



NARODOWA AGENCJA
WYMIANY AKADEMICKIEJ

ACADEMIC COOPERATION
BETWEEN POLAND AND KAZAKHSTAN



opracowanie

Warsaw 2023

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INTRODUCTION

The aim of this study is to present a picture of academic cooperation between Poland and Kazakhstan. Academic cooperation is understood here in a broad sense, including both individual and institutional cooperation.

The study is exploratory as well as practical and answers the following questions:

- What is the volume of publications by Polish and Kazakhstani co-authors?
- What thematic fields prevail in this regard?
- How intense has this cooperation been over the years?
- What higher education institutions in Poland cooperate with their Kazakhstani counterparts most intensely?
- Which Polish universities host the greatest number of students from Kazakhstan?

The study is addressed to the broadly understood academic community and the environment of higher education and scientific institutions as well as to Poland's policy-makers with regard to international academic cooperation.

The study is based on data available in SCOPUS¹, OECD, WORLD BANK, UNESCO and POLon databases.

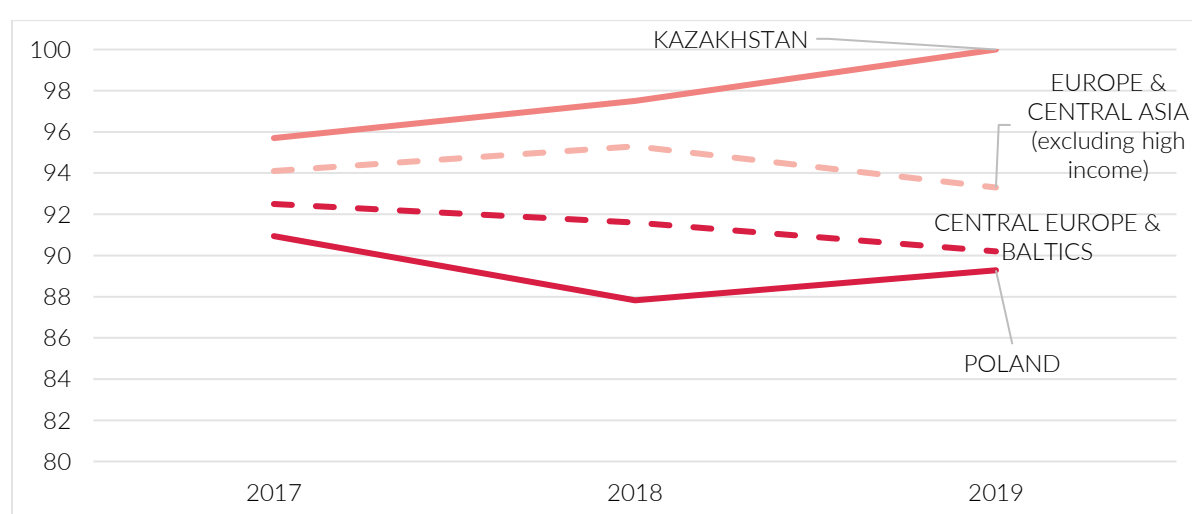
Due to the small size of the groups of Kazakhstani scientific employees working at Polish universities, this study presents only the data necessary to guarantee the anonymity of these individuals.

¹ Access to the SCOPUS database and the SciVal tool under a national licence provided by the Ministry of Education and Science.

1 POLAND AND KAZAKHSTAN – BASIC DATA

Below we present aggregate figures based on World Bank's estimates² from official responses to the annual education survey. Current expenditures are calculated on an annual basis and are expressed as a percentage of direct expenditures in public educational institutions at a specific level of education. They include staff salaries and current expenses other than staff salaries (e.g., teaching materials, support services and administration). Student financial aid and other transfers are excluded from these expenses. In order to gain a broader comparative perspective, Kazakhstan's and Poland's data were also cross-referenced with data describing the regions in which both countries are located, namely Central Europe and the Baltics and Latin America and Central Asia³.

Chart 1 Current expenditure on education and higher education (as % of total expenditure in public higher education institutions)



Source: World Bank (Accessed on 23 May 2023)

Current spending on higher education in Kazakhstan in 2019 represented 100% of direct public spending at universities. This is higher than comparable spending in European and Central Asian countries, as well as in Central Europe and the Baltics. It should be noted that the level of public spending in the group of countries to which Kazakhstan belongs in the World Bank database is relatively high.

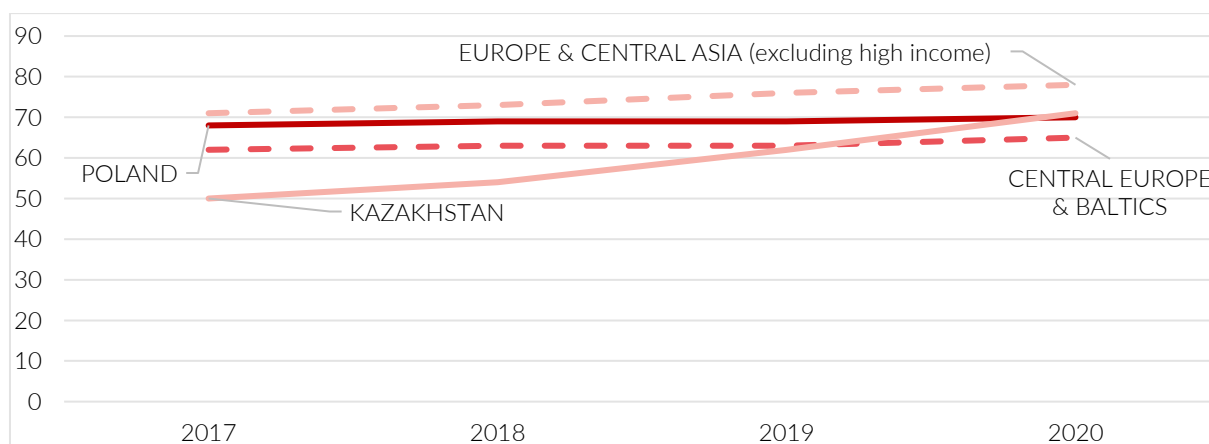
² <https://data.worldbank.org/indicator>

³ **Central Europe & the Baltics:** Bulgaria, Croatia, Czechia, Estonia, Hungary, Latvia, Lithuania, **Poland**, Romania, Slovak Republic, Slovenia

Europe & Central Asia (excluding high income): Albania, Armenia, Azerbaijan, Belarus, Bosnia and Herzegovina, Bulgaria, Georgia, **Kazakhstan**, Kosovo, Kyrgyz Republic, Moldova, Montenegro, North Macedonia, Russian Federation, Serbia, Tajikistan, Turkiye, Turkmenistan, Ukraine, Uzbekistan

Obtaining higher education qualifications, whether or not it leads to advanced scientific qualifications, usually requires, as a minimum condition of admittance, the successful completion of secondary education. Data showing the levels of gross enrolment rates are presented below, which reflect the capabilities of each level of the education system (here: higher education). However, it should be noted that the high rate may reflect a significant number of student-age people who enrol at universities later, for instance due to repeating a year or starting education late rather than a successful education system. The gross enrolment ratio for universities is calculated by dividing the number of university students regardless of their age by the population of the age group that officially corresponds to higher education, multiplied by 100.

Chart 2 Gross enrolment ratio – comparative data



Source: World Bank (Accessed on 23 May 2023)

The chart above shows how the share of people with higher education among Kazakhstan's citizens is growing dynamically – from the level of 54% in 2017, it reached the same level as the one recorded for Poland and countries in our region in 2020. However, looking at data relating to countries in Europe and Central Asia (78% in 2020), despite this dynamic growth, Kazakhstan's enrolment ratio is still 6 p.p. lower.

In Poland, the enrolment ratio in the area of tertiary education was 68% in 2017 and 70% in 2020. It is worth adding that as from 2017, the enrolment ratio for Poland as well as Central European countries has been well above the global level, which amounted to 38% in the same period.

According to the data presented by [UNESCO](#) on where foreign students studying in Kazakhstan come from, their countries of origin comprise: **Uzbekistan** (26,000), **India** (4,453), and **Turkmenistan** (over 3,000). Data on Poles are unavailable.

Kazakhstani citizens wishing to study abroad most often choose **Russian** (more than 70,000 people), **Turkish** (more than 2,000), **Kyrgyz** and **Czech** (2,000 each) universities.

Polish data from the POLon system show that the group of **Kazakhstani students** accounted for more than 1,700 people in the 2021/22 academic year. More than 30% in this group studied management, 14% studied computer science and 7% studied international relations. They studied mainly in Rzeszów (21%) at the University of Information Technology and Management and at Vistula University (less than 20%).

On the other hand, **academics** from Kazakhstan constituted isolated cases; hence, no characteristic of this group will be presented.

Another significant measure describing international scientific cooperation are joint publications. **Worldwide**, among the publications that appeared in sources indexed in the SCOPUS database, one in two pertained to the area of Natural Science, followed by Engineering and Technologies and Medical Science. In terms of the number of publications by authors affiliated with institutions grouped by country of affiliation, the top three countries are: China, the US, and the UK. **Kazakhstan is in the sixth ten, and Poland ranks in the second ten.**

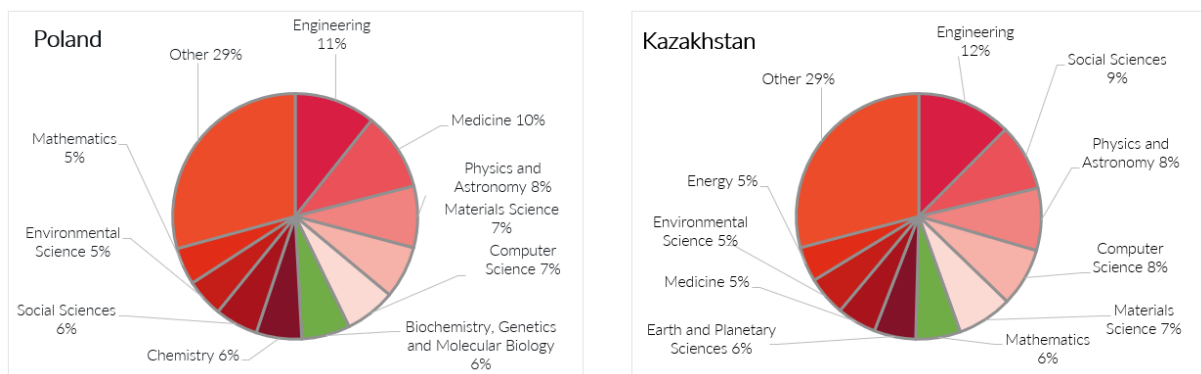
Table 1 Comparison of the number of publications by Polish and Kazakhstani scientists (2017–2022⁴)

Publication year	Number of publications	
	Poland	Kazakhstan
2022	59,163	6,383
2021	63,167	6,146
2020	59,303	5,804
2019	56,073	5,250
2018	53,182	4,287
2017	50,310	3,685
Total:	341,198	31,555

Source: SCOPUS-SciVal [accessed: 26/05/2023]

The pool of indexed publications for 2017–2022 authored by researchers affiliated with Polish institutions was a dozen times larger than by those affiliated with Kazakhstani ones in the same period. However, it is interesting to observe the change in the number of publications in the two countries – in the case of Poland, there was an average increase of 6%, while in Kazakhstan the average increase was 12%.

Chart 3 Publications of Polish and Kazakhstani scientists by area of knowledge (%) – comparison

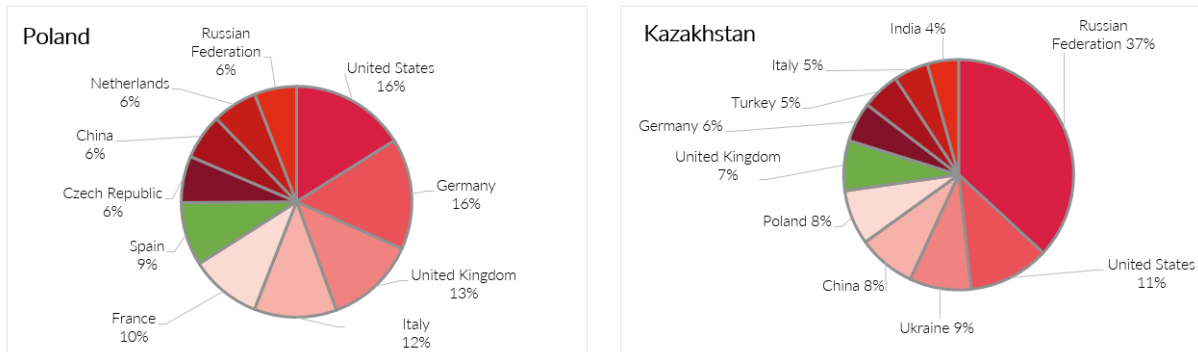


Source: SCOPUS-SciVal [accessed: 26/05/2023]

⁴ The data for 2022 is updated on an ongoing basis, so it is expected that the second half of 2023 will see increases in both publications that appeared in 2022 and their citations.

The thematic field of the prevailing number of publications overlaps between the analysed countries – researchers focus in their publications primarily in the areas of Engineering; Medicine; Physics and Astronomy; and Social Science.

Chart 4 Countries of origin of co-authors of publications by Polish and Kazakhstani scientists – comparison (%)



Source: SCOPUS-SciVal [accessed: 26/05/2023]

There is little overlap in the countries of origin of co-authors of publications with at least one scientist affiliated with a Polish institution and one with a Kazakhstani institution, and these include colleagues from the US, Germany and the UK. Interestingly, Polish scientists are among the ten nationalities most frequently publishing with Kazakhstani scientists. Poles, on the other hand, cooperate mainly with their European counterparts.

Chart 5 Sustainable Development Goals (SDGs)⁵. Relative Activity Index⁶ (RAI) – Poland-Kazakhstan comparison (2017–2021)



Source: SCOPUS-SciVal [accessed: 24/05/2023]

Another field that was used to compare Polish and Kazakhstani input into the development of global science are publications identified as those responding to one of the UN Sustainable Development Goals (hereafter: SDG). Globally, among publications assigned to SDG 1–16, those pertaining to health and well-being (SDG 3) prevail. The number of publications in the field of sustainable energy access (SDG 7) is eight times lower, although it is the second most published goal globally.

If we look at the share of scientists from both countries in a given field (the field being the SDG) in relation to the global share of publications in the same field (RAI), we see that the largest share of output in Poland concerns the goal focusing on solving problems of ensuring sustainable consumption and production (SDG 12). In Kazakhstan, on the other hand, researchers focus on other areas, which comprise quality education (SDG 4) and decent work and economic growth (SDG 8).

⁵ SCOPUS provides indicator values for SDGs 1–16. SDG 17 is not monitored in the database.

⁶ The Relative Activity Index (RAI) is defined as the share of an individual's (here: a country's) publications in a given field compared to the global share of publications in the same field. A value of 1.0 means that an institution's research activity in a particular field corresponds exactly to global activity in that field; a value higher than 1.0 indicates greater emphasis; and a value lower than 1.0 suggests less emphasis. In the case of the SDGs, to obtain a percentage result, the RAI is calculated by looking at the total number of publications on a given SDG by an institution, divided by the total number of publications by the same institution. The same calculations are performed for each global SDG. An index for an institution is calculated by dividing the percentage for the institution by the global percentage.

2 POLISH-KAZAKHSTANI SCIENTIFIC COOPERATION (2017–2022)

This section will analyse cooperation in terms of publications of scientists affiliated with Polish and Kazakhstani scientific institutions. Only those publications were taken into account in which at least one author indicated that they belonged to the Polish and the Kazakhstani academic community at the same time.

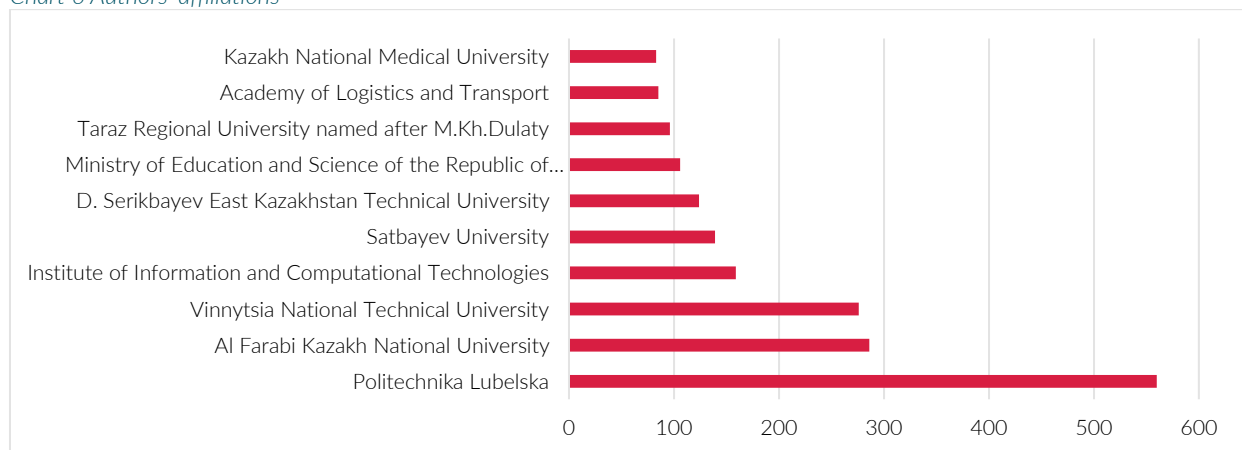
Table 2 Joint Polish-Kazakhstani publications in the SCOPUS database

Publication year	Number of publications
2022	257
2021	269
2020	209
2019	267
2018	186
2017	185
Total:	1,373

Source: SCOPUS-SciVal [accessed: 24/05/2023]

Publications under Polish-Kazakhstani cooperation in the analysed period accounted for less than 0.5% of all publications by Polish authors indexed in the SCOPUS database. A change in Polish-Kazakhstani publication cooperation during this period is evident, **as it increased by almost 40%** between 2017 and 2022.

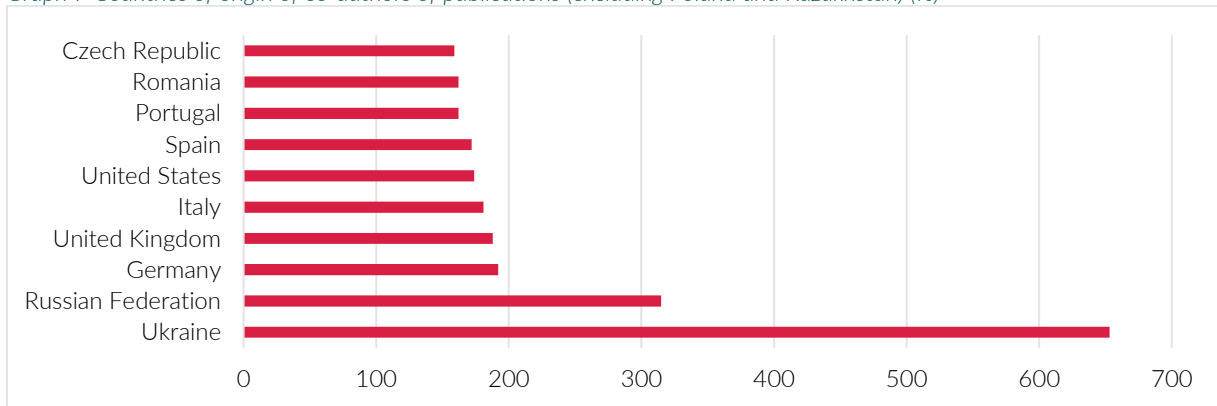
Chart 6 Authors' affiliations



Source: SCOPUS-SciVal [accessed: 26/05/2023]

Among ten most popular affiliations, **Lublin University of Technology** ranks first. It accounts for **40% of all joint publications**, among which those in the areas of Engineering (27%), Computer Science (18%), and Physics and Astronomy (16%) prevail. Other Polish universities to which co-authors of publications are affiliated (an average of 50 publications per university) comprise: the Jagiellonian University, the University of Warsaw, Adam Mickiewicz University, Poznań and the Medical University of Lodz.

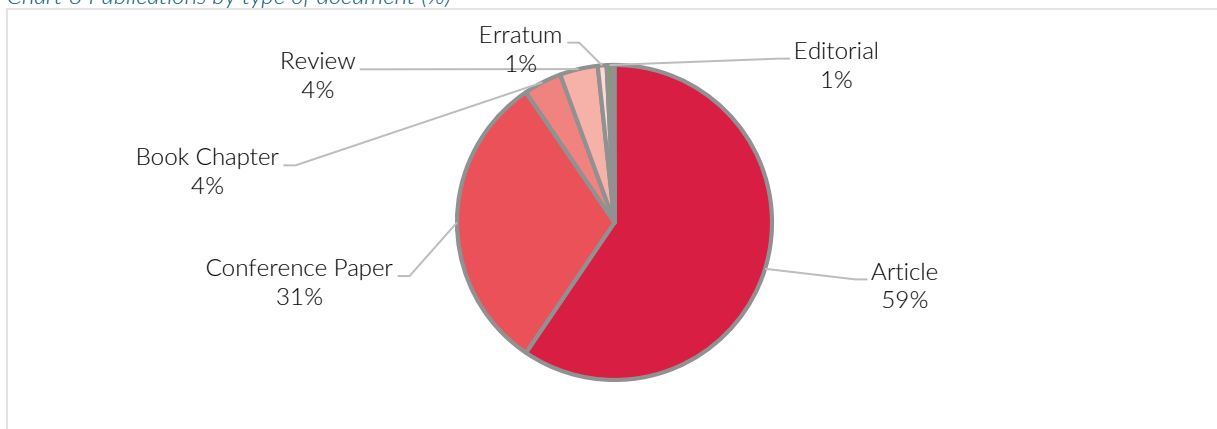
Graph 7 Countries of origin of co-authors of publications (excluding Poland and Kazakhstan) (%)



Source: SCOPUS-SciVal [accessed: 26/05/2023]

A far greater geographic diversity than in the case of the most productive institutions in Polish-Kazakhstani scientific cooperation is observed if we look at the countries of origin of the co-authors. Poland and Kazakhstan were intentionally not included in the graph above, as it is obvious that each of the 1,373 publications must have included at least one Pole and one Kazakhstani affiliated with these institutions at the same time. Thus, in addition to the countries that are the subject of this analysis, **the co-authors most often originated from Ukrainian, Russian and German institutions.** The countries listed partly coincide with those to which Kazakhstani citizens go to study. While they do not study at Ukrainian universities, they do choose Russian, Western European or American ones.

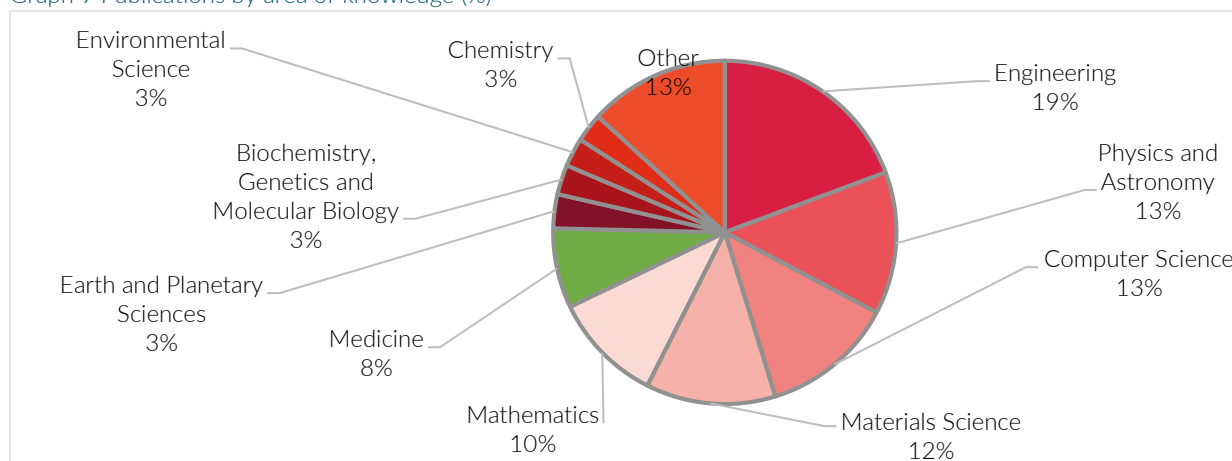
Chart 8 Publications by type of document (%)



Source: SCOPUS-SciVal [accessed: 26/05/2023]

In terms of the type of joint publications, articles in scientific journals prevail, accounting for 59% of all joint Polish and Kazakhstani publications. It is interesting to note that a book chapter appears as a kind of joint scientific contribution in the chart above. The chapters covered the following areas: Engineering (42 chapters); Computer Science (12); Economics, Econometrics and Finance (10). The areas indicated overlap with those presented below and related to the general subject of joint publications. The area of Engineering stands out in particular (19.3% of all joint publications, regardless of type).

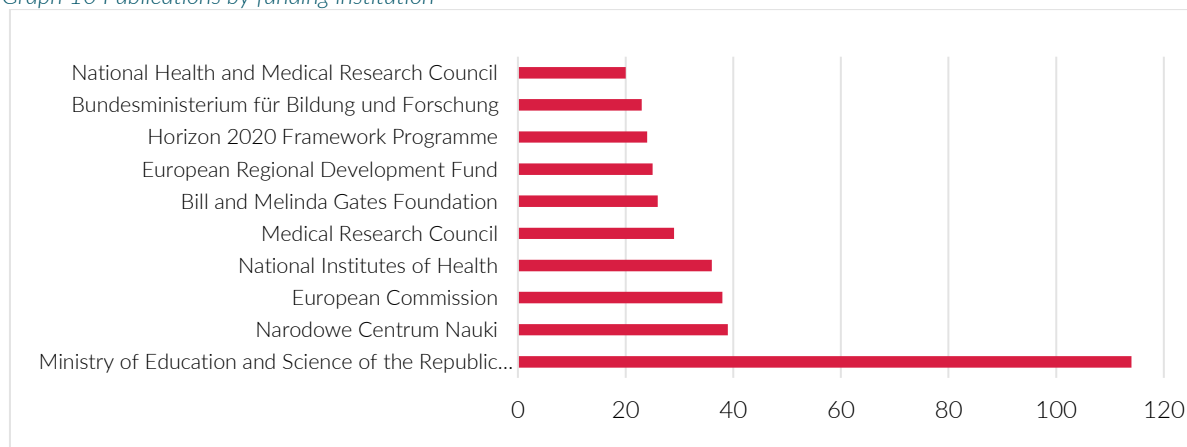
Graph 9 Publications by area of knowledge (%)



Source: SCOPUS-SciVal [accessed: 26/05/2023]

Scientists from Poland and Kazakhstan focus in their joint publications primarily on the research areas of **Engineering; Physics and Astronomy; and Computer Science**. The underdeveloped areas in terms of joint publications are those presented in the chart above under *Other*, with only a few publications in the fields of Agricultural and Biological Science; Chemical Engineering; Energy; and Business Management and Accounting. The last area is interesting as, according to data from the POLon system, it appears that management is the most frequently chosen field by students from Kazakhstan. Thus, it can be cautiously assumed that obtaining a degree in the mentioned area is not reflected in a graduate's further scientific interests.

Graph 10 Publications by funding institution



Source: SCOPUS-SciVal [accessed: 26/05/2023]

The institution with the largest financial contribution in the area of supporting the creation of joint Polish-Kazakhstani publications is the **Ministry of Education and Science of Kazakhstan**, followed by the **Polish National Science Centre**.

3 NAWA'S CONTRIBUTION TO POLISH-KAZAKHSTANI SCIENTIFIC COOPERATION

Among all publications written in Polish-Kazakhstani cooperation, as many as nine were co-financed by the Polish National Agency for Academic Exchange (NAWA) in the period 2017–2022. The earliest publications (chronologically) are those from 2020 (NAWA was established in October 2017).

Table 3 Affiliations of authors of publications co-funded by NAWA

Authors' affiliations	Authors' affiliations
Università degli Studi di Padova	University of Southampton
University of Lagos	Universitatea din Oradea
Universidade Federal da Paraíba	Iscte - Instituto Universitário de Lisboa
Thammasat University	Stockholms universitet
Cardinal Stefan Wyszyński University in Warsaw	Universidad Católica del Norte
New Bulgarian University	Karnatak University
HSE University	Københavns Universitet
Sakarya Üniversitesi	Academy of Sciences of the Czech Republic
Taras Shevchenko National University of Kyiv	University of Leicester
Eötvös Loránd Tudományegyetem	Universiteit Gent

Source: SCOPUS-SciVal [accessed: 26/05/2023]

Due to the fact that these publications are written by many authors, the researchers are affiliated with numerous institutions (more than 100). The leading institutions in the cooperation listed in the table above do not overlap with those presented when analysing the affiliations of Kazakhstani and Polish co-authors of publications. Here, one Polish university is ranked in the top twenty, i.e. **Cardinal Stefan Wyszyński University in Warsaw** (three publications). The following universities have two publications each: the **Medical University of Lublin**, the **University of Gdańsk**, and the **University of Information Technology and Management in Rzeszow**, followed by the **University of Warsaw** with one publication. Noteworthy is the University in Rzeszow, which has the highest percentage of students from Kazakhstan.

In terms of thematic fields, the authors most often focus on the area of **psychology**, followed by **biochemistry**; **chemistry**; and **pharmacology**. The rest of the areas are either scarcely covered or not covered at all.

Study prepared by:

dr Jolanta Buczek (NAWA)

Publisher:

Polish National Agency for Academic Exchange

ul. Polna 40

00-643 Warszawa

phone no. (22) 390 35 00

www.nawa.gov.pl