Mapeando objetivamente as revistas de Farmácia

Antonio M. MENDES
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Outline

- **Journal-based metrics**
- **What about Pharmacy?**
- **Mapping Pharmacy journals**

Conflicts of interest statement:

- **Yes, I have.**
  - **I'm a pharmacist, a researcher author of papers about clinical pharmacy services, and Editor-in-chief of Pharmacy Practice.**

Bibliometric principles

- Good articles are more cited than bad articles.
- Good journals are more cited than bad journals.

Impact Factor

J. Hyg. 60, 83 (1954).
5. D. Bodian, *Ibid.* 57, 81 (1953).
6. This work was aided by a grant from the

Sci. 222, 292 (1951).
16. A. B. Sabin and R. Ward, cited in *J. Mt. Sinai Hosp.* 11, 185 (1944).

26. H. A. Howe, D. Bodian, I. M. Morgan, *Am. J. Hyg.* 51, 85, (1950).
27. H. A. Howe, *Am. J. Hyg.* 60, 371 (1954).

Citation Indexes for Science

A New Dimension in Documentation

through Associati

Eu

"The uncritical citation of disputed data by a writer, whether it be deliberate or not, is a serious matter. Of course,

approach to s
ture of scienc
construction,

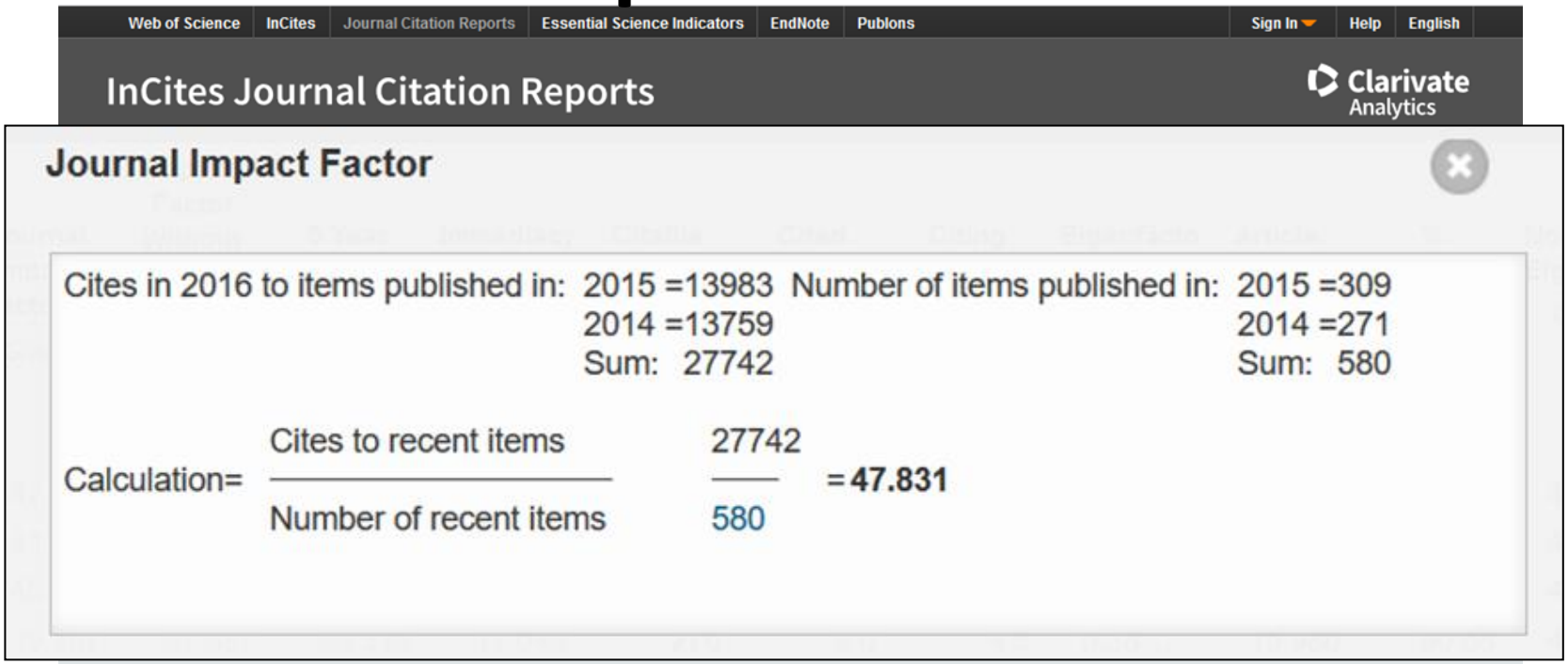
case. Classified indexes are also dependent upon a subject analysis of individual articles and, at best, offer us better consistency of indexing rather than greater specificity or multiplicity in the subject approach. Similarly, terminology is important, but even an ideal standardization of terminology and nomenclature will not solve the problem of subject

Such an "impact factor" may be much more indicative than an absolute count of the number of a scientist's publications, which was used by Lehman (*3*) and Dennis (*4*). The "impact factor" is similar to the quantitative measure obtained by Gross (*5*) in evaluating the relative importance of scientific journals, a method later criticized by Brodman (*6*) but used again by Fussler (*7*).

Garfield E. Citation indexes for science; a new dimension in documentation through association of ideas. Science. 1955;122(3159):108-111,

Impact Factor

Impact Factor



Key Indicators

Year	Total Cites Graph	Journal Impact Factor Graph	Impact Factor Without Journal Self Cites Graph	5 Year Impact Factor Graph	Immediacy Index Graph	Citable Items Graph	Cited Half-Life Graph	Citing Half-Life Graph	Eigenfactor Score Graph	Article Influence Score Graph	% Articles in Citable Items Graph	Normalized Eigenfactor Graph	Average JIF Percentile Graph
2016	214,732	47.831	46.465	48.082	16.303	337	9.0	4.7	0.40...	19.450	79.23	46.4...	99.032
2015	195,553	44.002	42.579	46.119	13.210	309	9.0	4.7	0.40...	19.136	91.91	46.4...	99.032
2014	185,361	45.217	43.967	42.724	12.967	271	9.2	4.7	0.39...	17.592	91.14	44.3...	99.026
2013	176,528	39.207	37.887	39.315	12.649	276	9.0	4.5	0.38...	15.986	90.58	41.9...	99.038
2012	166,922	39.060	37.888	36.427	9.556	313	9.1	4.8	0.36...	14.575	91.69	Not A...	99.032
2011	158,906	38.278	37.025	33.797	10.576	276	8.9	4.3	0.36...	13.611	94.57	Not A...	99.032

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Is the IF reliable to measure the quality of the scientific production of a researcher?

- Can we compare the IF of two different articles?
- Can we compare the summation of the IF between two authors?
- Can we compare the number of articles with IF between two authors?

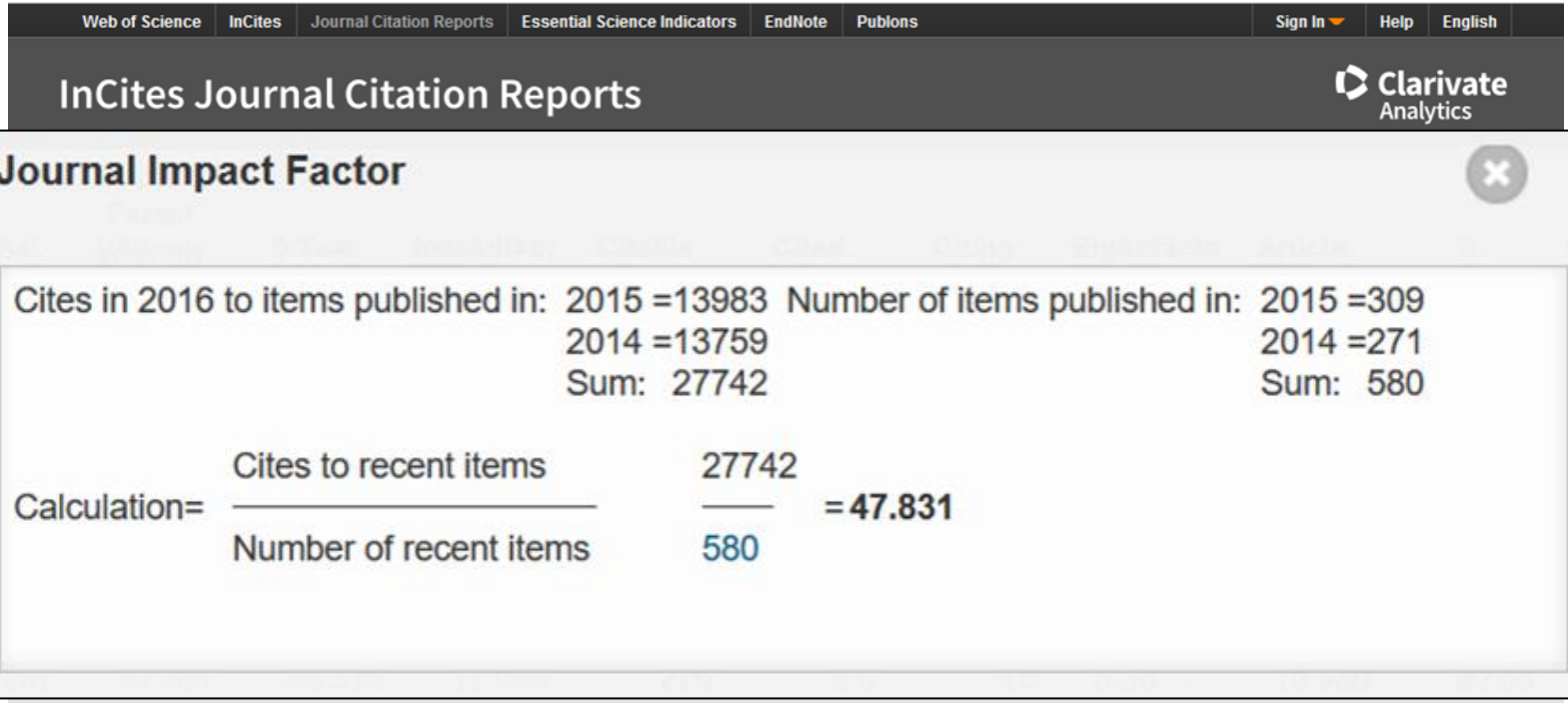
Problem #1: the denominator?

- Does the IF calculation divide by the number of all the articles published in a journal?
  - (Including original research articles, reviews, lleters, editorials, etc?)

Table 3. Grading System Used in Algorithm for Determining Substantial Articles

Information Supplied	Points Received
Author	
Anonymous	-1
One author	0
More than one author	+1
Address	
No address	0
Any address	+1
Pages	
Less than two	0
Two	+1
Three	+2
Four	+3
Five or more	+4
References	
Less than two	0
Two to four	+1
Five to eight	+2
More than eight	+3
Page overlap	
No article overlap	0
End overlaps next article	-1
Start overlaps previous article	-1
Start overlaps and end overlaps	-2

Problem #1: the denominator?



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Problem #1: the denominator?

2015
1992 articles

2014
1770 articles

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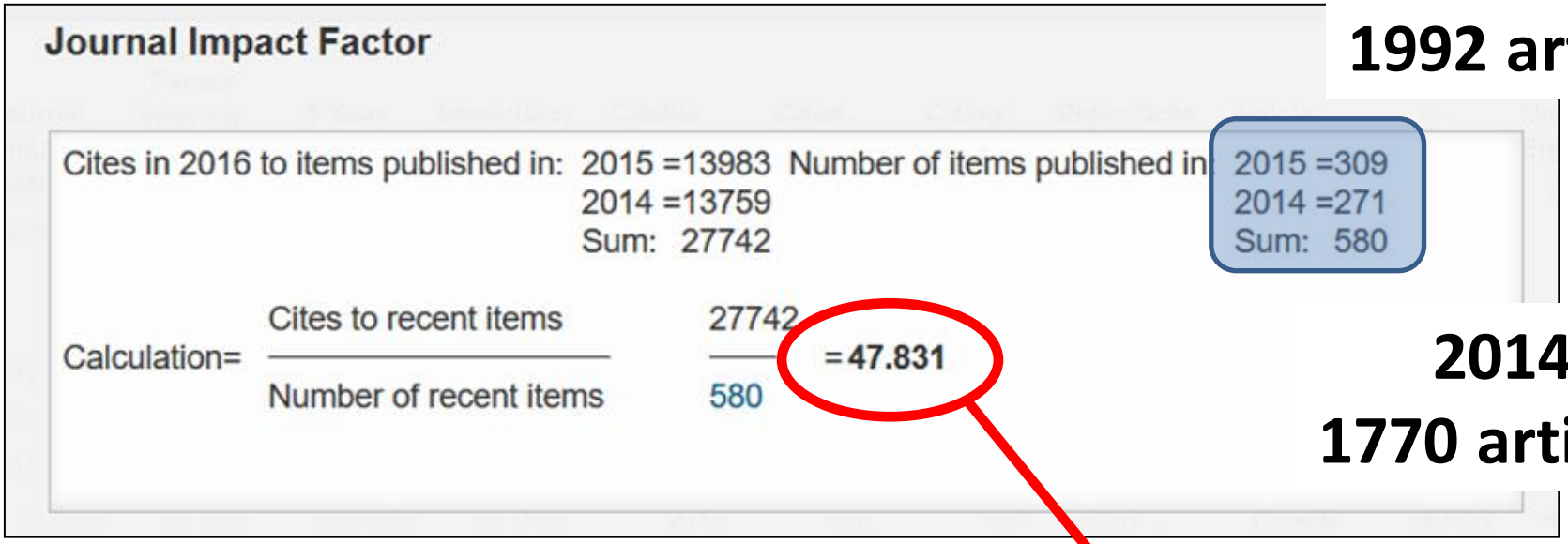


2014
1770 articles

=6.925

Problem #2: Only 2 years

- Why only 2 years?
- Why do we ignore citations of articles published in 2017 to articles published in 2014, 2013, 2012 … ?

- Cited Half-life: Median age of the articles that were cited in the year.

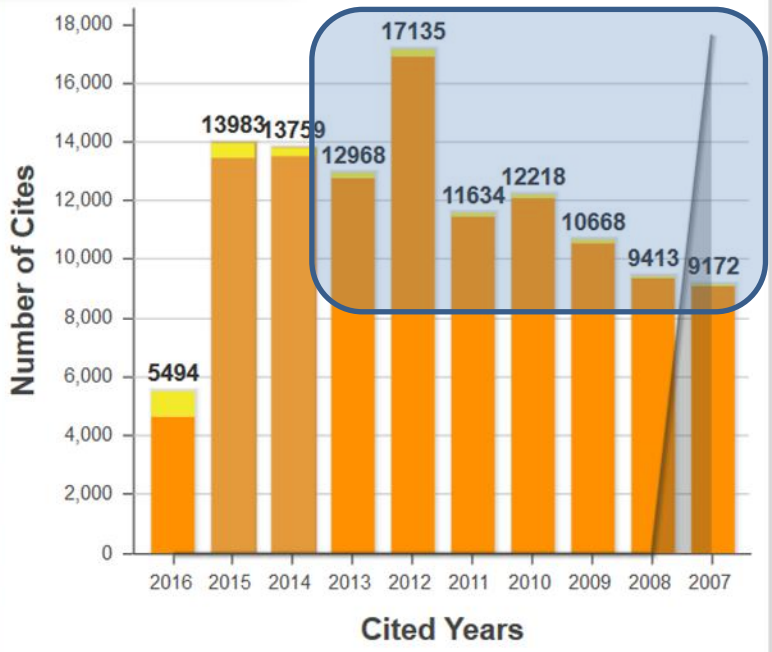
Problem #2: Only 2 years

Cited Half-life
Lancet: 9.0

Cited Half-Life Data

Cited Year	2016	2015	2014	2013	2012	2011	2010	2009
#Cites from 2016	5,494	13,983	13,759	12,968	17,135	11,634	12,218	10,668
Cumulative %	2.56	9.07	15.48	21.52	29.50	34.91	40.60	45.57

Cited Journal Graph



Cited Half-Life

The Cited Journal Graph shows the distribution by cited year of citations to articles published in a journal.

The white/grey division indicates the approximate position of the cited half-life (if < 10.0). Half of the journal's cited articles were published more recently than the cited half-life.

The top (gold or yellow) portion of each column indicates journal self-citations: citations to articles in the journal from articles in the same journal.
The bottom (dark orange) portion of each column indicates non-self citations: citations to the journal from articles in other journals.
The two light orange columns indicate citations used to calculate the Impact Factor (always the 2nd and 3rd columns)

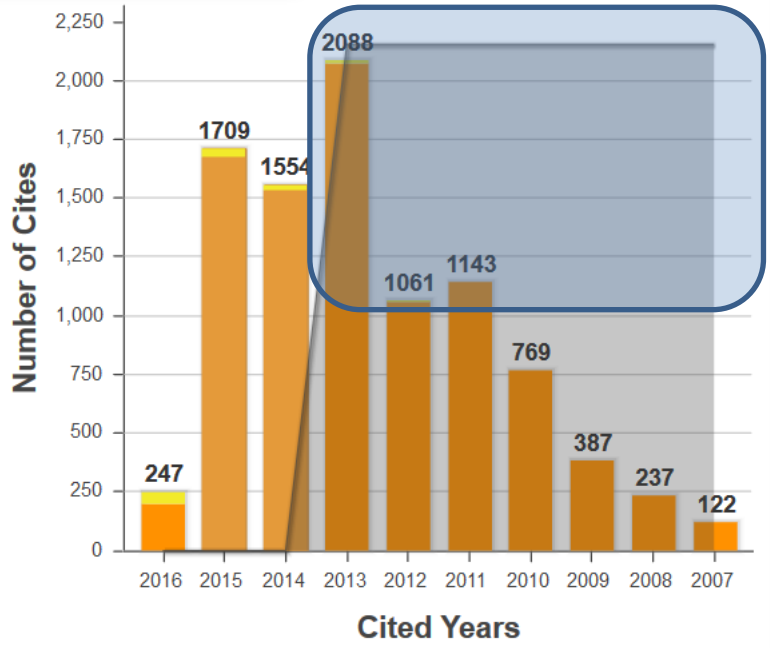
Problem #2: Only 2 years

Cited Half-life
BMC Med: 3.7

Cited Half-Life Data

Cited Year	2016	2015	2014	2013	2012	2011	2010	2009
#Cites from 2016	247	1,709	1,554	2,088	1,061	1,143	769	387
Cumulative %	2.53	20.03	35.94	57.33	68.19	79.90	87.77	91.74

Cited Journal Graph



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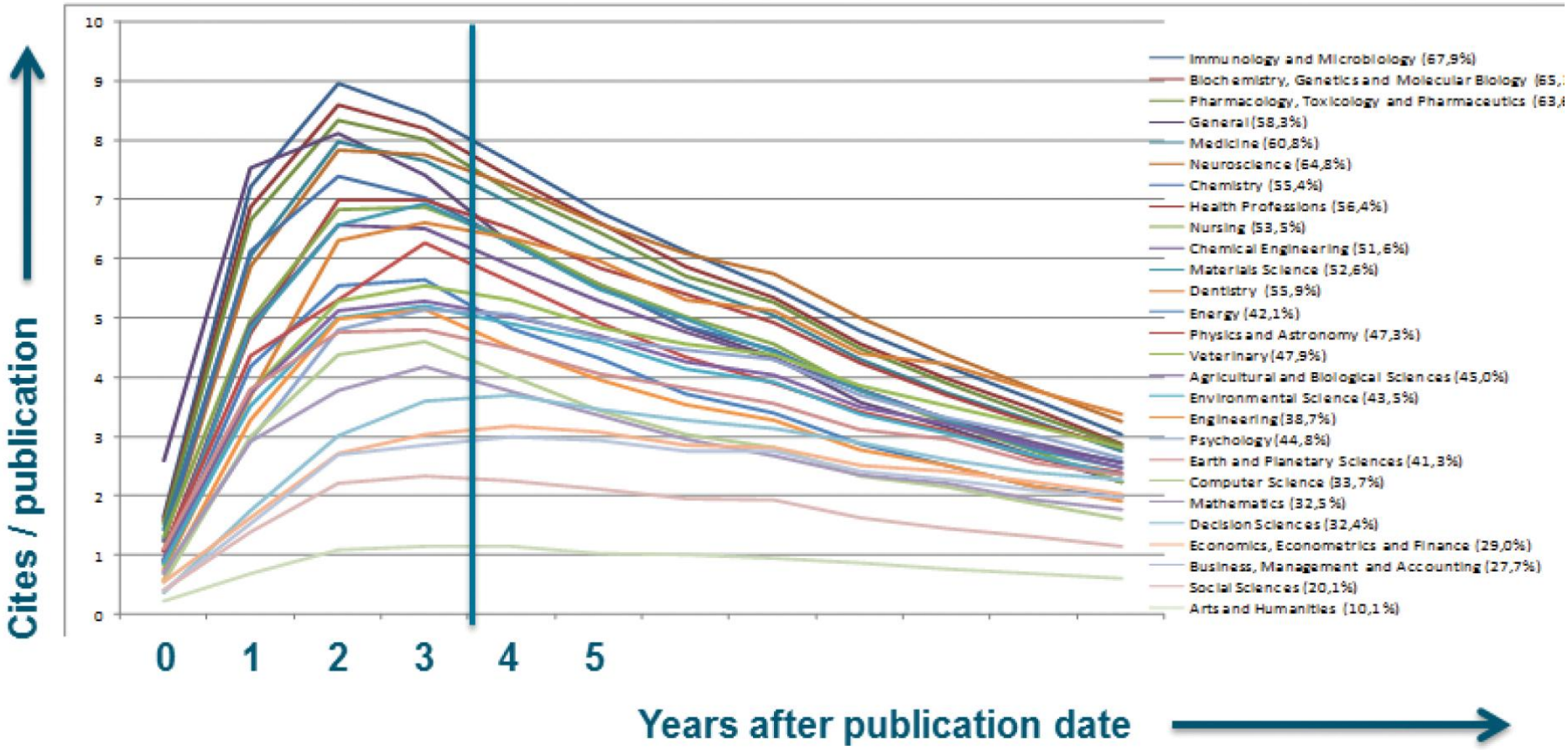
Problem #2: Only 2 years



Problem #3: the numerator

- **Do <u>all</u> the citations from <u>all</u> the journals in the world count for the IF?**

Problem #3: the numerator

- Selective coverage of WoS: source where citations are obtained

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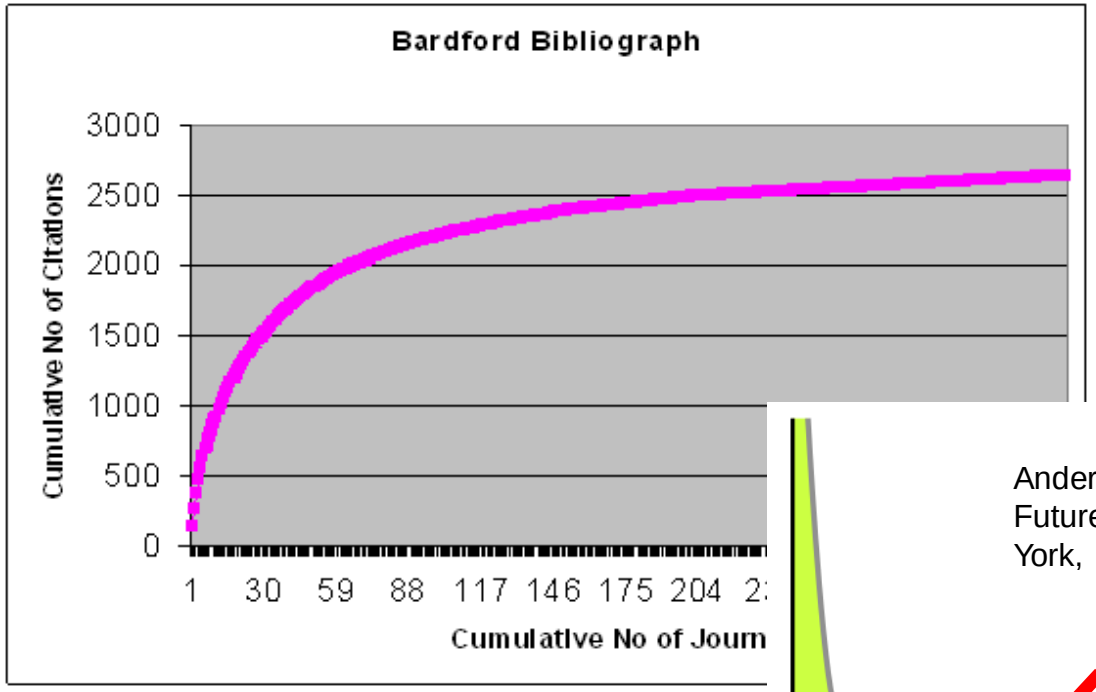
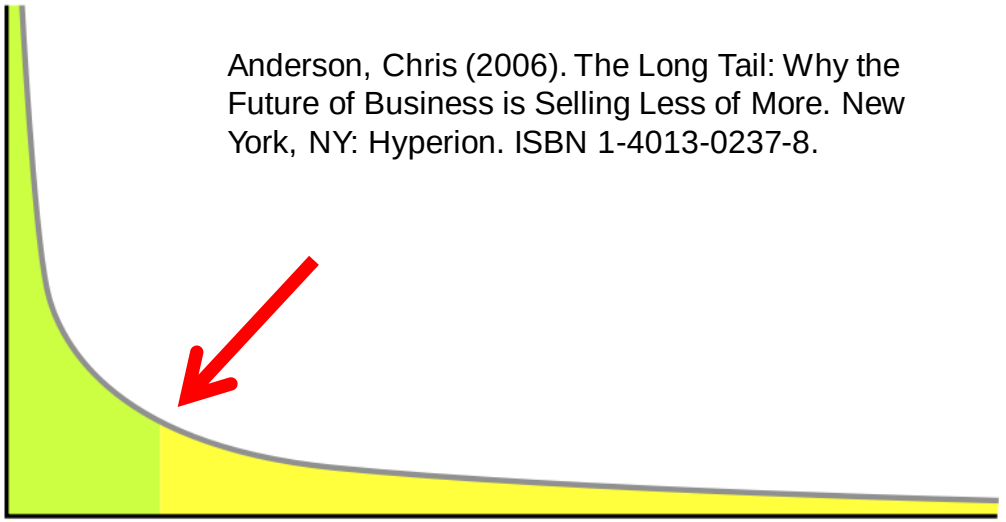
- Selective coverage of WoS: source where citations are obtained

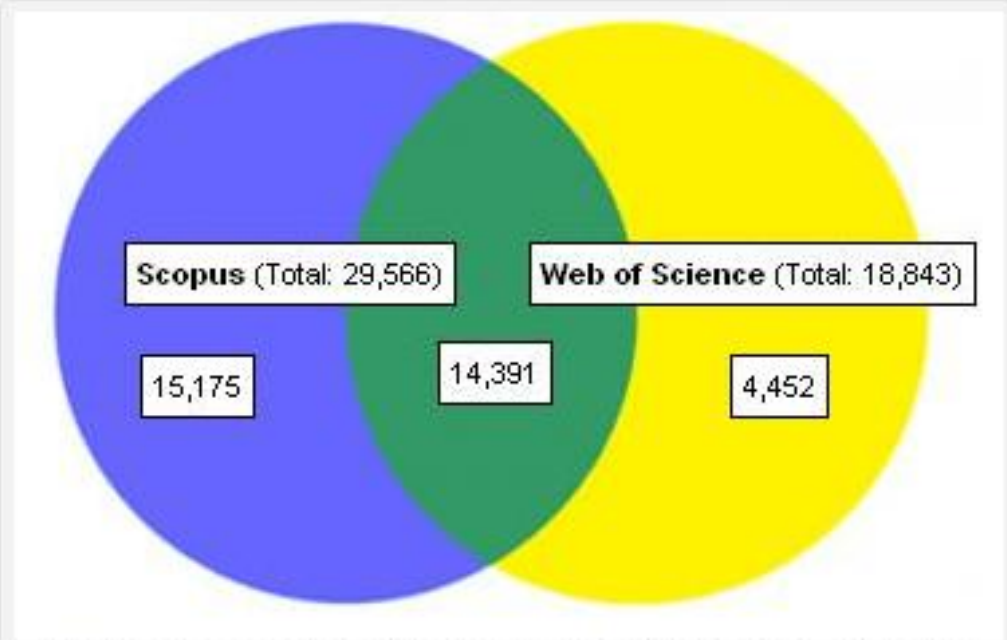




Anderson, Chris (2006). The Long Tail: Why the Future of Business is Selling Less of More. New York, NY: Hyperion. ISBN 1-4013-0237-8.

Problem #3: the numerator

- Contents



JISC-ADAT comparison of Scopus vs. Web of Science journal lists, both active and inactive titles, 2/28/2011

http://intellogist.wordpress.com/2011/02/25/2406

Differences among disciplines

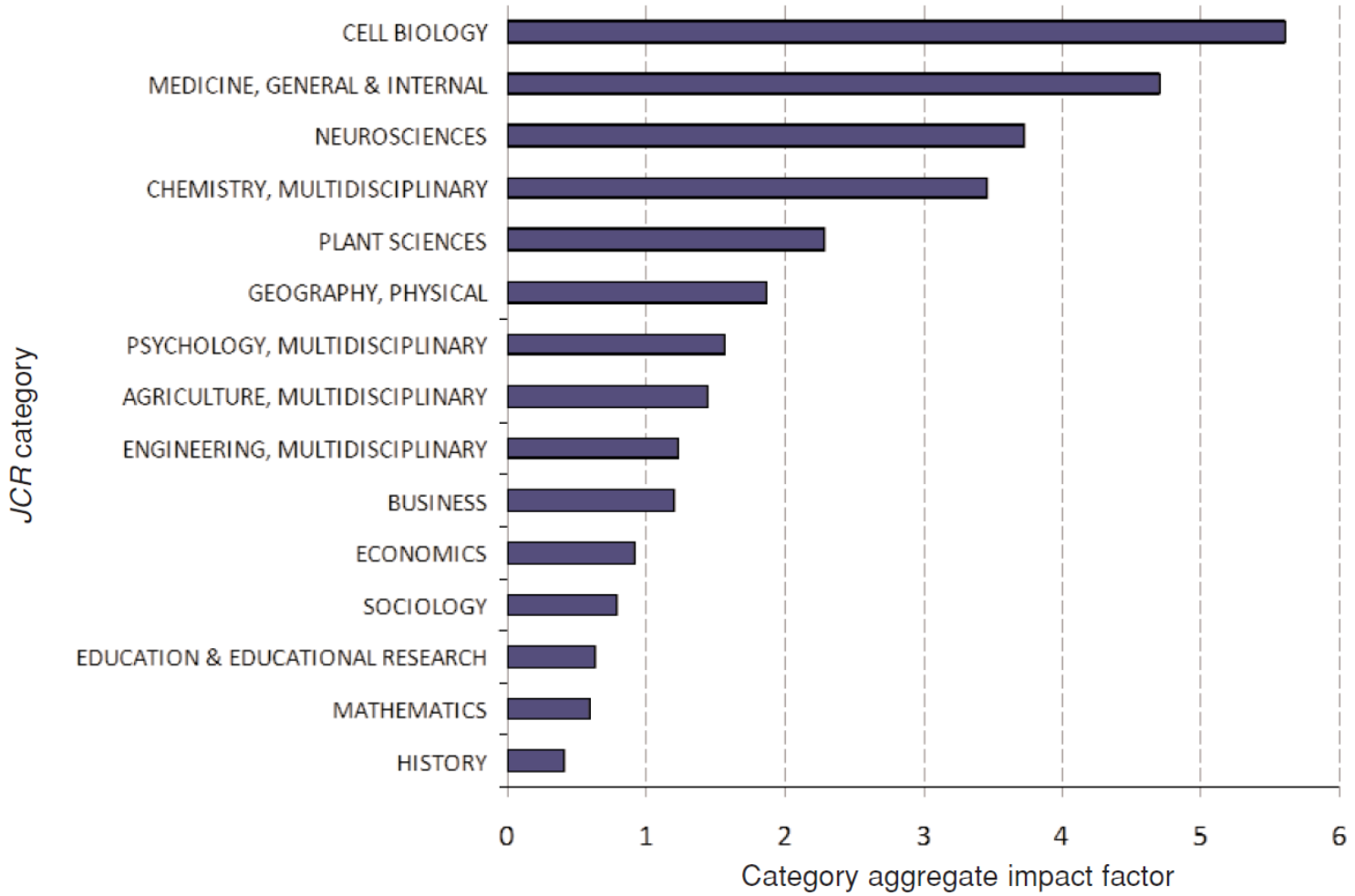


Figure 1. Impact factors for 15 categories from the 2007 JCRs

https://www.uksg.org/sites/uksg.org/files/19-Cross-H76M463XL884HK78.pdf

San Francisco DORA

Declaration on Research Assessment

The Journal Impact Factor is frequently used as the primary parameter with which to compare the scientific output of individuals and institutions. The Journal Impact Factor, as calculated by Thomson Reuters,* was originally created as a tool to help librarians identify journals to purchase, not as a measure of the scientific quality of research in an article. With that in mind, it is critical to understand that the Journal Impact Factor has a number of well-documented deficiencies as a tool for research assessment. These limitations include: A) citation distributions within journals are highly skewed [1–3]; B) the properties of the Journal Impact Factor are field-specific: it is a composite of multiple, highly diverse article types, including primary research papers and reviews [1, 4]; C) Journal Impact Factors can be manipulated (or "gamed") by editorial policy [5]; and D) data used to calculate the Journal Impact Factors are neither transparent nor openly available to the public [4, 6, 7].

http://www.ascb.org/dora/

San Francisco DORA

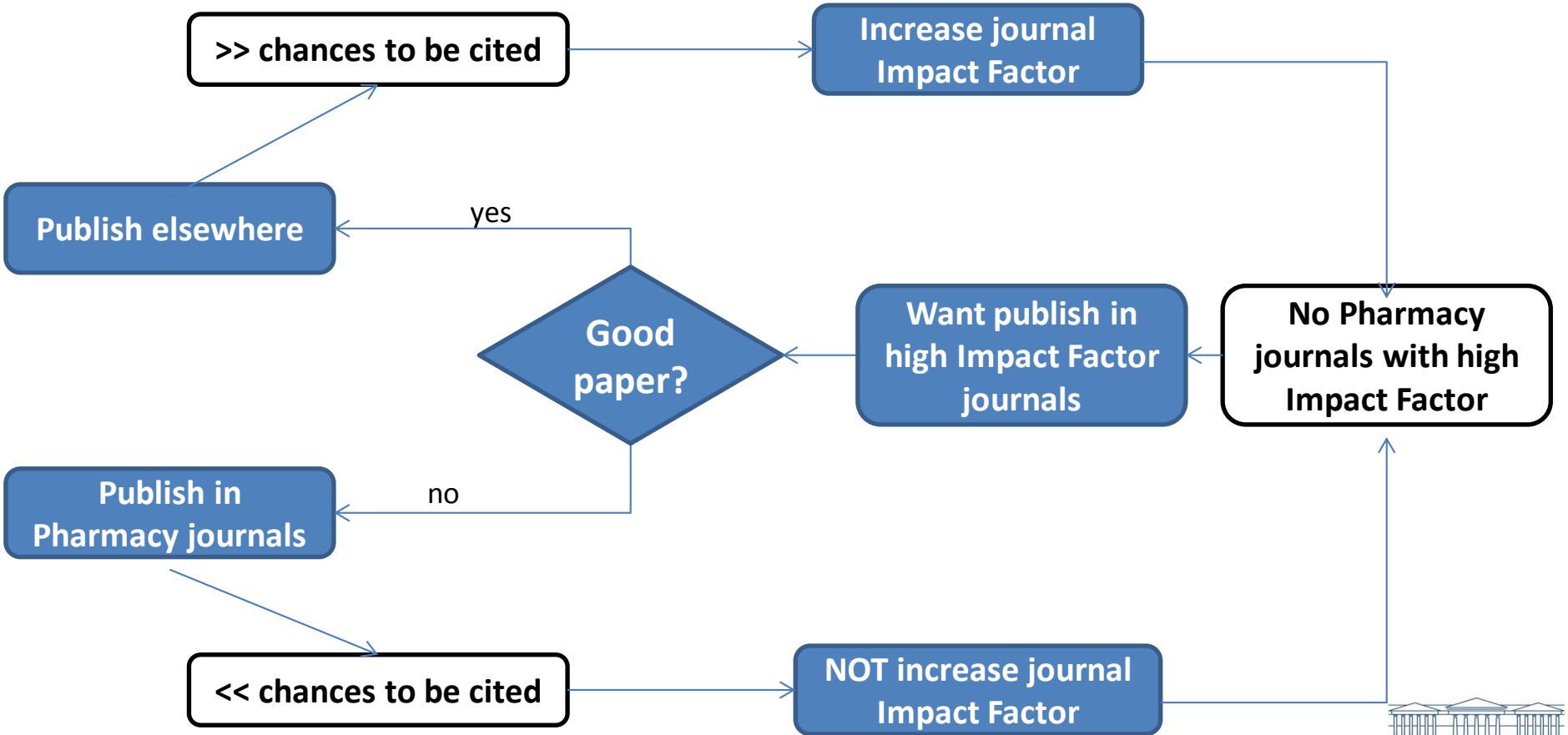
Declaration on Research Assessment

The signatories of the *San Francisco Declaration on Research Assessment* support the adoption of the following practices in research assessment.

General Recommendation

1. Do not use journal-based metrics, such as Journal Impact Factors, as a surrogate measure of the quality of individual research articles, to assess an individual scientist's contributions, or in hiring, promotion, or funding decisions.

http://www.ascb.org/dora/


>> chances to be cited
Increase journal Impact Factor
Publish elsewhere
yes
Good paper?
Want publish in high Impact Factor journals
No Pharmacy journals with high Impact Factor
Publish in Pharmacy journals
no
<< chances to be cited
NOT increase journal Impact Factor

And what about Pharmacy?

Is pharmacy sufficiently covered?

Pharmacology and Pharmacy

Category Name **Pharmacology & Pharmacy**

Category Description

Pharmacology & Pharmacy covers resources on the discovery and testing of bioactive substances, including animal research, clinical experience, delivery systems, and dispensing of drugs. This category also includes resources on the biochemistry, metabolism, and toxic or adverse effects of drugs.

http://mjl.clarivate.com/scope/scope_scie/

Int J Clin Pharm (2017) 39:989–997
DOI 10.1007/s11096-017-0527-2

RESEARCH ARTICLE

Redefining the pharmacology and pharmacy subject category in the journal citation reports using medical subject headings (MeSH)

Fernando Minguet[1] · Teresa M. Salgado[2] · Claudio Santopadre[3] · Fernando Fernandez-Llimos[4]

- The aim of this study was to subdivide the current JCR Pharmacology and Pharmacy subject category into three potential categories—'basic pharmacology', 'clinical pharmacology', and 'pharmacy'—based on the analyses of MeSH terms assigned to articles as a proxy of the journals' scope.

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- Identify all the journals in the 'Pharmacology & Pharmacy' Subject Category of the JCR.
- Extract from PubMed all the MeSH terms of the articles published in 2013, 2014 and 2015.
- Cluster analyses (13) using selected MeSH tree branches

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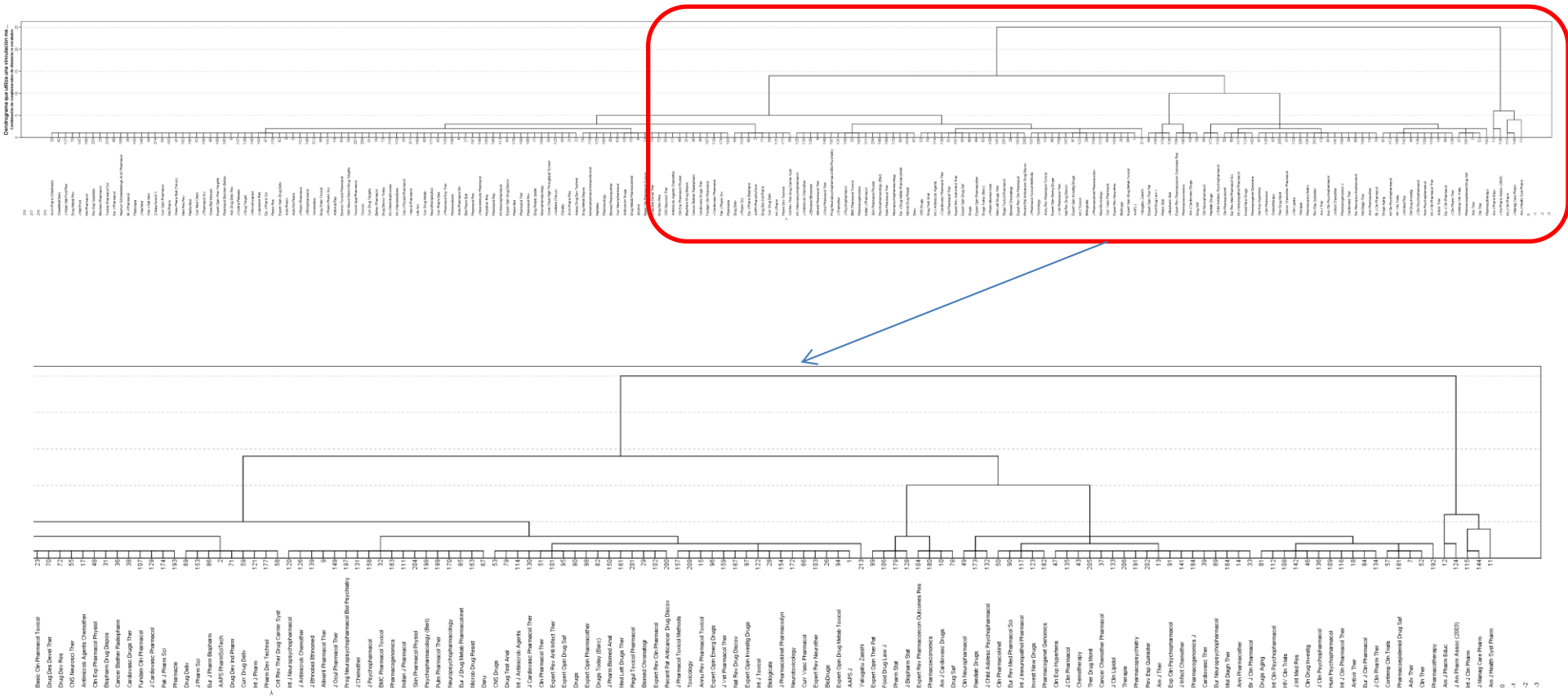

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CrossMark

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Model tested	Cluster 1: basic pharmacology No. journals	Cluster 2: clinical pharmacology No. journals	Cluster 3: pharmacy No. journals
Model 1. MeSH categories (M + N) + Branch (Pharmacy)	159	50	5 (Am J Health Syst Pharm, Am J Pharm Educ, Int J Clin Pharm, J Am Pharm Assoc (2003), J Manag Care Pharm)
Model 2. MeSH categories (M + N) + Branches (Pharmacy + PK)	165	44	5 (Am J Health Syst Pharm, Am J Pharm Educ, Int J Clin Pharm, J Am Pharm Assoc (2003), J Manag Care Pharm)
Model 3. MeSH categories (M + N) + Branches (Pharmacy + PK + Studies)	165	46	3 (Am J Health Syst Pharm, Am J Pharm Educ, J Am Pharm Assoc (2003))
Model 4. MeSH categories (M + N) + Branches (Pharmacy + Studies)	148	61	5 (Am J Health Syst Pharm, Am J Pharm Educ, Int J Clin Pharm, J Am Pharm Assoc (2003), J Manag Care Pharm)
Model 5. MeSH categories (M + N) + Branches (Pharmacy + Age)	119	90	5 (Am J Health Syst Pharm, Am J Pharm Educ, Int J Clin Pharm, J Am Pharm Assoc (2003), J Manag Care Pharm)
Model 6. MeSH Categories (M + N) + Branches (Pharmacy + Age + PK)	172	39	3 (Am J Health Syst Pharm, Am J Pharm Educ, J Am Pharm Assoc (2003))
Model 7. MeSH Categories (M + N) + Branches (Pharmacy + Age + Studies)	156	53	5 (Am J Health Syst Pharm, Am J Pharm Educ, Int J Clin Pharm, J Am Pharm Assoc (2003), J Manag Care Pharm)
Model 8. MeSH Categories (M + N) + Branches (Pharmacy + Animals + Age)	111	98	5 (Am J Health Syst Pharm, Am J Pharm Educ, Int J Clin Pharm, J Am Pharm Assoc (2003), J Manag Care Pharm)
Model 9. MeSH Categories (M + N) + Branches (Pharmacy + Animals + PK)	133	76	5 (Am J Health Syst Pharm, Am J Pharm Educ, Int J Clin Pharm, J Am Pharm Assoc (2003), J Manag Care Pharm)

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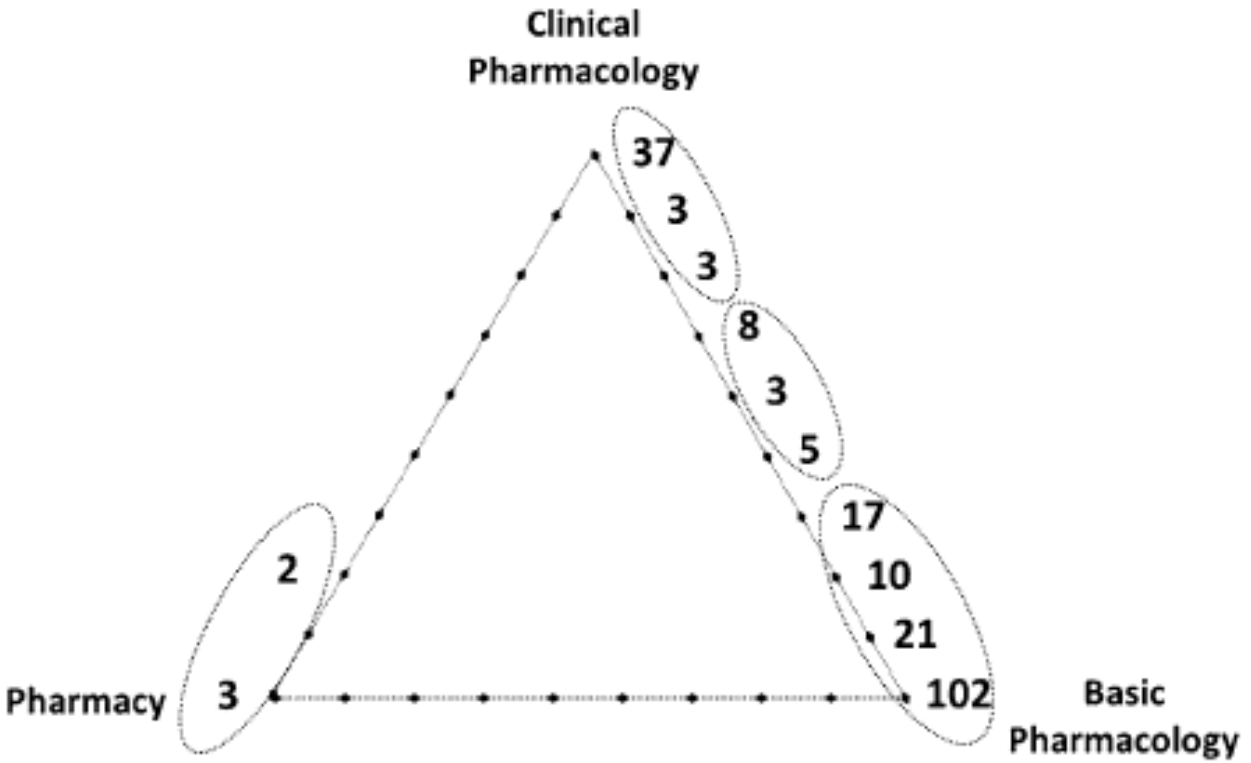


Fig. 1 Number of times that each journal fell within each of the three clusters (basic, clinical pharmacology or pharmacy) in the nine models tested

Objectivo

- **Mapear as subdivisões da área da Farmácia a partir dos artigos publicados em revistas científicas, com base nos titulos dos artigos.**

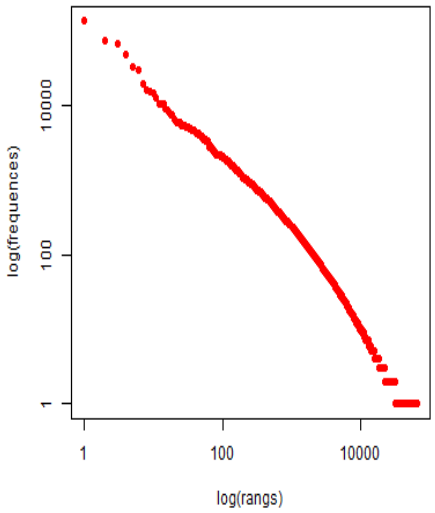
Pharmacy Journals: Identification

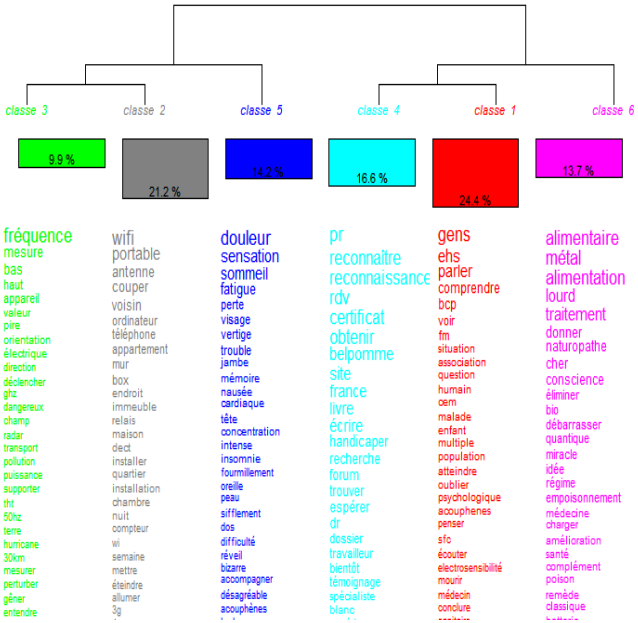
- Active journals (2006-2016)
- Pharmacy related terms
  - pharmacy, pharmacist*, pharmacotherap*, pharmaceuti* or pharmacol*
- Databases
  - NLM catalog (Medline);
  - PubMed Central Journal List;
  - CiteScore Metrics (Scopus);
  - Journal of Citation Reports (WoS).

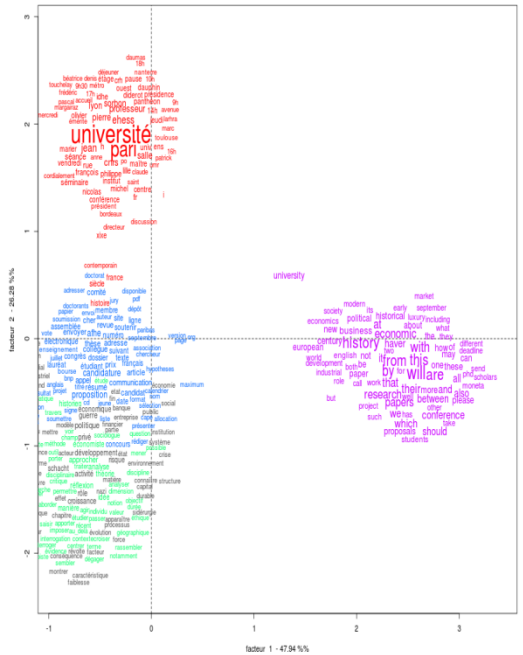
Pharmacy Journals: Text corpus analysis

- Titles of all the articles published (2006-2016).
- Lexicographic analysis (Iramuteq 0.7 alpha 2)
  - Text segments (TS) – Lexical analysis unit
  - Frequency of words
- Descending Hierarchical Classification (DHC)
  - Words and Journals - Similar lexical groups
- Factorial Correspondence Analyses (FCA)
  - 2D and 3D graphs – Words and Journals similarity visualization

IRaMuTeQ







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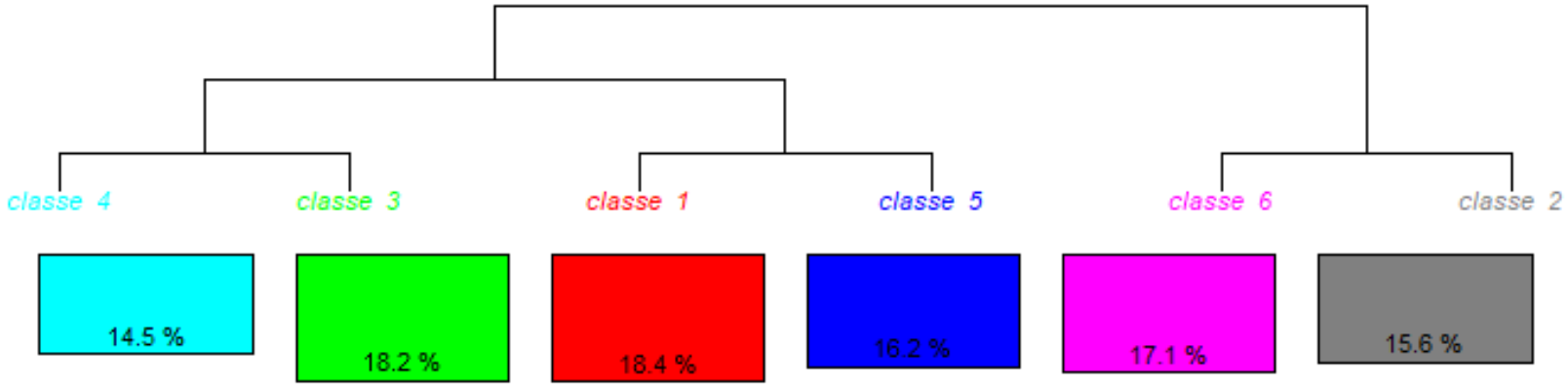
Pharmacy Journals: Results

- **285 journals**
- **397,477 articles**
  - **Mean=1,394; SD=2,056**
  - **Median=713; IQR=247 : 1,718**

Pharmacy Journals: Results (I)



determination
hplc
chromatography
method
liquid
m
spectrometry
simultaneous
mass
extract
lc
synthesis
plasma
activity
validation
leaf
tandem
rp
plant
chromatographic
performance
quantification
spectrophotometric
antioxidant
derivative
estimation
medicinal

delivery
formulation
release
nanoparticles
load
solid
tablet
dry
chitosan
preparation
characterization
polymer
vitro
drug
evaluation
dispersion
dissolution
carrier
coat
system
poly
particle
design
microspheres
powder
sustain
lipid
solubility

patient
trial
treatment
randomize
dose
disorder
healthy
blind
placebo
clinical
pharmacokinetics
case
child
schizophrenia
double
subject
safety
population
report
therapy
syndrome
volunteer
adolescent
meta
bipolar
antipsychotic
efficacy

pharmacy
pharmacist
care
health
medication
practice
hospital
community
student
service
program
education
medical
management
medicine
professional
prescribe
information
teach
perception
knowledge
prescription
survey
experience
attitude
implementation
error
learn

receptor
channel
rat
muscle
vascular
ischemia
reperfusion
induce
injury
smooth
nitric
artery
mouse
cardiac
oxide
myocardial
endothelial
role
angiotensin
function
heart
effect
ca2
cerebral
guinea
mechanism

cell
apoptosis
expression
human
induce
pathway
cancer
signal
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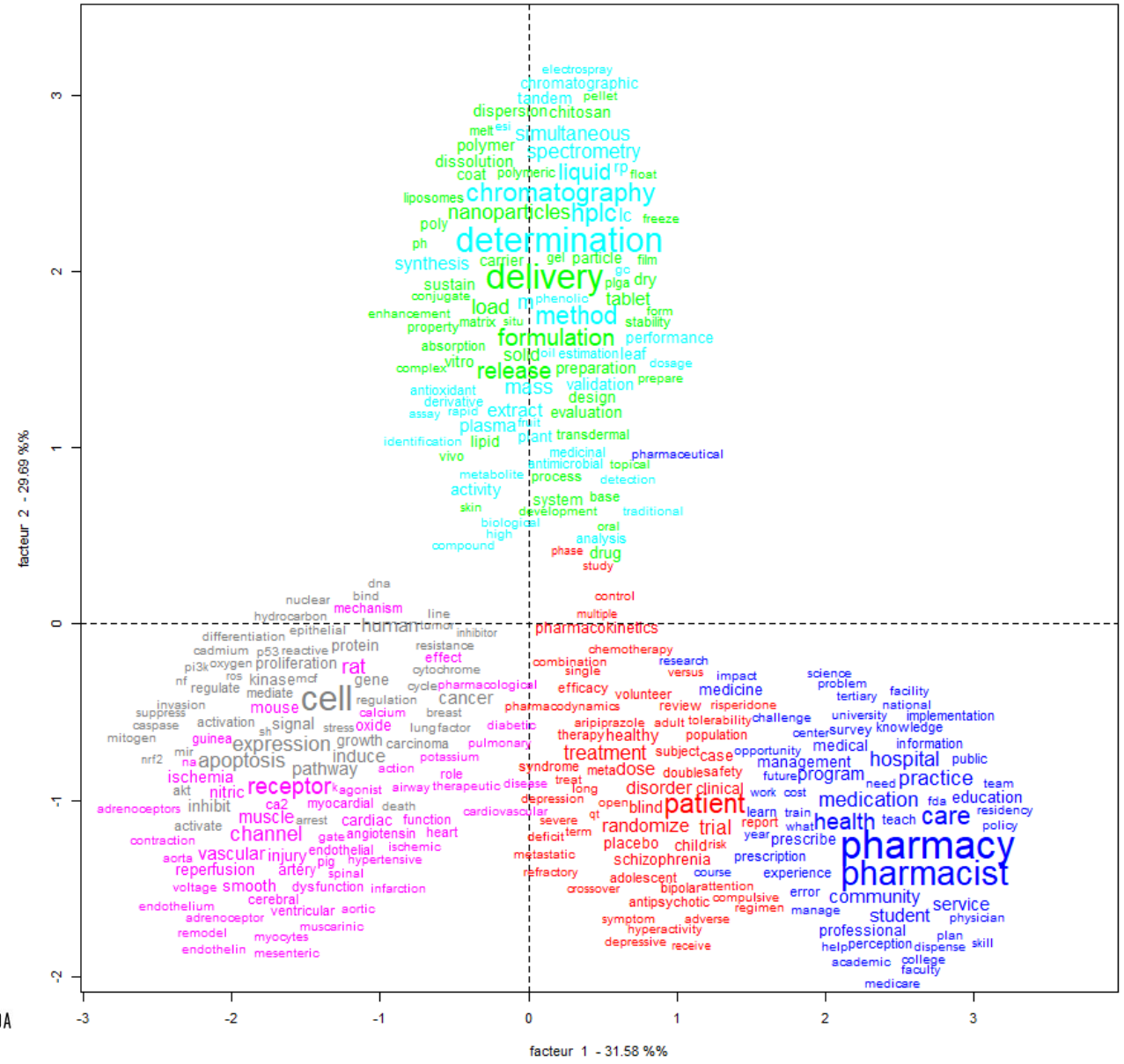
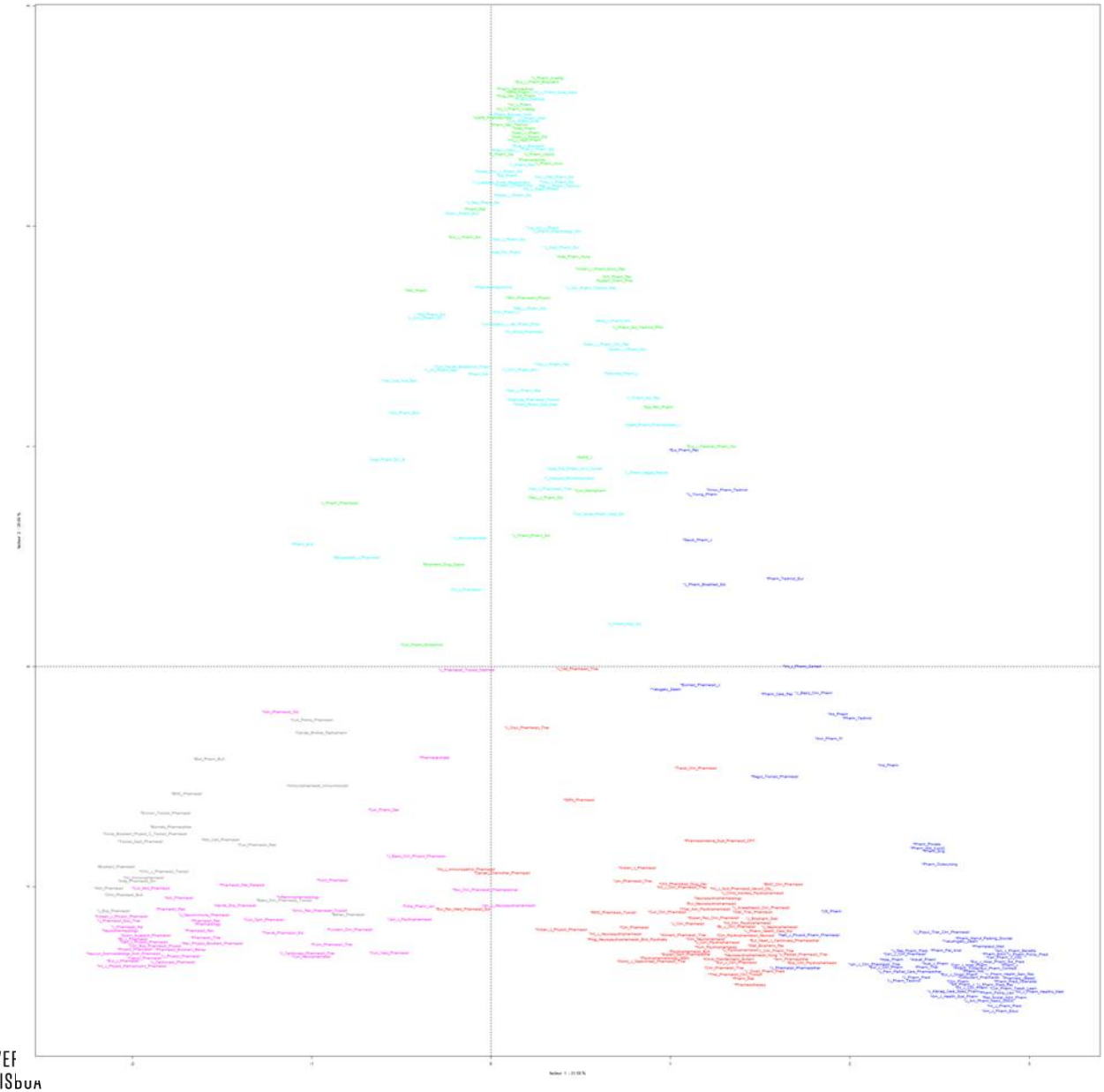
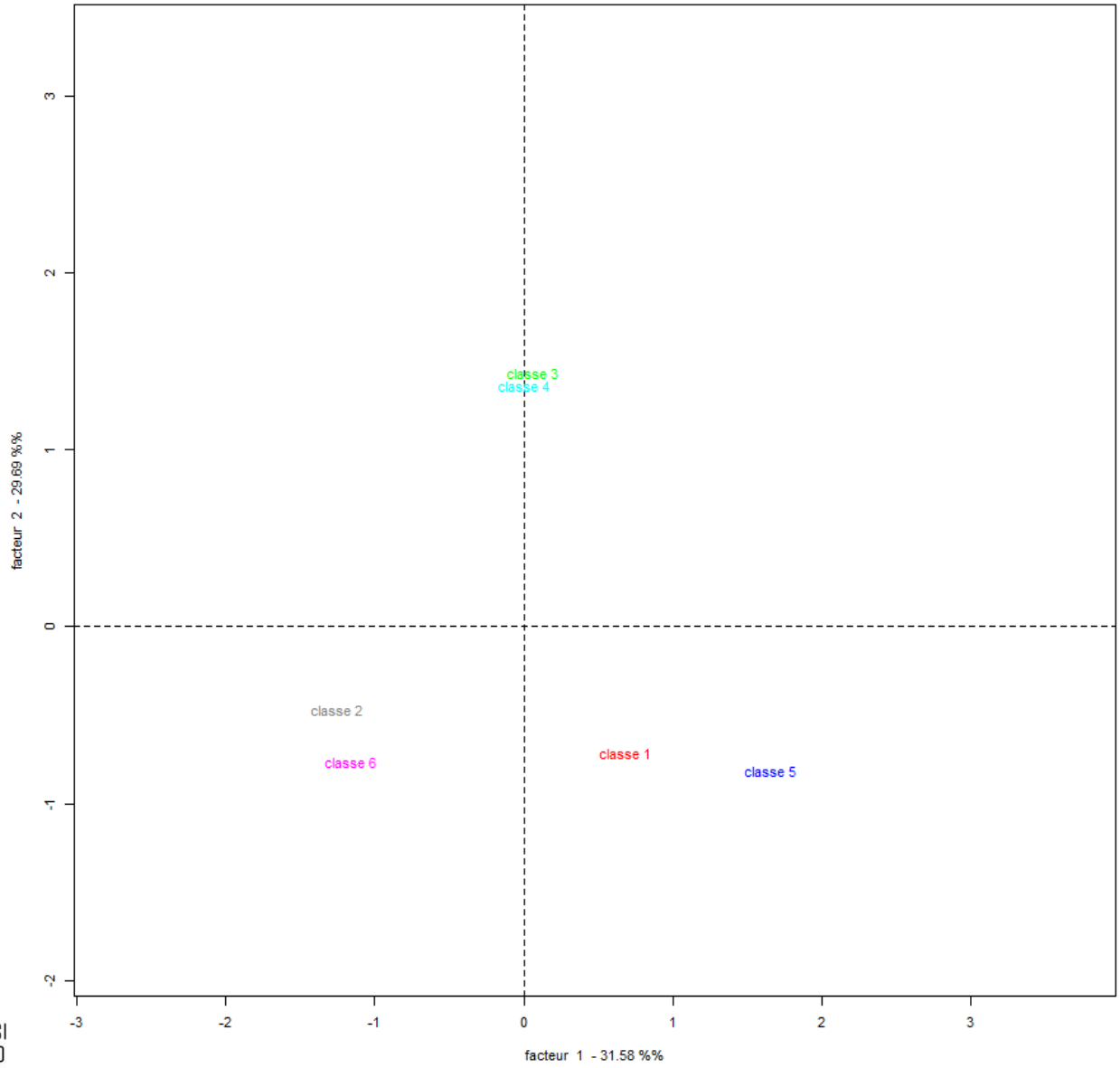
Pharmacy Journals: Results (II)



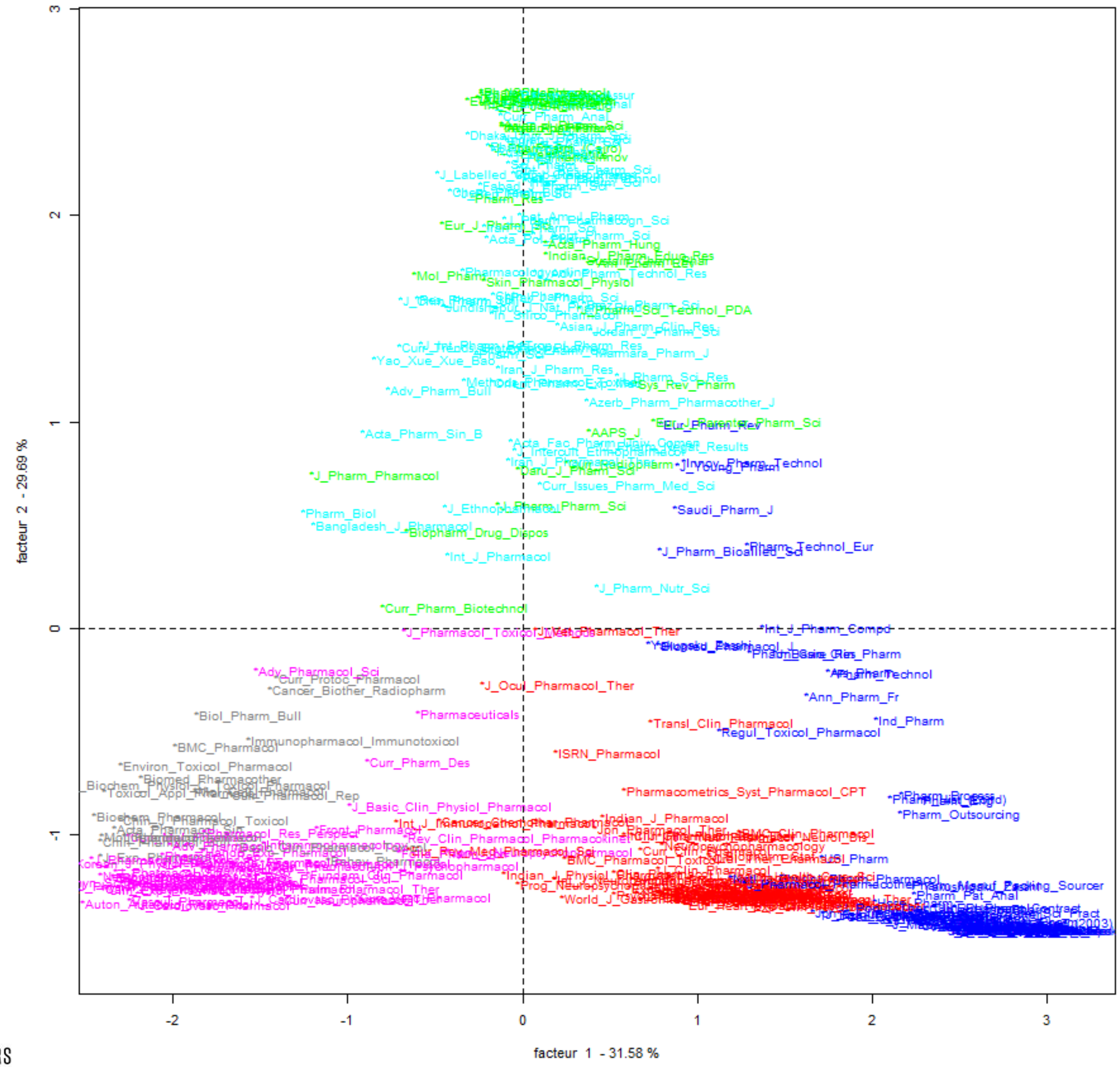
Pharmacy Journals: Results (IV)



Pharmacy Journals: Results (III)



Pharmacy Journals: Results (III)



Pharmacy Journals: Results (V)

Class	Area	Num	Medline	PMC	Scopus	SCIe
1	Clinical Pharmacology	57	42.1% 24	36.8% 21	82.5% 47	61.4% 35
5	Pharmacy Practice	67	25.4% 17	20.9% 14	91.0% 61	13.4% 9
2	Cell Pharmacology	20	55.0% 11	25.0% 5	95.0% 19	65.0% 13
6	Molecular Pharmacology	46	73.9% 34	23.9% 11	95.7% 44	69.6% 32
3	Pharmaceutics	35	48.6% 17	22.9% 8	85.7% 30	54.3% 21
4	Drug Design	60	6.7% 4	18.3% 11	93.3% 56	26.7% 16
Total		285	37.5% 107	24.6% 70	90.2% 257	44.2% 126

Pharmacy Journals: Results (VI)

Class	Area	Num	w/IF	Mean IF	Max IF	Min IF
1	Clinical Pharmacology	57	37	2.718	7.286	0.439
5	Pharmacy Practice	67	9	1.420	2.302	0.324
2	Cell Pharmacology	20	13	2.785	4.581	1.475
6	Molecular Pharmacology	46	32	4.433	17.893	1.442
3	Pharmaceutics	35	19	2.536	4.440	0.250
4	Drug Design	60	16	1.146	3.255	0.298
Total		285	126	2.844	17.893	0.250

IF= Impact Factor 2016

Pharmacy Journals: Results (VI)

Class	Area	Num	w/IF	Mean IF	Max IF	Min IF	IF > 2.844
1	Clinical Pharmacology	57	37	2.718	7.286	0.439	15
5	Pharmacy Practice	67	9	1.420	2.302	0.324	0
2	Cell Pharmacology	20	13	2.785	4.581	1.475	6
6	Molecular Pharmacology	46	32	4.433	17.893	1.442	17
3	Pharmaceutics	35	19	2.536	4.440	0.250	6
4	Drug Design	60	16	1.146	3.255	0.298	2
Total		285	126	2.844	17.893	0.250	46

IF= Impact Factor 2016

Pharmacy Journals: Results (VII)

Class	Area	Num	w/CS	Mean CS	Max CS	Min CS
1	Clinical Pharmacology	57	47	2.056	5.800	0
5	Pharmacy Practice	67	61	0.525	2.630	0
2	Cell Pharmacology	20	19	2.245	4.750	0.120
6	Molecular Pharmacology	46	44	3.574	18.370	0
3	Pharmaceutics	35	30	2.136	4.840	0.020
4	Drug Design	60	56	0.809	5.030	0
Total		285	257	1.698	18.370	0

CS= CiteScore 2016

Pharmacy Journals: Results (VII)

Class	Area	Num	w/CS	Mean CS	Max CS	Min CS	CS > 1.698
1	Clinical Pharmacology	57	47	2.056	5.800	0	26
5	Pharmacy Practice	67	61	0.525	2.630	0	5
2	Cell Pharmacology	20	19	2.245	4.750	0.120	12
6	Molecular Pharmacology	46	44	3.574	18.370	0	36
3	Pharmaceutics	35	30	2.136	4.840	0.020	17
4	Drug Design	60	56	0.809	5.030	0	7
Total		285	257	1.698	18.370	0	103

CS= CiteScore 2016

Conclusão

- **A Farmacia não é uma categoria homogenea.**
- **Através de um método objectivo de análise textual dos títulos dos artigos científicos, foi possível demonstrar a distinção existente no campo da Farmácia entre três grandes subcorpus e seis sub-areas que a compõem.**