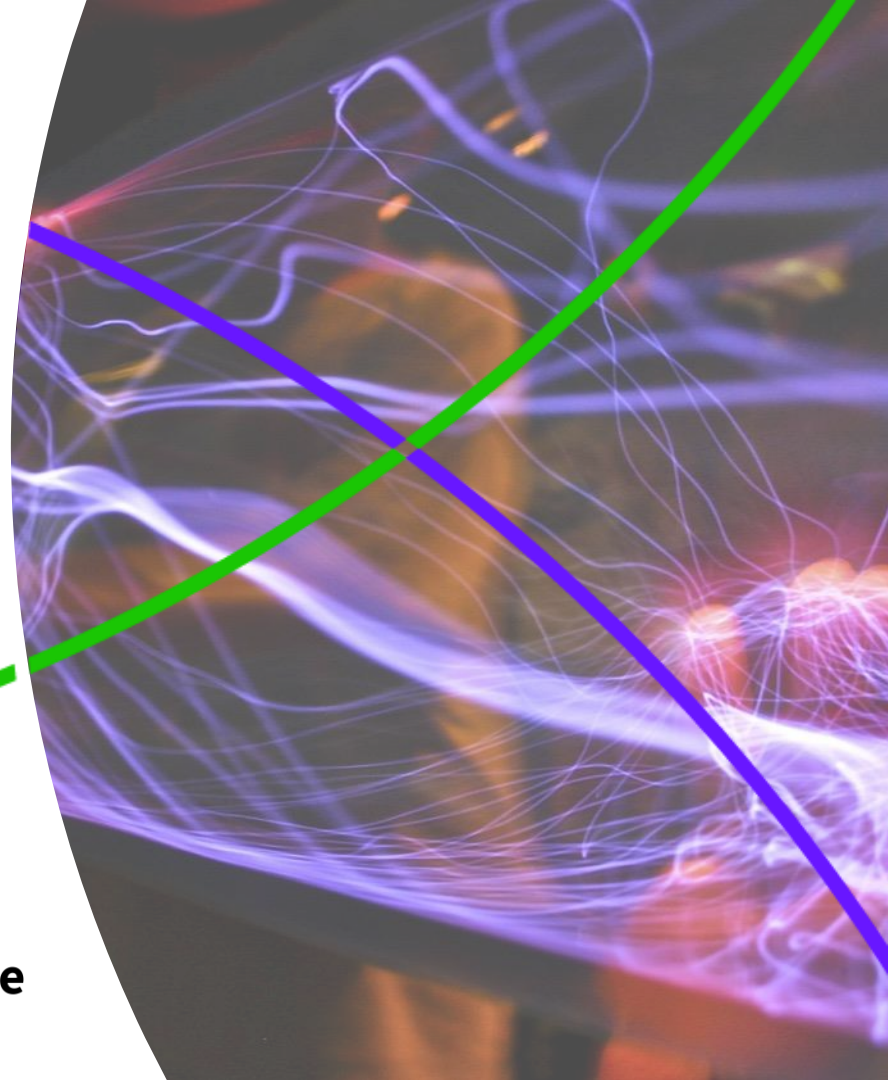# Research output of Armenia

Current state and trends

September 2018

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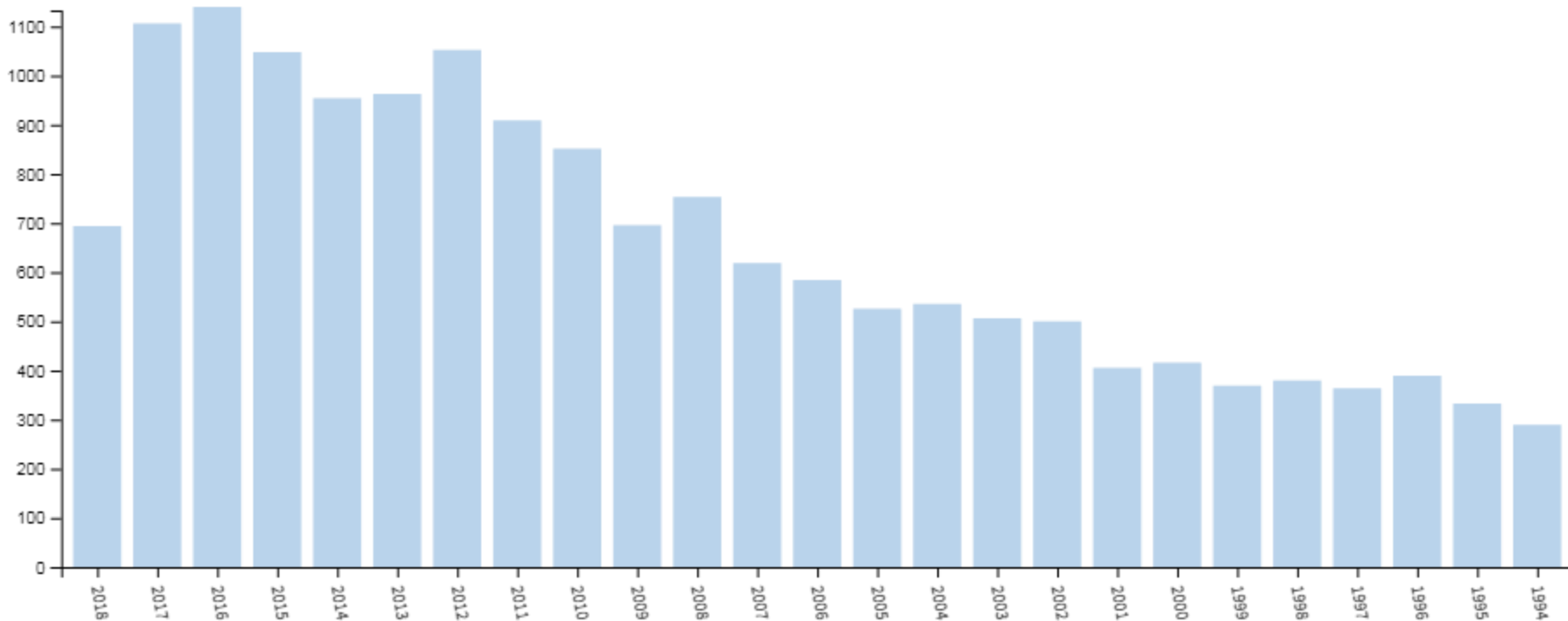
Clarivate
Analytics
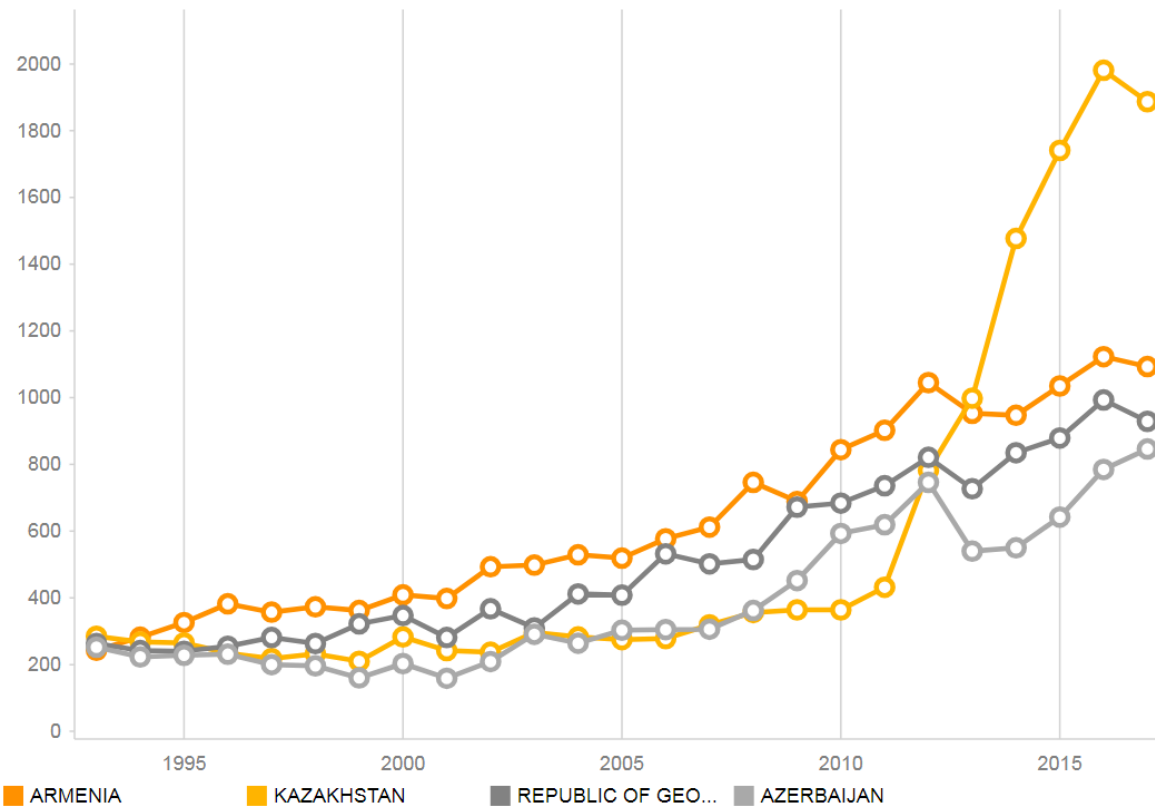
Agenda

Web of Science
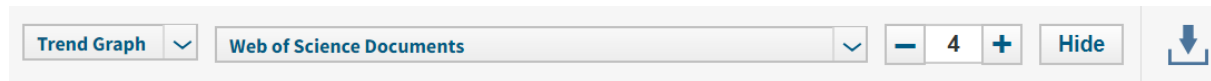*Trust the difference*

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Armenian research output dynamics

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Analytics

How does that fit into context?

Can we compare citations for those countries?
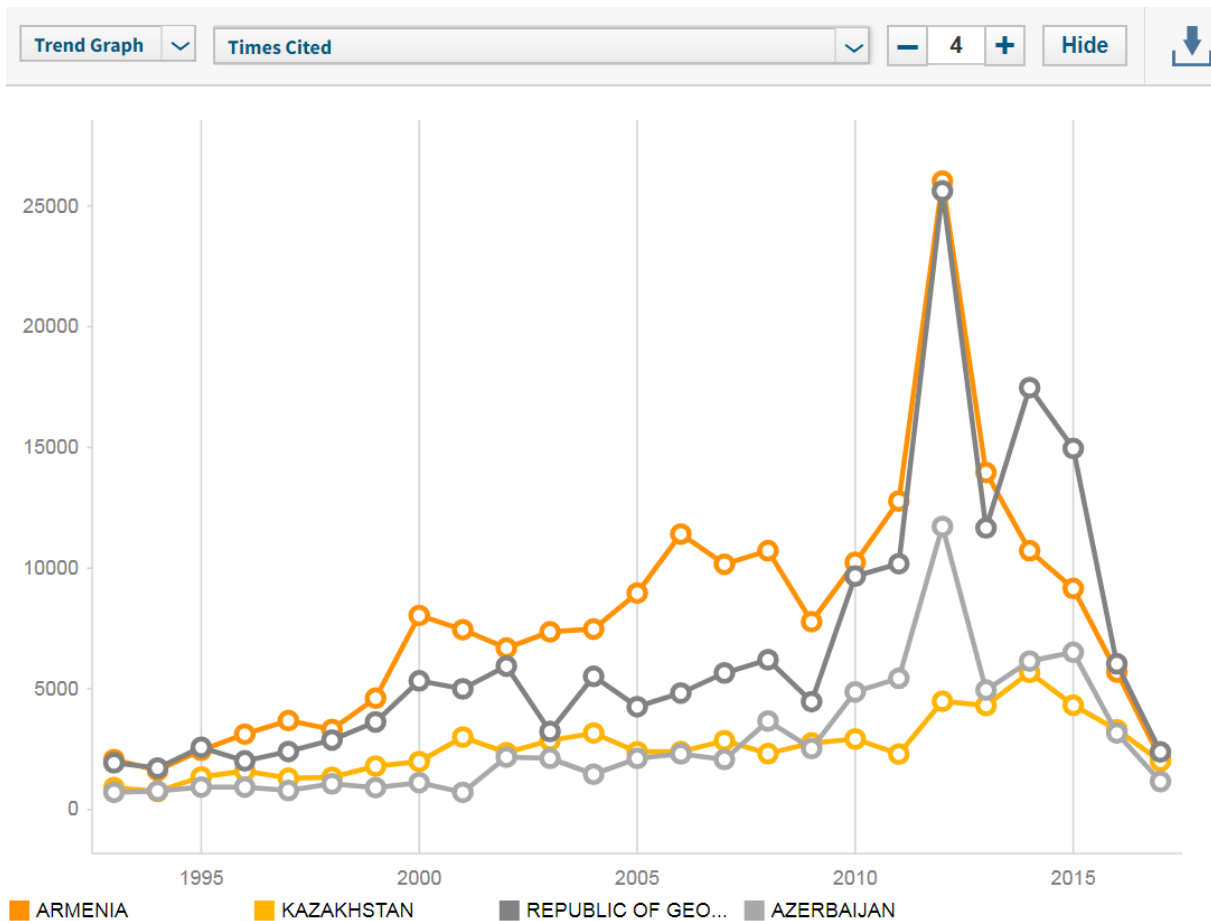
Category Normalized Citation Impact

$$CNCI_{paper} = \frac{\text{Times cited}}{\text{Average citations for all documents of the } \textit{same document type}, \text{ published in the } \textit{same year} \text{ and in the } \textit{same subject area}}$$

$$NCI_{group\ of\ papers} = \frac{CNCI_1 + CNCI_2 + ... + CNCI_N}{N}$$

$CNCI_{paper} > 1$: it is cited above global average (above expected level)

$CNCI_{paper} < 1$: it is cited below global average – or below expected level

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So, how do the values for Category Normalized Citation Impact compare for those countries?
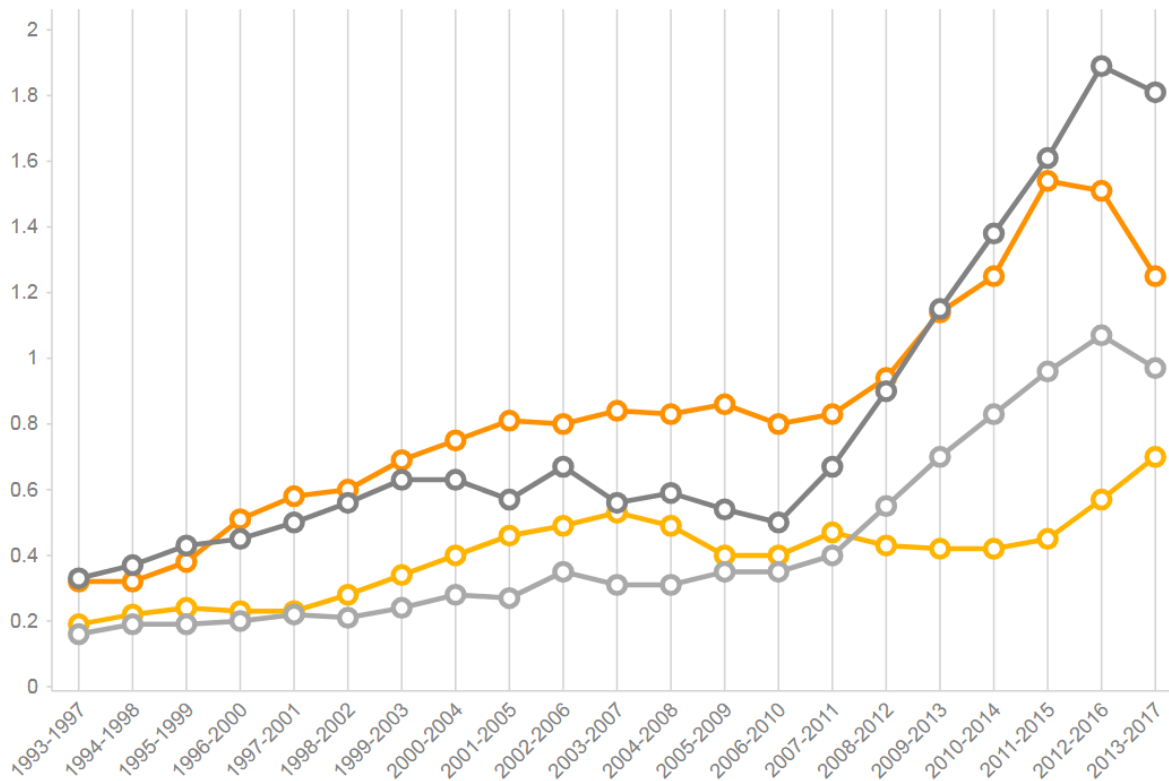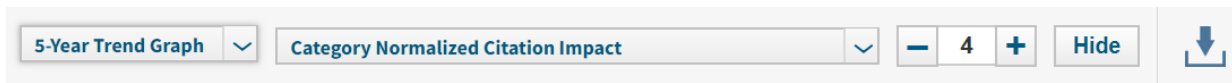
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Let's compare the Category Normalized Citation Impact for a wider group of neighbor countries for the most recent 10 year period

RUSSIA — 0.76
TURKEY — 0.74
IRAN — 0.84
UKRAINE — 0.73
BELARUS — 0.84
KAZAKHSTAN — 0.85
ARMENIA — 1.14
REPUBLIC OF GEORGIA — 1.52
AZERBAIJAN — 0.84
UZBEKISTAN — 0.50
KYRGYZSTAN — 1.14

Time Period

Min: 2008   Max: 2017

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Analytics
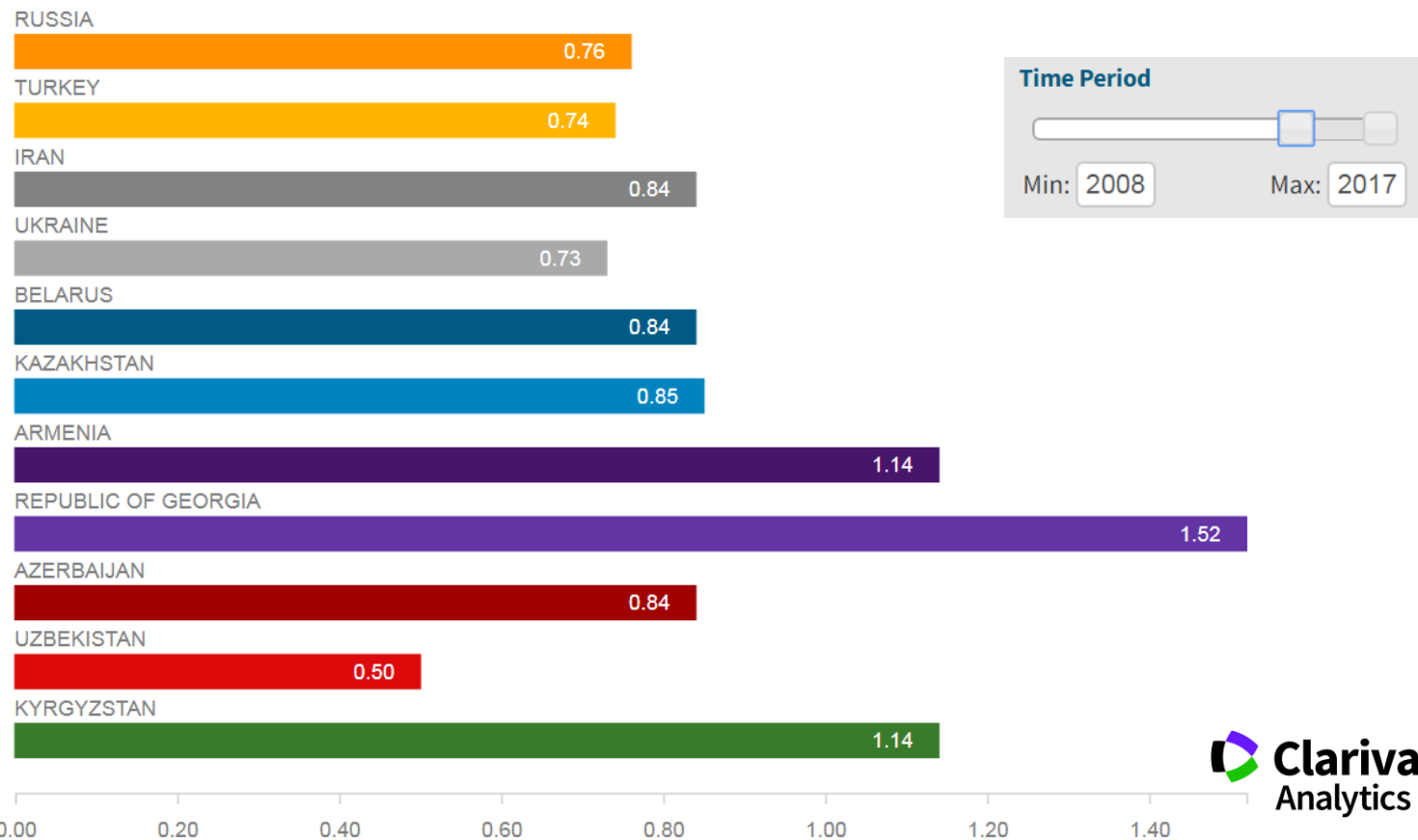
Top 10 research areas for Armenia for the most recent 10 year period

Armenia

- Physics 3,829
- Chemistry 868
- Clinical Medi... 517
- Space Sci... 476
- Mathematics 442
- Engineering 208
- Social ... 146
- Pharm... 137
- Biology & Biochemistry 391
- Materials Sci... 130
- Immu... 75
- Plant ... 75
- Psychi... 55
- Micr... 40
- Mu... 3
- Enviro... 50
- 11
- Neuroscience & Behavior 253
- Molecular Bi... 111
- Geosciences 93
- Agricul... 41
- Comp... 21

World

- Clinical Medicine 4,865,912
- Chemistry 1,851,867
- Social Sciences, .. 1,328,105
- Engineering 1,240,251
- Physics 1,084,550
- Biology & B... 955,966
- Plant & Animal Science 809,788
- Psychiatry/Psycho... 575,249
- Geosciences 464,138
- Agricultural ... 427,036
- Materials Science 789,440
- Molecular Biology & ... 553,975
- Mathe... 408,996
- Immun... 395,360
- Comp... 354,130
- Neuroscience & Beha... 779,638
- Pharmacology & To... 541,135
- Environment/Ecology 464,602
- Economic... 299,066
- Microbiology 209,595
- Space Sci... 143,915

Time Period

Min: 2008   Max: 2017

Web of Science
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Analytics

How do these subject areas in Armenia compare by Category Normalized Citation Impact?

Physics — 1.93
Chemistry — 0.47
Clinical Medicine — 0.90
Space Science — 0.74
Mathematics — 0.32
Biology & Biochemistry — 1.13
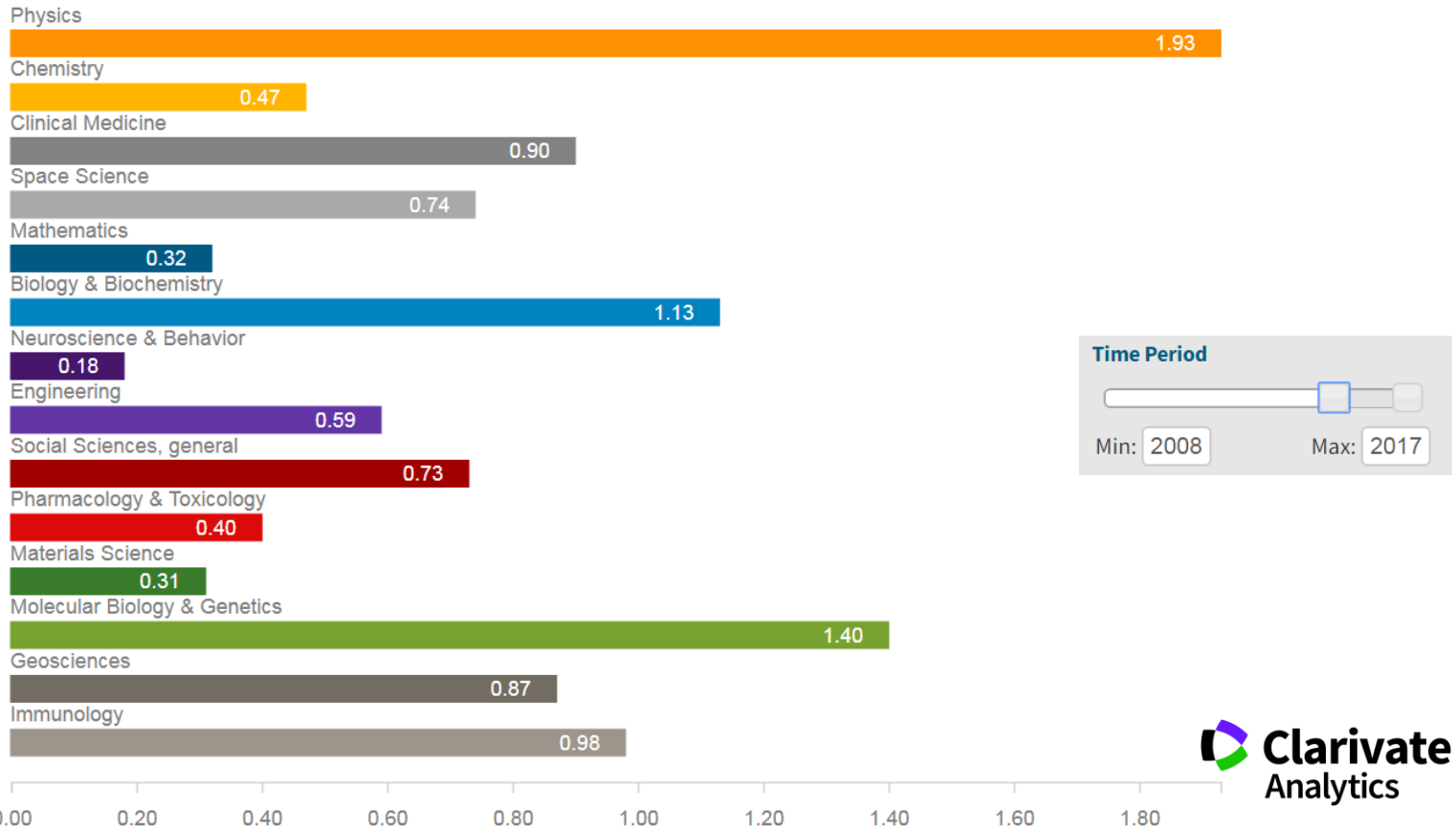Neuroscience & Behavior — 0.18
Engineering — 0.59
Social Sciences, general — 0.73
Pharmacology & Toxicology — 0.40
Materials Science — 0.31
Molecular Biology & Genetics — 1.40
Geosciences — 0.87
Immunology — 0.98

Time Period

Min: 2008   Max: 2017

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Another way to visualize this data: which areas are our strengths, weaknesses, opportunities and threats?
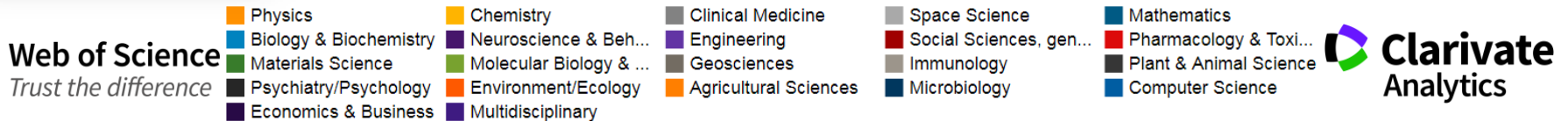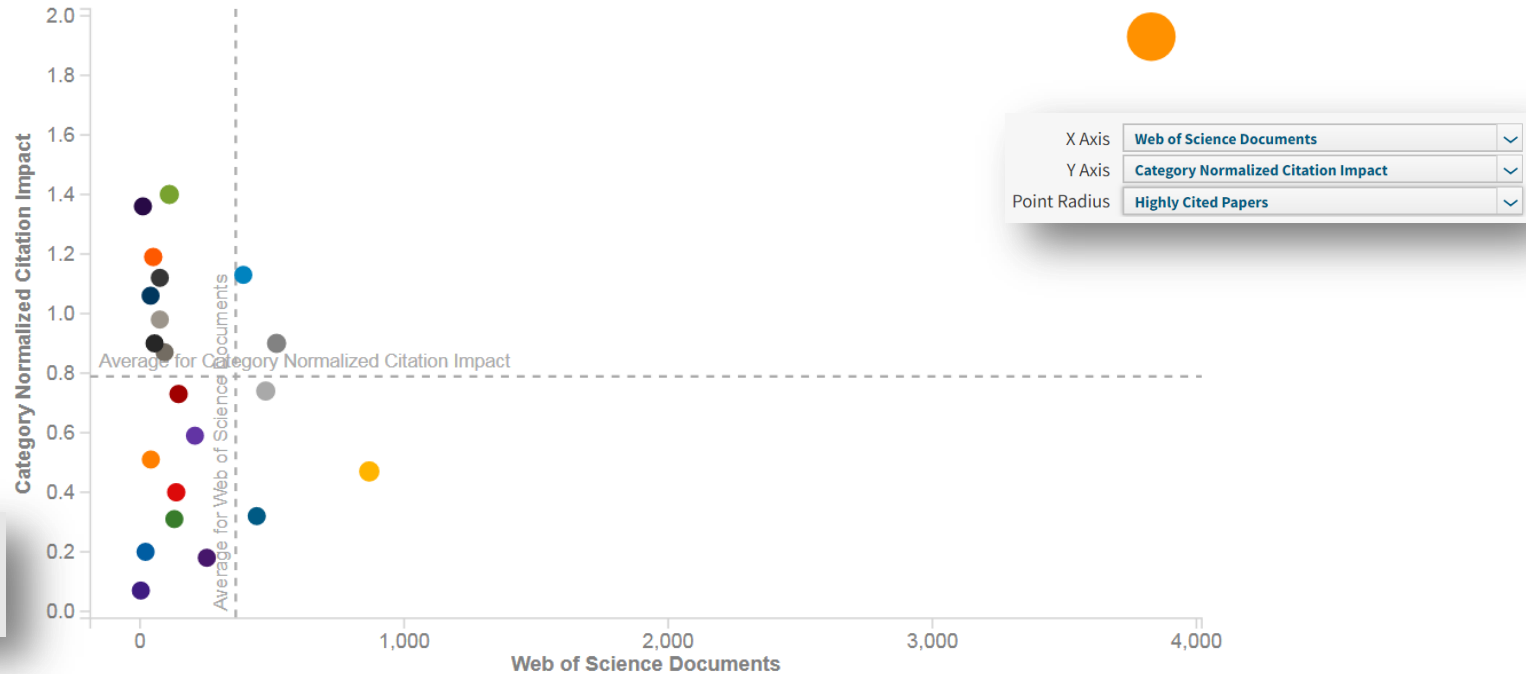
Collaboration analysis – which countries does Armenia mostly collaborate with?
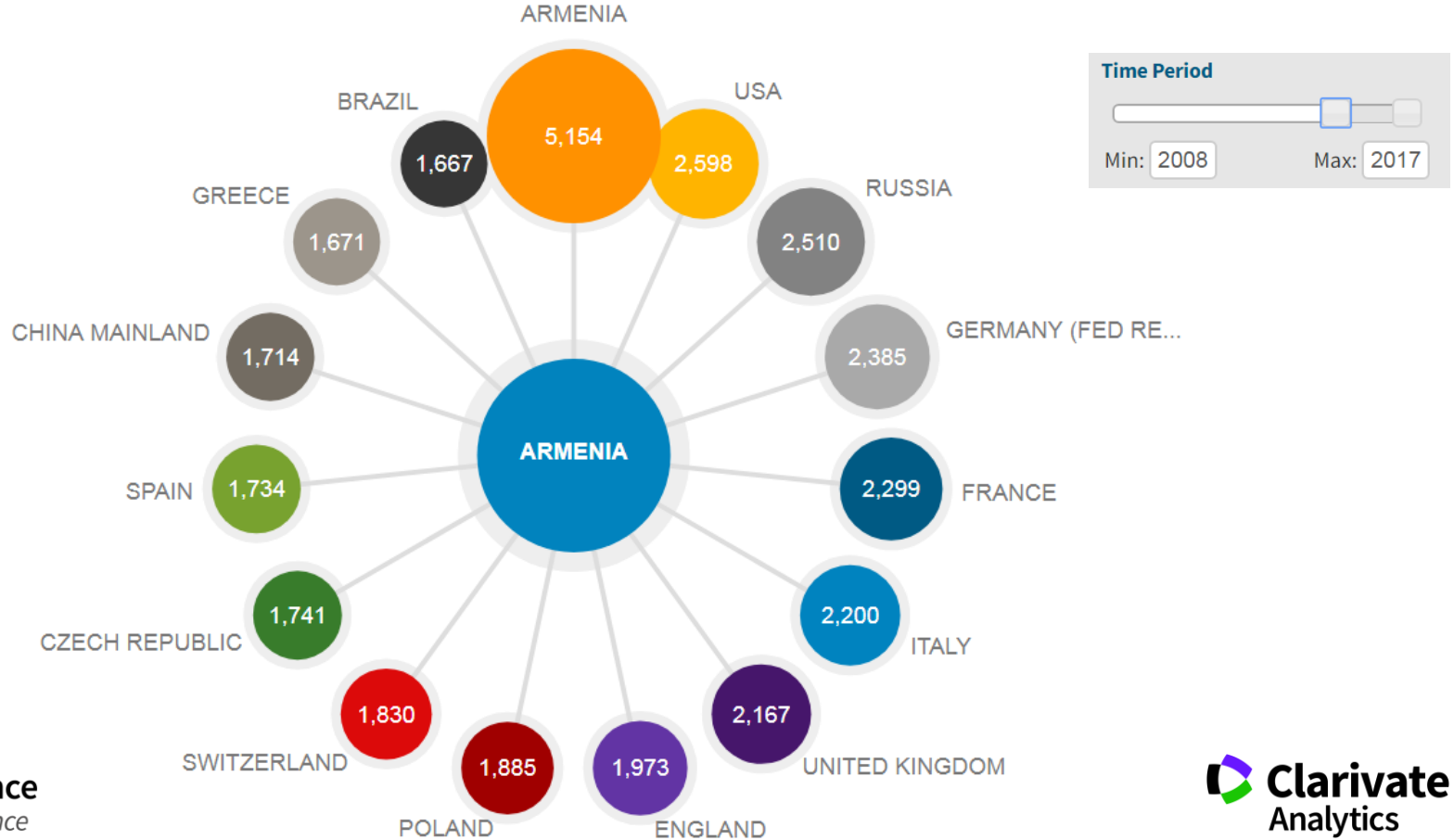
ARMENIA
5,154

USA
2,598

BRAZIL
1,667

RUSSIA
2,510

GREECE
1,671

GERMANY (FED RE...
2,385

CHINA MAINLAND
1,714

ARMENIA

FRANCE
2,299

SPAIN
1,734

ITALY
2,200

CZECH REPUBLIC
1,741

UNITED KINGDOM
2,167

SWITZERLAND
1,830

POLAND
1,885

ENGLAND
1,973

Time Period

Min: 2008   Max: 2017

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Analytics

Collaboration analysis – which countries does Armenia mostly collaborate with?

Web of Science
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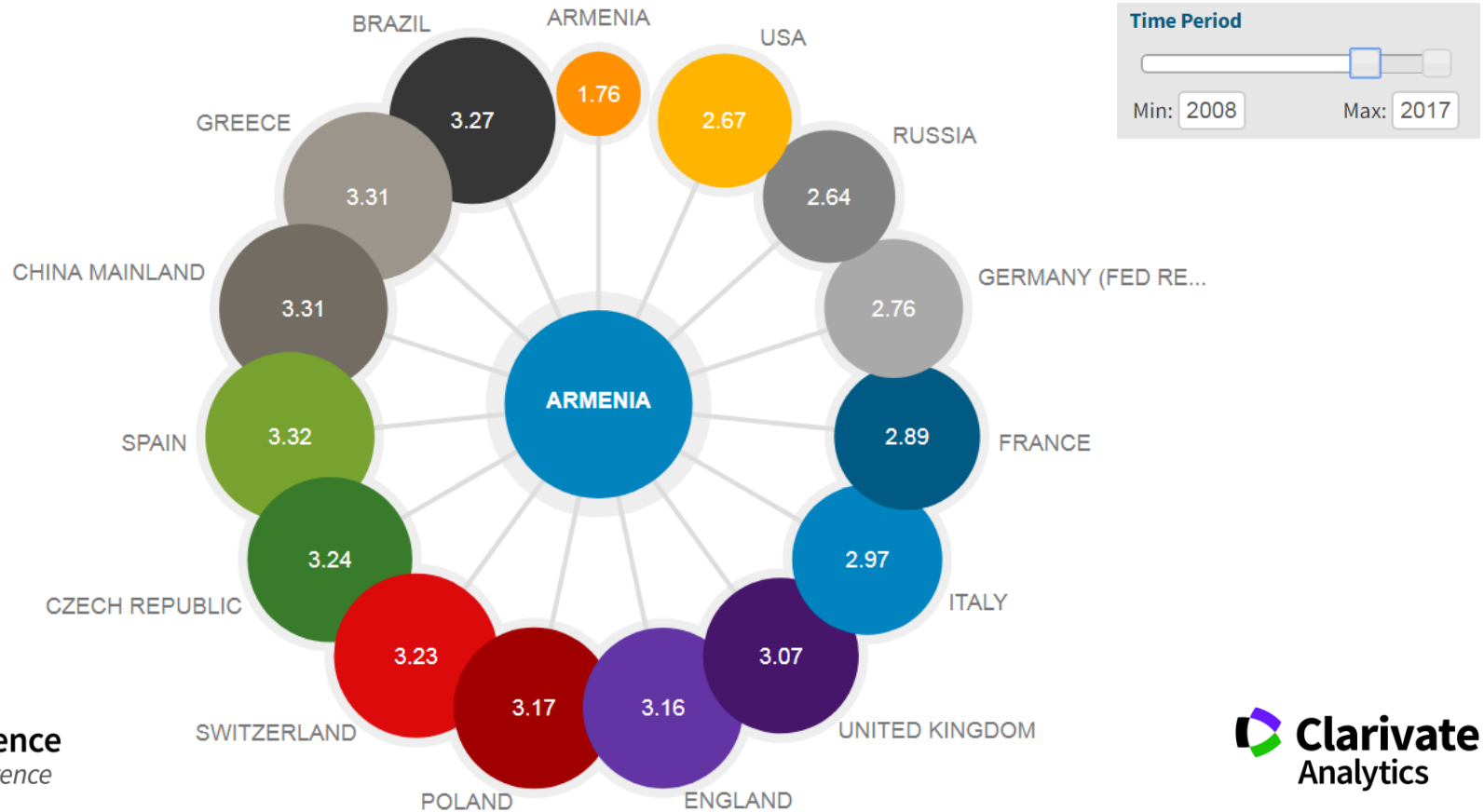
Remember this citation spike in 2012? That's the year of the most intensive LHC results publications

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Clarivate
Analytics
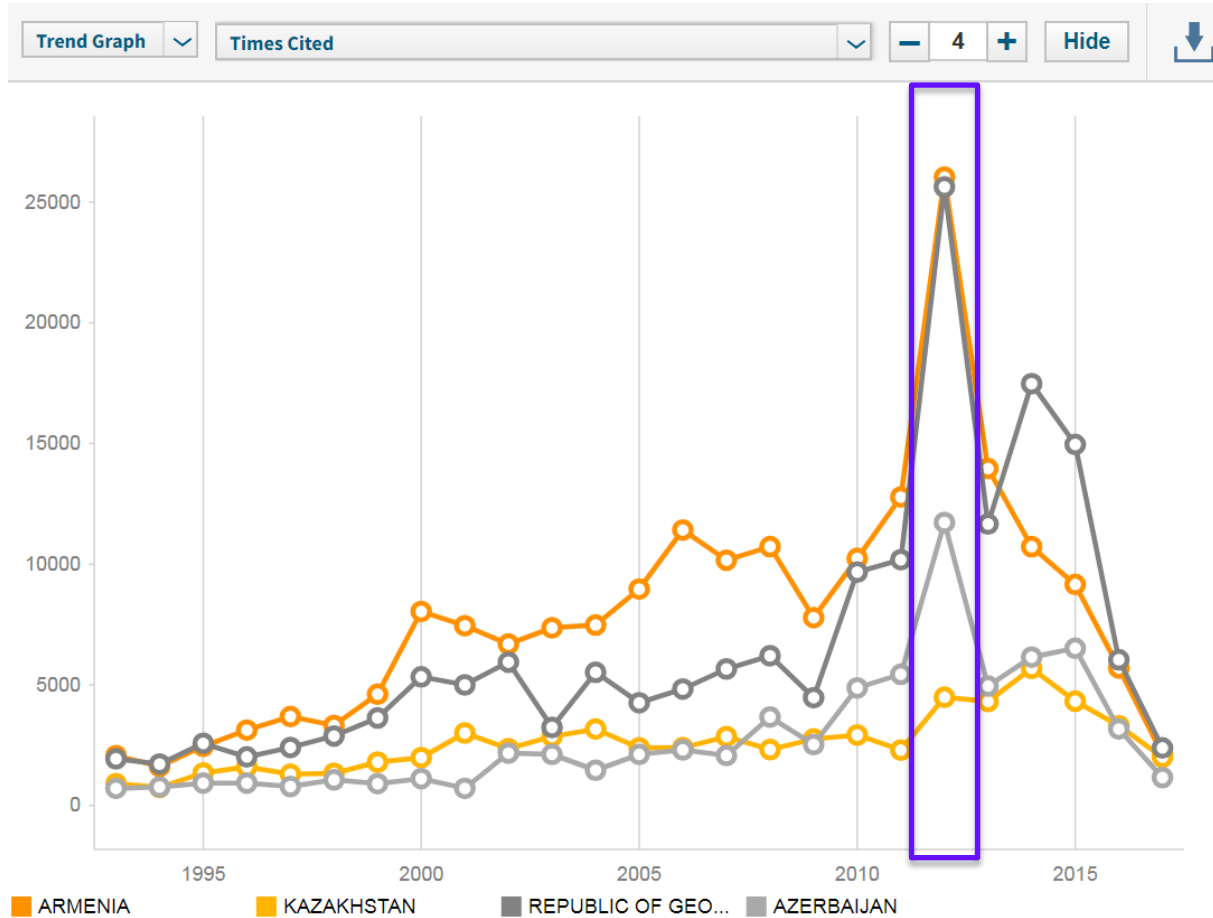
Since last year, there is an option to set thresholds for the records in InCites

Thresholds ⓘ

▶ **Web of Science Documents**

▶ **Times Cited**

▼ **Authors per Document**

Min: **1**   Max: **5,575**

▶ **JIF Quartile**
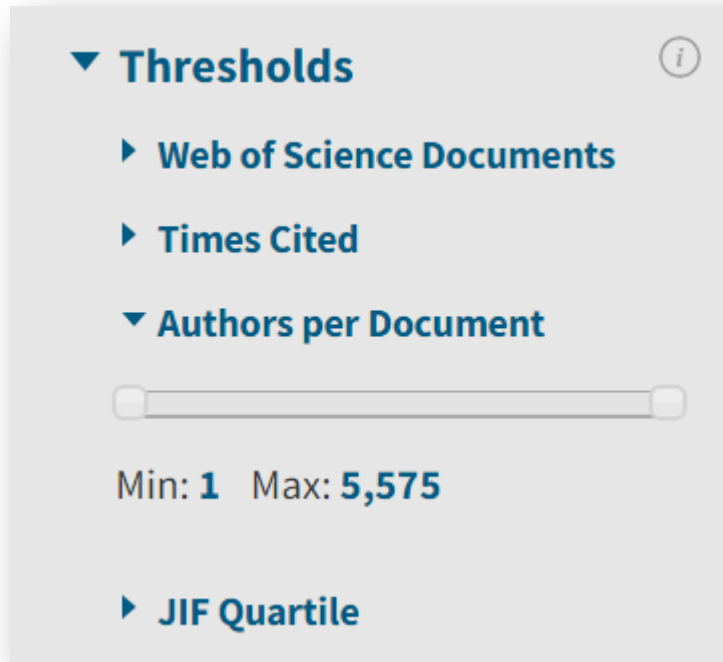
A generally accepted level that defines a *"large collaboration"* in bibliometrics is 30 authors per document

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Clarivate Analytics

Collaboration analysis – which countries does Armenia mostly collaborate with?

Authors per Document

Min: **1** Max: **30**

Time Period

Min: 2008 Max: 2017

REPUBLIC OF GEO... 1.52
ARMENIA 0.82
RUSSIA 0.91
USA 1.02
TAIWAN 0.71
GERMANY (FED RE... 0.89
POLAND 1.35
ARMENIA
FRANCE 1.16
BRAZIL 1.00
ITALY 1.21
SPAIN 1.35
UNITED KINGDOM 1.60
SWITZERLAND 1.32
ENGLAND 1.69
IRAN 0.45

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Analytics
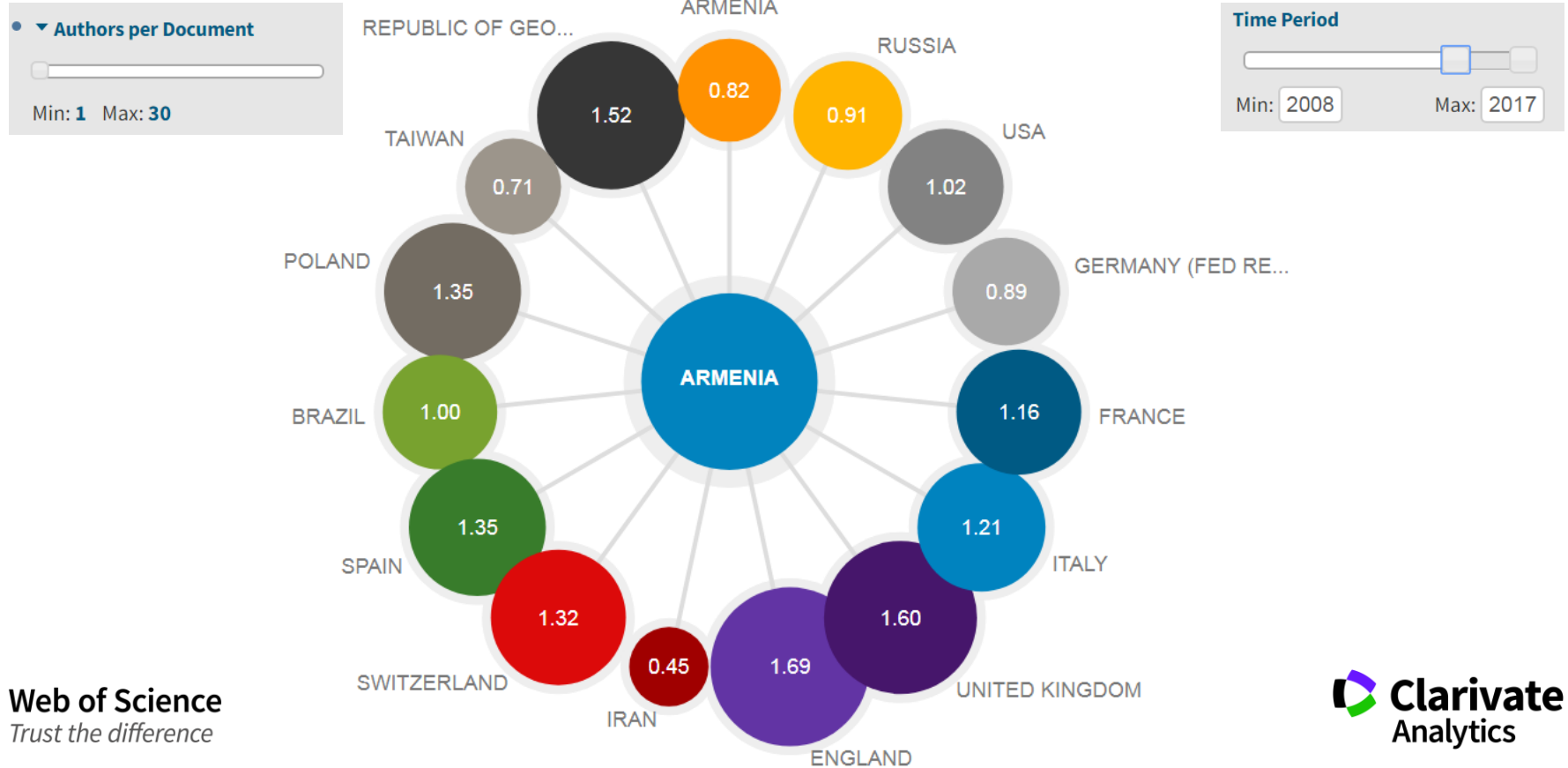
How do the neighboring countries relate in terms of Category Normalized Citation Impact then?
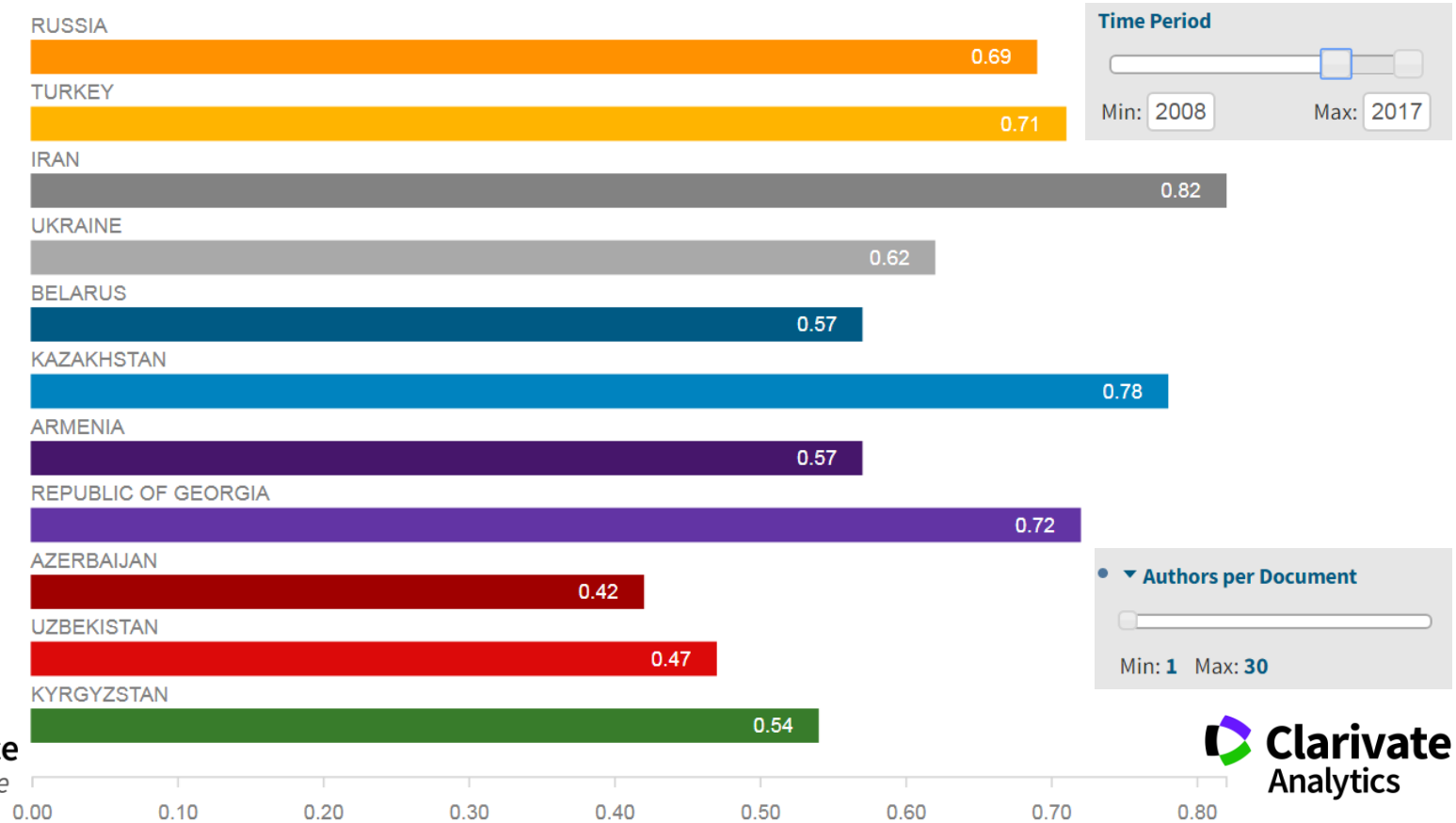
Which are our true strengths then?
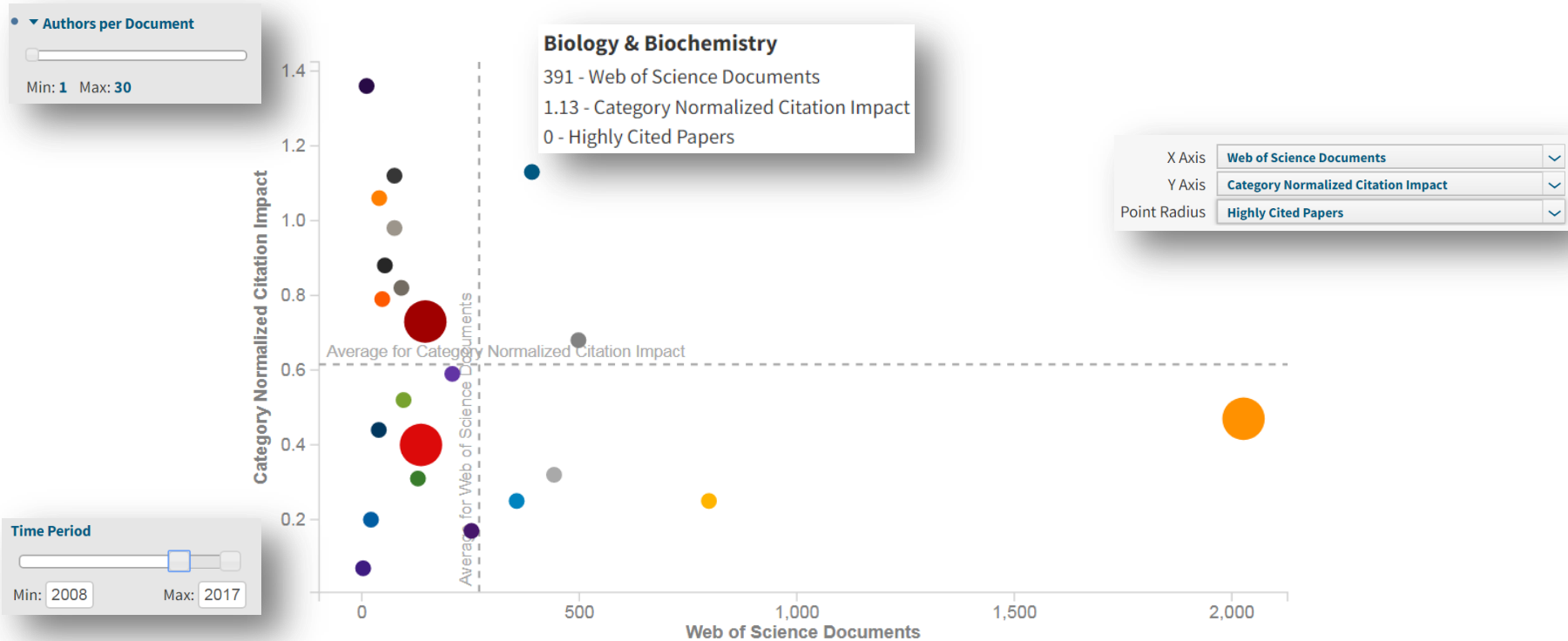
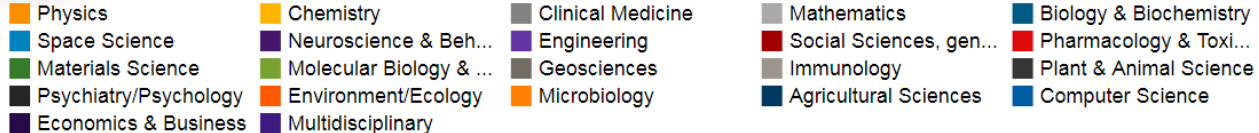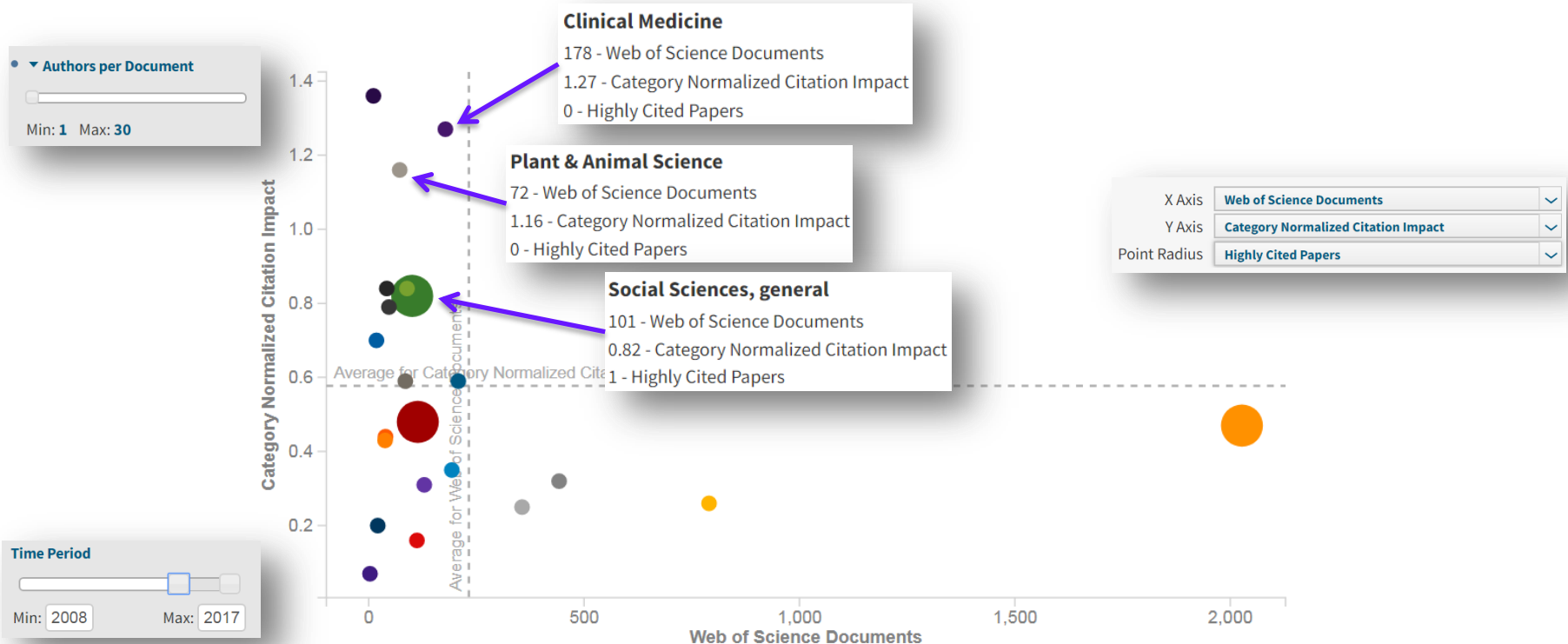# Are we doing really well in Biology & Biochemistry?

Article Title	Authors	Source	Research Area	Volume	Issue	Pages	Publication Date	Times Cited	Journal Expected Citations	Category Expected Citations	Journal Normalized Citation Impact	Category Normalized Citation Impact ▽	Percentile in Subject Area	Journal Impact Factor
Arginase and NO-synthase are target enzymes in breast anticancer therapy	Avtandilyan, N.; Trchounian, A.	FEBS JOURNAL	Biology & Biochemistry	284		256-256	2017	1	0	0.01	612.5	78.79	1.2	4.53
Characterization and differentiation of binding modes of water-soluble porphyrins at complexation with DNA	Barkhudaryan, Vigen G.; Ananyan, Gayane V.; Dalyan, Yeva B.	JOURNAL OF BIOMOLECULAR STRUCTURE & DYNAMICS	Biology & Biochemistry	31		55-55	2013	4	0.29	0.07	13.97	58.93	0.18	3.11
Application of viscometric methods for studying the interaction of various porphyrins with DNA	Barkhudaryan, Vigen G.; Ananyan, Gayane V.	JOURNAL OF BIOMOLECULAR STRUCTURE & DYNAMICS	Biology & Biochemistry	33		88-88	2015	3	0.66	0.06	4.56	50.25	0.18	3.11
GMPC model and the helix-coil transition in biopolymers	Morozov, V. F.; Tonoyan, Sh. A.; Melkonyan, L. V.; Poghosyan, N. L.; Sargsyan, Sh. A.	JOURNAL OF BIOMOLECULAR STRUCTURE & DYNAMICS	Biology & Biochemistry	31		110-110	2013	3	0.29	0.07	10.48	44.2	0.39	3.11

All those papers are meeting abstracts, and the citations mostly come from the authors themselves
It doesn't mean the papers are not good – it means the results have to be interpreted with caution

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What's remaining if we remove meeting abstracts together with large collaborations?

Authors per Document

Min: 1   Max: 30

Clinical Medicine

178 - Web of Science Documents

1.27 - Category Normalized Citation Impact

0 - Highly Cited Papers

Plant & Animal Science

72 - Web of Science Documents

1.16 - Category Normalized Citation Impact

0 - Highly Cited Papers

Social Sciences, general

101 - Web of Science Documents

0.82 - Category Normalized Citation Impact

1 - Highly Cited Papers

X Axis	Web of Science Documents
Y Axis	Category Normalized Citation Impact
Point Radius	Highly Cited Papers

Category Normalized Citation Impact (y-axis): 1.4, 1.2, 1.0, 0.8, 0.6, 0.4, 0.2

Average for Category Normalized Cit...

Average for Web of Science Documents

Web of Science Documents (x-axis): 0, 500, 1,000, 1,500, 2,000

Time Period

Min: 2008   Max: 2017

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Legend:
- Physics
- Biology & Biochemistry
- Immunology
- Economics & Business
- Chemistry
- Clinical Medicine
- Agricultural Sciences
- Multidisciplinary
- Mathematics
- Materials Science
- Microbiology
- Space Science
- Pharmacology & Toxi...
- Plant & Animal Science
- Computer Science
- Engineering
- Neuroscience & Beh...
- Environment/Ecology
- Psychiatry/Psychology
- Social Sciences, gen...
- Geosciences
- Molecular Biology & ...

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Authors per Document

Min: **1** Max: **30**

Time Period

Min: 2008 Max: 2017

Name	Rank	▼ Web of Science Documents ⓘ	Category Normalized Citation Impact ⓘ
Physics	1	**2,027**	0.47
Chemistry	2	**798**	0.25
Clinical Medicine	3	**498**	0.68
Mathematics	4	**442**	0.32
Biology & Biochemistry	5	**391**	1.13
Space Science	6	**356**	0.25
Neuroscience & Behavior	7	**252**	0.17
Engineering	8	**208**	0.59

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How well are our papers on mathematics cited in the journals we prefer to publish in?

Name	Rank	▼ Web of Science Documents ⓘ	Category Normalized Citation Impact ⓘ	Journal Impact Factor ⓘ
JOURNAL OF CONTEMPORARY MATHEMATICAL ANALYSIS- ARMENIAN ACADEMY OF SCIENCES	1	188	0.16	0.242
MATHEMATICAL NOTES	2	25	0.45	0.577
DISCRETE MATHEMATICS	3	15	0.72	0.738
IZVESTIYA MATHEMATICS	4	13	0.7	0.923
DIFFERENTIAL EQUATIONS	5	12	0.13	0.674
SBORNIK MATHEMATICS	5	12	0.34	0.865
COMPUTATIONAL MATHEMATICS AND MATHEMATICAL PHYSICS	7	10	0.1	0.677
COMPLEX VARIABLES AND ELLIPTIC EQUATIONS	8	9	0.13	0.832

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...and what about our papers on mathematics in top journals?

Name	Rank	Web of Science Documents ⓘ	Category Normalized Citation Impact ⓘ	▼ Journal Impact Factor ⓘ
NUMERISCHE MATHEMATIK	1	1	1.73	2.37
APPLIED MATHEMATICS AND COMPUTATION	2	3	2.16	2.3
COMPUTERS & MATHEMATICS WITH APPLICATIONS	3	1	1.32	1.86
IMA JOURNAL OF NUMERICAL ANALYSIS	4	1	0.45	1.837
ANALYSIS AND APPLICATIONS	5	1	0.11	1.787
MATHEMATICS OF COMPUTATION	6	1	4.32	1.75
FRACTALS-COMPLEX GEOMETRY PATTERNS AND SCALING IN NATURE AND SOCIETY	7	1	0.25	1.629
COMMUNICATIONS IN MATHEMATICAL SCIENCES	8	1	0.31	1.451

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Important to know
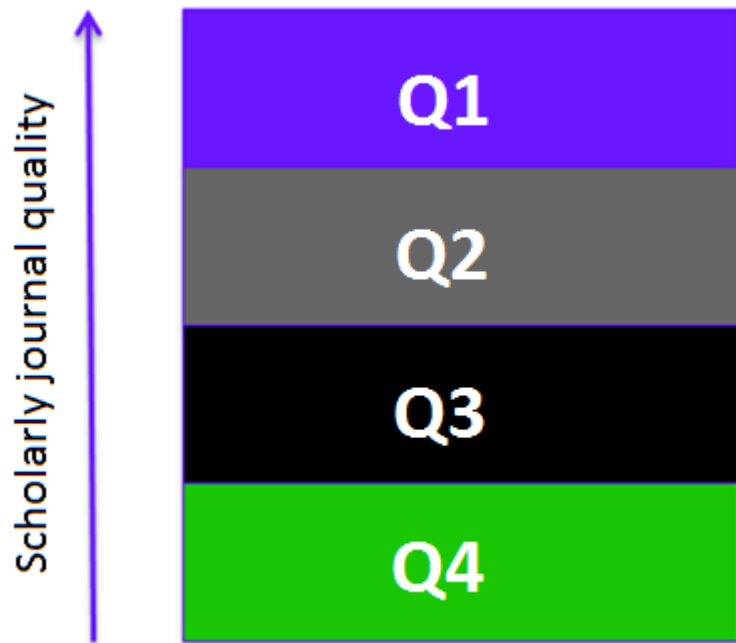
- Journal Impact Factor value may differ greatly across the research areas
- But a quartile is a measure that works well across the areas: Q1 always contains the most prestigious journals regardless of the subject field

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Journal Impact Factor is probably the most meaningful indicator of journal quality and impact. But it shouldn't be used to evaluate research output

At the same time, the situation in post-soviet countries makes it possible to use Journal Impact Factor as a compass to figure out where to publish your research results.

C **Clarivate**
Analytics

If you don't like the journal impact factors – consider how many people might read your paper

nature
International weekly journal of science

Home | News & Comment | Research | Careers & Jobs | Current Issue | Archive | Audio & Video | For Au

Archive > Volume 492 > Issue 7428 > Editorial > Article

NATURE | EDITORIAL

Announcement: A new iPad app for *Nature* readers

12 December 2012

PDF   Rights & Permissions

Many publishers hope that tablet renditions of newspapers and magazines will revive the fortunes of once-mighty but now financially stressed publications founded in print. *Nature*'s fortunes over the years have been relatively positive. Its print circulation has declined since its peak in 2002, but not as markedly as those of many other publications. Meanwhile, the online readership of *Nature* is more than 3 million unique users every month, and growing significantly year on year.

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Another example

The NEW ENGLAND
JOURNAL *of* MEDICINE

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Author Center What to Expect

Welcome and thank you for considering the New England Journal of Medicine (NEJM) as a venue for your work.

Our mission since 1812 has been to bring physicians the best research at the intersection of biomedical science and clinical practice. We are interested in original research that will change clinical practice or teach us something new about the biology of disease. We also publish reviews, cases, commentary, and other content of interest to the medical community.

The dedication of generations of researchers, authors, reviewers, and physician editors has made NEJM the most widely read and respected medical journal and website in the world, and the oldest continuously published medical periodical. Here are a few reasons why we hope you'll decide to send us your best work:

- More than 600,000 readers in nearly every country in the world read NEJM each week.
- Our impact factor (Science Citation Index rating) was 54.420 in 2013, the highest among general medical journals.
- We publish only the top 5% of the 5,000 research submissions we receive each year, more than half of those coming from outside of the U.S.

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Conclusions and recommendations

1. Armenian research output **is growing**. But it is extremely important to **ensure** this growth is **sustainable**. 3 ways of doing that:

    1. Base your research on the most authoritative results
    2. Collaborate with top authors and organizations
    3. Publish your research in the most prestigious journals with large readership audiences

2. Armenia is **doing well** in Physics, has potential in Clinical Medicine, Plant & Animal Science, Social Sciences. It is worth thinking about how this success can be **developed further**

3. There are certain fields, like Chemistry, Mathematics, and Neuroscience & Behavior, where Armenian research is cited significantly **below global average**. In most cases this means that good research results are published in low-impact journals. Low-impact journals are not bad, but their small readership audiences might negatively affect the citations of your papers. We recommend to focus on **publishing in high-impact journals**.

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