Workshop Target Objectives

At the end of this workshop, you will be able to:

• Explain the term bibliometrics;

• Use InCites to assess the citation impact of a researcher’s or research group’s papers;

• Use InCites to find potential collaborators in a particular institution or country.
What are Bibliometrics?

- Bibliometrics refers to the quantitative measures used to assess research output i.e. publication & citation data analysis.

  OR

- Statistical analysis of bibliographic data by counting citations
  - Measures patterns of authorship, publication & the use of the literature.
  - Assess research impact of individuals, groups, institutions
  - Measuring by author, article or journal
- Measure of impact (number of citations) not the quality of the work
  - Other measures could include funding received, number of patents, awards granted, or qualitative measures such as peer review
Why use Bibliometrics?

• Measure of the impact of your research
   Your publishing activity
   CV, promotion, grants, feedback to funding bodies/industry/public
   Showcase research of an individual/group/institution
   Identify areas of research strengths/weaknesses
   Inform research priorities
• Identify highest impact or top performing journals in a subject area
• Identify the top researchers in a subject area
   Collaborations/Competitors
   Recruitment
   Learning about a subject area
Examples of Metrics

- Scholarly Output: How many articles by an individual, research group, university
- Citation counts (to measure the impact of an article or author)
- Outputs in top percentiles
  - Journals in top 10%
- h-index
  - Measure of consistency for a researcher's publications
- Journal Impact Factor (Web of Science/Journal Citation Reports)
- (Category) Normalised Citation Impact (InCites)
  - Number of citations received by a paper divided with the average number of citations received by all other papers with the same document type, year of publication and subject area. 1 = global average
- Journal Normalised citation impact (InCites)
h-index

• The h-index is a simple metric to quantify the scientific output of an individual (Hirsch, 2005)
• A h-index of 10 means that of all of the papers written by this author, 10 papers have been cited at least 10 times each
• Only meaningful when compared to others within the same discipline area & at the same career stage

<table>
<thead>
<tr>
<th>Title</th>
<th>Journal Title</th>
<th>Year</th>
<th>Google Scholar Citations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effects of set-aside management on birds breeding in lowland Ireland</td>
<td>Agriculture, ecosystems &amp; environment</td>
<td>2006</td>
<td>27</td>
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<tr>
<td>Breeding bird populations of Irish peatlands</td>
<td>Bird Study</td>
<td>2008</td>
<td>5</td>
</tr>
<tr>
<td>The impact of farming on over-wintering bird populations</td>
<td>Tearmann</td>
<td>2003</td>
<td>5</td>
</tr>
<tr>
<td>The diversity of birds and butterflies in Irish lowland landscapes with special reference to the effects of set-aside management on birds in the breeding season</td>
<td>PhD Thesis</td>
<td>2004</td>
<td>1</td>
</tr>
<tr>
<td>Lowland bogs, fens and reedswamps</td>
<td>Bird Habitats in Ireland</td>
<td>2012</td>
<td>0</td>
</tr>
<tr>
<td>The value of the Open Access Repository to the Marine Institute</td>
<td>GLINT</td>
<td>2012</td>
<td>0</td>
</tr>
<tr>
<td>The potential use of online tools for scientific collaboration by biology researchers</td>
<td>Aslib Journal of Information Management</td>
<td>2014</td>
<td>0</td>
</tr>
<tr>
<td>Measuring the value of e-resources</td>
<td>An Leabharlann</td>
<td>2014</td>
<td>0</td>
</tr>
</tbody>
</table>

The h-index is 3 as 3 publications have at least 3 citations each. In order to obtain a h-index of 4, the 4th ranked publication (the PhD thesis) would need to receive 3 more citations.
Tools to find citations & calculate the h-index

1. Web of Science

2. Scopus

3. Publish or Perish (using Google Scholar data)
   - Coverage varies in content, depth, discipline
   - Note: Does your discipline publish in journals & are those journals included in the datasets being used to generate metrics?
Web of Science (http://www.webofscience.com)

Citation Report: 116
(from Web of Science Core Collection)
You searched for: AUTHOR IDENTIFIERS: (A-7377-2008) ...More
This report reflects citations to source items indexed within Web of Science Core Collection. Perform a Cited Reference Search to include citations to items not indexed within Web of Science Core Collection.

Published Items in Each Year
Citations in Each Year

The latest 20 years are displayed.

The latest 20 years are displayed.

Results found: 116
Sum of the Times Cited : 1431
Sum of Times Cited without self-citations : 1135
Citing Articles : 729
Citing Articles without self-citations : 637
Average Citations per Item : 12.34

h-index : 21

Sort by: Times Cited -- highest to lowest

Use the checkboxes to remove individual items from this Citation Report
or restrict to items published between [1945] and [2014] Go

<table>
<thead>
<tr>
<th>Year</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
<th>Total</th>
<th>Average Citations per Year</th>
</tr>
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<td>89</td>
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<td>76</td>
<td>91</td>
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<td>139</td>
<td>9.93</td>
<td></td>
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<tr>
<td>2</td>
<td>12</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>82</td>
<td>3.73</td>
<td></td>
</tr>
</tbody>
</table>

1. ANKE, a new facility for medium energy hadron physics at COSY-Julich
   By: Barsov, S; Bechtstedt, U; Bothe, W; et al.
   NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-A-CCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT Volume: 462 Issue: 3 Pages: 364-381 Published: APR 21 2001

2. NEW METHOD TO POLARIZE PROTONS IN A STORAGE-RING AND IMPLICATIONS TO POLARIZE ANTIPROTONS
   By: RATHMANN, F; MONTAG, C; FICK, D; et al.
   PHYSICAL REVIEW LETTERS Volume: 71 Issue: 9 Pages: 1379-1382 Published: AUG 30 1993
This paper has been cited 96 times. How does this citation count compare to the expected citation count of other articles published in the same journal, in the same year? It is necessary to normalise for:

- **Journal** = Anaesthesia
- **Year** = 2001
- **Document type** = Letter
Run a Web of Science search for all documents in Anaesthesia in 2001 that are categorised as the document type ‘letter’. Then create a citation report.

Letters published in ‘Anaesthesia’ in 2001 have been cited on average 1.19 times. This is the Expected Count.

Compare the total citations received to a paper to what is expected.

96 (Journal Actual) / 1.19 (Journal Expected) = 80.67
The paper has been cited 80.67 times more than expected. This is called Journal Normalised Citation Impact or Journal Actual/Expected Citations ratio.
InCites Indicators Handbook

November 12, 2014

Always equal to one, if the numerical value of the Impact Relative to World exceeds one, then the assessed entity is performing above the world average. If it is less than one, then it is performing below the world average.

\[
\text{Impact relative to World} = \frac{\text{Citation Impact}}{\text{Baseline (world citation impact)}}
\]

Note that although this indicator does normalize for year, it does not take into account the differences in the subject mix that an institution or a country is publishing in; therefore, it is recommended to use it in conjunction with bibliometric indicators that do take into account the differences in the average citation rates of the set of documents under evaluation.

Normalized Citation Impact

The Normalized Citation Impact (NCI) of a document is calculated by dividing the actual count of citing items by the expected citation rate for documents with the same document type, year of publication and subject area. When a document is assigned to more than one subject area, an average of the ratios of the actual to expected citations is used. The NCI of a set of documents, for example the collected works of an individual, institution or country, is the average of the NCI values for all the documents in the set.

For a single paper that is only assigned to one subject area, this can be represented as:

\[
\text{NCI} = \frac{c}{\hat{e}\text{td}}
\]

For a single paper that is assigned to multiple subjects, the NCI can be represented as the average of the ratios for all actual to expected citations for each subject area:

\[
\text{NCI} = \frac{\sum c}{\hat{e}\text{td}} = \frac{c}{\hat{e}(1)\text{td}} + \frac{c}{\hat{e}(2)\text{td}} + \ldots + \frac{c}{\hat{e}(n)\text{td}}
\]

For a group of papers, the NCI value is the average of the values for each of the papers, represented as:

\[
\text{NCI}_i = \frac{\sum \text{NCI}_{\text{each paper}}}{p_i}
\]

Where: \(c\) - the expected citation rate or baseline, \(c\) - Times Cited, \(p\) - the number of papers, \(f\) - the field or subject area, \(t\) - year, \(d\) - document type, \(n\) - the number of subjects a paper is assigned to, and \(i\) - the entity being evaluated (institution, country, person, etc).

NCI is a valuable and unbiased indicator of impact irrespective of age, subject focus of document type. An NCI value of 1 represents performance at par with world average, values above 1 are considered above average and values below 1 are considered below average.

NCI is a valuable and unbiased indicator of impact irrespective of age, subject focus or document type. Therefore, it allows comparisons between entities of different sizes and different subject mixes. An NCI value of one represents performance at par with world average, values above one are considered above average and values below one are considered below average. An NCI value of two is considered twice world average.

Note: A quirk of the way baselines are calculated (whole counting of subjects for papers in more than one subject category) and the way NCI is calculated (fractional counting of subjects for papers in more than one subject category) results in the NCI of the world not being equal to one exactly.

NCI is an ideal indicator for benchmarking at all organizational levels (author, institution, region etc). One can also use NCI to identify impactful sub-sets of documents and assess any research activity. For example, an institution may use the NCI to assess which collaborations are the most impactful or identify new potential collaboration opportunities. Or to identify the performance of up-and-coming researchers compared to established ones and to aid with faculty recruitment by assessing candidates' past activity. For a funding organization, one may use the NCI as a quantitative performance indicator to monitor the performance of funded projects, or assess the track record of a research team applying for a new funding.

http://ipscience-help.thomsonreuters.com/inCites2Live/8980-TRS
Issues & Limitations

• Sciences (quantitative) vs Humanities (qualitative):
  • Do bibliometrics suit sciences better?
  • Citation rates in Humanities much lower (Social Sciences fare better)

• Citation patterns can differ greatly between disciplines.
  • Need to compare like with like!

• Some disciplines don’t publish as much in journals.
  • Computer Science, Electrical Engineering, Arts, Humanities, Social Sciences

• Only published literature included.
  • Excludes: Policy papers, professional journals, working papers, monographs, reports, dissertations

• Citation does not have to be positive!

• Citation tools don’t index all research areas or publications.
  • Different tools/datasets = different results
InCites
https://incites.thomsonreuters.com/

Subject Areas: Web of Science Documents University of Limerick

- ENGINEERING, ELECTRICAL & ELECTRONIC: 742
- MATERIALS SCIENCE, MULTIDISCIPLINARY: 634
- MEDICINE, GENERAL & INTERNAL: 495
- CHEMISTRY, PHYSICAL: 342
- ENGINEERING, BIOMEDICAL: 320

Category Normalized Citation Impact per Year University of Limerick

- Times Cited Per Year University of Limerick
- Web of Science Documents per Year University of Limerick
InCites

- InCites is a citation-based evaluation tool which allows universities and research organisations to analyse institutional productivity and benchmark output against peers and aspirational peers in a national or international context.
- Uses Web of Science dataset.
Set up an InCites Account

Sign In

Email Address

Password

Sign In

Stay signed in

You are connected through an authorized network.

Register an email address to sign into InCites from anywhere.

Forgot Password
Exploring Researchers & Groups

https://youtu.be/JZqBSDnMygg
Identifying Peer Organisations

https://youtu.be/orHx5NNF9_o
Evaluating Institutional Collaborations

https://youtu.be/y4r8r3LT0DY
Exploring by Research Area

https://youtu.be/3IH_tcZMmPI
Exporting Custom Datasets from Web of Science to InCites

https://youtu.be/i9IuyOSr6wA
Exercise 1

- Using InCites (https://incites.thomsonreuters.com), compare **Stephen W. Hawking**’s and **Sergei D. Odintsov**’s research output in the Essential Science Indicator category of “**Physics**” in terms of **h-index** and **Category Normalised Citation Impact** for the years **1995 to 2015**.
Exercise 2

- Using InCites (https://incites.thomsonreuters.com), find a university in England conducting research in the Web of Science category of “Education & Educational Research” at a similar scale to the University of Limerick over the period 2000-2015.

- Using the Refocus tool find the names of potential collaborators in this university.
Research Area Schemas


Web of Science Research Areas

The Web of Science scheme comprises approximately 250 subject areas in science, social sciences, and arts & humanities. Many broad areas such as physics and materials science are represented by smaller subfields. Selecting subject areas from this list enables you to make comparisons in targeted areas such as Applied Chemistry or Geriatrics & Gerontology. To see the journals assigned to each category, click one of the following links:

- [Science Citation Index Expanded Journals](http://ipscience-help.thomsonreuters.com/inCites2Live/researchAreaSchema.html) (View Scope Notes)
- [Social Sciences Citation Index Journals](http://ipscience-help.thomsonreuters.com/inCites2Live/researchAreaSchema.html) (View Scope Notes)
- [Arts & Humanities Citation Index Journals](http://ipscience-help.thomsonreuters.com/inCites2Live/researchAreaSchema.html) (View Scope Notes)

Note: Articles from multidisciplinary journals may be reclassified into specific subject areas. See [Reclassification of Papers in Multidisciplinary Journals for Creation of Thomson Reuters Field Baselines](http://ipscience-help.thomsonreuters.com/inCites2Live/researchAreaSchema.html).
Short Training Videos

http://wokinfo.com/training_support/training/incites/
Key Points for Using Bibliometrics Responsibly

• Compare like with like:
  ▪ Similar research areas
  ▪ Stage of academic career
  ▪ Similar size institutions

• Data needs to be looked at in context! Use a variety of metrics and other qualitative information where appropriate.
Recent Articles on Bibliometrics

• “Bibliometrics: The Leiden Manifesto for research metrics”: Diana Hicks et al. (2015)
  http://www.nature.com/news/bibliometrics-the-leiden-manifesto-for-research-metrics-1.17351

• “The focus on bibliometrics makes papers less useful”
  Forcing research to fit the mould of high-impact journals weakens it. Hiring decisions should be based on merit, not impact factor, says Reinhard Werner. (2015)
  http://www.nature.com/news/the-focus-on-bibliometrics-makes-papers-less-useful-1.16706
Research Services Guide http://libguides.ul.ie/research
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Research Services & Bibliometrics Librarian
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or at this link