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MINISTERSTVO
ŠKOLSTVA, VEDY,
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SLOVENSKEJ REPUBLIKY

Open Science in Slovakia

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The Slovak Centre of Scientific and Technical
Information



NISPZ^{IV}

Investment to your future



Open Science – just science done right

The importance of openness – in science and in society

Openness increases:

- Efficiency,
- Visibility,
- Impact,
- Cooperation
- Integrity.



Open Science in the world: unstoppable tendency

Funders, representatives of public interest (European Commission, UNESCO) and prestigious research institutions are aware of the key role of openness:



NASA is making a long-term commitment to building an inclusive open science community over the next decade. Open-source science is a commitment to the open sharing of software, data, and knowledge (algorithms, papers, documents, ancillary information) as early as possible in the scientific process.

UNESCO: **Recommendation on open educational resources** (2019), **Recommendation on open science** (2021), [Toolkit](#): Guidelines for building capacities for open science, Guidelines for creating open science policies, Strengthening open infrastructures..

„ Let's move away from the "publish or perish" paradigm and the inappropriate use of metrics. Let's value the full spectrum of work done by researchers!“

Marc Schiltz, President of Science Europe

Paradigm shift, its price and opportunities it brings:

- Research communication **is undergoing a paradigm shift**
- At the same time (as any other change) it **requires investments and brings new problems** (e.g., unavailability of publishing in prestigious journals due to the high APC costs or the development of predatory publishers practices).
- It is wise to try **to solve these problems**, because the global scientific community is not going back to being closed.
- The key to these problems may lie in **the support of diamond OA journals/platforms**, but especially in the **change of the science evaluation system** in terms of COARA principles.

How will be the opportunities, offered by the global transition to openness, used in Slovakia depends on all actors of our research ecosystem.

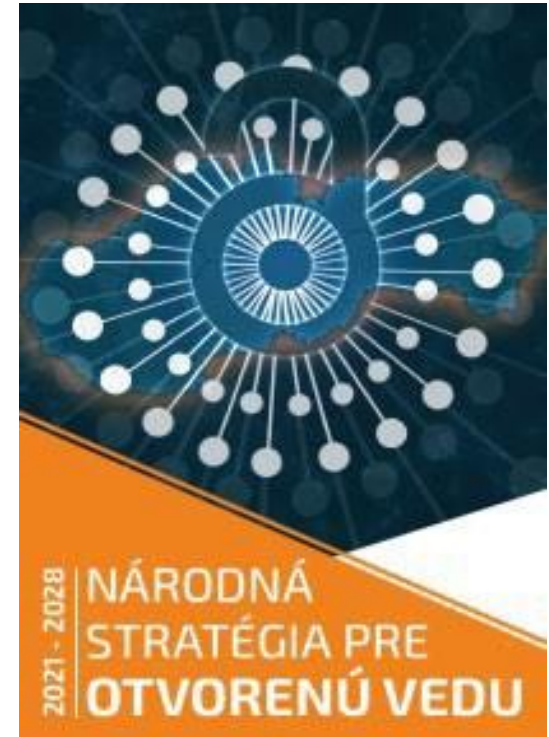
More open communication can at least partially help us out of the vicious circle of "weak" (poorly visible) science, the lack of public support, the lack of funding that further weakens science...

Open Science in Slovakia: the National Strategy

Approved by the Slovak government in June, 2021.

- It harmonizes the development of Slovak science and research with the Recommendations of the EU on access to and preservation of scientific information and the Horizon 2020 and Horizon Europe Guidelines.

<https://otvorenaveda.cvtisr.sk/narodna-strategia-otvorenej-vedy/>

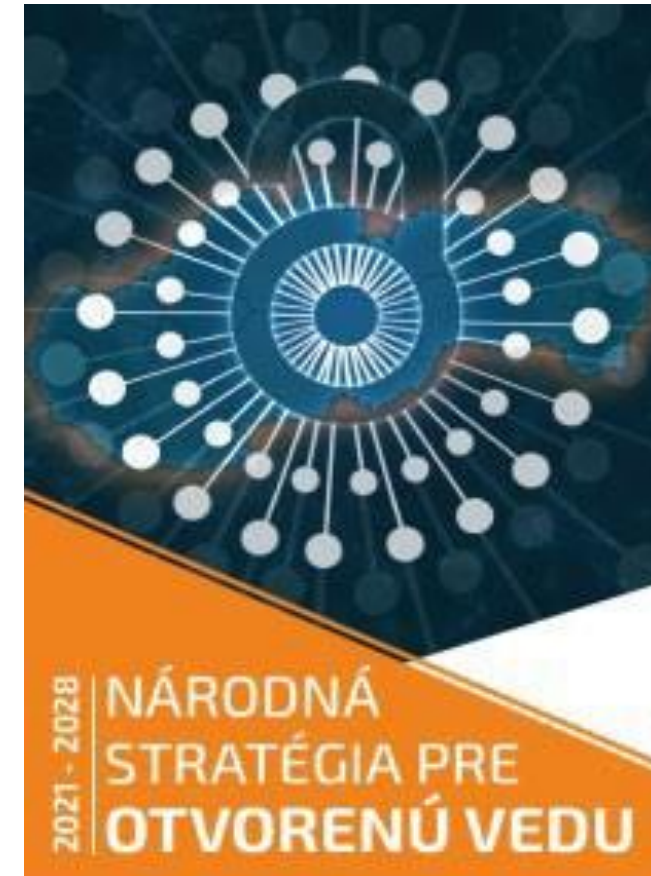


NINE STRATEGIC PRIORITIES

direction of open science developments in the period 2021 – 2028

1. Supporting open access to publicly funded research outputs,
2. Supporting open access to research data and RDM,
3. Supporting open science infrastructure development,
4. Financial support to open science,
5. Intellectual property rights and public licenses,
6. Supporting existing open IT solutions,
7. Reinforcing academic community with open science skills,
8. Reviewing research assessment criteria,
9. Supporting citizen science.

Since 2012, the European Commission has been asking member states to actively support open science. It is time to repay this debt, because remaining closed is leading to missing new opportunities for researchers and in the terms of economy, innovations and social development wasted opportunities for society.



The National strategy for Open Science

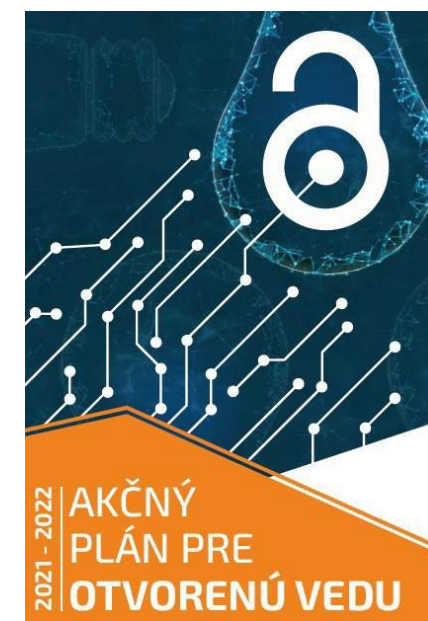
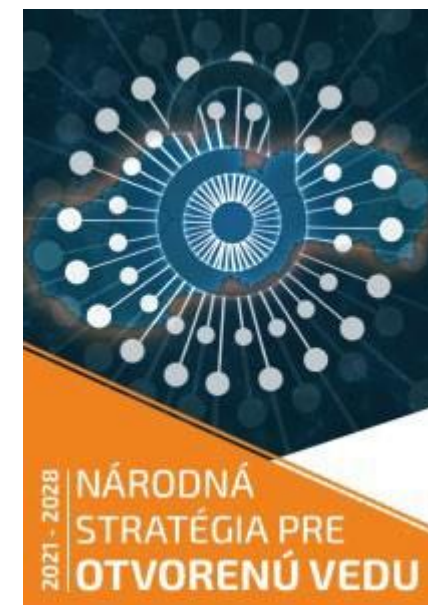
Action Plan 2021-2022 – what we achieved:

- Working group for open science (meetings once a month),
- Analysis of the legislative environment in relation to open science,
- Analysis of APC fees,
- Improving the access to university theses and dissertations,
- Methodology for creating institutional Open Science policies,
- Educational materials were created (a handbook for doctoral students, citizen science, CC...),
- Contracts with major publishers,
- Discussions about changing the research assessment.

Transferred tasks:

- Methodology for institutional repositories,
- Introduction of DMP as part of grant applications from Slovak agencies,
- Open Science Education Platform,
- Analysis of open IT tools in Slovak science.

Evaluation of the 2021-2022 Action Plan: <https://rokovania.gov.sk/RVL/Material/28066/1>



The Action Plan for 2023-2024

The new action plan is awaiting the government's decision.

It contains tasks from the following areas:

- Monitoring the state and development of open science and APC monitoring,
- Open data support (grant DMP – the pilot phase),
- The use of open IT tools and reuse of open data,
- Reproducibility of research (cooperation with the Reproducibility network) and scientific integrity (cooperating on the National Code of Ethics and Integrity),
- Infrastructure building support (manual for institutional repositories),
- Support for open access funding,
- Education in the field of open science, intellectual property rights,

LP/2023/420 Akčný plán pre otvorenú vedu na roky 2023 - 2024

RSS2.0 | ATOM

Typ materiálu:	Nelegislatívny všeobecný materiál
Legislatívna oblasť:	Nelegislatívna oblasť
Aktuálne štádium materiálu:	Vyhodnotenie medzirezortného pripomienkového konania
Rezortné číslo:	2023/10509:2-D1230
Podnet:	na základe bodu B. 4. uznesenia vlády Slovenskej republiky č. 317 z 9. júna 2021 k Národnej stratégii pre otvorenú vedu na roky 2021 - 2028 a k Akčnému plánu pre otvorenú vedu na roky 2021 - 2022
Zodpovedná inštitúcia:	MŠVVaŠSR (Ministerstvo školstva, vedy, výskumu a športu Slovenskej republiky)
Zodpovedný predkladateľ:	Bútor, Daniel, Mgr.
Skrátený legislatívny proces:	Nie
Skrátené MPK:	Nie
Posledná zmena:	27.09.2023
Číslo legislatívneho procesu:	LP/2023/420
Dátum začiatku MPK:	19.07.2023
Dátum konca MPK:	01.08.2023

[Sprievodná dokumentácia](#)

[Zobraziť pripomienky](#)

[Zobraziť hromadné pripomienky](#)

[Vznesené pripomienky v rámci MPK \(docx\)](#)

Štádia procesu

▼ Príprava nelegislatívneho materiálu

Sprievodné dokumenty

▼ Medzirezortné pripomienkové konanie

Sprievodné dokumenty

▼ Vyhodnotenie MPK (neleg. materiál)

Prebieha

<https://www.slov-lex.sk/legislativne-procesy/-/SK/LP/2023/420>

How to make Open Science work?

- A functional ecosystem of science in general,
- Awareness of scientists, supporting staff and managers about the importance and possible benefits of open science,
- Open mind, open culture (prioritize cooperation over competition),
- Continuous education (of students, scientists and other academic staff),
- Systematic support (the existence of infrastructure, but also of personnel: when researchers decide for open procedures, there should be someone at the institution who can advise and help them).

How to achieve at least partial changes for the better when the conditions are not optimal?

- Starting discussions (gather feedback),
- Create a plan,
- Start implementing in practice... Be active, be the one who argues, who can give advice,
- If the necessary financing is not forthcoming, develop those activities that do not require large investments,
- Prepare ideas for projects, look for potential collaborators and, when the suitable challenge comes, try to take advantage of it.

How much are researchers from Slovak institutions paying for OA publishing?

<https://zenodo.org/record/7184268>

Analysis – estimated APCs paid by scientists from Slovak research institutions, using data from the Web of Science database, Clarivate Analytics (export via API).

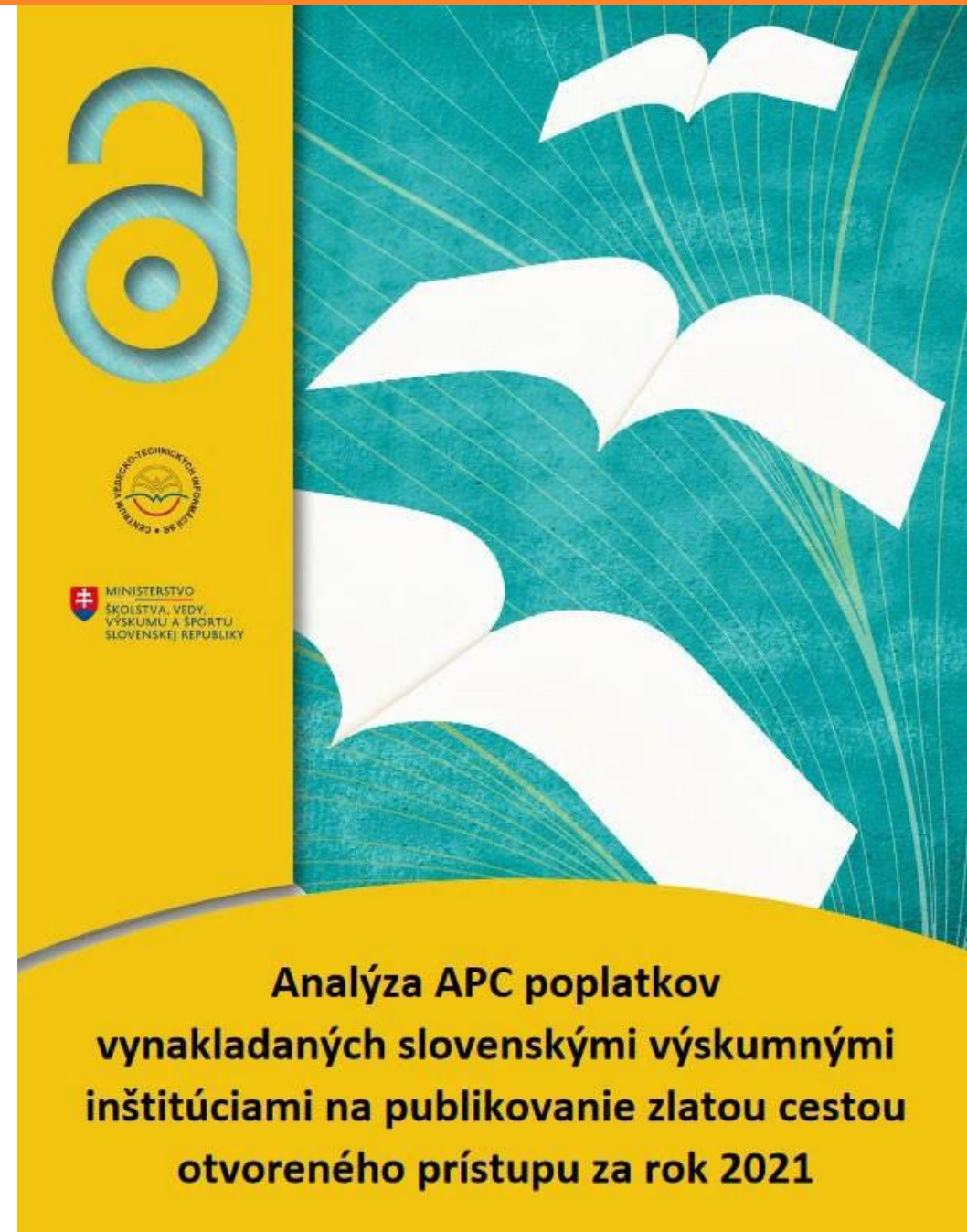
Criteria:

- Year of publication: 2021.
- Publication method: OA Gold or Hybrid.
- Corresponding author affiliated with a Slovak research institution.

We assigned the APC amounts to the journals according to the data in the DOAJ or on the publisher's website (in the Euro currency, or recalculated according to the NBS exchange rate current at the time of data processing).

Possible inaccuracies:

- We assumed that APC is usually paid by the corresponding author (in practice there are exceptions: discounts, fee waivers, payment by another member of the author collective who has more grant funds, or the authors contribute to the amount...).
- Database limitation (Slovak authors publish and probably pay APCs outside the Web of Science database).
- Limitation by the type of the fee (we only looked at APCs, although some publishers charge authors other fees when publishing).



Estimate of the total amount of APCs paid by authors from Slovak institutions in 2021

List	APC (€) paid
Authors clearly affiliated to one of Slovak research institution	€2,909,426
Authors with multiple affiliations in various Slovak institutions	€212,077
Authors with Slovak and at the same time foreign affiliation	€555,703
Total	€3,677,206

According to the data from Web of Science, the total amount of APCs spent by Slovak institutions on APCs in 2021 may be in the range of **3.1-3.7 million euros**. The lower estimate assumes the possibility that for corresponding authors affiliated to both a Slovak and a foreign institution, the expenses for the APCs for the publication were covered by a foreign institution, the upper estimate considers the alternative that the APC was covered by a Slovak institution.

The methodological limitations of the survey and the incomplete, ambiguous or inaccurate database data on the publications of Slovak scientists imply the necessity to **start monitoring APC internally at research institutions**, or through the publication activity registration system.

The growth of open access – Slovakia, neighbors, and Western European OA champions

What is the percentage of the total number of publications published in open access?

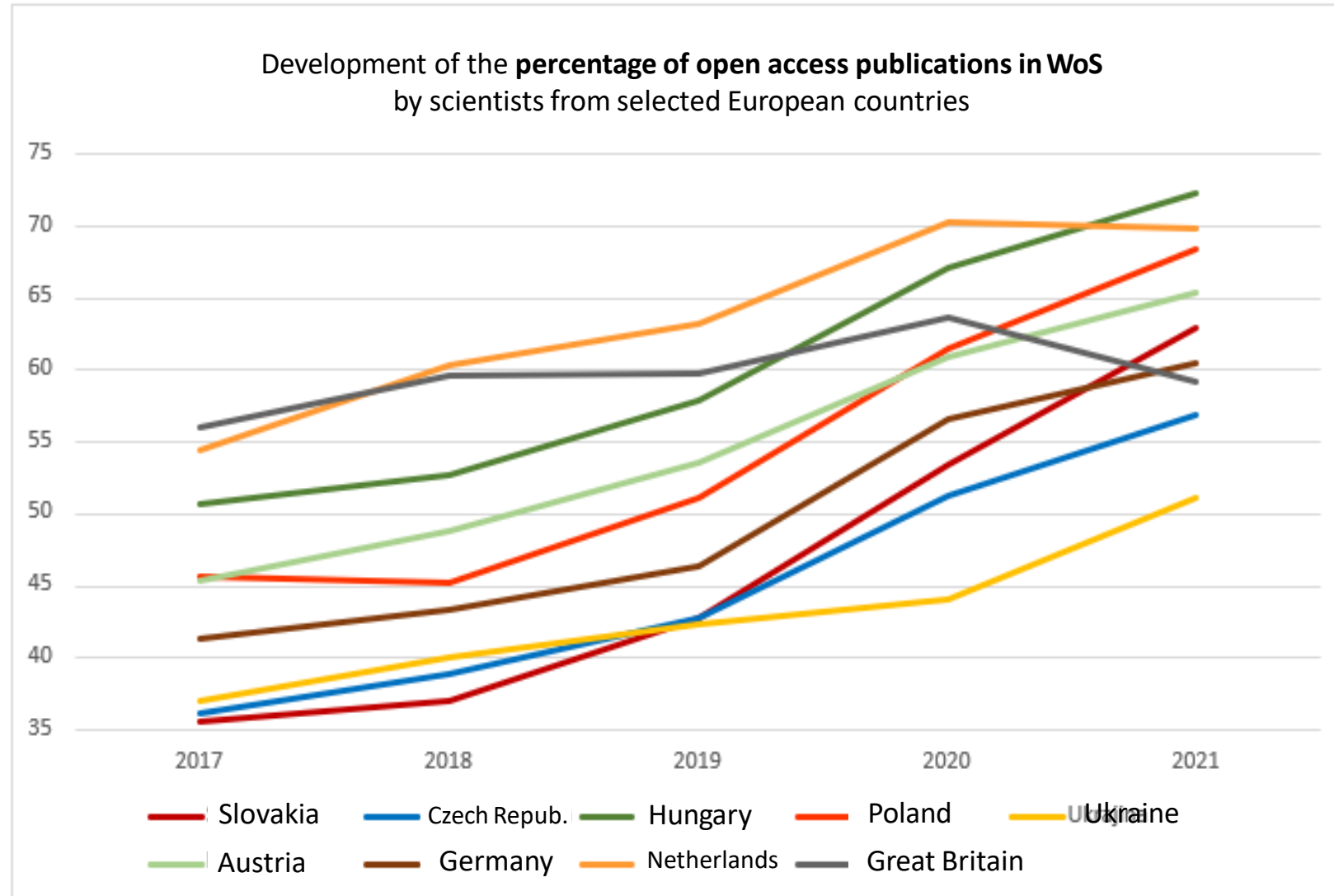
Development of the percentage of the publications indexed in the Web of Science published in open access in the period 2017-2021.

The proportion of open publications (out of all publications by authors with affiliation in a given country) is slightly increasing abroad.

Since 2018, the rise in the percentage of open publications has been somewhat rapid in Slovakia and Poland.

Stagnation or a slight decline can only be observed in England since 2018 and the Netherlands since 2020, while these countries have had the highest proportion of open publications since the beginning.

Slovak scientists publish more and more openly... **But where?**



Growth of the MDPI (comparison with the other European countries)

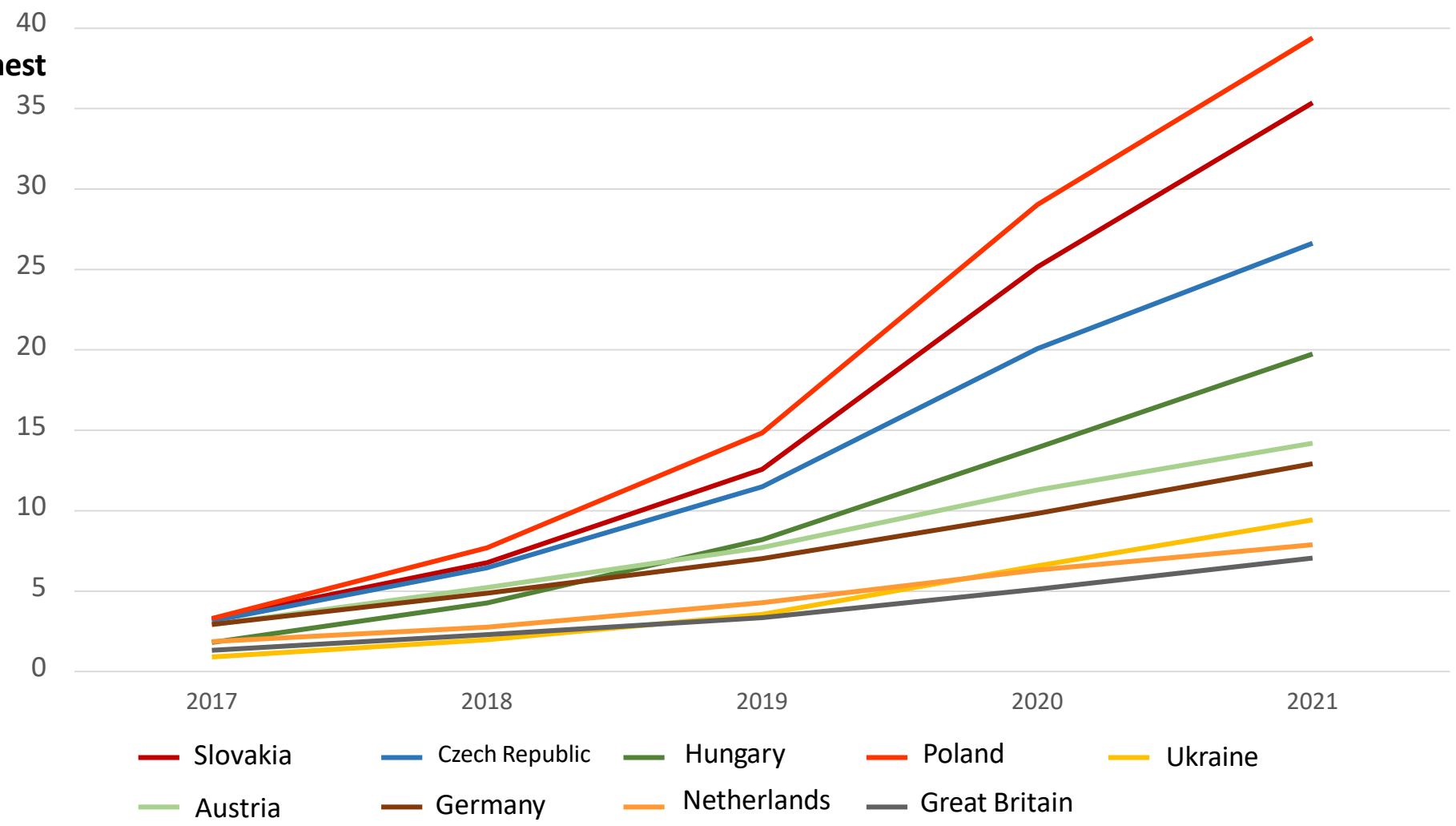
MDPI's share of Slovak open publishing is growing significantly and is one of the highest in Europe.

For developed countries, the share of publishing in MDPI is below 15%. The problem is that MDPI, with its policy of numerous special issues with guest editors, **is losing the trust of the scientific community.**

Some institutions and learned societies do not recommend their members/staff to publish in MDPI.

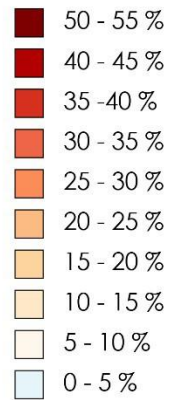
In 2023, some MDPI journals were **removed from the Web of Science.**

Development of the **percentage of open access WoS publications published in MDPI** by scientists from selected European countries



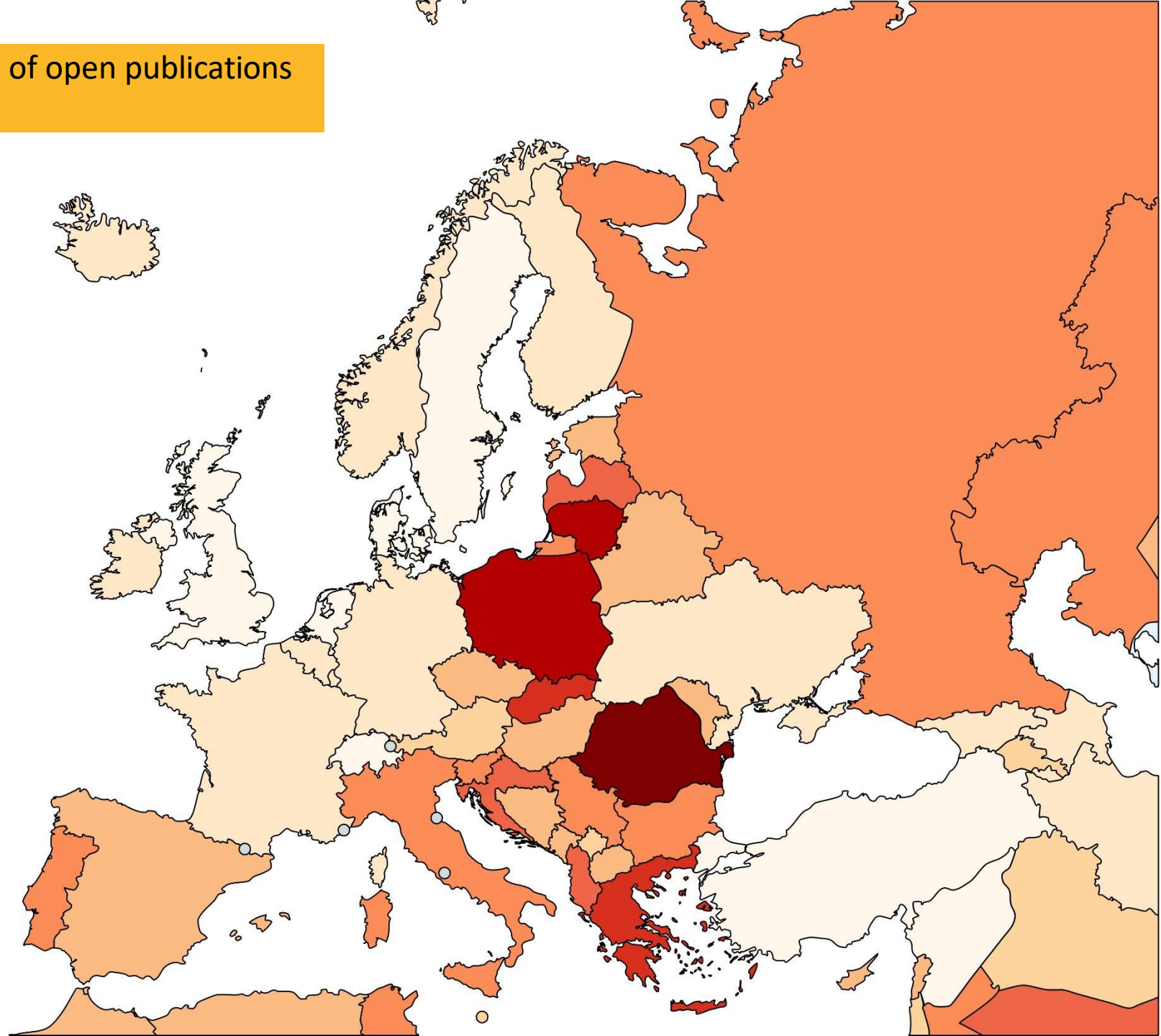
Source: Web of Science (Clarivate Analytics), 2022.

The share of MDPI from the total number of open publications in European countries



The highest "affinity" for the MDPI is in the (relatively) new EU countries with the lowest number of publications per capita, where the pressure to publish is combined with the difficulty of getting into the "respected" scientific journals.

Several European countries (e.g., France, Spain) do not support MDPI publications in the science evaluation system and at the same time allow their scientists to publish "free of charge" with respected publishers through transformative agreements.



Z. Stožická, 2023

(data: Web of Science, 2022, map: mapchart.net)

Created with mapchart.net

Transformative agreements for Slovakia – where to publish?

Lists of journals and FAQ: <https://eiz.cvtisr.sk/open-access-publikovanie/>

Transformative agreements also known as „read and publish“ agreements

Goals:

- to expand the number of journals from recognized publishing houses in which Slovak scientists can publish without paying APCs,
- to bring more open content and to increase the competitiveness of scientists from authorized institutions,
- to bring institutional investments intended for publication and access to information resources under more effective supervision and control in order to reduce costs,
- support the transformation of publishing scientific journals to open access.

In Slovakia, transformative agreements with Springer-Nature publishers (SAS and the most universities), IEEE (Comenius University and technical universities) and Elsevier (SAS and the most universities) have been concluded so far 2023).

- **Paid:** till the end of **2024**, **procure:** till the end of **2026**.

Limits of transformative agreements:

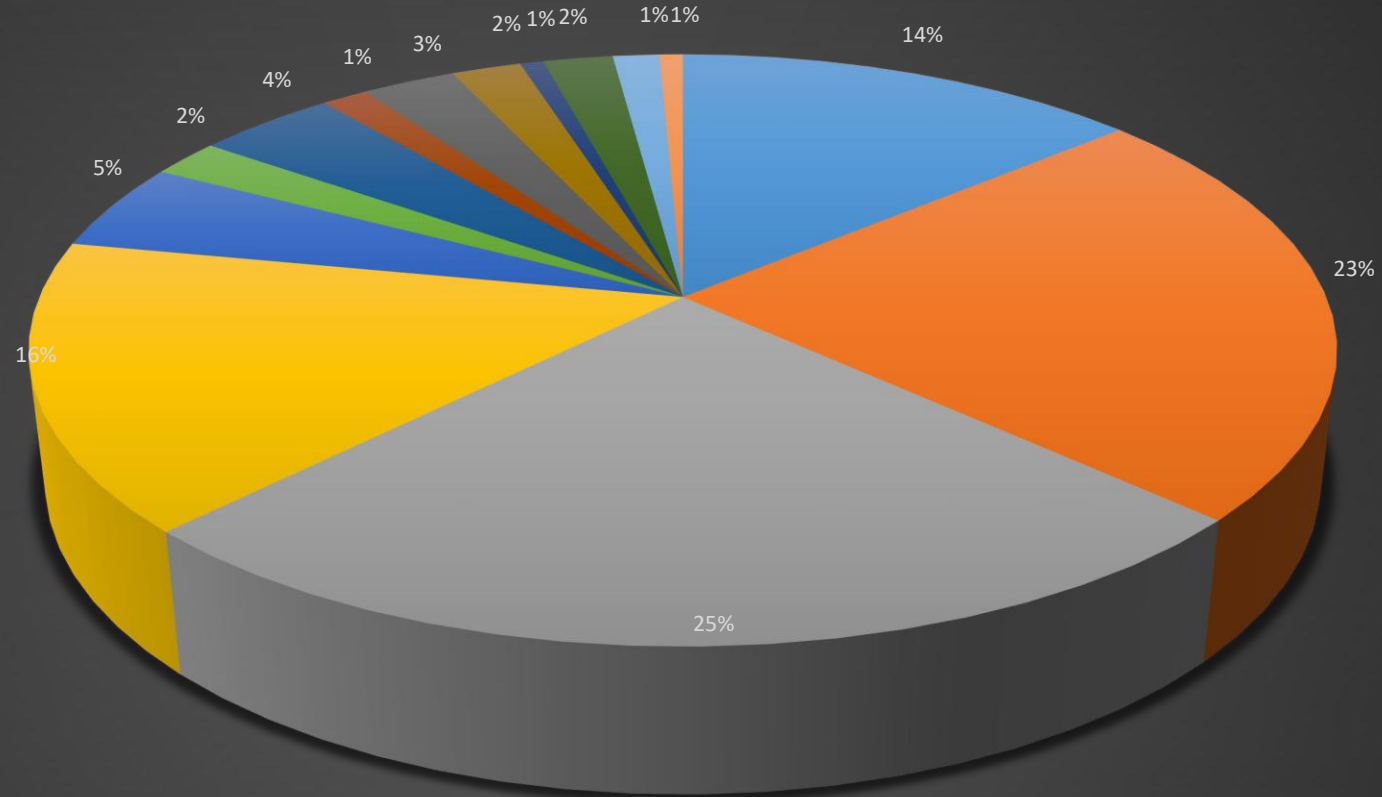
- a temporary solution (western countries plan to withdraw their support),
- they preserve inequality in the system (disadvantage of small publishers, scientists without affiliation and from countries that cannot afford TA)
- B. Brembs: "We replace disadvantageous contracts that are difficult to terminate with contracts that are even more difficult to terminate."

Contracted numbers of articles:		used up to now:
Springer-Nature:	1172	156
IEEE:	116	11
Elsevier:	200 gold and 200 hybrid	23

Transformative agreement: Springer Nature

Springer Nature: Published articles by institutions (May-November 2023)

The most articles with Springer Nature were published by Comenius University, the SAS and P.J. Šafárik University.

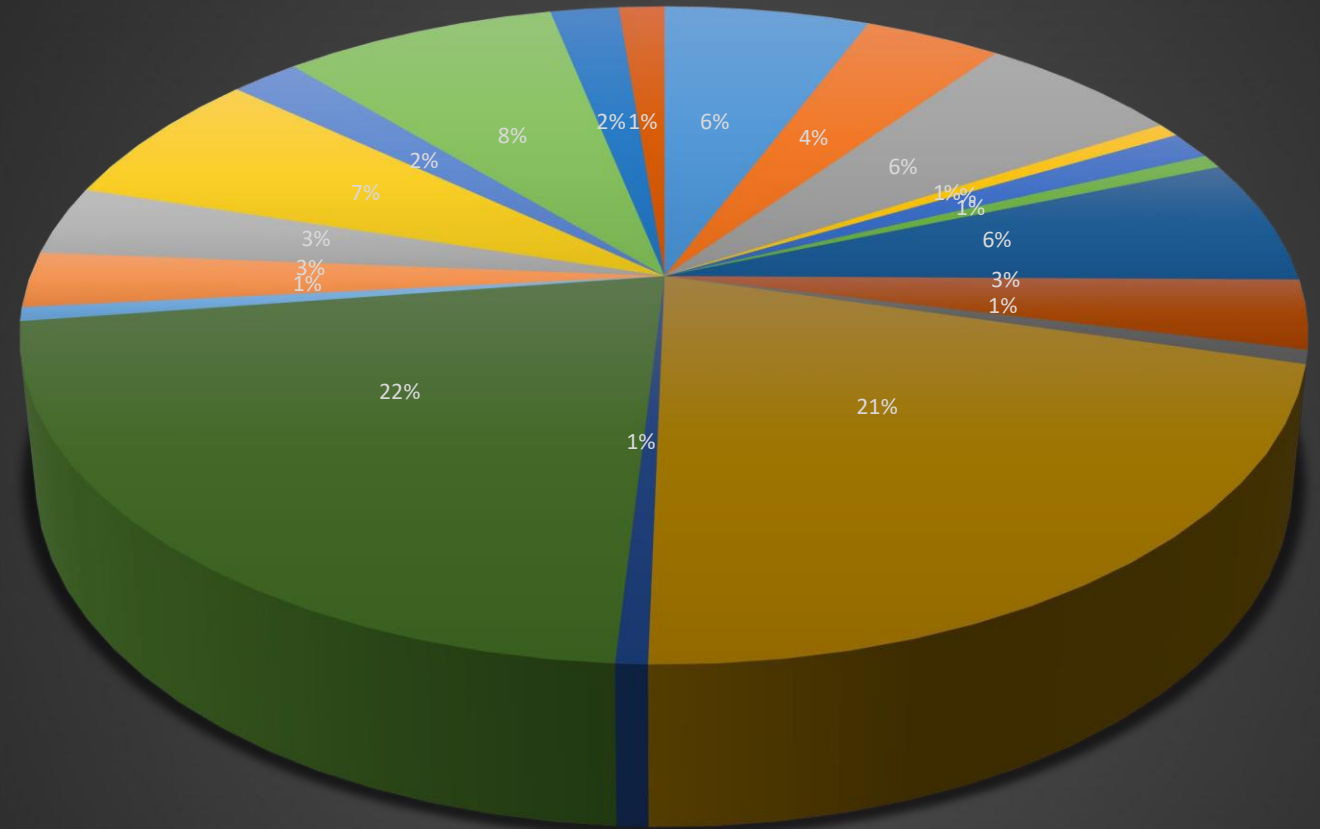


- Slovak University of Technology
- Pavol Jozef Šafárik University in Košice
- University of Technology in Košice
- Žilina University in Žilina
- Prešov University in Prešov
- Slovak Academy of Sciences
- Constantine the Philosopher University in Nitra
- University of Veterinary Medicine and Pharmacy
- Alexander Dubček University in Trenčín
- University of Matej Bel in Banská Bystrica
- Comenius University in Bratislava
- University of SS. Cyril and Methodius in Trnava
- Slovak University of Agriculture in Nitra Trnava
- University in Trnava

Transformative agreement: Springer Nature

Main research areas where researchers publish under transformative agreement with Springer Nature are:
life sciences, biomedicine, chemistry, physics etc.

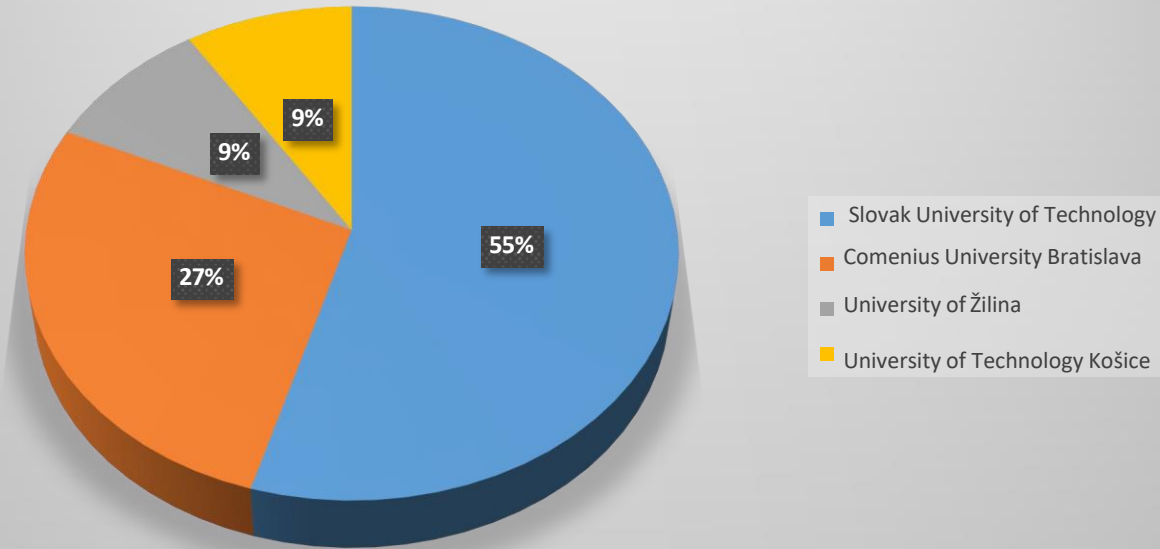
Springer Nature: Published articles by the research area (May- November 2023)



- | | | | | |
|--------------------------|------------------|----------------|-------------------|-----------------|
| Biomedicine | Computer Science | Earth Sciences | Economics | Education |
| Energy | Engineering | Environment | Geography | Chemistry |
| Law | Life Sciences | Literature | Materials Science | Mathematics |
| Medicine & Public Health | Philosophy | Physics | Psychology | Social Sciences |

Transformative agreement: IEEE

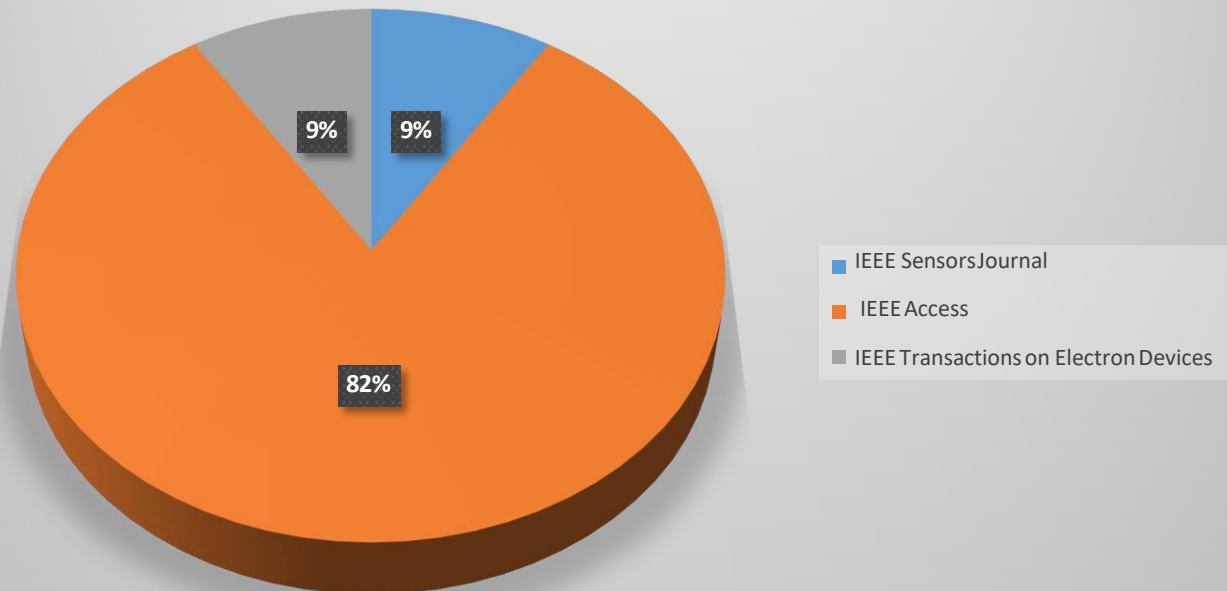
IEEE Published articles by institutions
(May–November 2023)



With the IEEE, mainly scientists from engineering/ technical fields are publishing. So far, scientists from the Slovak University of Technology in Bratislava and Comenius University have been the most active in using the transformative agreement with the IEEE.

The majority of articles published by Slovak scientists were published in the IEEE Access magazine.

IEEE Published articles by journals
(May–November 2023)



Methodological recommendation for developing open science policy

<https://zenodo.org/records/7446490#.Y7v8fRWZOUK>

- **Research performing institutions** can also follow the open science principles and decide which of them they find relevant to their research and pedagogical activity.
- The document contains **Methodological recommendation** and **Open science policy model**. It is intended for universities, Slovak Academy of Sciences and other research performing institutions that can use it in development of their own open science policy.

Development of open science policy presents an opportunity for an institution to **open** discussion on open science and explore how **open practices can help the institution to achieve its goals**, for example in the area of impact.

Model inštitucionálnej politiky otvorenej vedy

1. Preambula

1. [Názov inštitúcie] rozvíja vedu a šíri vedomosti v prospech spoločnosti prijímaním postupov otvoreného, reprodukovateľného a zodpovedného výskumu.
2. [Názov inštitúcie] uznáva „otvorenosť“ ako jeden z hlavných princípov a zaväzuje sa propagovať ju o. i. podnecovaním a podporovaním výskumných procesov a nástrojov, ktoré zlepšujú spoluprácu, umožňujú vytvoriť nové pracovné postupy a sociálne väzby, stimulujú rozširovanie vedomostí, dostupnosť a opätovné použitie výsledkov výskumu, podporujú otvorený prístup k publikáciám a dátam a budujú nevyhnutnú infraštruktúru na podporu otvorenej vedy. V súlade s princípmi otvorenosti [Názov inštitúcie] prijíma nasledujúcu politiku:

2. Právomoc a účinnosť politiky

Politika sa týka všetkých vedecko-výskumných pracovníkov zamestnaných v [Názov inštitúcie]. V prípade, že k financovaniu výskumu prispieva tretia strana, [Názov inštitúcie] sa bude snažiť o presadzovanie tejto politiky v čo najväčšej možnej miere, s ohľadom na jednotlivé zmluvné vzťahy.

3. Základné pojmy

Otvorený prístup (angl. Open Access, OA) znamená online prístup k publikáciám/dátam, ktoré sú bezplatne prístupné okamžite alebo s obmedzeným časovým embargom pri dodržaní autorských práv a práv duševného vlastníctva.

Zelená cesta otvoreného prístupu je otvorený prístup uskutočňovaný prostredníctvom repozitáru a online úložísk. Článok, monografiu alebo dáta ukladá samotný autor alebo jeho

Metodické odporúčanie na tvorbu a implementáciu inštitucionálnej politiky otvorenej vedy pre inštitúcie vykonávajúce vedu a výskum



Ciel'ové skupiny: vysoké školy, Slovenská akadémia vied a iné inštitúcie vykonávajúce vedu a výskum

Spracoval: Centrum vedecko-technických informácií SR

Zverejnené: 2022

Open education – a door to open science

Publications – open educational resources (online, free for readers, CC licenses)

- **A Guide to the World of Scientific Publishing:** <https://zenodo.org/record/3236329> (2nd supplemented edition, 2023)

Courses (cca 200

participants): <https://otvorenaveda.cvtisr.sk/category/kurzy/>

- **Open science in practice**, modules:
 - Open science basics,
 - Open science infrastructure,
 - Open research data,
- **Electronic information resources for science–Publication guide.**

Thanks to open educational resources it is easy to introduce open science education at your institution. It is best to combine general knowledge about open practices with specific knowledge from the practice of a scientist active in the field.



A Journey to Open Science. A practical guide for PhD students

<https://zenodo.org/records/7346039#Y34GJX2ZOUk>

A handbook designed to guide graduate students through every step of the research process, from planning a scientific approach to publishing research results. It provides a **set of tools and best practices** that can be directly implemented in research in any field.

Reprodukovateľný spôsob práce:
nielen pre vás, ale aj pre druhých

Čo tým máme na mysli?



Výskum sa považuje za reprodukovateľný, ak sú všetky dôležité informácie týkajúce sa projektu sprístupnené...

...vďaka čomu môže niekto iný reprodukovať výsledky výskumu, ktoré ste dosiahli.

Opatrenia na dosiahnutie reprodukovateľnosti môžu byť rôzne v závislosti od odboru a využívaných metód. Umožnia identickú aplikáciu experimentálneho protokolu, reprodukciu štatistického spracovania kvantitatívnych dát, rekonštrukciu jednotlivých štádií analýzy korpusu obrázkov alebo textov a pod.

Využívanie voľne dostupných zdrojov

Začínate pracovať na svojej záverečnej práci. Potrebujete prístup k publikáciám, článkom a dátam, ktoré sú vo vašom odbore už publikované. Toto je začiatok prekážkovej dráhy...

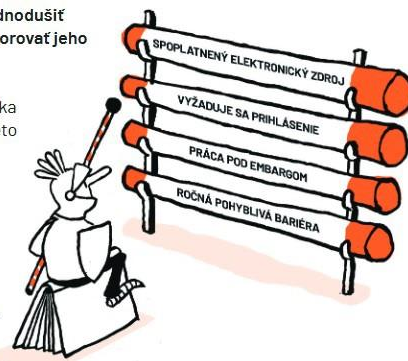
Prístup a opakované použitie

Hnutie otvorenej vedy má za cieľ **zjednodušiť prístup k vedeckému obsahu a podporovať jeho opakované použitie**.

Myslíme tým najmä:

- Zdroje s otvoreným prístupom: vďaka autorovi a/alebo vydavateľovi sú tieto zdroje voľne prístupné bez toho, aby čitateľ alebo jeho inštitúcia museli platiť.
- Voľné zdroje: tak ako zdroje s otvoreným prístupom, sú tieto zdroje opakovane použiteľné v závislosti od platnej licencie na šírenie. Napríklad licencia Creative Commons umožňuje opakované používanie, ak sú splnené podmienky určené autorom.

Pre viac informácií navštívte [▼creativecommons.org](https://creativecommons.org).



CESTA K OTVORENEJ VEDE



PRAKTICKÁ
PRÍRUČKA
PRE
DOKTORANDOV

Checklist for open access publishers on implementing the UNESCO Recommendation on Open Science – Slovak translation

- Transparency, clear rules and rights
- Reproducibility, integrity
- Respect and accountability
- Publishing (also) negative results
- Fostering open culture and diversity
- Fostering bibliodiversity
- Fostering multilingualism
- Fostering open peer review
- Inclusion of citizen science ...

What all should a good scientific journal consider? Ideological opposition to the attitude "I only care about... scientific rigor and good metrics".



■ USMERNENIA PRE OPEN ACCESS VYDAVATEĽOV K IMPLEMENTÁCII ODPORÚČANIA UNESCO O OTVORENEJ VEDE

Tento dokument patrí medzi nástroje UNESCO určené na rozvíjanie otvorenej vedy. Cieľom dokumentu je podporiť implementáciu **Odporúčania UNESCO o otvorenej vede**. Usmernenia boli vypracované v spolupráci so Združením akademických vydavateľov open access (Open Access Scholarly Publishing Association, OASPA), združujúcim vydavateľov zapojených v oblasti otvorenej vedy. Dokument poukazuje oblasti, ktoré sa týkajú vydavateľov otvoreného prístupu, aby komunita tých, ktorí chcú podporiť uvedenie Odporúčania UNESCO do praxe, umožnil jeho lepšie pochopenie a poskytol im praktickú pomoc.



Dokument sa z oblasti otvorených poznatkov vzťahuje na vedecké publikácie, medzi ktoré patria, okrem iného, články vo vedeckých časopisoch a knihy, výskumné správy a konferenčné príspevky. Tieto publikácie môžu tvoriť, obsahovať alebo vo svojich prílohách zahŕňať pôvodné výsledky vedeckého výskumu, výskumné dáta, softvér, zdrojový kód, zdrojový materiál, pracovné postupy (workflows) a protokoly, digitálne záznamy obrazových alebo grafických materiálov a vedecký multimediálny materiál.

Podľa **Odporúčania UNESCO o otvorenej vede** má byť prístup k vedeckým poznatkom taký otvorený, ako je možné, ale za určitých okolností ho možno obmedziť, napríklad z dôvodu ochrany ľudských práv, dôvernosti/utajenia informácií, práv duševného vlastníctva, osobných údajov, informácií o ohrozených druhoch, posvätných a tajných domorodých znalosti atď. Tieto okolnosti sa považujú za výnimky z postupov uvedených v tomto dokumente.

Ako open access vydavateľ by ste mali:

Šíriť vedecké publikácie

Vydavateľia môžu šíriť vedecké publikácie a/alebo sprístupný materiál dvomi spôsobmi:

- publikovať na online platforme s otvoreným prístupom (open access); a/alebo
- uložiť a sprístupniť publikácie okamžite po uverejnení v otvorených online repozitároch, ktoré sú podporované a udržiavané:
 - » akademickými inštitúciami,
 - » vedeckými spoločnosťami,
 - » vládnymi inštitúciami alebo
 - » inými etablovanými neziskovými organizáciami zameranými na verejný záujem, ktoré umožňujú otvorený prístup, neobmedzené šírenie, interoperabilitu a dlhodobé uchovávanie a archiváciu.

Poskytovať jasné prístupové práva

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¹ Bez ohľadu na miesto, státnu príslušnosť, rasu, vek, rod, príjem, sociálno-ekonomickú situáciu, štádium kariéry, disciplínu, jazyk, náboženstvo, zdravotné postihnutie, príslušnosť k etnickej skupine, migračný status alebo z akýchkoľvek iných dôvodov.

Not translated into Slovak yet,
but might be interesting for you...

Checklist for universities on implementing the UNESCO recommendation on open science

How to foster practices we want researchers to adopt?

Open practices as „mainstream“

Thinking beyond scientific articles

Support dialog

Engage actors and stakeholders across

the whole society (participatory
methods – citizen science)...

Checklist for universities on implementing UNESCO Recommendation on open science <https://unesdoc.unesco.org/ark:/48223/pf0000383328>



CHECKLIST FOR UNIVERSITIES ON IMPLEMENTING THE UNESCO RECOMMENDATION ON OPEN SCIENCE

This document is part of the UNESCO Open Science Toolkit, designed to support implementation of the UNESCO Recommendation on Open Science. It has been prepared in partnership with Library Support for Embedded NREN Services and E-infrastructure (LIBSENSE). The aim is to provide practical assistance to the university community to better understand the Recommendation on Open Science, in particular by highlighting the areas that apply to university leaders who wish to support its implementation.



As a university practicing open science, how are you...

Nurturing open methods

Are the scientific practices at your university open by default? Are the innovators in your university encouraged and incentivized to make their practices and products open? Are newcomers to your institution introduced to open science early on?

It is possible to nurture open science from the bottom-up through capacity building and from the top-down through policy changes. Combinations of these approaches, such as mandates for training in open science, may be suitable in your context.

A clear understanding of the possibilities and risks of open science practices enable students, educators and researchers to make smarter decisions in a scientific system that is as open as possible, as closed as necessary.

Mainstreaming open practices

Rather than creating separate open science policies, it may be more efficient and effective to build openness into core policies for science, data management, educational resources and more.

Open science practices can also be mainstreamed into partnerships involving the university and external actors, including international partners.

Using and creating scientific infrastructures

Are the tools used by scientists and students at your institution openly available on open platforms? Infrastructures can be both physical and virtual. The UNESCO Recommendation on Open Science provides guidance for ensuring that access to the tools required for open science is itself open and equitable.

Thinking beyond scientific articles

Scientific practice spans far more than the production of data or articles. The Recommendation provides guidance for opening up all stages of the scientific process, from conceptualization and co-design of research projects through to post-publication communication.

Those scientific outputs related to publications¹ that are openly licensed or dedicated to the public domain should be deposited in a suitable open repository, following appropriate technical standards properly linking to the publications.

Supporting inclusive engagement and dialogue

Open science includes all scientific disciplines and aspects of scholarly practices and builds on four key pillars: open access to scientific knowledge, open science infrastructures, open engagement of societal actors and open dialogue with other knowledge systems.

There are multiple actors and stakeholders in research and innovation systems and each of them plays a role in the operationalization of open science. Similarly, universities serve many audiences in addition to academics and scientific researchers.

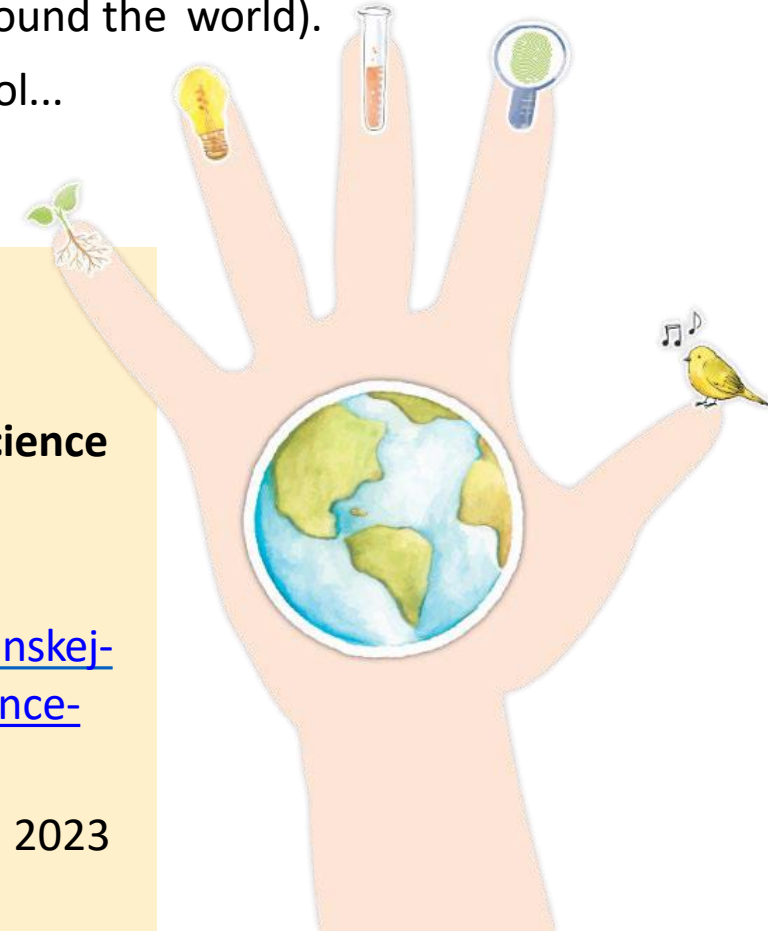
In practice, inclusive engagement ranges from addressing practical aspects of accessibility through to meaningful engagement with marginalized and underrepresented groups. Engagement and dialogue can inform not only education and the practices of open science but also the co-design, creation, use and production of scientific outputs in multiple formats.

Citizen Science

- **Citizen science or participatory research approaches** (involving the public into research more than in the role of subject of research) are in developed countries considered as valued assets that enable researchers to obtain **rich data, increase the impact of research, build public attitudes towards science and foster scientific literacy**.
- Awareness of citizen science is low in Slovakia, so the first task of open science advocates is to make the scientific community aware of the existence and possibilities of citizen science, to find existing projects and to support them (at least by raising their visibility and informing about grant calls for citizen science around the world).
- Other tasks: networking, creation of a Slovak platform, citizen science (summer) school...

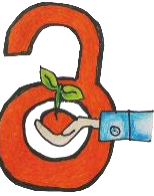
Sources on citizen science in Slovak:

- Web: <https://otvorenaveda.cvtisr.sk/obcianska-veda/>
- Introductory online course **Začnime si s občianskou vedou / Let's start with citizen science** (platform EU-citizen.science, 2021): <https://eu-citizen.science/resource/256>
- Article (Stožická et al. 2022): <https://itlib.cvtisr.sk/%c4%8cl%c3%a1nky/4527/>
- [List of participatory projects in Slovakia: https://otvorenaveda.cvtisr.sk/projekty-obcianskej-vedy-na-slovensku/](https://otvorenaveda.cvtisr.sk/projekty-obcianskej-vedy-na-slovensku/), English version: <https://otvorenaveda.cvtisr.sk/en-gb/citizen-science-projects-in-slovakia/>
- Webinars with representatives of Slovak participatory projects, the latest from 24. 10. 2023 (Recording: <https://video.nti.sk/rec/?10338911VYTY3DW60>)



What can we do now?

- **Speak about open science.** It may seem to you that talking is not enough, but still many scientists in Slovakia do not know the basic terms and meaning of open science and they do not know what it could bring them.
- **Participate in our events and organize your own open science events** at your workplace. Invite open-minded people from your neighborhood to cooperate. Open yourself to stimuli from the international environment, from other fields, open the door to science and the public.
- **Translate high-quality and important materials about open science** from an international environment and adapt them to Slovak conditions.
- **Create or support the creation of Slovak documents on open science** – policies, methodologies, research...
- **Support the creation of theses on open science topics.** You will thereby contribute to the mapping of the state and development of open science in Slovakia and, at the same time, help to establish open science as a legitimate topic of research in the Slovak environment.
- **Learn and pass on the experience.** If you create educational resources, publish them as open educational resources (under an open license). Support the integration of open science into the teaching process at your institution.



Thank you!



<https://otvorenaveda.cvtisr.sk/>

