



ACADEMY OF FINLAND

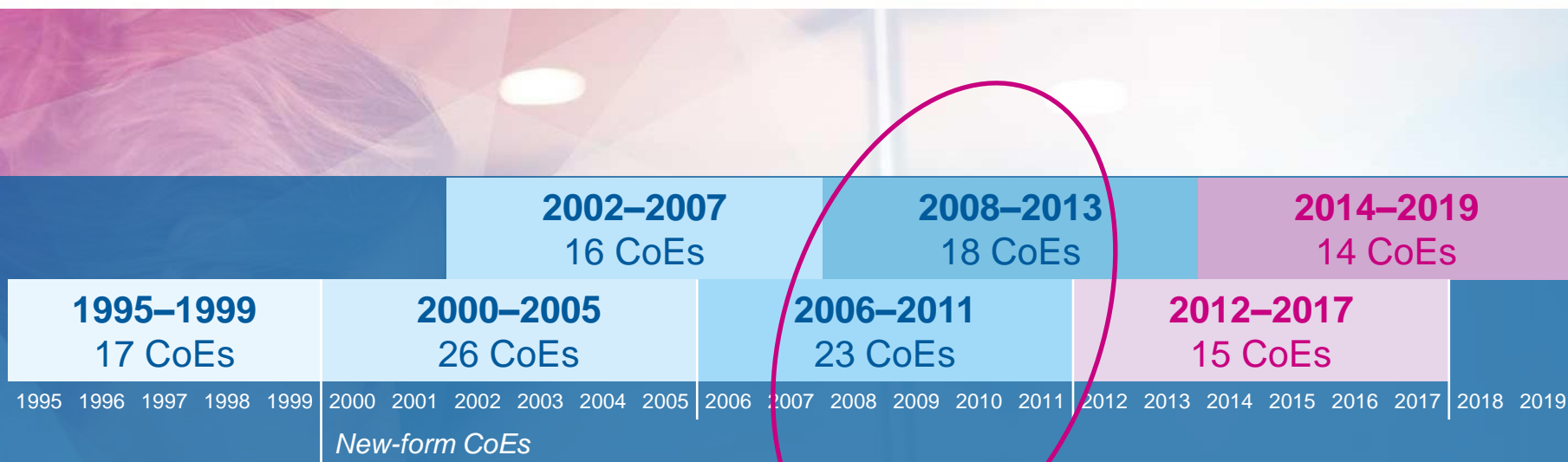
# Bibliometric analysis of CoE programmes 2006-11 and 2008-13 and their impact on the quality of Finnish science

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CENTRES OF EXCELLENCE IN RESEARCH

## Centre of Excellence Programmes



- Final evaluation of the CoE Programmes 2006-2011 and 2008-2013
- Evaluation on Programme level, not on the level of individual CoEs
- Data collected from the Academy's reporting system

## Why CWTS Leiden?

- ▶ Strong track record in bibliometric analyses e.g. for research evaluations of universities
- ▶ Continuous emphasis on methodological development
- ▶ Leiden Ranking: Scientific performance (output, collaboration and impact) of 750 major universities worldwide by 5 main fields
- ▶ CoE analysis follows the Leiden ranking methodology as closely as possible
- ▶ For more information: <http://www.leidenranking.com/methodology>
  
- ▶ **Acknowledgement:** Joost Kosten and Ludo Waltman, CWTS Leiden
- ▶ **Original data processing:** Katri Vihma ja Erkki Rasi, Academy of Finland

## Bibliometric indicators

### ▶ State-of-the-art bibliometric indicators

- Normalised indicators in terms of field and publication year
- The fractional counting method leads to a more proper field normalisation of impact indicators
  - Fairer comparisons between CoEs/universities active in different fields
- Author self citations excluded

### ▶ New, advanced approaches

- Includes only Web of Science (WoS) core publications from articles and reviews
- Algorithmically defined fields at the level of individual publications, not journals
- Publications in general science journals (e.g. *Science*) properly assigned to a field

# Bibliometric impact analysis of the Academy of Finland's CoE Programmes: Key questions

1. What is the overall publication output, citation impact and collaborative profile of CoEs?
2. What is the publication output, citation impact and collaborative profile of CoEs by main field of science?
3. What is the impact of CoE publications on the level of Finnish science?

## Dataset for bibliometric analysis

Unit of analysis	Counting method	Articles	Reviews	Total Publications
CoEs (2006-2013)	Full	6 787	312	7 099
CoEs (2006-2013)	Fractional	4 486	204	4 690
Finland incl. CoEs (2006-2013)	Fractional	50 554	2 272	52 826
Finland excl. CoEs (2006-2013)	Fractional	46 069	2 068	48 136

-> About 9% of the publications (based on fractional counting) are from the CoEs

**Data analysis:** CWTS, Leiden University;  
 data source: Thomson Scientific/ISI (enhanced version of **Web of Science**)

# **1. What is the overall publication output, citation impact and collaborative profile of CoEs?**

# Bibliometric analysis of CoE

Unit of Analysis
CoEs 2006-2009/2010
CoEs 2010-2013/2014



**P**

## **Total number of publications**

## Bibliometric analysis of CoEs: Publications

Unit of Analysis	P (fract.)
CoEs 2006-2009/2010	2 288
CoEs 2010-2013/2014	2 402

## **MNCS**

**Mean normalised citation score**

**The average number of citations of the publications of CoEs**

**Normalized for field and publication year**

## Bibliometric analysis of CoEs: Publications, MNCS

Unit of Analysis	P (fract.)	MNCS
CoEs 2006-2009/2010	2 288	1.28
CoEs 2010-2013/2014	2 402	1.20

## PP top 10%

**The proportion of CoE publications that, compared with other publications in the same field and in the same year, belong to the top 10% most frequently cited**

## Bibliometric analysis of CoEs: Publications, MNCS, PP top 10%

Unit of Analysis	P (fract.)	MNCS	PP top 10%
CoEs 2006-2009/2010	2 288	1.28	13.5%
CoEs 2010-2013/2014	2 402	1.20	12.1%

# **Bibliometric analysis of CoEs: Collaboration types**

## **International collaboration**

**The address information in the publication  
contains addresses from at least two countries**

## Bibliometric analysis of CoEs: Collaboration types

Unit of Analysis	International P (full)
CoEs 2006-2009/2010	1 801 (55%)
CoEs 2010-2013/2014	2 136 (60%)



# **Bibliometric analysis of CoEs: Collaboration types**

## **National collaboration**

**The address information in the publication  
contains addresses from one country but from at  
least two different institutions**

## Bibliometric analysis of CoEs: Collaboration types

Unit of Analysis	International P (full)	National P (full)
CoEs 2006-2009/2010	1 801 (55%)	639 (20%)
CoEs 2010-2013/2014	2 136 (60%)	691 (19%)

# **Bibliometric analysis of CoEs: Collaboration types**

## **No collaboration**

**The address information in the publication  
contains a single institutional address**

**Such publications can have multiple authors from  
the same institution**

# Bibliometric analysis of CoEs: Collaboration types

Unit of Analysis	International P (full)	National P (full)	No collaboration P (full)
CoEs 2006-2009/2010	1 801 (55%)	639 (20%)	818 (25%)
CoEs 2010-2013/2014	2 136 (60%)	691 (19%)	751 (21%)

**Industrial collaboration 5%**

**Industrial collaboration 8%**

## **2. What is the publication output, citation impact and collaborative profile of CoEs by main field of science?**

- Biomedical and health sciences
- Life and earth sciences
- Mathematics and computer science
- Physical sciences and engineering
- Social sciences and humanities

# Bibliometric analysis of CoEs by main field: Publications

	Unit of analysis	Main field				
		Biomed & health	Life & earth	Math & comp.	Phys sci & eng.	Soc sci & hum.
P (fract.)	CoEs 2006-2009/2010	786	469	209	685	139
P (fract.)	CoEs 2010-2013/2014	820	574	205	664	139

## Bibliometric analysis of CoEs by main field: MNCS, PP top 10%

	Unit of analysis	Main field				
		Biomed & health	Life & earth	Math & comp.	Phys sci & eng.	Soc sci & hum.
<b>MNCS</b>	CoEs 2006-2009/2010	1.23	1.31	1.37	1.32	1.05
<b>MNCS</b>	CoEs 2010-2013/2014	1.27	1.18	1.27	1.09	1.25
<b>PP top 10%</b>	CoEs 2006-2009/2010	12.7%	14.5%	14.2%	13.8%	12.9%
<b>PP top 10%</b>	CoEs 2010-2013/2014	13.4%	12.4%	14.7%	9.2%	12.4%

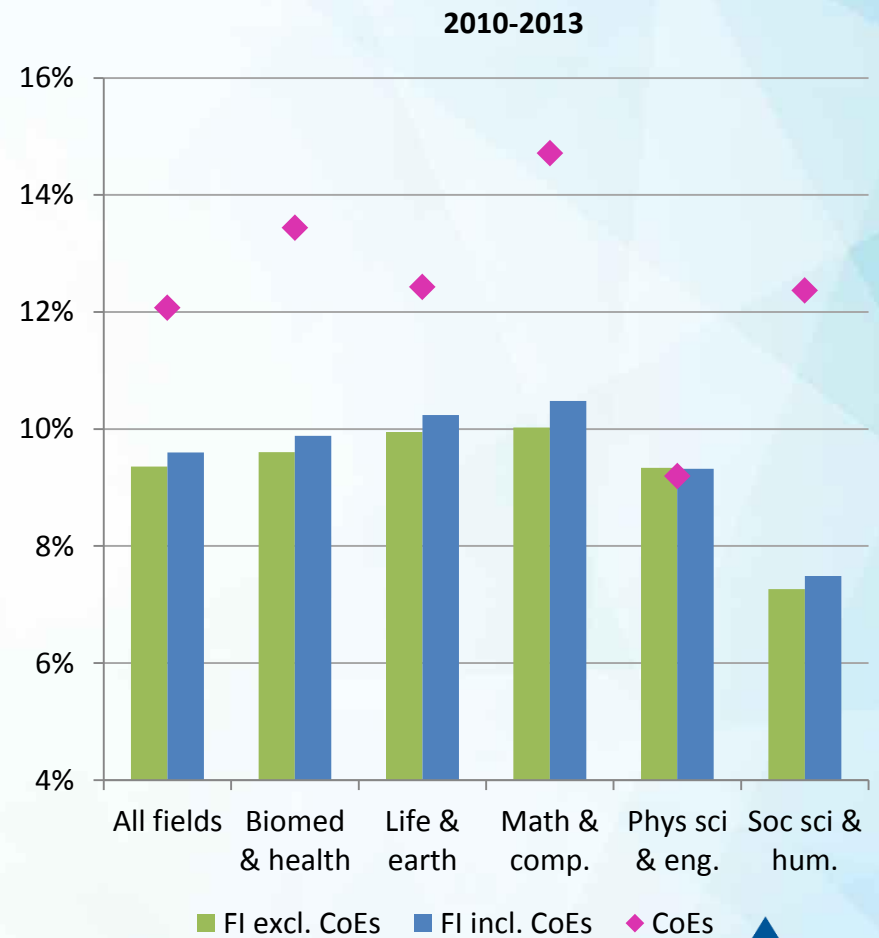
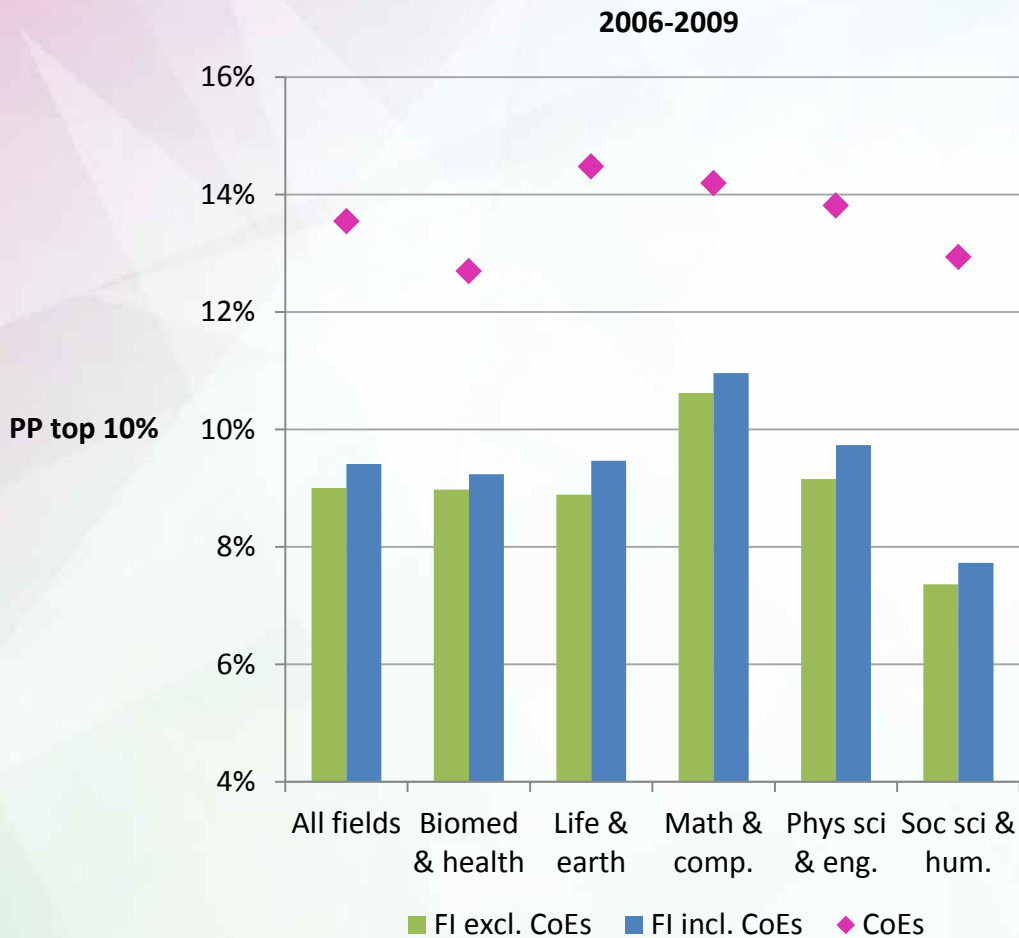
## Bibliometric analysis of CoEs by main field: Collaboration profile

Collaboration type / Period	Biomed & health	Life & earth	Math & comp.	Phys sci & eng.	Soc sci & hum.
International collaboration 2006-2009	58%	52%	42%	60%	41%
International collaboration 2010-2013	61%	62%	56%	59%	46%
National collaboration 2006-2009	27%	20%	15%	13%	19%
National collaboration 2010-2013	25%	15%	12%	17%	28%
No collaboration 2006-2009	14%	28%	43%	28%	40%
No collaboration 2010-2013	14%	22%	31%	24%	26%



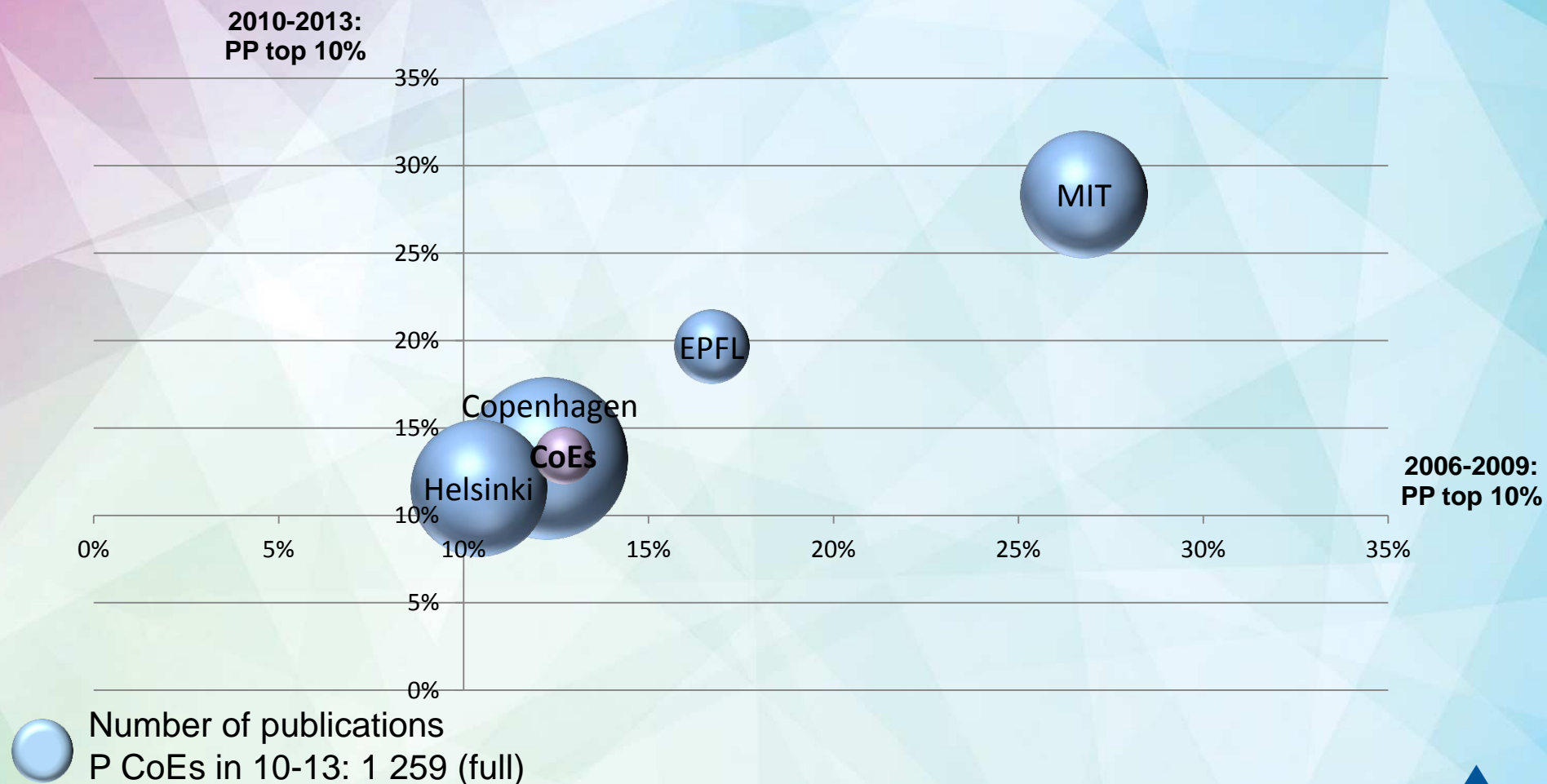
### **3. What is the impact of CoE publications on the level of Finnish science?**

# Bibliometric analysis of Finland and CoEs by main field: PP Top 10%

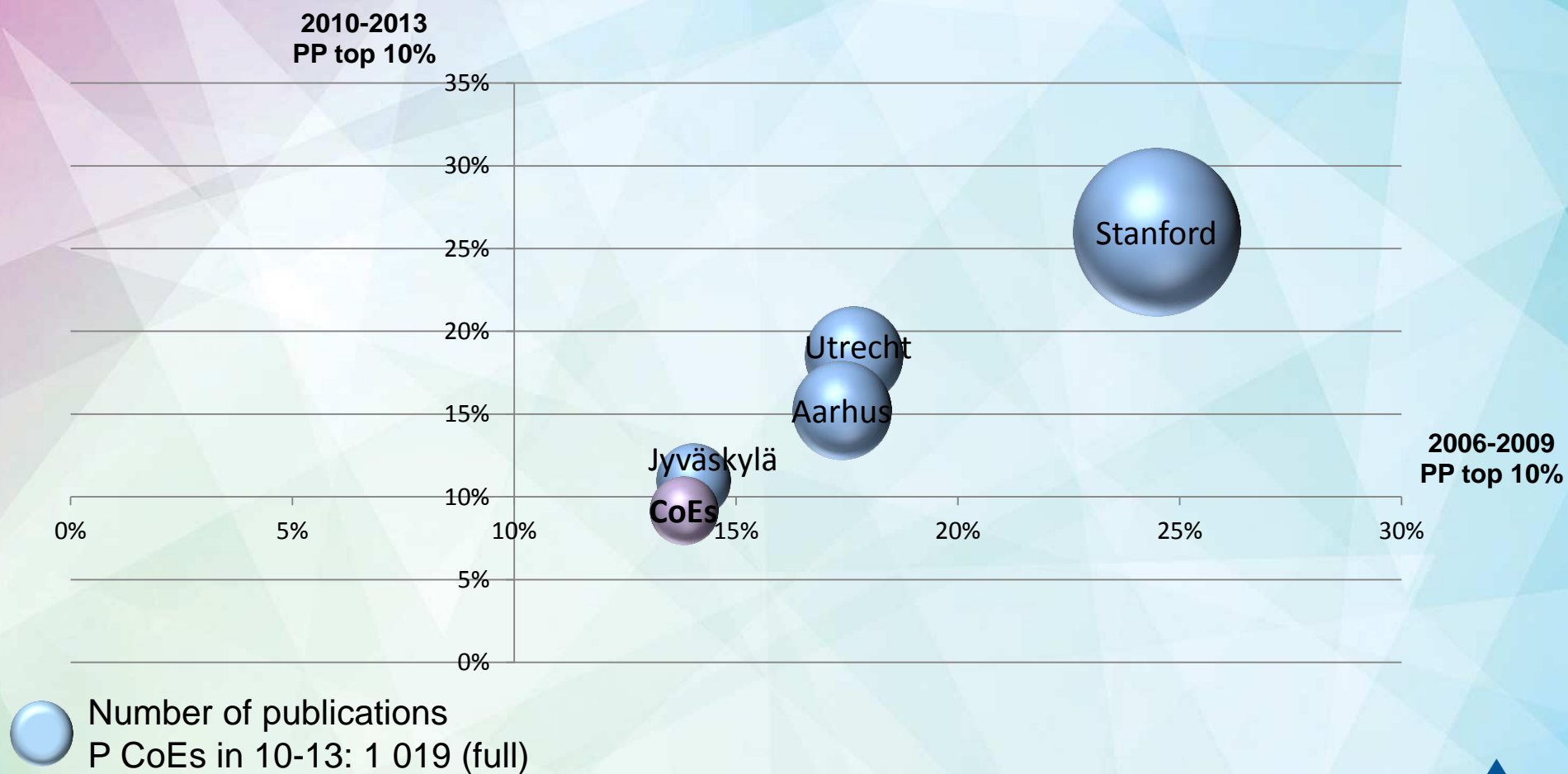


## Some additional results

# CoEs compared to selected universities PP top 10% in Biomedical and health sciences



# CoEs compared to selected universities PP top 10% in Physical sciences and engineering

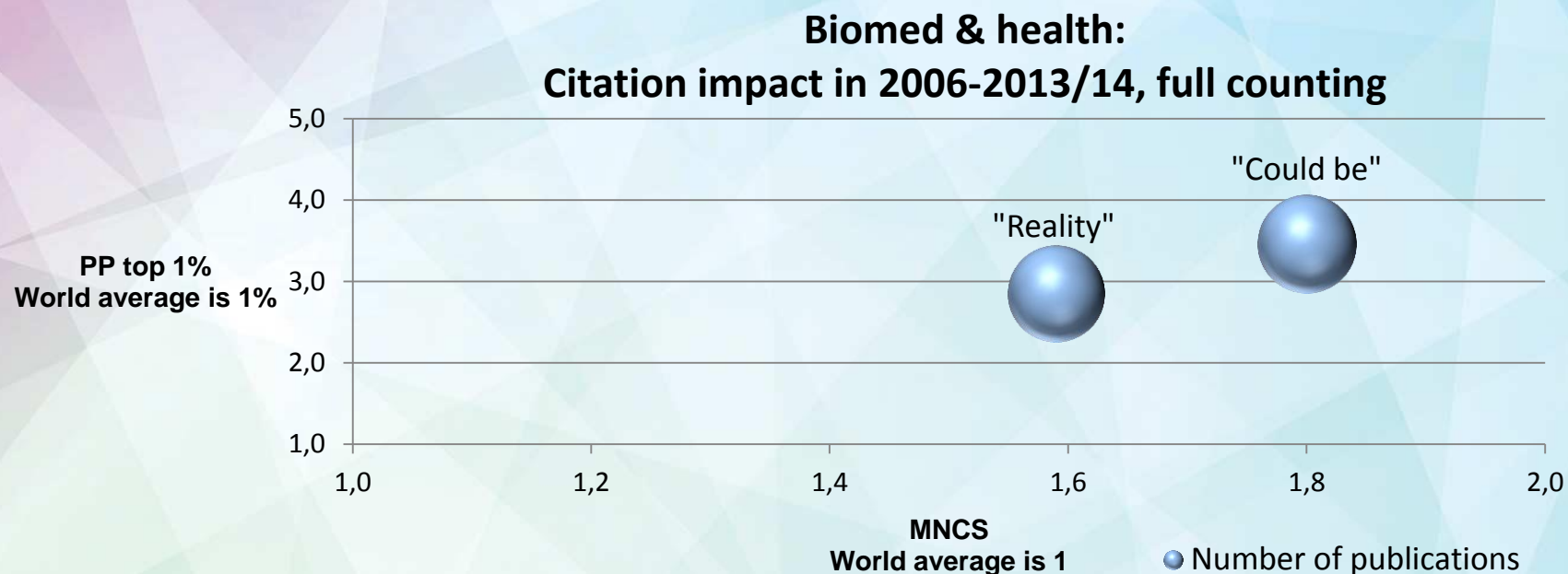


## Bibliometric analysis of CoE publications which did not include an affiliation in Finland (Finnish address)

Unit of Analysis	P (full)	MNCS*	PP top 10%*
CoEs 2006-2013/14 (publications <b>without</b> a Finnish address)	263	3.74	29.6%

\* **Note:** Here the citation analysis is based on full counting. The values would probably be lower if the analysis was based on fractional counting like in other tables and figures in this presentation.

# Bibliometric analysis of CoE publications: The possible effect of affiliation in Biomedical and health sciences



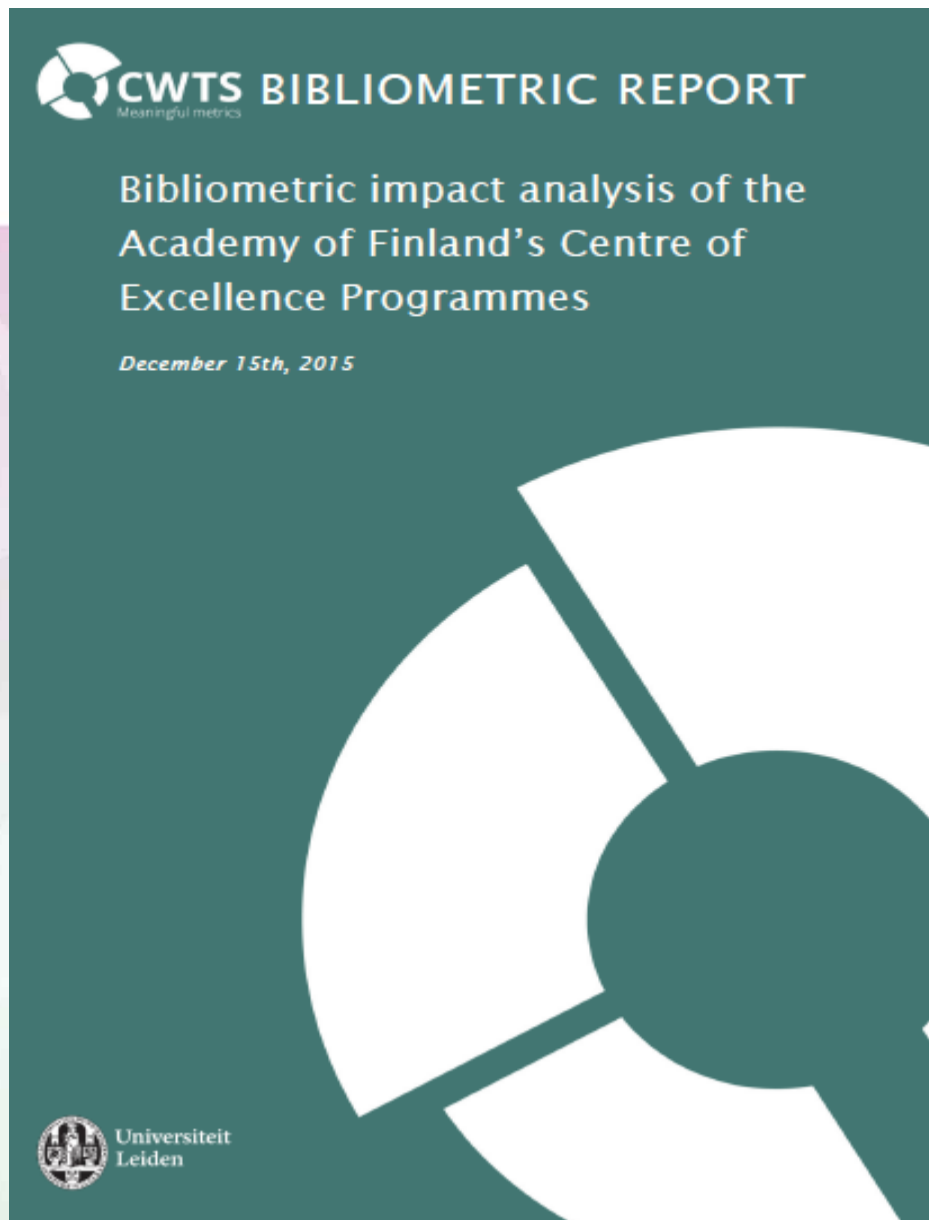
”Reality”: CoE publications with a Finnish address

”Could be”: CoE publications **if** also the publications **without** a Finnish address could be included

## Conclusions

- ▶ Analysis based on around 7 000 CoE publications in WoS
- ▶ Citation impact of CoEs 1.20 to 1.28% at the aggregate level
- ▶ 12%-14% of CoE publications belong to the most highly cited publications
- ▶ **The CoE publications have a substantially higher citation impact than Finnish publications on average**
- ▶ International collaboration has become more important over the years
- ▶ Affiliation counts!





Report is available at

[http://www.aka.fi/en/  
research-and-science-policy/  
centres-of-excellence//](http://www.aka.fi/en/research-and-science-policy/centres-of-excellence//)

More about bibliometrics:  
[www.aka.fi/tieteentila](http://www.aka.fi/tieteentila)



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