That measure is the number of times pairs of papers have been co-cited, that is, the number of later papers that have cited both of them.

•The clusters are named using a semi-automatic process based on frequently occurring title words and phrases.

•Statistical characteristics of each cluster are also determined, including the number of highly cited papers, the sum of their citation frequencies, the citations per paper, and the mean year of papers in the front. The number of highly cited papers gives an indication of the size of the foundation literature; the sum of citation frequencies reflects the size of the research front; the citations per paper the degree of concentration, and the mean year of papers the currency, or "hotness," of the cluster.
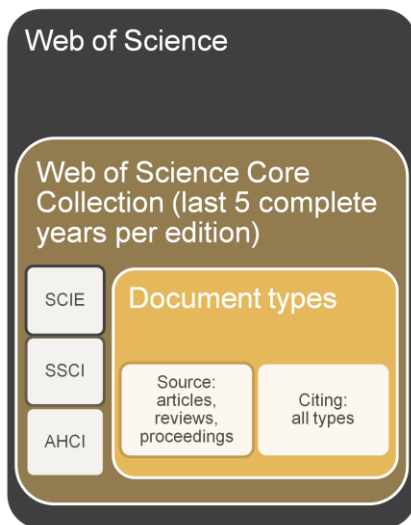
Field Classification

Research fronts are assigned to the 22 broad fields based on the field of the most frequently occurring journal in the front.

Inclusion Criteria

Only those fronts meeting a minimum size threshold and high average currency are included in Essential Science Indicators. Currency is determined by calculating the mean of the years of publications of the highly cited papers.

2.2.1 JCR data

Web of Science

Web of Science Core Collection (last 5 complete years per edition)

SCIE

SSCI

AHCI

Document types

Source: articles, reviews, proceedings

Citing: all types

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- A journal is included when the last 3 full years are available to calculate a Journal Impact Factor (JIF).

- Journals included in Thomson Reuters Master Journal List (about 12,000 active titles).
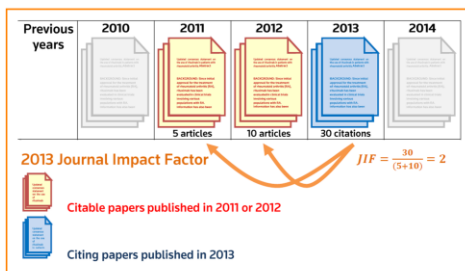
Each Edition of the Journal Citation Reports is published mid year and contains Journal metrics from the previous 5 complete years. Prior to this release, the previous 5 year period is available (eg from Jan – Jul 2014, JCR data will include 2008-2012 data, and the 2012 JIF).

The Journal Impact Factor was first released in 1975 using an identical methodology. The impact factor has gone from being a measure of a journal's citation influence in the broader literature to a surrogate that assesses the scholarly value of work published in that journal. These misappropriated metrics have been used to assess individual researchers, institutions, and departments.

•The 5-Year Journal Impact Factor was included in JCR from 2007.

•Aggregate Journal Impact Factors are calculated for all citable items in the journals from the Subject Areas. The median Impact Factor is the median of the JIF in the Subject Areas. They are calculated for each edition (SSCI and SCIE).

Key publications on Journal Impact Factor:

•Garfield, E. (1999). Journal impact factor: a brief review. *Canadian Medical Association Journal, 161(8), 979-980.*

•McVeigh, M. E., & Mann, S. J. (2009). The Journal Impact Factor Denominator Defining Citable (Counted) Items. *Jama-Journal of the American Medical Association, 302(10), 1107-1109. doi: 10.1001/jama.2009.1301*

•Hubbard, S. C., & McVeigh, M. E. (2011). Casting a wide net: the Journal Impact Factor numerator. *Learned Publishing, 24(2), 133-137. doi: 10.1087/20110208*
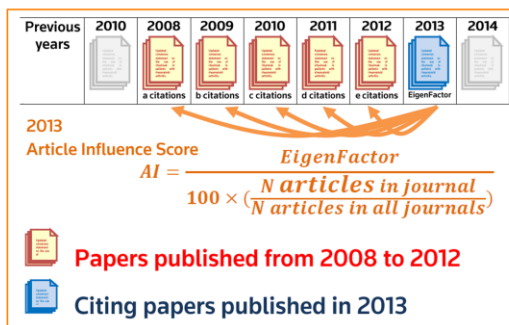
Like the Impact Factor, the *Eigenfactor* Score and *Article Influence*® Score use citation data to assess and track the influence of a journal in relation to other journals. *Eigenfactor* Metrics are available only for JCR years 2007 and later. You can learn more about *Eigenfactor* Score and *Article Influence* Score at www.eigenfactor.org.

Eigenfactor

•The *Eigenfactor* Score calculation is based on the number of times articles from the journal published in the past five years have been cited in the JCR year, but it also considers which journals have contributed these citations so that highly cited journals will influence the network more than lesser cited journals. References from one article in a journal to another article from the same journal are removed, so that *Eigenfactor* Scores are not influenced by journal self-citation.

•The Eigenfactor EF of a journal is defined as the percentage of the total weighted citations that a journal receives from all journals listed in JCR.

Article Influence

•It is calculated by dividing *Eigenfactor* Score by 100 x a fraction of number of articles in the journal compared to all articles in all publications in the last 5 years.

•This measure is roughly analogous to the *5-Year Journal Impact Factor* in that it is a ratio of a journal's citation influence to the size of the journal's article contribution over a period of five years.

•The mean *Article Influence Score* for each article is 1.00. A score greater than 1.00 indicates that each article in the journal has above-average influence. A score less than 1.00 indicates that each article in the journal has below-average influence.

Immediacy indexes

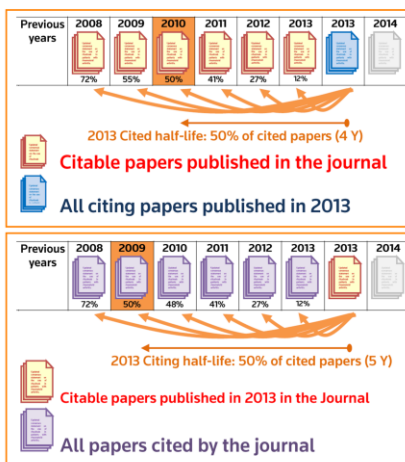Because it is a per-article average, the Immediacy Index tends to discount the advantage of large journals over small ones. However, frequently issued journals may have an advantage because an article published early in the year has a better chance of being cited than one published later in the year. Many publications that publish infrequently or late in the year have low Immediacy Indexes.

Half Life

•Cited Journal data show how many citations the journal received in the JCR year.

•The citing half-life is the median age of articles cited by the journal in the JCR year.

Only journals cited 100 or more times in the JCR year have a cited half-life.

Example - JCR with JIF 2012

1. Select JIF top Quartiles: Q1

2. Select categories: WoS = Ecology

3. Filter publisher's information: all publishers and countries

4. Select indicators: JIF, immediacy index, citable items, Article Influence

5. Sort result by JIF

   • *Ecology Letters (166 papers, including 148 articles)*

   • *Trends in Ecology & Evolution (high immediacy index 2.974)*

   • *Annual Review of Ecology Evolution and Systematics (21 reviews)*

   • *ISME Journal*

   • *Ecological Monographs (26 articles, 1 review)*

   • *Frontiers in Ecology and the Environment*

   • *Molecular Ecology Resources*

   • *Global Ecology and Biogeography*

   • *Global Change Biology*

   • *Molecular Ecology*

6. Review individual journal data (eg type of citable items)

7. Export the data to Excel

2.3.2 Using Highly Cited papers

Q: Who are the most influential authors in a discipline?

- Estimate future entrants to the list of Highly Cited researchers,
- Identify authors of leading papers.

1. Change Result list to "*Authors*"
2. Filter by "*Research Fields*"
3. Include results for "*Highly Cited Papers*"
4. Sort Results by *Highly Cited Papers*
5. *Click on the author name to review Highly Cited Papers*

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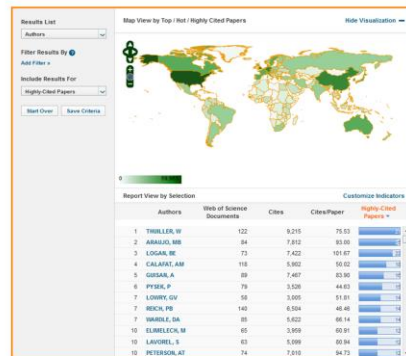
Example ESI 2nd update 2014

1. Change Result list to "Authors"
2. Filter by "Research Fields": *Environment/ecology*
3. Include results for "Highly Cited Papers"
4. Sort Results by Highly Cited Papers: rank top authors (137 Highly Cited Researchers were selected for the 2014 list in Env/Ecology, http://highlycited.com/, including those with a * in the top 10)
   - *THUILLER, W (122 papers, incl. 27 HC)
   - *ARAUJO, MB (84 papers, incl. 25 HC) **30% highly cited papers**
   - *LOGAN, BE (73 papers, incl. 22 HC) **30% highly cited papers**
   - *CALAFAT, AM (118 papers, incl. 18 HC)
   - *GUISAN, A (89 papers, incl. 16 HC)
   - *PYSEK, P (79 papers, incl. 15 HC)
   - *LOWRY, GV (58 papers, incl. 14 HC)
   - *REICH, PB (140 papers, incl. 14 HC)
   - *WARDLE, DA (85 papers, incl. 14 HC)
   - *ELIMELECH, M (65 papers, incl. 12 HC)
   - *LAVOREL, S (63 papers, incl. 12 HC) **19% highly cited papers**
   - *PETERSON, AT (74 papers, incl. 12 HC)
   - ZHANG, H (356 papers, incl. 12 HC) **most certainly covering different persons**
5. Click on the author name to review Highly Cited Papers

2.3.3 Benchmarking institutions

Q: How does organisation A compares to Organisation B?

- Identify and evaluate potential partners,
- Overview of the performance by an institution,

Rank institutions
1. Change Results list to "*institutions*".
2. Filter results by "*country*".
3. Sort results by "*Highly Cited Papers*".
4. Identify key institutions.

Calculate additional metrics, i.e. : % Highly Cited papers, % papers in institution

Research portfolio
1. Change Results list to "*Research Fields*".
2. Filter results by "*institution*"
3. Sort results by "*Research Fields*".
4. Download the data as a csv, xls file
5. Repeat steps 1-4 for each benchmarked institution.
6. Compare relative performances per broad fields of research.

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Example ESI 2nd update 2014

Rank institutions
1.   Change Results list to "*institutions*".
2.   Filter results by "*country*" = Australia
3.   Sort results by "*Highly Cited Papers*".
4.   Identify key institutions = Deakin Univ, Curtin Univ Technol (about 100 HC papers)

Research portfolio
1.   Change Results list to "*Research Fields*".
2.   Filter results by "*institution*" = Deakin Univ (then Curtin Univ Technol)
3.   Sort results by "*Research Fields*".
4.   Download the data as a csv, xls file.
5.   Repeat steps 1-4 for each benchmarked institution to merge the results in a single list
6.   Compare relative performances per broad fields of research (additional metrics can also be added).

		Deakin		Curtin	
		HC	WOS	HC	WOS
1	AGRICULTURAL SCIENCES Org 1 > Org 2	272	4	-	-
2	BIOLOGY & BIOCHEMISTRY	373	3	-	-
3	CHEMISTRY	529	7	858	1
4	CLINICAL MEDICINE Org 1 > Org 2	1335	38	1396	8
5	ENGINEERING Org 1 < Org 2	399	2	1063	26
6	ENVIRONMENT/ECOLOGY	287	4	333	6
7	GEOSCIENCES	-	-	1215	44
8	MATERIALS SCIENCE	-	750	10	-
9	PLANT & ANIMAL SCIENCE	483	5	282	6
10	PSYCHIATRY/PSYCHOLOGY	572	6	-	-
11	SOCIAL SCIENCES, GENERAL Org 1 > Org 2	1299	36	1215	9

Only research areas with at least 1 Highly Cited paper are listed.

THANK YOU
More questions?
jfdh@thomsonreuters.com

GIVE US SOME FEEDBACK:
BIT.LY/TRAININGWOS

A view shows the Labynkyr lake, some 100 km south of Oymyakon in the Republic of Sakha, northeast Russia, February 1, 2013. REUTERS/Maxim Shemetov