



***Report: Comparing
research at Nordic
higher education
institutions using
bibliometric
indicators***

Bibliometrics Seminar 2017

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Background for NORIA Network reports on higher education institutions (Piro 2017)

- NORIA Network on Bibliometrics
 - Established in 2008 by NordForsk
 - To facilitate cross-country comparisons of research performance in bibliometric terms
- In 2010: focus from Nordic countries to Nordic universities (and university hospitals) -> bibliometric results demonstrated at the institutional level

Fredrik Piro (2017): Comparing Nordic universities and higher education sectors using bibliometric indicators – results from the latest NORIA-net –report. Keynote presentation at 22nd Nordic Workshop on Bibliometrics and Research Policy. Helsinki, 9-10 November 2017. Available at

https://figshare.com/collections/NWB_2017_Oral_Presentations/3896053

Background for NORIA-net reports on higher education institutions (Piro 2017), cont.

- Available university rankings are often not very transparent
 - Composite measures
 - Difficult to understand scores and rank positions
 - Standardized scores presented instead of raw scores
- Principles of NORIA network
 - Transparency
 - Raw numbers for comparison
 - Not ranking, but comparison

Current report

- “Comparing Research at Nordic Higher Education Institutions Using Bibliometric Indicators”
 - Available at https://www.nordforsk.org/en/publications/publications_contain_er/comparing-research-at-nordic-higher-education-institutions-using-bibliometric-indicators-covering-the-years-1999-2014
- Update and extension of previous, similar reports by NORIA Network
 - More institutions
 - More years (1999-2014)
 - More focus on Social Sciences & Humanities
 - From 9 to 16 subfields
 - Previous reports available at https://www.nordforsk.org/en/programmes-and-projects/projects/the-use-of-bibliometrics-in-research-policy-and-evaluation-activities?set_language=en

Data

- Clarivate Analytics: *Science Citation Index Expanded*, *Social Sciences Citation Index* and *Arts & Humanities Citation Index*
- Data from the years 1999-2014 in four periods: 1999-2002, 2003-2006, 2007-2010 and 2011-2014
- Publication types: research articles or reviews
- 172 HEIs (73 university colleges, 56 universities, 24 university hospitals, 12 research institutes and seven other HEIs, e.g. academies)
 - First group (74 institutions): the core of the publishing activity in the HE sectors
 - Other group (98 institutions): “Other HES”
 - The threshold for inclusion in the main analysis: HEI had 150 fractionalised publications in 2011-2014

Methods

- Data cleaning techniques (i.e. address matching)
- Research activity based on fractionalised publication counts and impact measures based on fractionalised citation indicators (self-citations excluded)
- 16 main subject fields, based on the 250 journal subject categories used by Clarivate Analytics
- First group production statistics, threshold of 150 fractionalised publications in 2011-2014 (25 for Icelandic)
- Citation statistics, threshold of 40 fractionalised publications within each subject field in 2011-2014
- Normalisation procedures relative to the “world average”, i.e. the average citation rate in Web of Science for a given subject category or an aggregation of categories

Indicators

- Fractionalised number of publications
- Field normalised citation rates
- Percentage of highly cited papers (among the top 10 per cent of world production)
- Relative Specialisation Index, indicating whether a HEI has higher or lower than average activity in the world in a specific scientific field



16 subject fields

- Agriculture, Fisheries & Forestry (includes 12 subject categories)
- Biology (11 subjects)
- Biomedicine & Molecular Biosciences (24 subjects)
- Business Studies & Economics (4 subjects)
- Chemistry (9 subjects)
- Clinical Medicine (32 subjects)
- Computer & Information Sciences (6 subjects)
- Engineering (27 subjects)
- Geosciences (10 subjects)
- Health Sciences (15 subjects)
- Humanities (31 subjects)
- Materials Science (9 subjects)
- Mathematics & Statistics (5 subjects)
- Physics (15 subjects)
- Psychology (11 subjects)
- Social Sciences (29 subjects)

Publication activity: country level shares, growth and OA shares

- Highest share of publications, lowest annual growth rate in 1999-2014: Sweden
- Lowest share of publications, highest annual growth rate in 1999-2014: Iceland
- Finland behind Sweden and Denmark in publication share, ahead of Sweden in growth rate
- Share of open access publishing
 - Overall share from 0.7% in 1999-2002 to 7.4% in 2011-2014
 - Highest share in 2011-2014: Iceland, 11.5%
 - Finland from 0.6% in 1999-2002 to 6.8% in 2011-2014

Growth of publication activity per subject fields

- Highest growth rates (1999-2002 is 100)
 - Social sciences: 432 in 2011-2014
 - Humanities: 336 in 2011-2014
 - Business studies and economics: 312 in 2011-2014
- Expansion of databases, change in publication behaviour?
- Finland, highest growth rates
 - Social sciences: 420 in 2011-2014
 - Business studies and economics: 405 in 2011-2014
 - Humanities: 316 in 2011-2014
- Decrease in clinical medicine in Finland: 88 in 2011-2014, Nordic countries overall: 129 in 2011-2014

Publication activity and growth rates among Finnish HEIs

- Fractionalized publications, 1999-2014
- Highest share of publications: U Helsinki, 24.6% in 2011-2014
- Highest average growth rates in 1999-2014
 - U Vaasa: 13%
 - Lappeenranta UoT: 11%
 - U Lapland: 9%
- Growth rates much dependent on raw publication numbers: small HEIs have high growth rates

International co-publishing in Nordic countries and in Finland

- Whole counts, 1999-2014
- Nordic countries: share of int. co-publications from 41% in 1999-2002 to 55% in 2011-2014
- Finland: share of int. co-publications from 41% in 1999-2002 to 58% in 2011-2014
- Highest shares in Finland in 2011-2014
 - Lappeenranta UoT: 60%
 - U Helsinki: 59%
 - U Turku: 57%
- Lowest shares in Finland in 2011-2014
 - U Tampere and Oulu U Hospital: 43%
 - Kuopio and Tampere U Hospitals: 44%

Research profiles in Nordic countries

- Nordic countries: publication activity above world average in
 - Social sciences; Business Studies and Economics; Health Sciences; Humanities
 - (Biology; Geosciences; Psychology)
- Nordic countries: publication activity below world average in
 - Chemistry; Materials Science; Mathematics & Statistics
- Report presents research profiles on various HEI groups
 - Agricultural universities
 - HEIs without medical or health faculty
 - Universities with medical or health faculty
 - Business schools

Citation impact in Nordic countries, excl. Finland

- Denmark
 - Share of top 10 publications: 12-13% entire period
 - Average citation rate from 1.07 in 1999-2002 to 1.24 in 2011-2014
- Iceland
 - Share of top 10 publications: 9-10% entire period
 - Average citation rate from 0.97 in 1999-2002 to 0.99 in 2011-2014
- Norway
 - Share of top 10 publications: 9-10% entire period
 - Average citation rate from 0.98 in 1999-2002 to 1.06 in 2011-2014
- Sweden
 - Share of top 10 publications: 11% entire period
 - Average citation rate from 1.10 in 1999-2002 to 1.11 in 2011-2014

Citation impact in Finnish HE sector

- Finland total
 - Share of top 10 publications: 9-10% entire period
 - Average citation rate from 0.99 in 1999-2002 to 1.05 in 2011-2014
- Finland HEIs, some observations
 - Aalto U and U Helsinki:
 - Top 10: 11-12%, entire period
 - Citation rate clearly above world average, entire period
 - Hanken SoE from 1999-2002 to 2011-2014: top 10 3% -> 18%, citation rate 0.25 -> 1.67 (small publication numbers!)
 - Lappeenranta UoT: top 10 from 4% in 1999-2002 to 9% in 2011-2014 (but 5% in 2007-2010)

Influence of collaboration on citation impact

- Average citation rate for internationally co-authored publications between 1.27-1.33 in Nordic countries in 1999-2014 (Finland: 1.17-1.24)
- Share of top 10 publications for internationally co-authored publications between 13-14% in Nordic countries in 1999-2014 (Finland: 12-13%)
- Nationally co-authored publications have no similar influence on citation impact

Conclusions

- Relatively stable differences between the Nordic universities, university colleges and university hospitals
- Different research profiles and specialisations, institutions with different volumes of research activity
- Relatively stable differences with regard to citation indicators
 - Majority of Nordic HEIs perform above the world average
 - Some Nordic HEIs score on a very high international level with regard to citation impact and shares of highly cited papers
- Questions:
 - How can stable differences be explained?
 - What have the few most-cited institutions done to achieve their high impact on international research?
 - What can other Nordic institutions do to achieve the same?

Future work

- Further updates of reports
- Further indicator development
 - Traditional bibliometric data sources are expanding and being supplemented by new types of data sources -> improvement of representation of the Social Sciences and Humanities in future?



THANK YOU!

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