

Research assessment and evaluation in Russian fundamental science

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National research assessment exercises





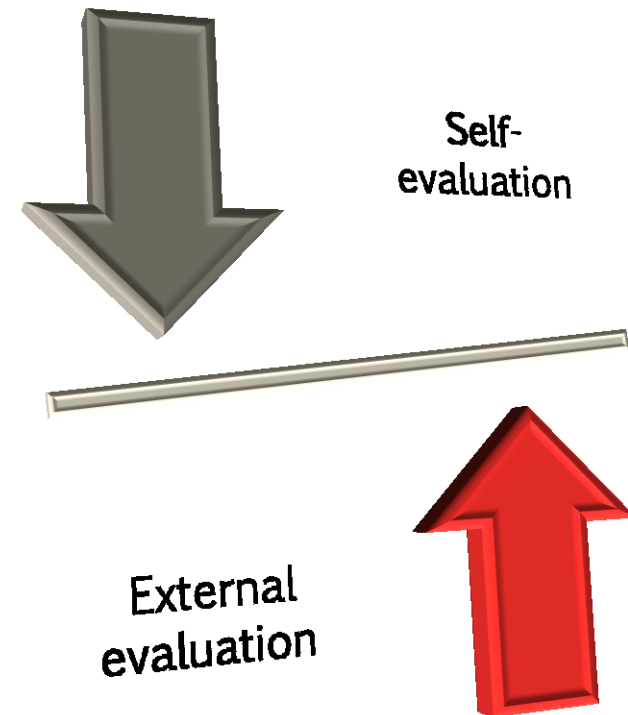
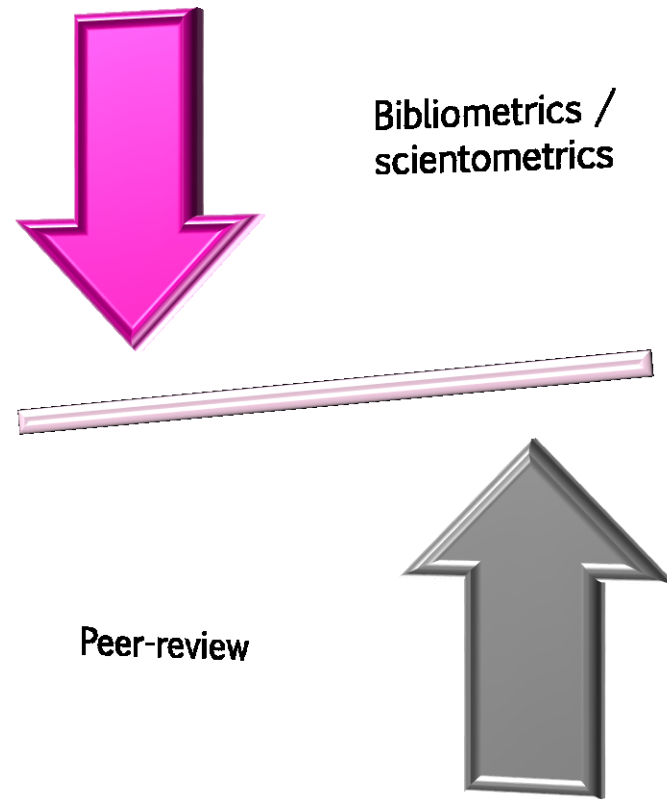
National research assessment

Country	Program or Authority	Year(s)
UK	Research Assessment Exercise (RAE)	1989, 1992, 1996, 2001, 2008
UK	Research Excellence Framework (REF)	2014
Netherlands	Standard Evaluation Protocol (SEP)	1993
France	Comité National d'Évaluation, CNE	1989 – 2006
France	Agency for the Evaluation of Research and Higher Education, AERES	2007 - ...
Italy	Triennial Evaluation Exercise (VTR)	2006 - 2009
Italy	Quality of Research Assessment (VQR)	2011 - 2014

And many others...



Methods classification

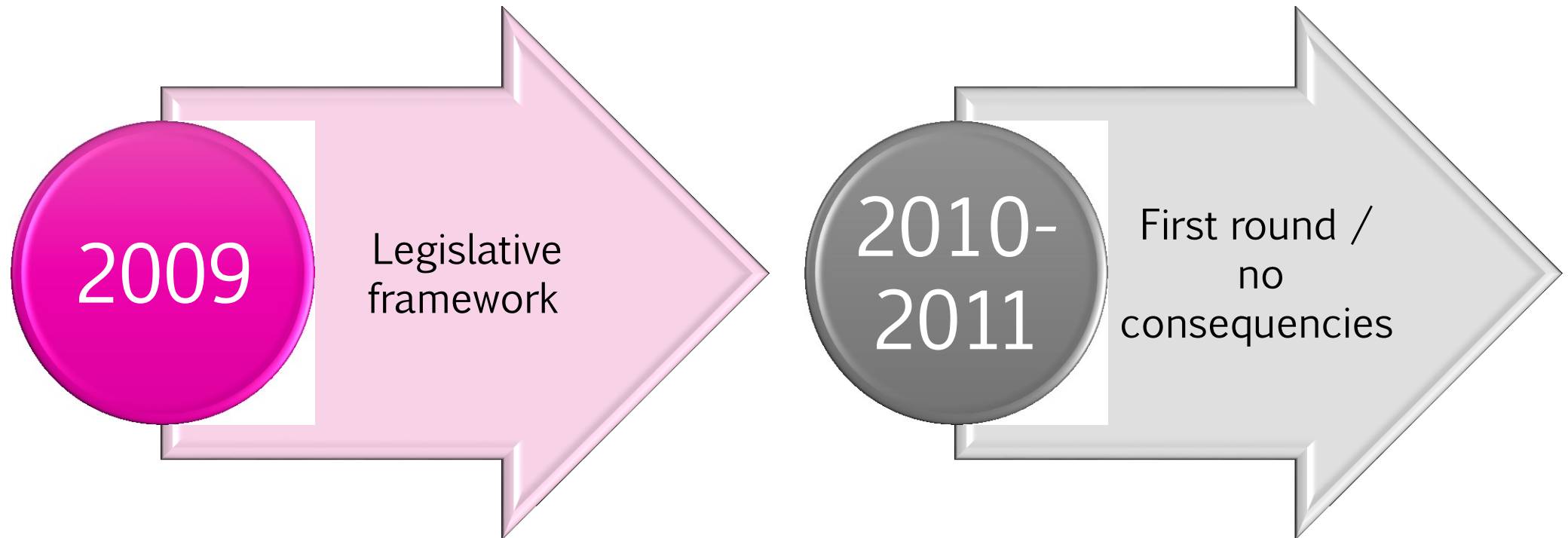


Research assessment in Russia – hard path milestones



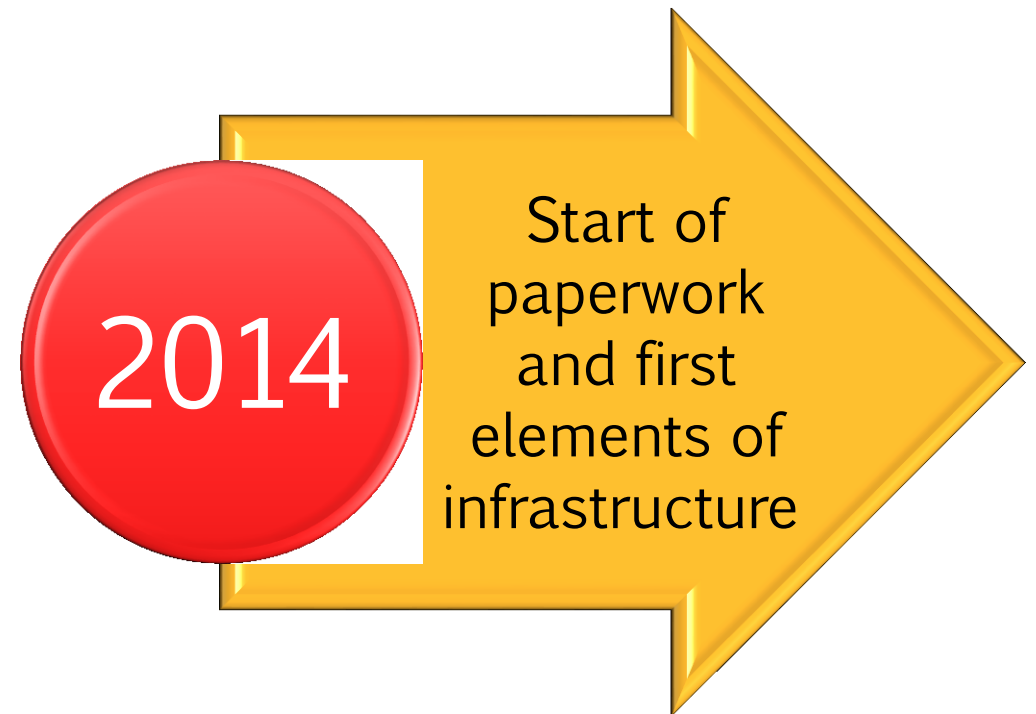
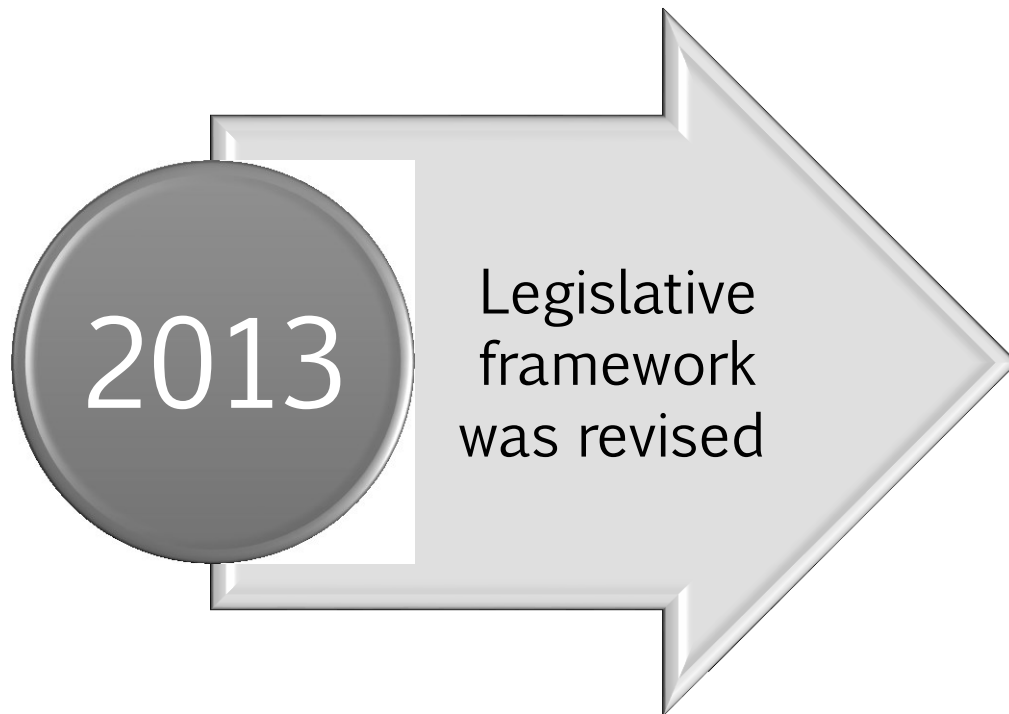


Start





Second round





Second round





Second round



Federal monitoring system



Federal monitoring system (sciencemon.ru)

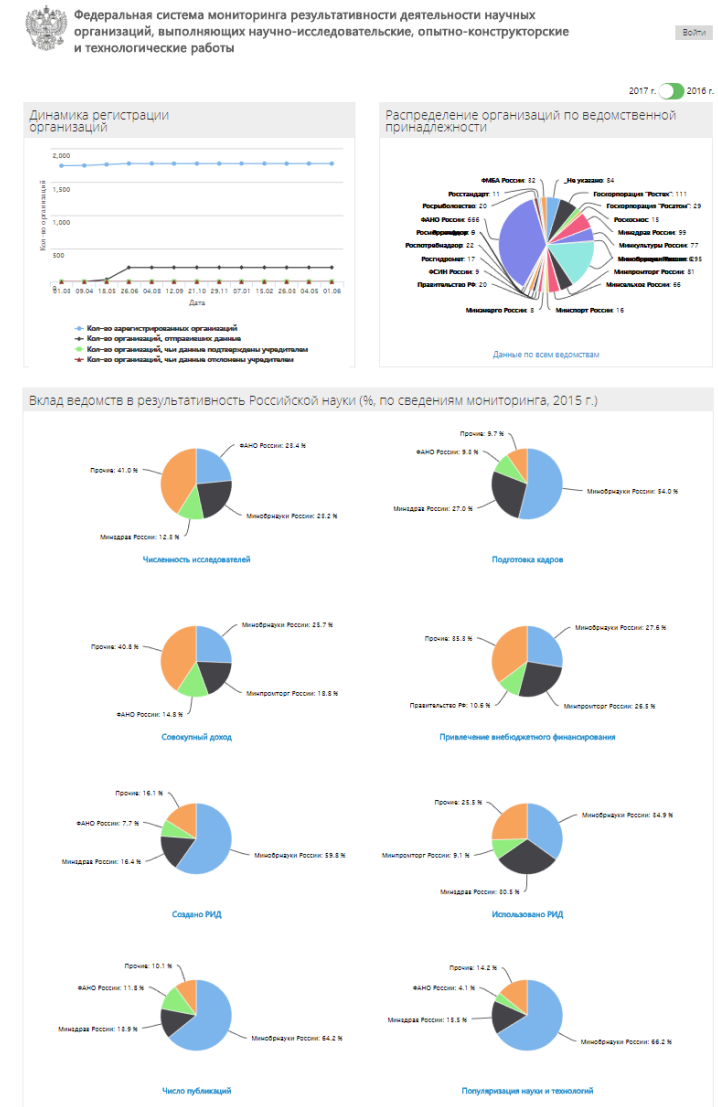


1781
organizations

78 indicators



Federal system for monitoring of the effectiveness of scientific organizations performing scientific research, experimental design and technological work





Indicators

4 MAIN GROUPS

- › the effectiveness and relevance of scientific research;
- › development of human resources;
- › integration into the world scientific space, dissemination of scientific knowledge and increasing the prestige of science;
- › resource support for the research activities

PROBLEMS AND ISSUES

aggregated indicators:

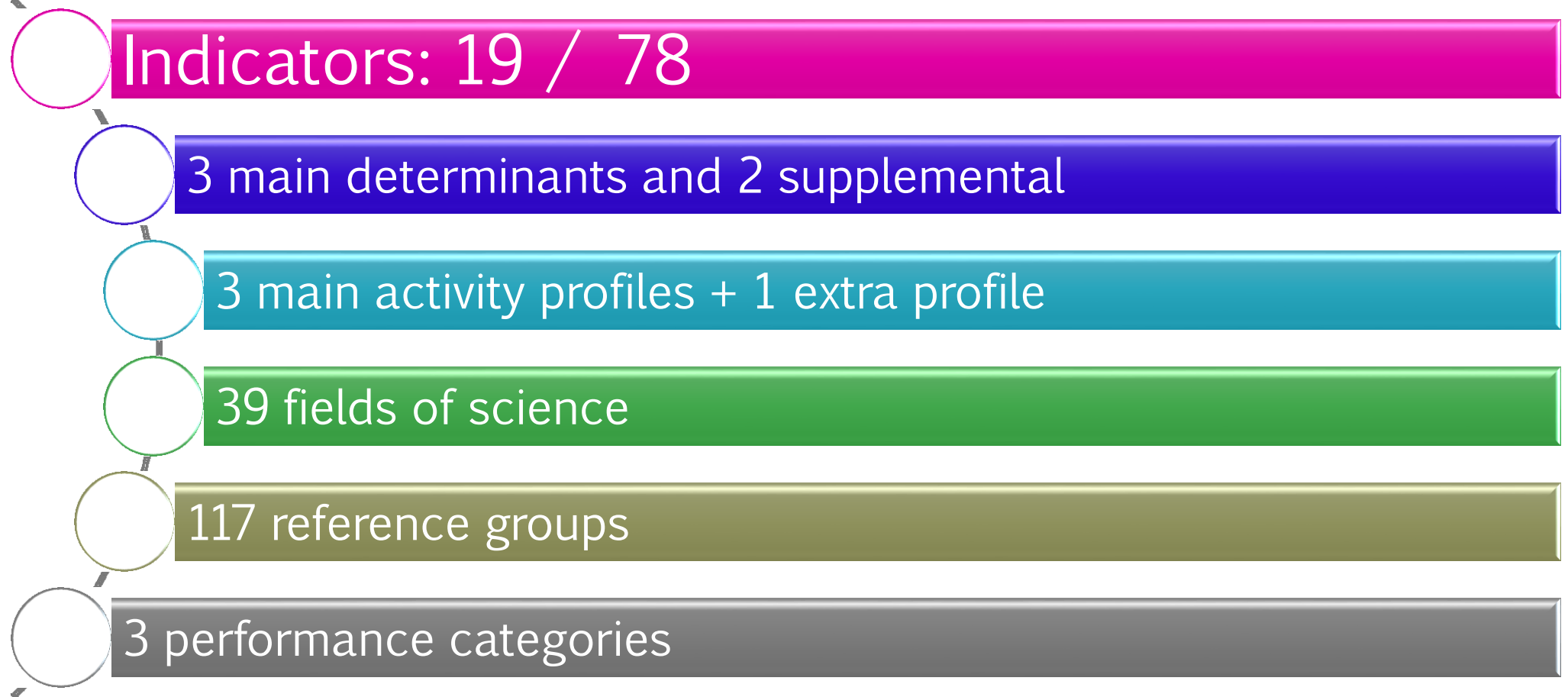
- › misunderstandings and interpretations
- › hard to verify (and prove)
- › possibility of manipulation

Quantitative assessment methodology



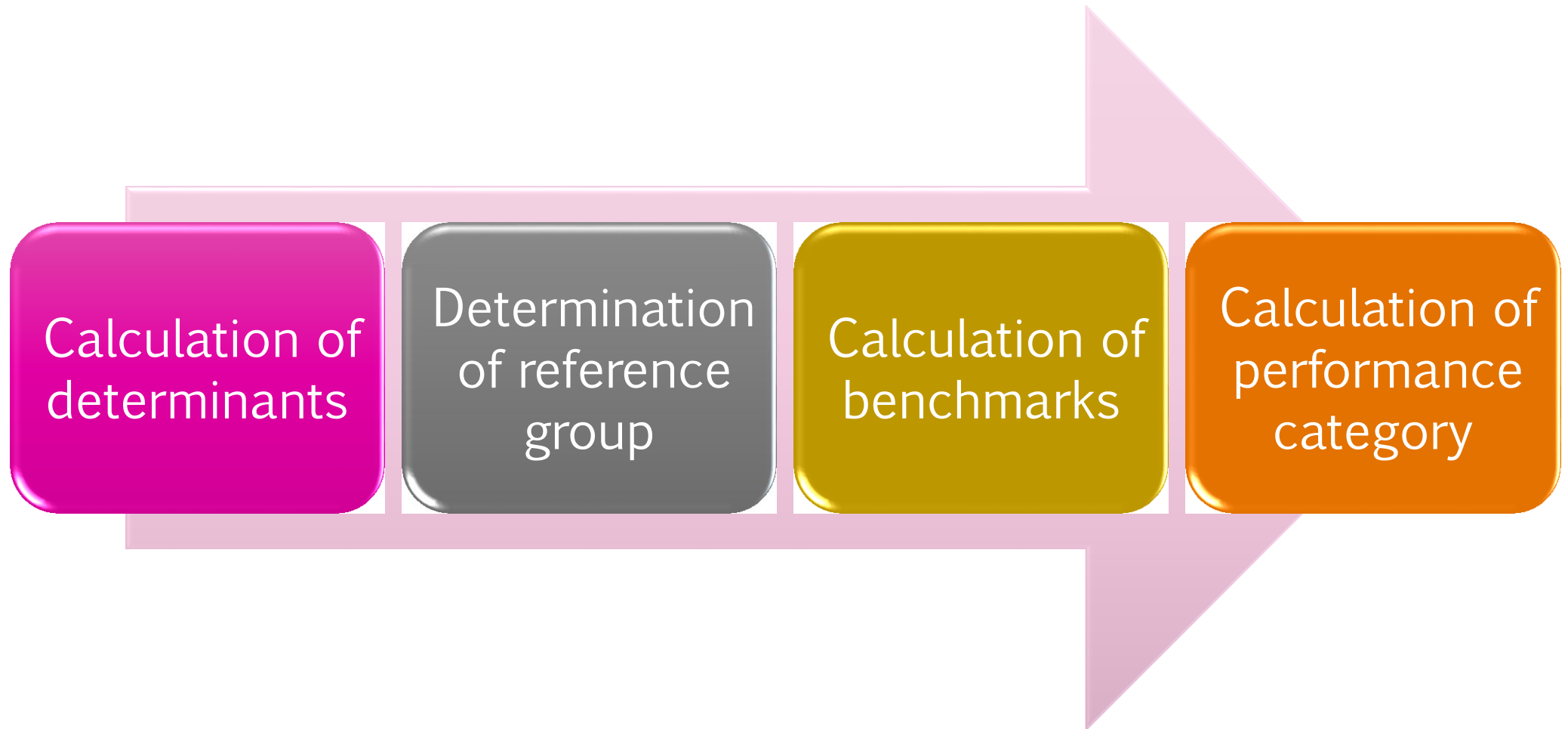


Basics





Stages





Main determinants

- A** The number of books or scientific periodicals and papers indexed in Web of Science, Scopus or other specialized database (maximum value from one of the databases representative for an organization) per 100 researchers (FTE).
- B** Number of IPRs registered in the Russian Federation or abroad as well as the number of issued design documentation per 100 researchers (FTE).
- C** Income from all types of R&D, S&T services provided per total R&D personnel of an organization.



Activity profiles

Determinant A

· Knowledge generation

Determinant B

· Technology development

Determinant C

· Provision of S & T services



Category assignment

Thresholds

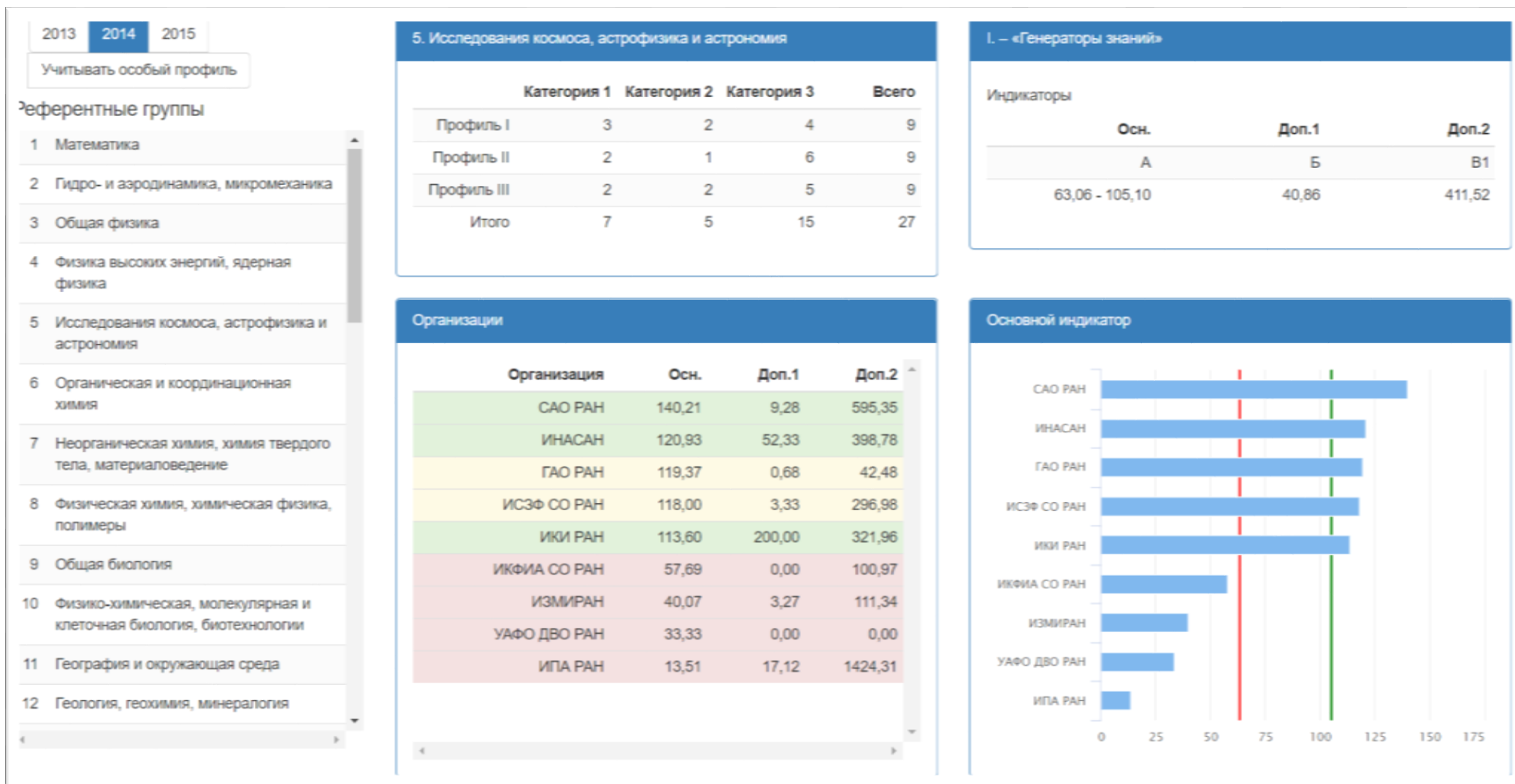
- › med = median of main determinants in the reference group
- › min threshold = $0.75 * \text{med}$
- › max threshold = $1.25 * \text{med}$

Category

1. Leading institutions
2. Sustained institutions
3. Degraded institutions (loosing research functions)



Example



FASO of Russia departmental assessment exercise





Quantitative assessment

- › was based on the Federal monitoring system data for 2013-2015
- › trial calculation by the general methodology showed unsatisfactory results
- › adjustments were proposed
- › final results were calculated



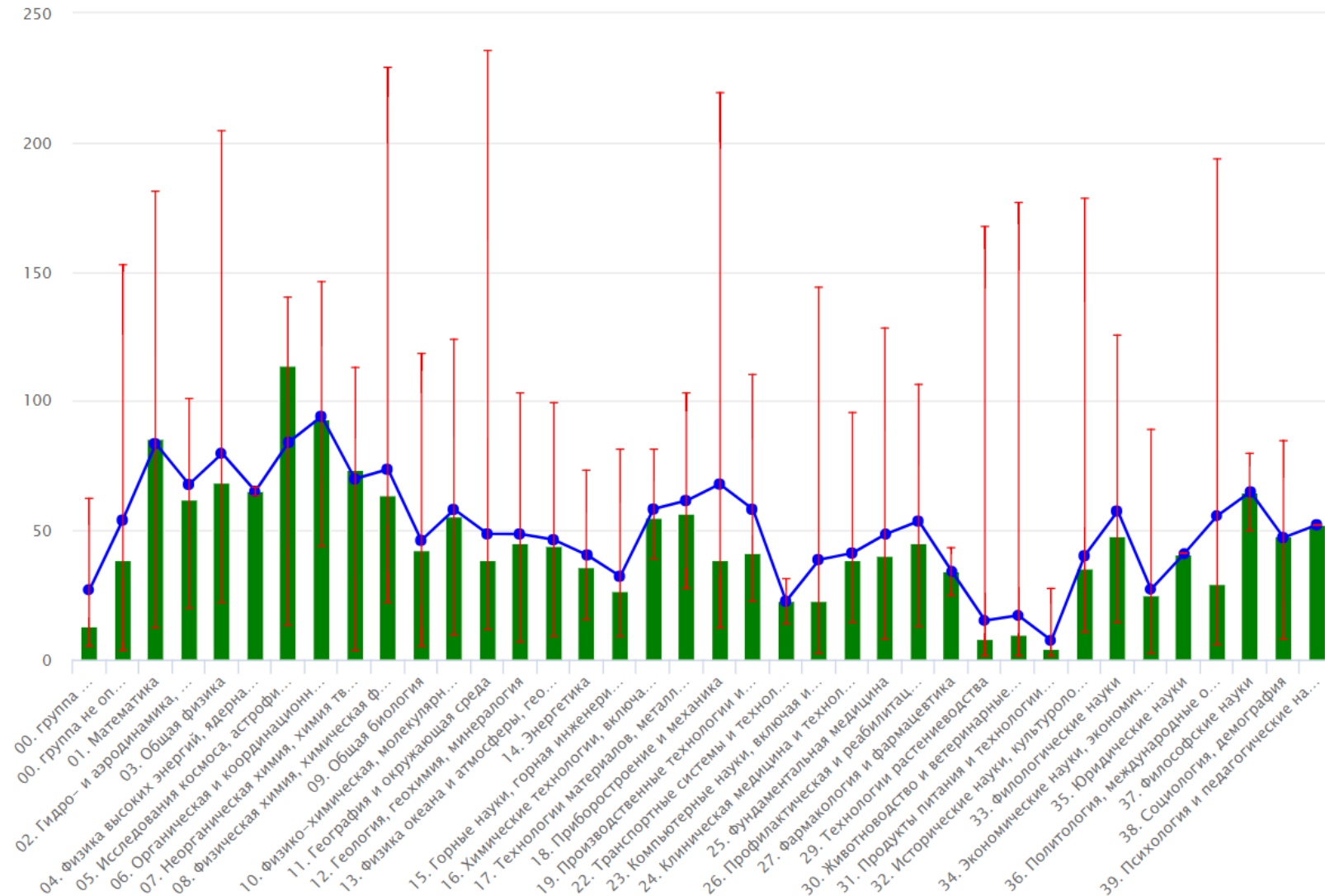
Main proposed changes

- › The distribution of organizations by reference groups was made only by the main field of research.
- › The main determinant C was calculated as a ratio of income from all types of R&D, S&T services to basic funding amount.
- › The thresholds for activity profile Knowledge generation were calculated within reference groups, and for activity profiles Technology development, Provision of S & T services – within all institutions, because the main determinants for these profiles are less biased by the main field of research.
- › Categories were calculated for all three activity profiles simultaneously.
- › The resulting profile and category of organization was chosen by selecting the best assigned category in all profiles.

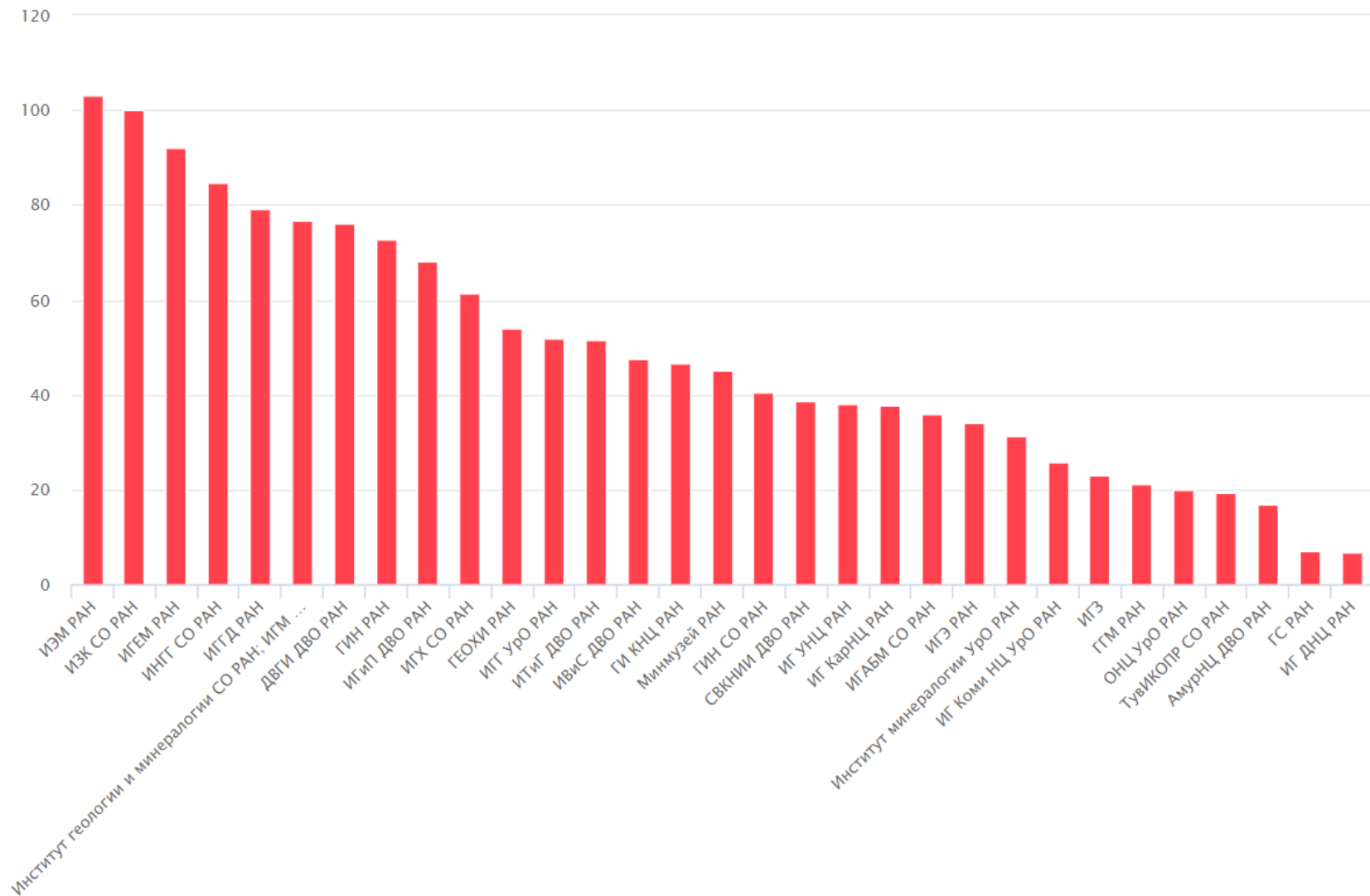


Determinant A

mean, median and dispersion in reference groups



Distribution of determinant A in the reference group “Geology, geochemistry, mineralogy”







Reference group “Psychology and Pedagogical Sciences”

39. Психология и педагогические науки

	Категория 1	Категория 2	Категория 3	Всего
Профиль I	0	1	0	1
Профиль II	0	0	1	1
Профиль III	1	0	0	1
Итого	1	1	1	3

I. – «Генераторы знаний»

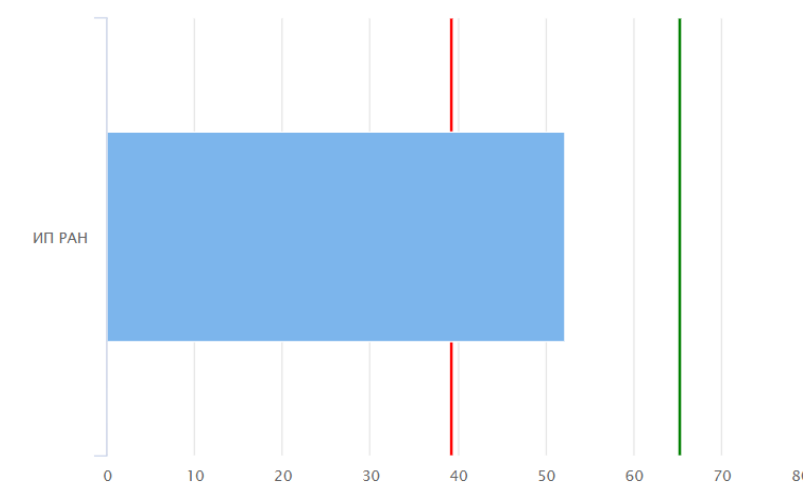
Индикаторы

Осн.	Доп.1	Доп.2
А	Б	В1
39,13 - 65,22	0,87	612,41

Организации

Организация	Осн.	Доп.1	Доп.2
ИП РАН	52,17	0,87	612,41

Основной индикатор





Reference group “Philosophy”

37. Философские науки

	Категория 1	Категория 2	Категория 3	Всего
Профиль I	0	2	0	2
Профиль II	0	0	2	2
Профиль III	0	0	2	2
Итого	0	2	4	6

I. – «Генераторы знаний»

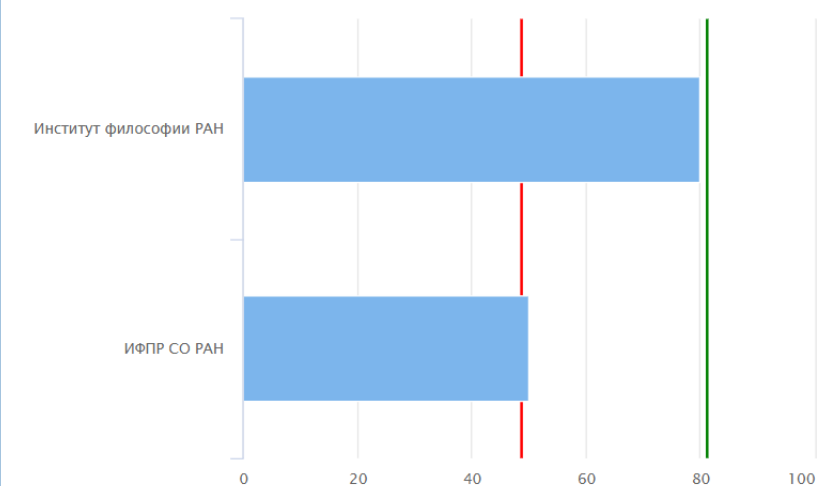
Индикаторы

Осн.	Доп.1	Доп.2
А	Б	В1
48,67 - 81,12	0,00	127,27

Организации

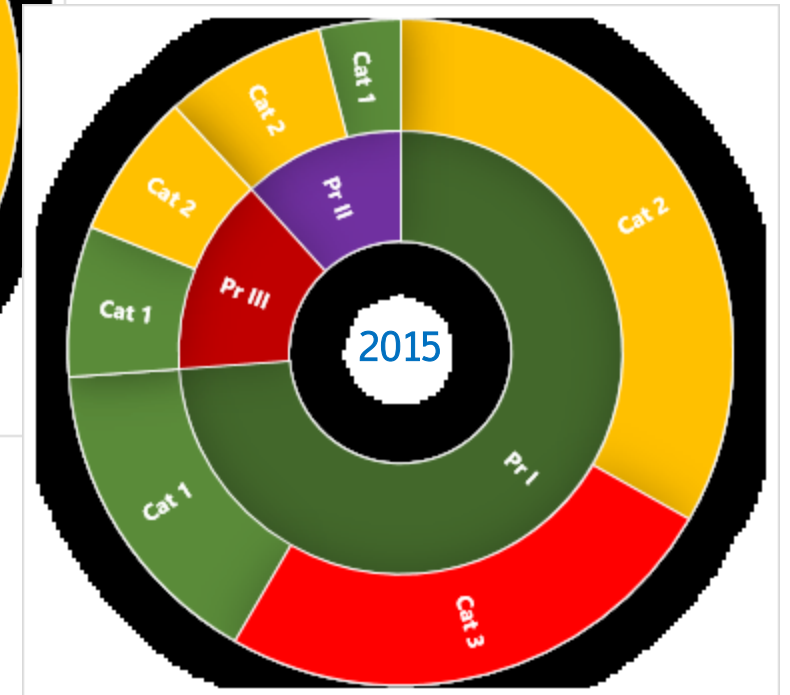
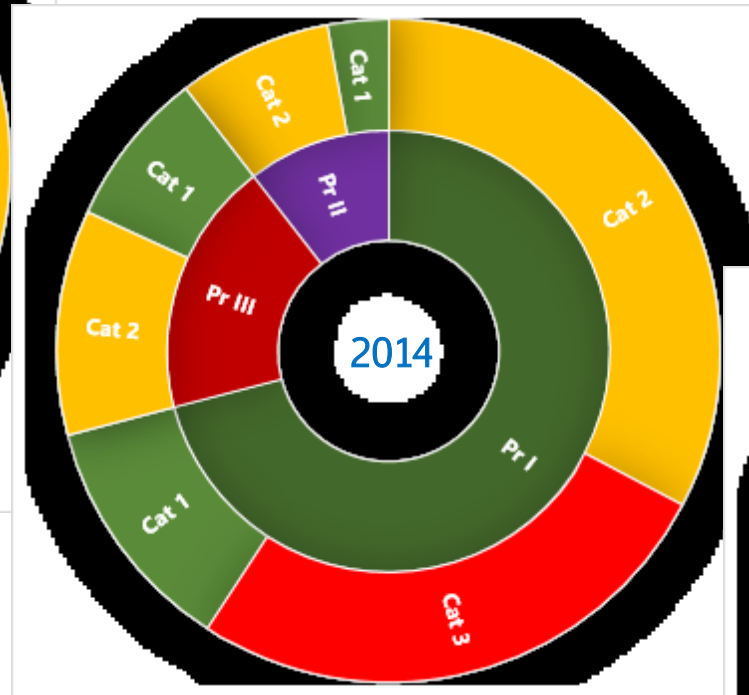
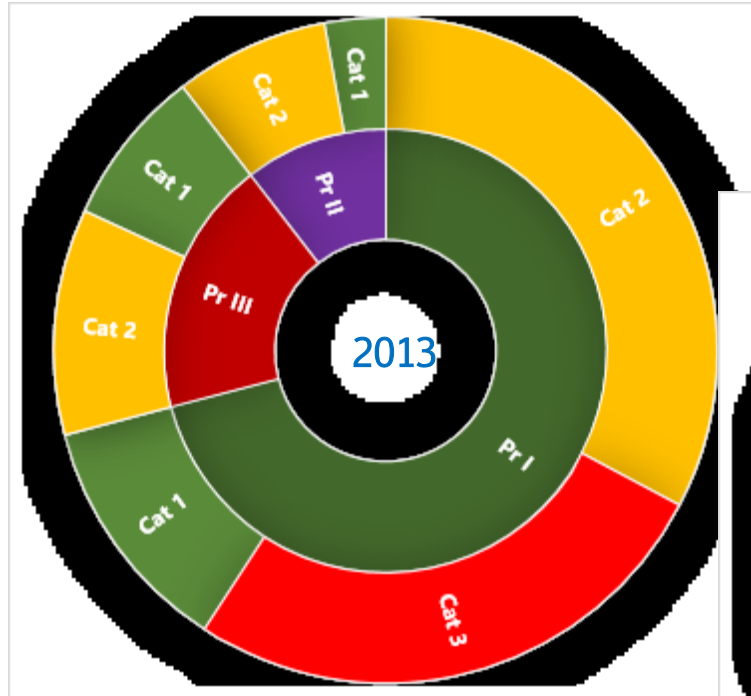
Организация	Осн.	Доп.1	Доп.2
Институт философии РАН	79,79	0,00	103,42
ИФПР СО РАН	50,00	0,00	151,11

Основной индикатор



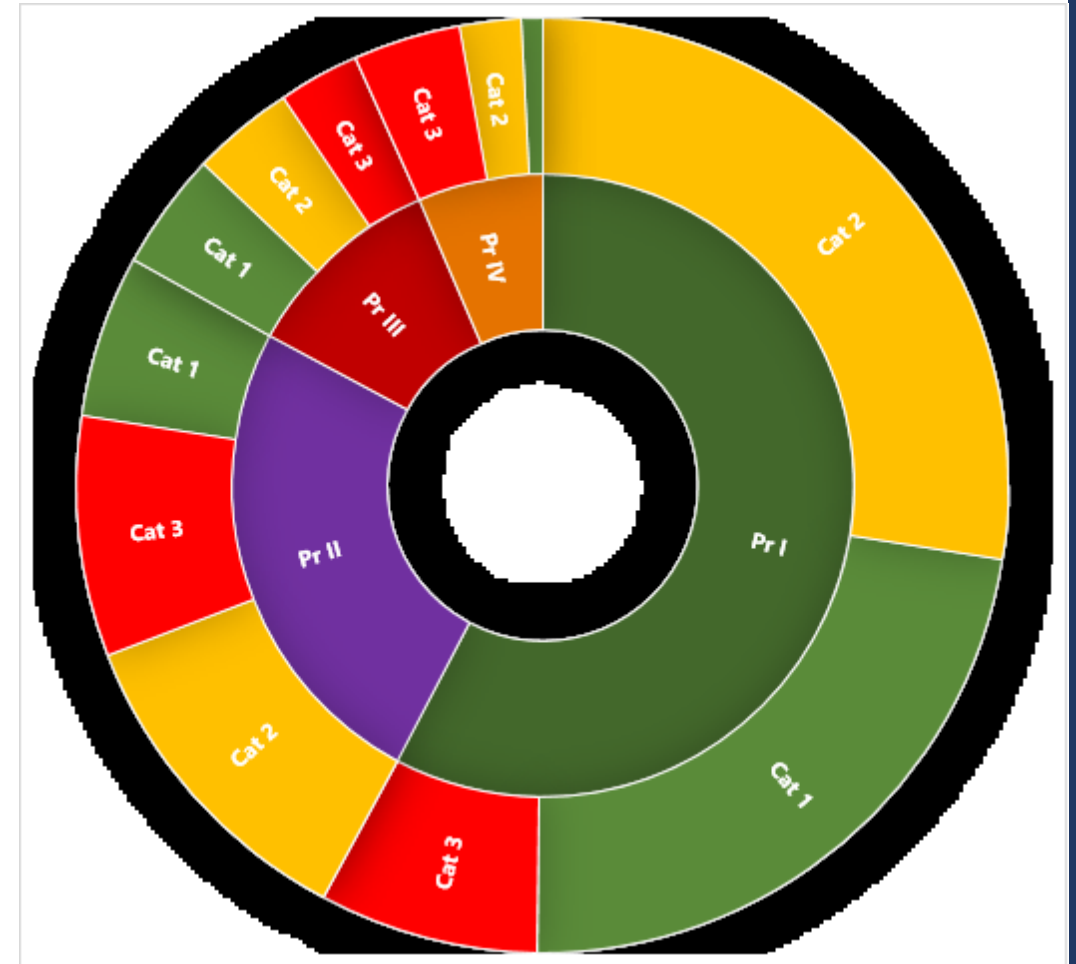
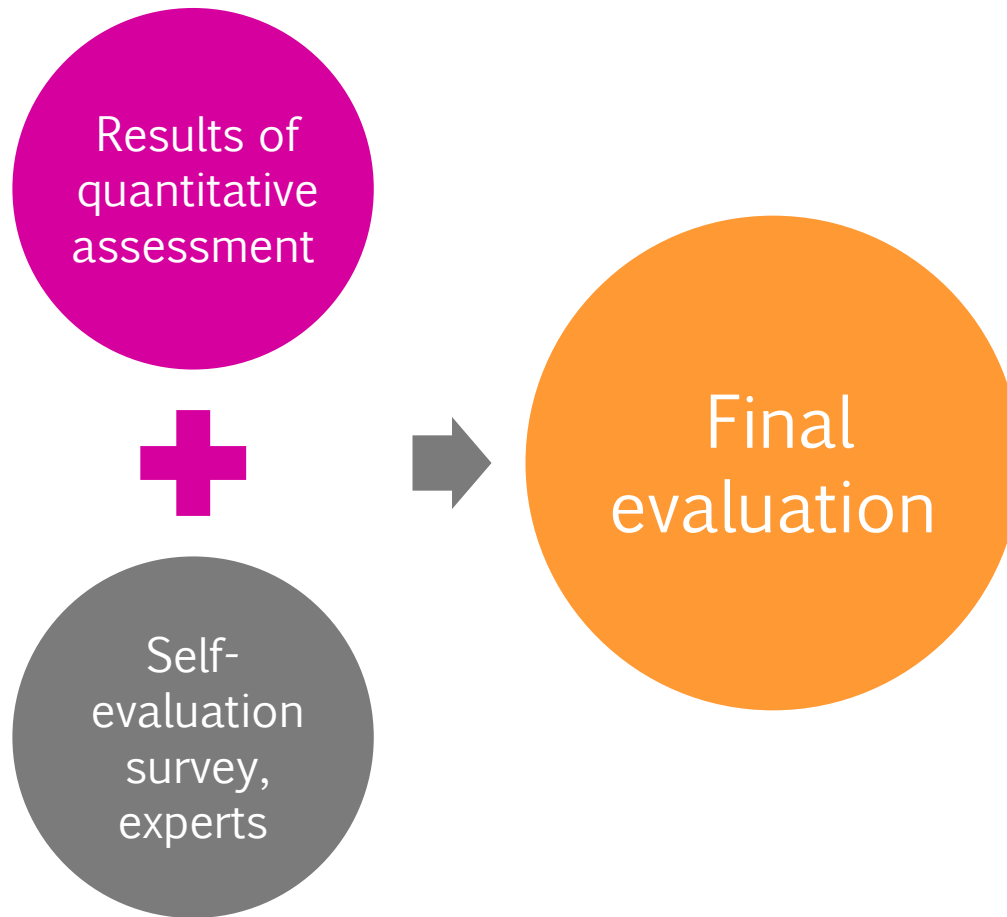


Results of quantitative assessment





Expert assessment



Comparison of quantitative stage results and final assessment assigned categories distributions

Science field	2013 - 2015 average distribution by category			Final distribution by category		
	Cat 1	Cat 2	Cat 3	Cat 1	Cat 2	Cat 3
Natural Sciences	29%	49%	22%	45% 	45% 	11%
Technical Sciences	36%	46%	18%	28% 	48% 	23%
Social Studies	14%	44%	42%	20% 	49% 	31%
Humanities	11%	49%	40%	56% 	41% 	4%
Health Sciences	30%	49%	20%	21% 	59%	21%
Agricultural Sciences	18%	55%	27%	20%	43% 	37%



Lessons and conclusions

- › Pure theoretical approach to the evaluation methodology design is unlikely to lead to good results.
- › Uneven distribution of organizations by reference groups makes assessment difficult and unreliable for small ones.
- › It's hard to achieve first category for diversified institutions with strong technology component in quantitative evaluation.
- › Usage of indicators relative to number of researchers in organization can be significantly biased by incorrect count of researchers.
- › Questionable character of determining of total number of publications as maximum from several sources.

Recent novelties in FASO research assessment and reporting





Evaluation of publications' "quality"

- › Fractional authorship
- › Journal "quality": Quartile Score (SCI), indexing in Scopus, listing in Russian High Attestation Commission special register

The new standard of quality – DOI !!!

"... It turned out that 4704 research projects (45% of all) do not have any articles with assigned DOI (Digital Object Identifier). This means that the information network does not contain data on these publications. I emphasize that there is no data not only in the Web of Science database, but in general nowhere, as DOI today must have all the more or less significant publications! It turns out that the performers of the good half have nothing to report..."

Alexey Khokhlov, Vice President of RAS

Methodology of calculation of quality of publication activity of research organization

$$T_{NUM} = \sum_{m=1}^M 3^{(4-Q^m)} \left(\frac{1}{N^m} \sum_{I=1}^{N^m} \frac{1}{a_I^m} T_I^{num} \right)$$

M – total number of publications

Q – Quartile of the journal (SCI)

N – number of article authors

a – number of authors' affiliations

T_i^{num} – number of authors' affiliations with FASO organizations

“Compliance” with the
statements of
the Leiden Manifesto
for Research Metrics





The Leiden Manifesto for research metrics

Quantitative evaluation should support qualitative, expert assessment	+
Measure performance against the research missions of the institution...	+
Protect excellence in locally relevant research	-
Keep data collection and analytical processes open, transparent and simple	-
Allow those evaluated to verify data and analysis	-
Account for variation by field in publication and citation practices	+
Avoid misplaced concreteness and false precision	-
Recognize the systemic effects of assessment and indicators	-
Scrutinize indicators regularly and update them	-

Main source of spotted problems





Prerequisites

- › Implementation of a project approach to planning and managing basic scientific research in accordance with the Programs of fundamental scientific research of the State academies of sciences for 2008-2012 and 2013-2020.
- › Transition to the service-oriented model of the public administration, which was expressed in the introduction of the concept of the state assignment in 2007, which led to a change in the funding model of scientific organizations from 2012.



Design and implementation sequence

- › The main cornerstones of the methodology were laid at the highest level of authority at the first stage without proper study and preparations.
- › Independence of separate teams responsible for the main parts – indicators and monitoring system, methodology (calculations and procedures) of assessment
- › Lack of public discussions and expert community involvement.



Ministry of Finance

is at the core of developed approaches:

- › Single year planning
- › Elementary indicators
- › Straightforward way to the calculation of necessary funding (number of FTE * standard costs)

GOODHART'S LAW

Charles Albert Eric Goodhart



«As soon as the government attempts to regulate any particular set of financial assets, these become unreliable as indicators of economic trends»

In scientometrics:

«All metrics of scientific evaluation are bound to be abused»

Mario Biagioli

Biagioli, Mario (12 July 2016).
«Watch out for cheats in citation game».
Nature. 535 (7611): 201.
doi:10.1038/535201a

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THANK YOU
for your attention!



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