Bibliometric analysis for University of Copenhagen Excellence Programme for Interdisciplinary Research

Introduction and methodology

This bibliometric analysis covers the publications, which are produced by the individual projects in the University of Copenhagen Excellence Programme for Interdisciplinary Research. There were 18 interdisciplinary projects in the programme, covering all main research areas.

Data collection

The projects have supplied publications lists for this analysis, and the University of Copenhagen Office for Research Services have enriched the publications lists with publications ID's for the Web of Science (WoS) . The search was limited to the publication types: journal articles, letters and reviews. The total number of publications for each project can be seen in the analysis section.

The impact indicators as calculated by the Danish Centre for Studies in Research and Research Policy, Aarhus University using the CWTS Leiden database are included in the main bibliometric analysis section below. The CWTS Leiden database is based on Web of Science data, but is enriched by CWTS. This is followed by an analysis of how various forms of collaboration have an influence on the impact indicators.

The WoS database covers mainly medical and natural sciences, and the coverage for Social Sciences and Humanities is limited. This influences the publications results in the database for a programme of projects that are all interdisciplinary in nature. However, an attempt was made to do searches and analyses in WoS for all the projects, but it is important to bare this limiting factor in mind when reading the results.

As it turned out, there was a number of the publications on the projects lists, that we not suitable for analysis. There were several reasons for this:

1. The publications were not registered in the Web of Science Database
2. The publication is registered, but is not a journal article, letter or review
3. Publications from 2017 and 2018 are not yet suited for citations analysis since these have not received sufficient amount of citations yet.
4. A number of publications were found in Web of Science, but not in the CWTS Leiden database

It was decided to use the three most common indicators of impact in the bibliometric analysis for each project. Here follows a short definition of each indicator, and the other figures included in the analysis.

The period covered by the analysis was 2013 – 2018, using a so-called "variable citation window". This means that all citations received by all publications in this fixed time period have been counted: the citation window will thus vary for younger articles and for older articles. "Full counting" was used, i.e. all authors/affiliations of a publication are weighted equally.

Number of publications

This is the total number of publications for each project used in the analysis. Only journal articles, letters and reviews are included.

MNCS: Mean Normalized Citation Score

This indicator seeks to normalize the differences in citation patterns between publications from different research fields, from different publication years and of different publication types. The research fields to

which the publications belong are determined by the WoS subject categories to which the journals they are published in belong. The normalized citation score of a publication is the ratio of the citations received by the publication and the expected number of citations received by all publications in the WoS subject category, in the same publication year and of the same document type.

The MNCS indicator uses a baseline of "1,00" (the "world" or the "database") against which a comparison can be made. A resulting MNCS indicator of, say, 1,00 for a whole project indicates that on average, the publications of the project have a citation impact equal to other publications in the field. A MNCS indicator of 2,00 thus indicates that on average, the publications of a project have a citation impact twice that of other publications in the field (see Figure 1).

PPtop10%: Proportion of top 10% publications

This indicator shows the proportion of a project's publications, which belong to the top 10% of all WoS publications in the same field, the same publication year, and of the same publication type, determined by the number of citations received. If, for example, the PPtop10% indicator of a project is given as 0,2 this means that 20% of the projects publications lie in the zone of the top cited 10% of WoS publications in the same research field, in the same year and of the same publication type.

MNJS: Mean Normalized Journal Score

The MNJS indicator is very similar to the MNCS, but instead of using the citations in different research fields, the MNJS uses the average number of citations of all publications published in the individual journals.

Interpretation of the MNJS is also similar to the MNCS: a MNJS indicator of, say, 2,00 indicates that on average the publications of the programme have been published in journals that have been cited twice as much as would be expected in the field.

Bibliometric analysis

At the outset it was known that certain projects' field of research would fall outside of the main coverage of the WoS database. The number of projects challenged by the coverage in the database is increased by the interdisciplinary nature of the programme. Also, the citations analysis is preliminary at best, since the projects are only just concluded, and thus the publications are so recently published that they have not been able to generate citations as of yet. Most projects have included, in their final report, a list of publications that are in preparation or in press. Many publications from the interdisciplinary projects are book chapters that are not included in the WoS database and therefore limit the total number of publications included. In combination, these factors mean that the results should be read with care. Especially, 12 projects with low publication numbers. Indicators and data for these 12 projects are marked with red in Table 2.

Table 1: Impact indicators for all 18 projects:

	Publications included	MNCS	PPtop10%	MNJS
All projects combined	803*	1,68	0,191	1,66

*unique publications

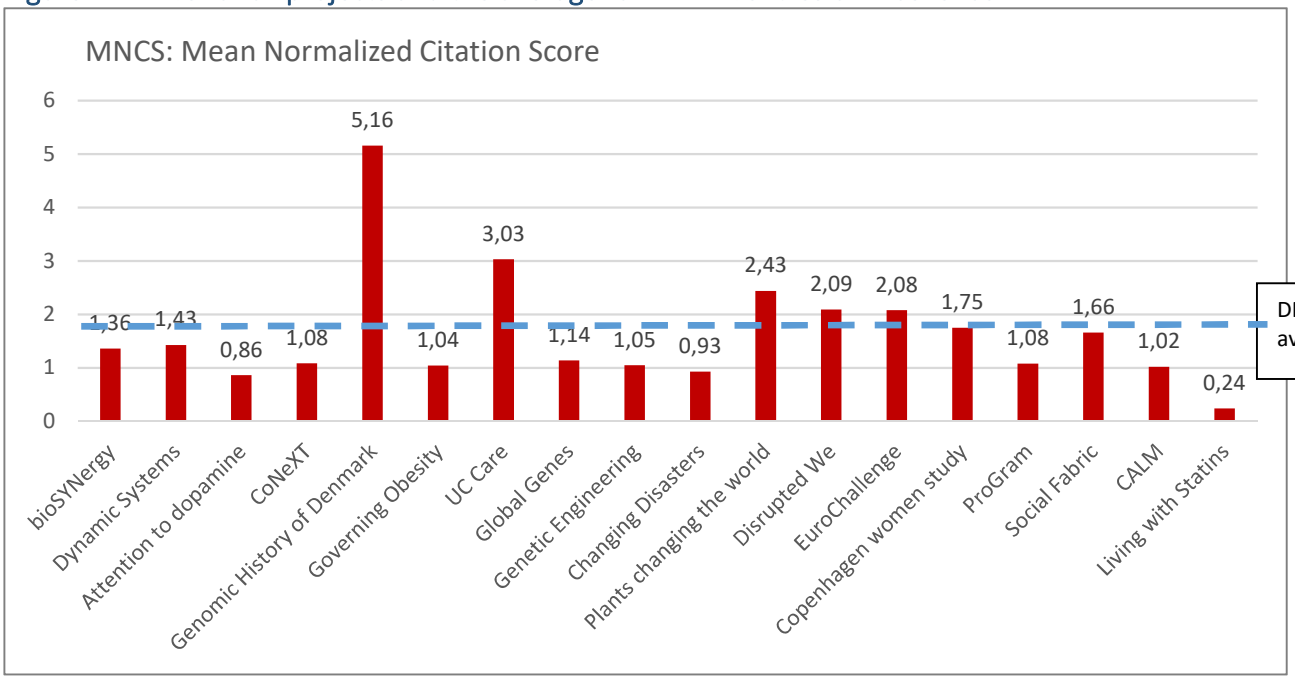
Looking at all the projects combined in Table 1, the MNCS is 1,68, which shows that the projects as a whole have a cited impact 1,7 times higher than other publications, comparable by field, period and type. The projects combined have 19,1% of their publications in the top 10% of all publications comparable by field, period and type.

Table 2: Indicators of impact for all individual projects: Sorted by falling number of publications

Project (notice there are overlapping publications between projects)	**Pubs in WoS**	**MNCS**	**PPtop10%**	**MNJS**
1 bioSYNergy	262	[illegible]6	[illegible]4	[illegible]
2 Dynamic Systems	107	1,43	0,205	1,26
3 Attention to dopamine	96	0,86	0,087	1,33
4 CoNeXT	66	1,08	0,105	1,11
5 Genomic History of Denmark	59	5,16	0,540	4,67
6 Governing Obesity	52	1,04	0,152	1,05
7 UC Care	39	3,03	0,251	1,57
8 Global Genes	32	1,14	0,150	1,23
9 Genetic Engineering	30	1,05	0,172	1,63
10 Changing Disasters	24	0,93	0,125	1,03
11 Plants changing the world	24	2,43	0,329	1,71
12 Disrupted We	21	2,09	0,164	1,10
13 EuroChallenge	21	2,08	0,301	1,29
4 Copenhagen women study	18	1,75	0,308	1,58
15 ProGram	9	1,08	0,140	1,25
16 Social Fabric	8	1,66	0,208	1,49
17 CALM	7	1,02	0,238	1,47
18 Living with Statins	3	0,24	0,000	0,60

Red warns against low publication numbers; >50 publications the indicators can be vulnerable to a few outliers (highly cited papers)

Figure 1: MNCS for all projects and the average for DNRF Centres of Excellence



Note: The Danish National Research Foundation's Centre of Excellence average MNCS were published by Schneider, J. & Costas, R. in 2013.

Table 3: Indicators in comparison

	MNCS	PPtop10%
UCPH Excellence Programme for Interdisciplinary Research	**1,68**	**0,191**
Univ. Of Copenhagen Programme of Excellence	1,77	0,218
DNRF Centres of Excellence	1,87	0,203
Denmark	1,1	0,119
Technical University of Denmark	1,32	0,136
University of Copenhagen	1,19	0,126
Aarhus University	1,16	0,116
University of Southern Denmark	1,05	0,108
University of Aalborg	1,01	0,111

Note: These analyses were carried out independently of one another, and thus should be read with care.

Sources: DNRF: Schneider, J. & Costas, R (2013): Bibliometric analyses of publications from Centres of Excellence funded by the Danish National Research Foundation; Denmark + Universities: www.leidenranking.com (2018).

Research Collaboration and Joint Publications

An impact analysis was conducted for publications published in collaboration with industry, with international colleagues, national colleagues or having no collaboration. The analysis show, that the impact of the publications are higher for collaborative publications.

Table 4: Impact indicators for collaboration, all projects:

	Publications	MNCS	PPtop10%	MNJS
Industry collaboration	86	2,01	0,233	1,89
International collaboration	488	1,88	0,216	1,94
National collaboration	96	1,77	0,207	1,46
No collaboration	219	1,20	0,130	1,11

Table 5: Publications with Industry Collaboration, by project

	P	MNCS	PPtop10%	MNJS
bioSYNergy	35	2,75	0,257	2,34
Genetic Engineering	19	0,73	0,102	1,41
CoNeXT	16	1,23	0,131	1,07
Attention to dopamine	4	0,40	0,000	1,00
Copenhagen women study	4	2,19	0,511	2,21
Genomic History of Denmark	4	5,83	0,750	4,83
Dynamic Systems	2	0,51	0,000	1,20
Global Genes	2	3,08	0,500	1,74
UC Care	2	0,83	0,000	1,00
CALM	1	0,41	0,000	0,54
Disrupted We	1	0,76	0,000	1,27
Governing Obesity	1	2,66	0,968	1,24

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Table 6: Publications with International Collaboration, by project

	P	MNCS	PPtop10%	MNJS
bioSYNergy	180	1,55	0,151	1,87
Attention to dopamine	64	0,89	0,091	1,44
Dynamic Systems	61	1,62	0,253	1,35
CoNeXT	48	1,10	0,111	1,18
Genomic History of Denmark	45	5,77	0,630	5,55
Genetic Engineering	23	0,90	0,138	1,36
UC Care	22	3,03	0,288	1,68
Governing Obesity	18	1,19	0,223	1,27
Global Genes	16	1,16	0,138	1,16
Plants changing the world	15	2,00	0,193	1,55
Changing Disasters	13	0,62	0,077	1,15
Copenhagen women study	10	2,00	0,305	1,93
Disrupted We	7	1,35	0,073	1,18
ProGram	6	1,33	0,210	1,49
EuroChallenge	4	1,84	0,250	1,44
CALM	3	2,09	0,551	1,49
Social Fabric	3	1,39	0,222	2,40

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Table 7: Publications with National Collaboration, by project

	P	MNCS	PPtop10%	MNJS
bioSYNergy	24	0,90	0,111	1,24
Attention to dopamine	13	0,53	0,000	1,24
Governing Obesity	13	1,63	0,222	0,91
UC Care	10	4,14	0,200	1,50
Dynamic Systems	8	1,23	0,250	1,50
Global Genes	5	0,97	0,018	1,58
Genetic Engineering	5	1,76	0,400	3,02
CoNeXT	4	1,69	0,274	1,04
EuroChallenge	4	4,47	0,750	1,98
CALM	3	0,29	0,000	1,47
Genomic History of Denmark	3	5,24	0,829	3,93
Social Fabric	3	2,67	0,333	1,05

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Table 8: Publications with no collaboration, by project

	P	MNCS	PPtop10%	MNJS
bioSYNergy	58	0,95	0,046	1,18
Dynamic Systems	38	1,16	0,120	1,06
Governing Obesity	21	0,55	0,049	0,94
Attention to dopamine	19	0,97	0,132	1,01
CoNeXT	14	0,84	0,036	0,88
Disrupted We	13	2,49	0,226	1,09
EuroChallenge	13	1,41	0,178	1,02
Changing Disasters	11	1,29	0,182	0,90
Genomic History of Denmark	11	2,61	0,091	1,27
Global Genes	11	1,18	0,227	1,17
Plants changing the world	8	2,98	0,500	2,00
Copenhagen women study	7	1,45	0,357	1,08
UC Care	7	1,46	0,209	1,36
Living with Statins	2	0,26	0,000	0,61
ProGram	2	0,50	0,000	0,73
Social Fabric	2	0,53	0,000	0,79
Genetic Engineering	2	1,00	0,000	1,19
CALM	1	0,00	0,011	1,37

Red warns against low publication numbers; >50 publications the indicators can be vulnerable to a few outliers (highly cited papers)

Concluding remarks

Although most projects have reported some difficulty finding publishing outlets for interdisciplinary research, and in spite of the fact that most of the publications are too new to be cited, the overall results of the

programme are very favorable in comparison with the average of Danish Universities and almost at the same high level as the previous Univ. Of Copenhagen Programme of Excellence and the DNRF Centres of Excellence – see table 3.

Several challenges to this analysis has been put forward by the projects and by the analyst at Danish Centre for Studies in Research and Research Policy.

The projects have mentioned:

- It takes longer to produce publishable research results in interdisciplinary projects
- It is harder to find high ranking journals who will publish interdisciplinary research

The Center for Research Analysis have mentioned:

- Several projects have less than 50 WoS-publications, which substantially weakens results
- Citations analysis cannot be conducted on publications from 2017 and 2018