Researcher! Reclaim your metrics

The use of bibliometric indicators in research applications

NARMA vårkonferanse 2015

Research Adviser Marianne Gauffriau

SUND Research & Innovation, Faculty of Health and Medical Sciences, University of Copenhagen / marianne.gauffriau@sund.ku.dk

Research Support, Faculty Library of Natural and Health Sciences, The Royal Library / mgau@kb.dk

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My background

2014 - Present: Special Adviser at Faculty Library of Natural and Health Sciences, The Royal Library

2013 – Present: Research Adviser at Faculty of Health and Medical Sciences, University of Copenhagen

2008 – 2013: Research Adviser at Danish National Research Foundation

2006 – 2008: Consultant at Technical Knowledge Center of Denmark - D'ARC, Technical University of Denmark

Bibliometrics in research applications

Status of bibliometrics in research applications

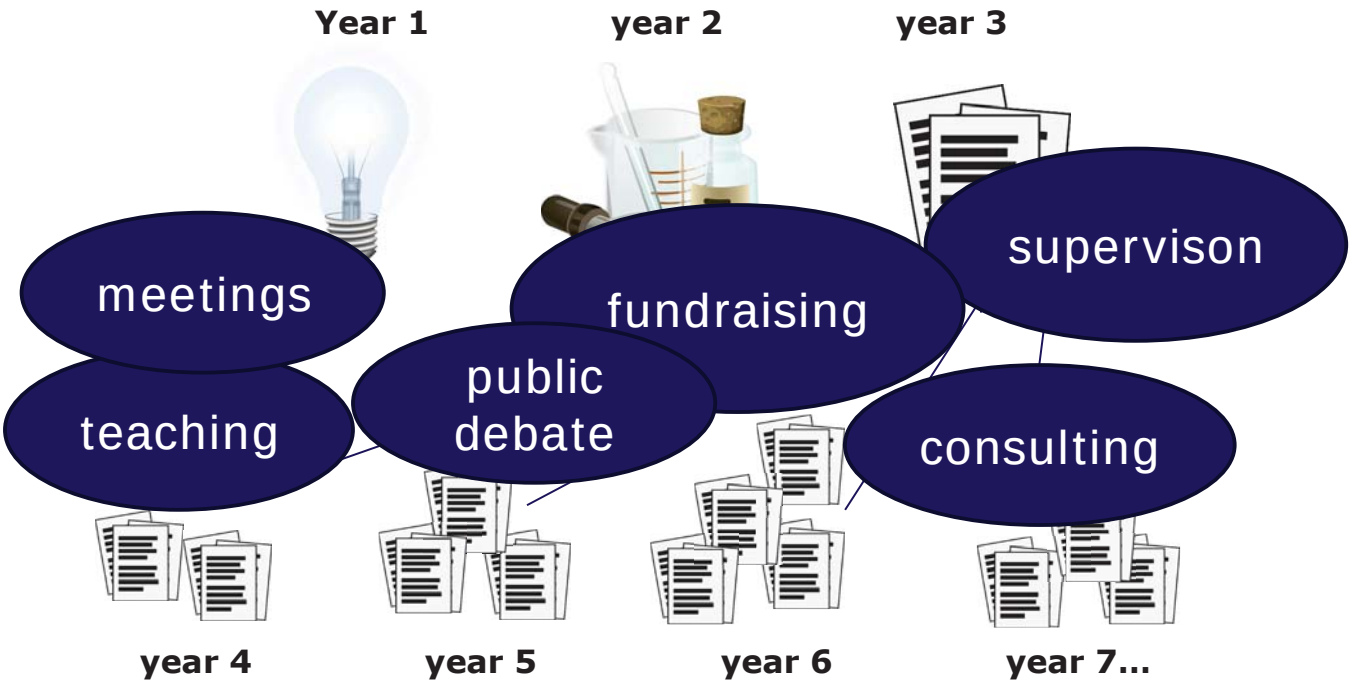
ERC information for applicants.

Early achievements track-record: “The PI should list his/her activity as regards: 1. Publications in major international peer-reviewed multi-disciplinary scientific journals and/or in the leading international peer-reviewed journals, peer-reviewed conferences proceedings and/or monographs of their respective research fields, listing up to five (Starting Grant) or up to ten (Consolidator Grant) representative publications, those without the presence as co-author of their PhD supervisor, and the number of citations (excluding self-citations) they have attracted (if applicable);”

Danish Council for Independent Research.

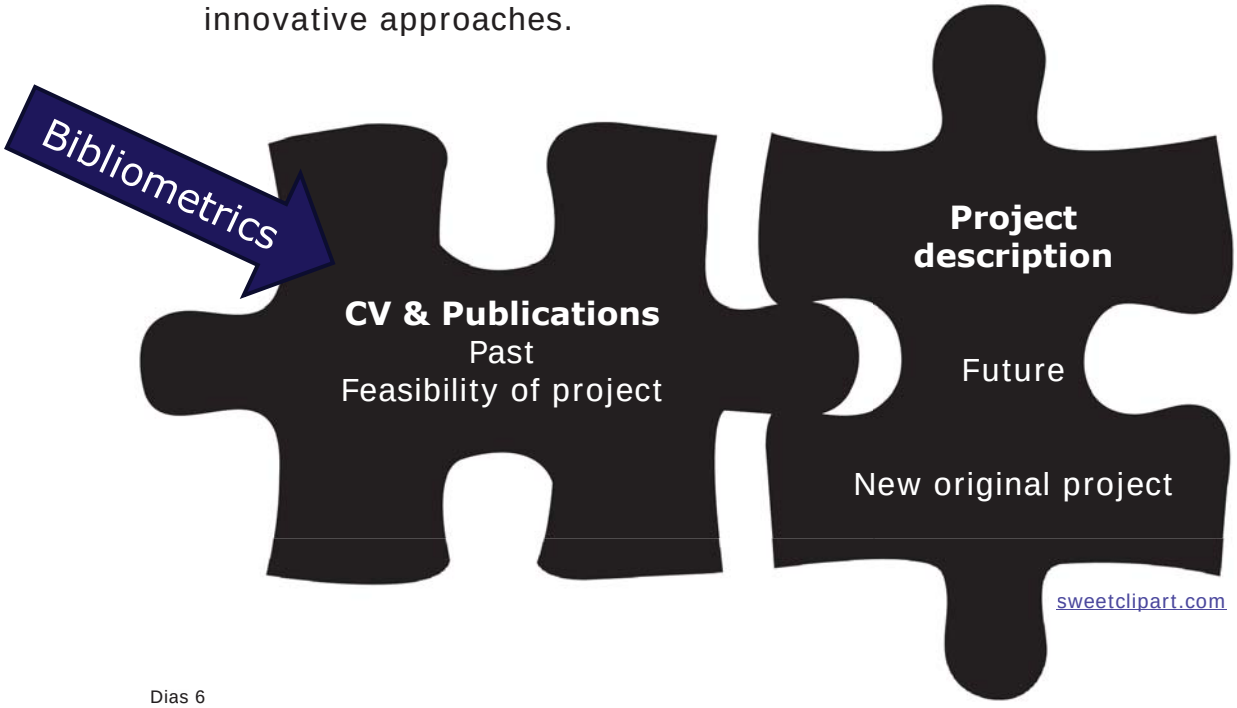
CV: ”If you list your h-factor in your CV or list of publications, you must briefly state how it is calculated.”

Bibliometrics: the analysis of publications and citations



Use of bibliometrics in research applications

The ERC encourages in particular proposals that cross disciplinary boundaries, pioneering ideas that address new and emerging fields and applications that introduce unconventional, innovative approaches.



Bibliometric profile at researcher or publication level

No standards

No quick fixes

Collaboration between
applicant and bibliometrician

Widely used metrics – H-index and Journal Impact Factor

Researcher	A	B	C	D	E
H-index	17	10	29	26	72
PhD age	9	4	13	11	33
Field	Pharma-cology	Meta-bolism	Molecular biology	Pharma-cology	Genetics
Database	Scopus	Scopus	Web of Science	Google Scholar	Web of Science
...					

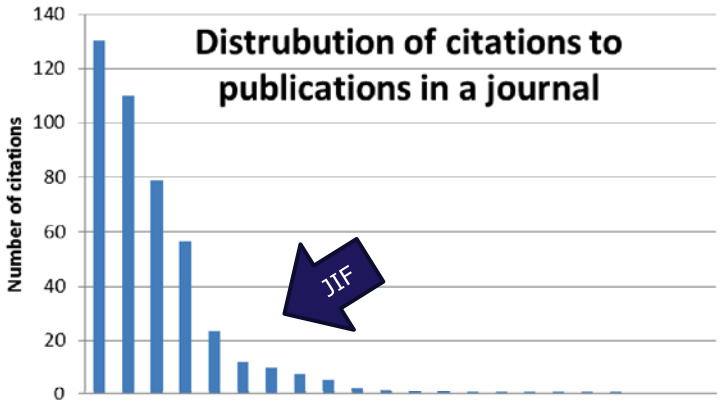
Widely used metrics – H-index and Journal Impact Factor

H-index		
Researcher	A	B
Rank	Citations	
1	1205	99
2	1199	80
3	1145	68
4	1009	55
5	478	34
6	257	30
7	123	21
8	78	19
9	40	14
10	11	12
11	9	8
12	4	5
…		

H-index

Journal Impact Factor (JIF):

$$\frac{\text{Number of citations in 2013 to publications from 2011 or 2012}}{\text{Number of publications from 2011 or 2012}}$$



What to include in a research application

1. The call

Early achievements track-record: "The PI should list his/her activity as regards: 1. Publications in major international peer-reviewed multi-disciplinary scientific journals and/or in the leading international peer-reviewed journals, peer-reviewed conferences proceedings and/or monographs of their respective research fields, listing up to five (Starting Grant) or up to ten (Consolidator Grant) representative publications, those without the presence as co-author of their PhD supervisor, and the number of citations (excluding self-citations) they have attracted (if applicable);"

2. Other metrics – peer reviewed publications

3. Other – not peer reviewed

Profile of the researcher

1. The call

- Full publication list / Latest ten years / 5 or 10 representative publications (peer reviewed, international)
- Mark 5 or 10 representative publications
- Mark publications without supervisor as co-author (AdG: main author)
- Number of citations excluding self-citations (if applicable). Show graph.

2. Other metrics – peer reviewed publications

- Statistics on number of: publications, first- / last-authorships, publications with international co-authors, publications in high impact journals, citations from abroad, citations from other research fields …

3. Other – not peer reviewed

- Public outreach, altmetrics etc.

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5 or 10 representative publications

Do always explain why these publications are highlighted

Relevance for the project

- Preliminary results, development of method etc.

Prestige

New publications:

- High impact, multidisciplinary journals. Almost self-explanatory.
- High impact journal within field, for example top 10 % JIF.
- First- / last-authorships. Almost self-explanatory.
- Cover picture. Show cover.
- Prize
- …

Older publications:

- Many citations
- Still cited after many years
- Cited by other research fields
- Cited in Nature ☺
- …

Alternatives to Web of Science and Scopus

	Humanities	Social sciences	Technology and production	Natural sciences	Health sciences
Journal publ.	19 %	35 %	45 %	68 %	74 %

Analyses of the scholarly and scientific output from grants funded by DFF from 2005 to 2008

Publiseringsindikatoren (The Norwegian Publication Indicator)

- Level 2 publication sources
- Not international but similar systems in Denmark and Finland

European Reference Index for the Humanities and the Social Sciences (European Science Foundation 2008/ Norwegian Social Science Data Services 2014)

- … main aim is to enhance *global visibility* of high quality research …
- Criteria for inclusion: peer reviewed, national or international authorship, academic editorial board, ISSN

Field specific lists, for example RePEc/IDEAS rankings for economics

Google Scholar, Academia.edu, ResearchGate etc.

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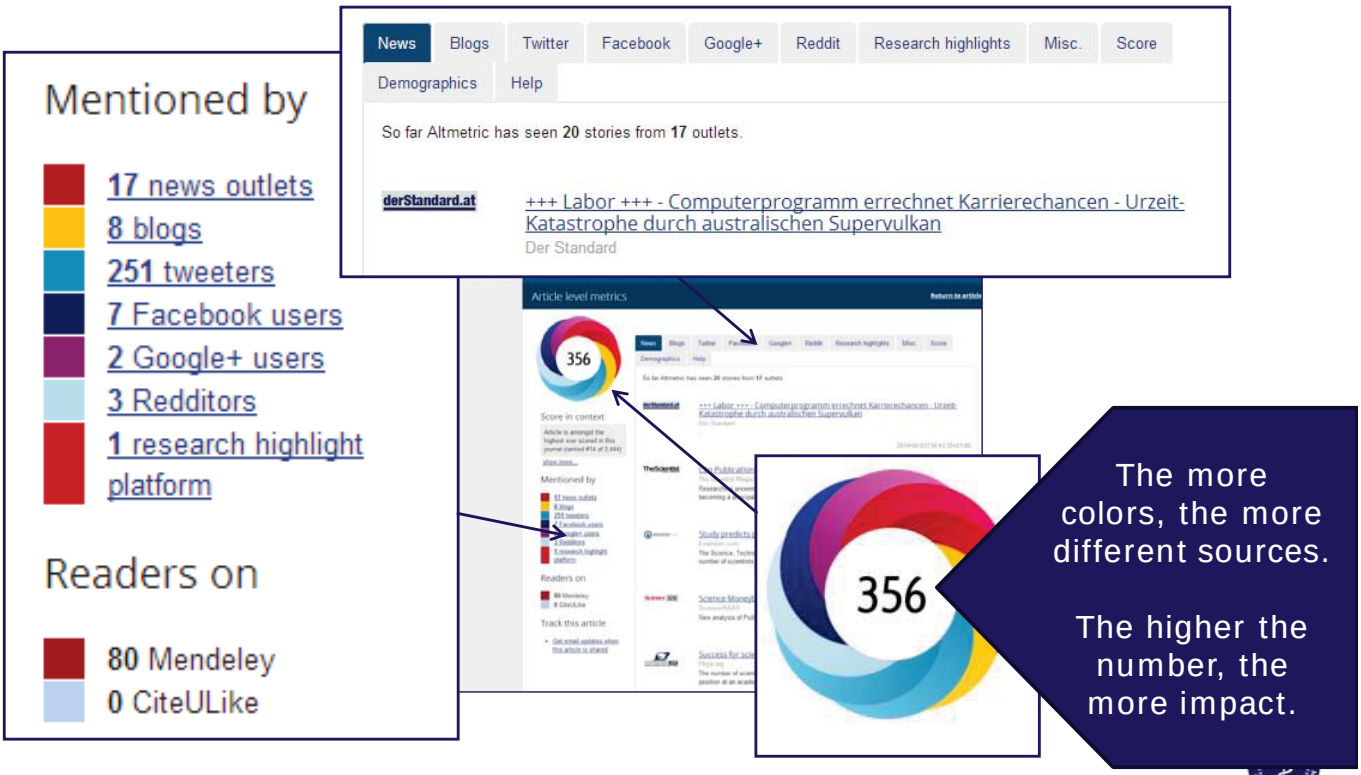
Other – not peer reviewed: Altmetrics – an example

Altmetrics – an example



Altmetrics vs. citation indicators

Altmetrics	Citations
Impact from social media, news media, downloads, (citations) etc.	Impact from scientific journals
Not peer reviewed	Peer reviewed
Anyone can contribute to the impact	Researchers contribute to the impact
An indication of interest from many different sectors	An indication of interest from the research sector
The impact may be visible fast and may also peak fast	The impact will be visible as citing articles are published

Thank you for your attention

Questions?

Improved metrics

Normalized impact

Top 10 % highly cited

Fractional counting

Normalized impact

What is the problem?

Traditional indicators do not allow a direct comparison of citation scores across research fields etc.

Solution

To normalize citation scores. The number of citations to a publication is compared to the world average for similar publications (same publication year, same publication type and same subject field).

Examples

- Mean normalized citation score in the Leiden Ranking
- Report: Comparing Research at Nordic Universities using Bibliometric Indicators, Nordforsk, section 4.

Normalized impact - example

Publication (P)	A	B	C	D	E	F	G
Citations (C)	16	4	16	8	12	24	4
Year (Y)	2010	2010	2010	2011	2011	2010	2011
Type (T)	Review	Article	Article	Article	Article	Review	Article
Subject (S)	Genetics	Biology	Biology	Genetics	Genetics	Genetics	Genetics

P	A	F	S. Average
C	16	24	20
Y	2010	2010	
T	Review	Review	
S	Genetics	Genetics	

P	B	C	S. Average
C	4	16	10
Y	2010	2010	
T	Article	Article	
S	Biology	Biology	

P	D	E	G	S. Average
C	8	12	4	12
Y	2011	2011	2011	
T	Article	Article	Article	
S	Genetics	Genetics	Genetics	

P	A	C	E	All
C	16	16	12	
S. Average	20	10	12	
Normalized impact	0.8	1.6	1.0	1.1

Top 10 % highly cited

What is the problem?

Traditional indicators focus on average impact, not high impact.

Solution

To isolate the top 10 % most cited publications and identify the authors, the institutions, the countries etc. of these publications.

Examples

- PP (top 10 %) in the Leiden Ranking
- Report: Comparing Research at Nordic Universities using Bibliometric Indicators, Nordforsk, section 4.

Top 10 % highly cited - example

Biology							
P	P1	P2	P3	P4	P5	…	P20
C	15	9	8	4	3	…	0
Top 10 %	Yes	Yes	No	No	No	No	No

Publication (P)	A	B	C	D
Citations (C)	16	4	8	8
Type (T)	Review	Article	Article	Article
Subject (S)	Genetics	Biology	Biology	Genetics
S. Thershold	15	9	9	11
Meets threshold	Yes	No	No	No

$$\text{Top 10 \% highly cited} = (1+0+0+0)/4/10\% = 2.5$$

Normalized impact and share of highly cited papers

All Nordic countries	Citation rate 2000-2003	Citation rate 2004-2007	Citation rate 2008-2011	Share of top 10 publications 2000-2003	Share of top 10 publications 2004-2007	Share of top 10 publications 2008-2011	Number of field normalized citations 2008-2011
Denmark	1.25	1.25	1.31	1.30	1.34	1.41	31624
Finland	1.06	1.03	1.08	1.00	0.98	1.03	20707
Iceland	0.94	1.11	1.05	0.77	1.03	0.97	1176
Norway	1.02	1.07	1.10	0.95	1.04	1.08	17271
Sweden	1.12	1.12	1.15	1.11	1.12	1.16	46762
Averages and total for the Nordic countries	1.12	1.12	1.16	1.11	1.13	1.18	117541

*Data from Science Citation Index – Thomson Reuters

Comparing Research at Nordic Universities using Bibliometric Indicators,

Fractional counting

What is the problem?

Traditional indicators use full counting where all authors, institutions, countries etc. get full credit for all their publications, not the share equal to their contribution.

Solution

To divide the credit for publications and citations among the authors, institutions, countries etc. who contributed according to the affiliations in the publication.

Examples

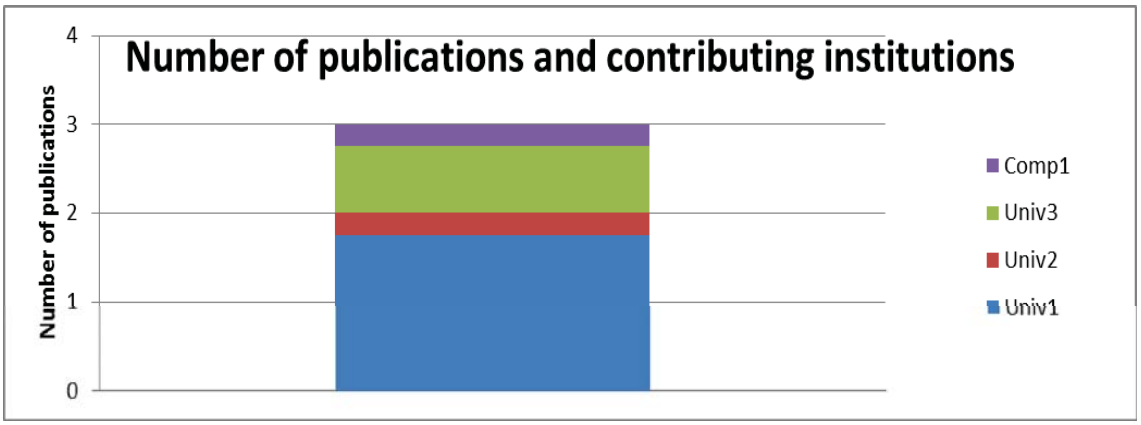
- Publiseringsindikatoren (The Norwegian Publication Indicator)
- Leiden Ranking
- Report: Comparing Research at Nordic Universities using Bibliometric Indicators, Nordforsk.

Fractional counting - example

Publication (P)	A	B	C
Citations (C)	16	4	8
Authors (A)	Univ1	Univ1	Univ1
	Univ2		Univ3
	Univ3		
	Comp1		

Number of publications	Univ1	Univ2	Univ3	Comp1	Total
Full	3	1	2	1	7
Fractional	1.75	0.25	0.75	0.25	3

Number of citations	Univ1	Univ2	Univ3	Comp1	Total
Full	28	16	24	16	84
Fractional	12	4	8	4	28



Improved metrics

but not beyond the citation databases