The impact of the Russia-Ukraine War on Scientific Circles

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ABSTRACT

What happens thousands of kilometres away from us today affects our daily lives and has global consequences much faster and more acutely than it did, for instance, 100 years ago. Ukraine and Russia have been in a military conflict since February 2014, which escalated into a full-scale Russian aggression war on February 24, 2022.

In this paper, we examine the trends in how and to what extent aspects of the Russo-Ukrainian War have been disseminated in scientific circles. Who are the authors in the circle dealing with this topic? Have the different geographical locations affected the focus of research? What fields of research and topics does it cover, and what is the scope of the war's impact?

1. Introduction

The full-scale Russo-Ukrainian war, which began on 24 February 2022, has a long history that dates back to February 2014. In some ways, the period before February 2022 can be compared to many examples in world history, the most famous of which is known as the Phony War. Military actions took place, resulting in casualties on both sides, but it was not yet front-page news worldwide.

In the current paper, the time window 2014-2023 under consideration has been divided into two periods: from 2014 to the second half of 2022 and from the second half of 2022 to August 2023. The basis of such a division is, firstly, the assumption that the time required to prepare a topic considering all the rules of research work, even

for the most pressing cases, is at least six months. Secondly, it allows for the comparison of trends and, perhaps in retrospect, to identify future developments.

We observe the trends in how and to what extent aspects of the Russo-Ukrainian War have been disseminated in scientific circles. Who are the authors in the circle dealing with this topic? Have the different geographical locations affected the focus of research? What fields of research and topics does it cover, and what is the scope of the war's impact?

No comprehensive bibliometric, text analysis, or content analysis research has been conducted on this topic. However, there have been some studies with a narrower focus; for instance, bibliometric analysis has been used in a paper on the agro-food crisis caused by the Russo-Ukrainian war (Peng et al., 2023), also in a review on renewable energy systems (Pestisha,2023). Scientometric analysis is used to investigate green bonds (Marín-Rodríguez, 2022). Eguskiza, Ignacio Gaztaka (Eguskiza, 2022) has used textual analysis to study the works of a Ukrainian war photographer. In many cases, content analysis has been used in the approaches investigating the use of Twitter (Kobilke, et al, 2023; Chen & Ferrara, 2023), Tik Tok (Primig, et al, 2023), and online news media (Roman, et al, 2017; Udris, et al, 2023; Hanley, et al, 2023, 327-338; Hanley, et al, 2023, 339-350). The period before the full-scale Russian aggression includes a content analysis of ethnic stereotypes (Sikevich, 2017).

2. Methodology

For the purpose of our analysis, we utilized our study of the Clarivate Web of Science for the period 2014–2023, employing the following keywords: Ukrainian War, Russian- Ukrainian War, War in Ukraine, Russian Aggression, Russian Invasion, and Russo- Ukrainian War. In total, we selected 3164 papers (Table 1).

Next, the following data were identified: (1) Co-authorship geography; (2) Research areas; (3) Authors' keywords.

Based on the received data, we formed three smaller datasets: a) papers where at least one author was from Ukraine, b) papers where at least one author was from Russia, and 3) papers written without Ukrainian and Russian authors. Based on these, we conducted a text analysis and content analysis to identify differences and concurrences between data from different time periods and authors.

3. Findings

3.1 Comparison between two periods

The main difference between the two periods is that while from February 22, 2022 there is talk about a full-scale war between Ukraine and Russia, there are different interpretations about the period from 2014 to 2022 – it has also been called frozen conflict (Corboy, et al, 2014; O'Loughli, et al, 2014), Ukrainian crisis (Gromyko, 2015). At the same time, it is essential to note that at the outset of the war, there was a terminological confusion, and it was unclear whether the situation would remain localized or escalate. Therefore, in the papers written by the same authors, a change in terminology can be observed over time, where the term "war" becomes dominant (O'Loughli, et al, 2020).

Secondly, the start of a full-scale war by Russia created an urgent need to analyse the situation from different perspectives and viewpoints scientifically. This is also evident in the number of published papers – over the

previous eight years, 1,637 scientific articles were published, and from July 2022 to August 2023, 1,527 papers were published (Table 1).

Thirdly, the first period as a whole can be described as a prelude to the battle for souls – historical roots (Kotenko, 2015; Alexandra, et al, 2018), ethnic characteristics (Podrezov, et al, 2019; Riabchuk, 2016), public opinion (Smeyukha et al, 2021), and mainly – the fight for the media (Litvinenko, A, et al, 2019; Koltsova & Pashakhin, 2020; Amirov, 2021; Fedorov & Levitskaya, 2021).

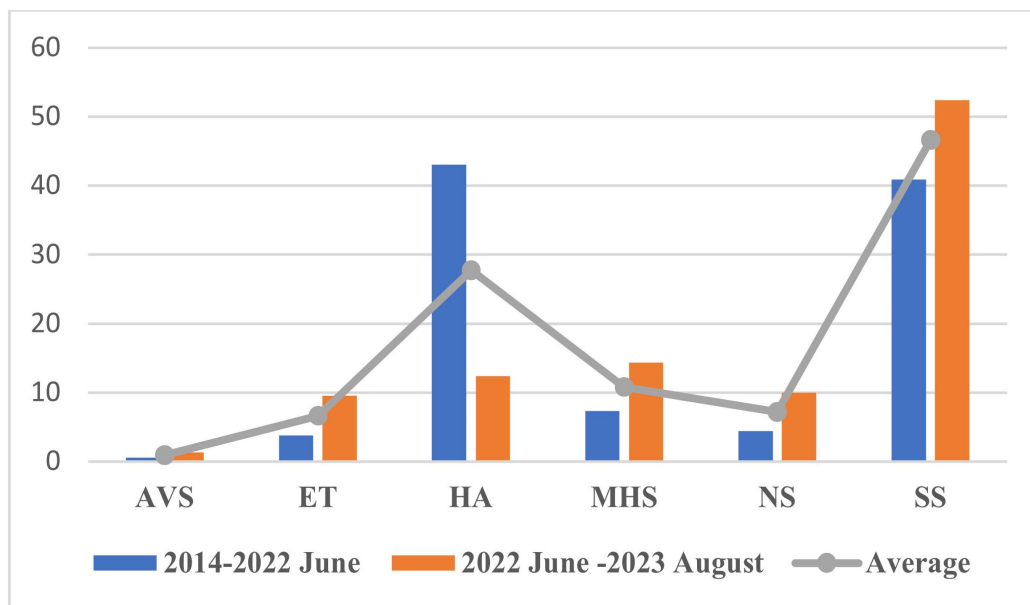| OTHER					Ukraine			Russia		
Years	In-ternal	Do-mestic	Inter-national	NA	Inter-nal	Do-mestic	Inter-national	In-ternal	Do-mestic	Inter-national
2014'	16	7	4	10	0	2	2	1	0	1
2015'	20	7	4	14	1	0	2	3	0	0
2016'	40	11	7	11	4	0	2	0	0	1
2017'	27	4	4	6	2	1	3	1	1	0
2018'	44	8	7	5	47	15	8	13	7	0
2019'	54	7	2	26	51	39	11	14	6	0
2020'	43	15	5	3	57	51	8	12	3	2
2021'	42	8	8	5	50	52	8	21	5	3
2022'	350	161	132	94	113	201	89	21	6	7
2023'	284	229	158	35	77	122	88	4	2	7
Total	920	457	331	209	402	483	221	90	30	21

Table 1. The number of papers by authors' group, co-authorship type and year

4. Research Areas

As previously noted, papers written in different periods have varying focuses. This is especially evident in the analysis of research areas. During the first period of the war, the field was strongly inclined towards the Humanities and Social Sciences, with 89.67% of papers (Figure 1).
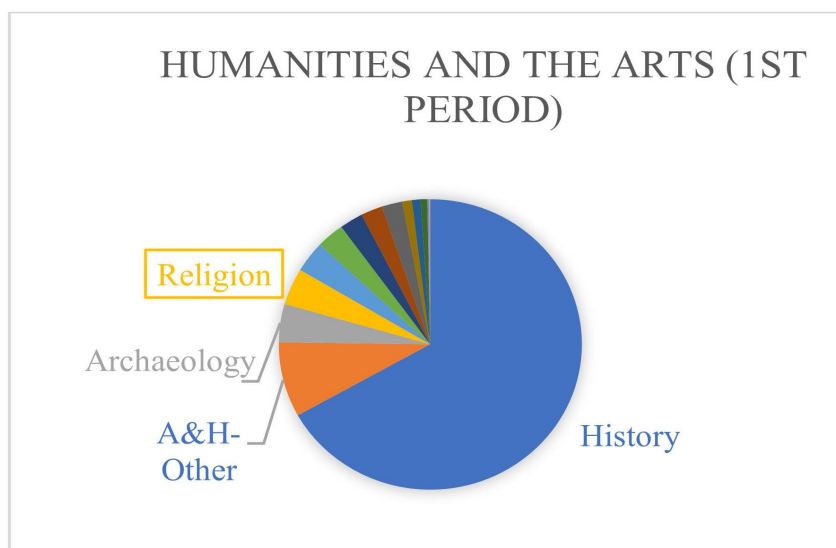
In humanities, approaches to history dominated (28.8%) (Figure 2). As we mentioned before, this period was largely battle for brains. Erkki Tuomioja, the founder of the initiative Historians Without Borders, has stated, "In a globalized world, it is increasingly important to be aware of both history and various interpretations about it, not to mention their influence on politics and events in the world today" (Historianswithoutborders). The process taking place in Ukrainian humanities (history, archaeology, literature, and the arts) is comparable

to the same development that occurred, for example, in the Baltic countries thirty years ago. The need to reassess one's history and culture is a natural development of liberated countries. Of course, the ongoing war leaves its mark on the assessments and even on research objects – Gogol and Taras Bulba (Wilkinson, 2023, Koshino, 2023), images of war in Ukrainian literature after 2014 (Nasi³owska, 2022), interpretation of WWII and the Great Patriotic War (Pivovar & Kosovan, 2021), roots of sign Z (Otroshchenko, 2023). Quoting one of the papers on this issue, "Only the political crisis resolution of the Russian- Ukrainian relationship can reduce

AVS= Agricultural and veterinary sciences; ET= Engineering and technology; HA= Humanities and the arts; MHS= Medical and health sciences; NS=Natural Sciences; SS= Social Sciences

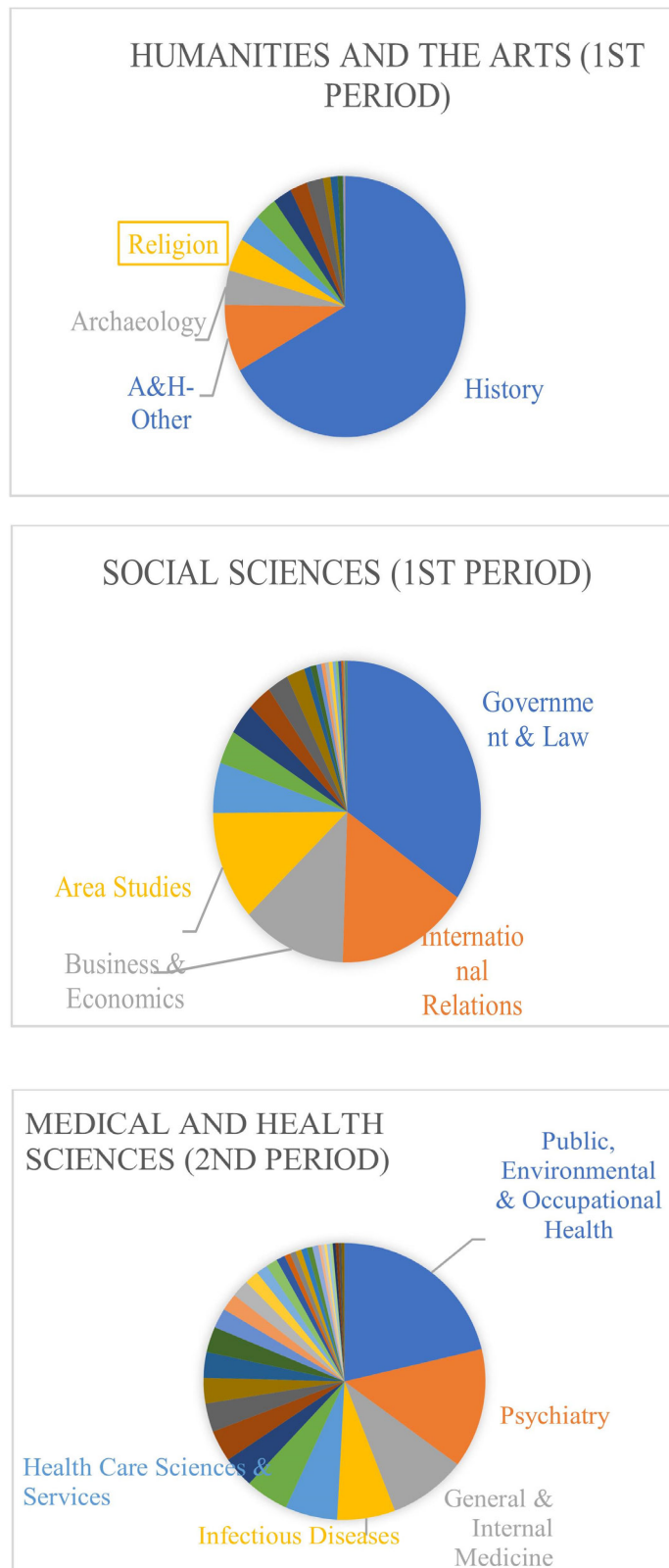Figure 1. Distribution of papers by periods and by research fields (%)

Figure 2. The division of the two most prevalent research areas into narrower fields

the intensity of historical battles by renouncing the language of hatred and overly politicized assessments of the common history" (Nikolaev et al., 2021). In the second period, the scope of research areas is wider (Figure 2), with papers on Social Sciences accounting for more than half (52.45%). The top fifty most frequently occurring keywords (excluding war, Ukraine, and Russia) are energy, refugees, migrants, food, social media, mental health, anxiety, and education.

From 2022, the most pressing issue especially for countries bordering Ukraine is the humanitarian and refugee crisis (Zawadzka-Paluektau, 2023; Perzycka-Borowska, et al, 2023; Khvorostianov, 2023; Varpina, 2022; Sauer, et al, 2023), more globally, the Russo-Ukrainian war affects the availability of energy resources and food security. Which in turn can lead to a global humanitarian disaster (Figure 3).
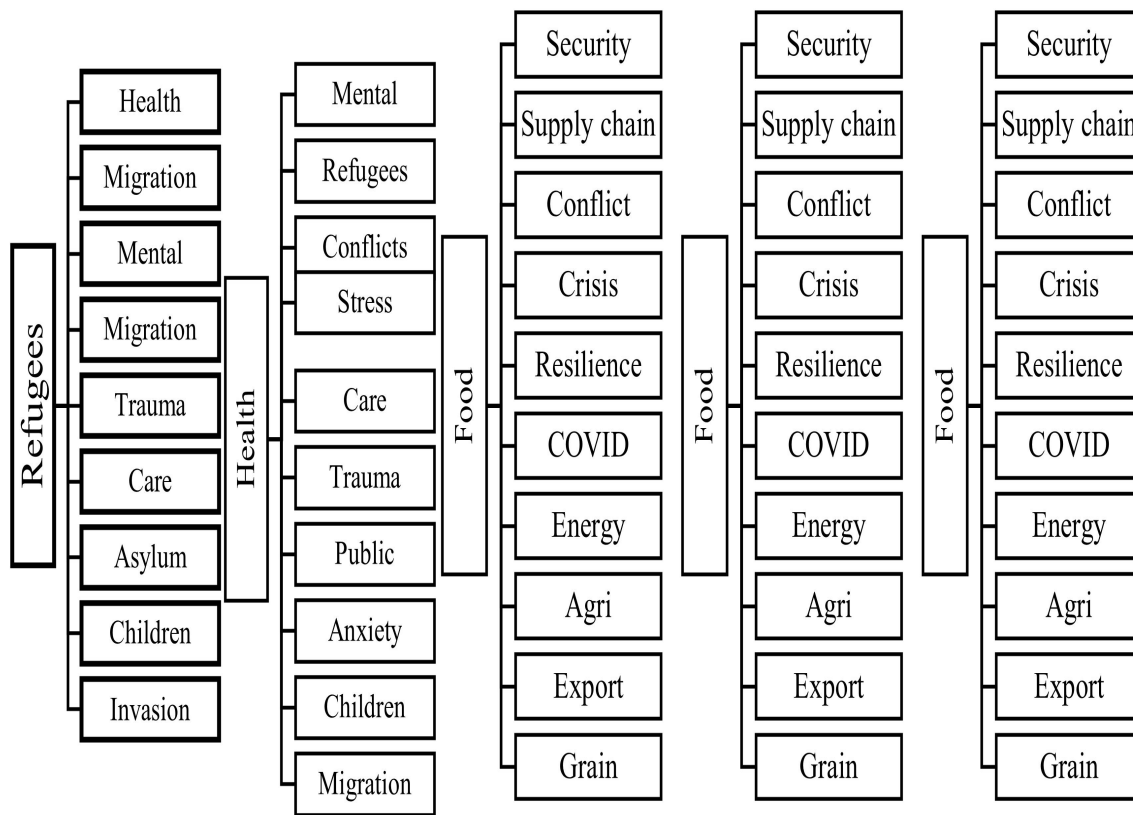

Figure 3. The ten most frequently occurring terms related to the keywords "Refugees", "Health", "Food", and "Energy"

At the same time, the battle continues in a more sophisticated form on social media. Contemporary history has shown that social media platforms play a significant role in wars and crises, primarily due to their speed and broad range of applications. Thanks to this, research on social media can be quickly put into scientific circulation (Chen & Ferrara, 2023; Lewis, 2023; Udris, et al, 2023).

4.1 Differences due to the location of the authors

The 3164 papers published on the topic had a total of 4516 authors from 117 countries (for 207 papers, there was no location data), and 75.1% of the authors were from Europe. Upon closer examination of how European authors
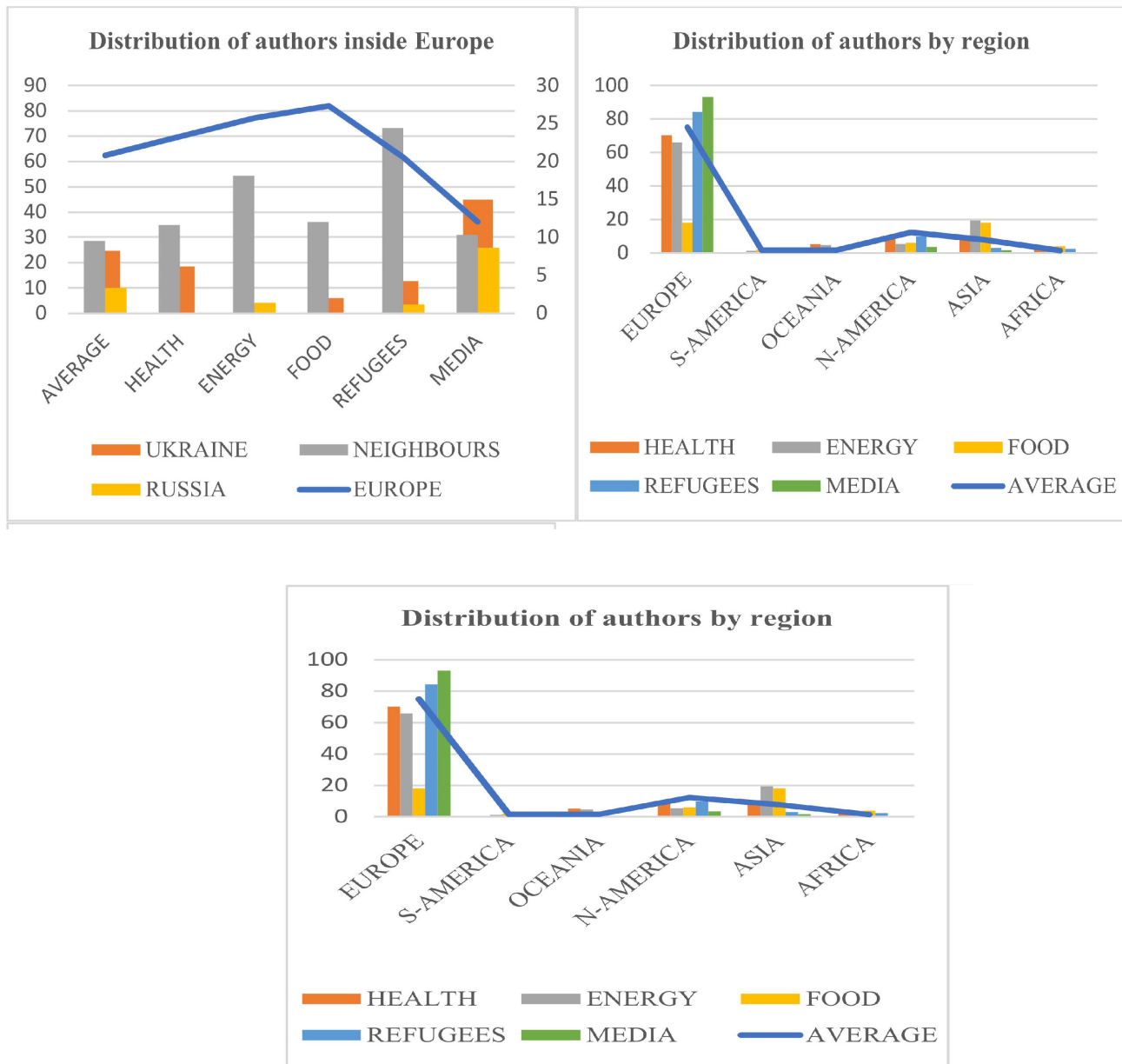
Figure 4. Distribution of authors by world region and within Europe (%)

are divided, the activities of the countries bordering Ukraine (Poland, Moldova, Bulgaria, Slovakia, and Hungary) come to the forefront (Figure 4). For example, approximately a quarter (24.42%) of the papers on refugees are written by refugees themselves. At the same time, Ukrainian authors are particularly active on the topic of media (36.21% of European authors).On the same topic, Russian authors are much more active than average (8.62% vs 3.32%).

While the topic seems to be mainly relevant for European authors, two areas are also of considerable interest to Asian authors. These are energy – 19.46% of authors and food – 18% of authors (Figure 4).
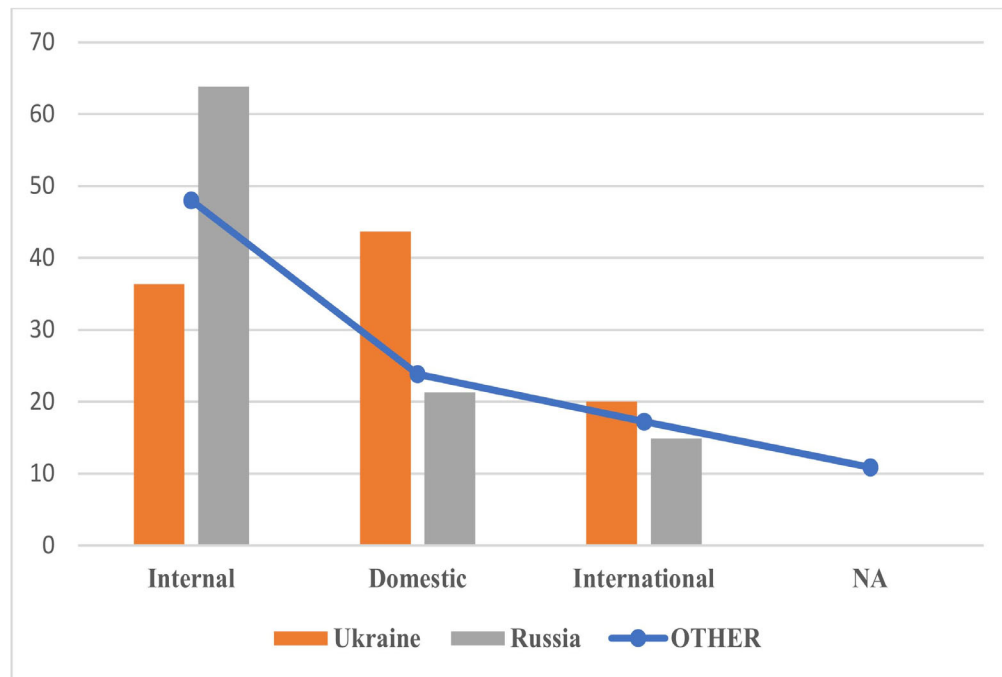
Figure 5. The proportion of papers published by authors within a single organization, with domestic partners or with international partners

The average number of authors per paper is 1.4. The high proportion of papers in the social sciences and humanities can explain the latter. The individualistic nature of research is generally characteristic of these areas. It is also characteristic of the authors of the published papers that a large part of the cooperation occurs within their organization, then within the country, and thirdly, internationally. Ukraine differs from the pattern – the majority of papers were published in the framework of domestic cooperation (Table 1; Figure 5). How big a role was played here by the fact that in June 2022, more than 40 higher education institutions were also relocated due to military operations (Humeniuk, 2022)? This is the subject of a separate study. Considering the topic of our study, the small representation of Russian authors is somewhat understandable. Observing the rules of research integrity may conflict with the political situation in the country. Despite this, there are papers that analyse the ongoing Russo-Ukrainian war in terms of a colonial seizure undertaken *by a fading but aggressive Russian empire* (Petrovsky, 2022), or discuss the topic of *collective responsibility in conjunction with the Russian invasion of Ukraine*(Bulakhova, 2022; Magun, et al, 2022).

5. Conclusion

Based on articles published between 2014 and 2023, a notable difference between the two periods – before and after the outbreak of a full-scale war – can be observed.The lion's share of published articles belongs to the field of social sciences and humanities. 75.1% of the authors are from Europe. At the same time, there are topics which are vital for the rest of the world. The Asian authors' contribution to energy-linked topics is 19.46%, and on the subject of food – 18% of the total number of authors. Considering the circle of authors (from 117 countries), it must be recognized that the impact of the Russo-Ukrainian war is already global, and in one way or another, no country in the world remains unaffected.

Acknowledgements

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