

**Publication activity indicators of the Moscow Healthcare Department
organizations in the subject area "Transplantation"**

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Abstract

Background. *Bibliographic analysis for the period 2017–2022 showed an extremely small number of literary sources (scientific publications) in both foreign and domestic periodicals, which would cover issues related to the consideration, study and/or analysis of any aspects of publication activity in the field of transplantology at the global, national and regional levels or in with respect to specific organizations, journals and authors. In Russian periodicals, the objects of research are often either various countries of the world (in comparative characteristics with Russia), or medical universities of the Russian Federation, or scientific medical organizations of federal designation, while there is a complete absence or a small number of publications devoted to the issues of publication activity of organizations at the level of the city of Moscow.*

Aim. *Conducting a scientometric study to characterize, analyze and evaluate the publication activity of the Moscow Healthcare Department organizations in the subject area "Transplantation".*

Material and methods. *The study was carried out for the subject area "Transplantation" using analytical platform SciVal for more than 10 quantitative and shared scientometric indicators (from 2019 to 2021) for 55 organizations from the categories of research institutes, scientific and practical centers and city clinical hospitals subordinated to the Moscow Healthcare Department.*

Results and discussion. *The main scientometric indicators (in quantitative and fractional ratio) characterizing the publication activity over a three-year period – from 2019 to 2021 – in the subject area "Transplantation" in organizations subordinate to the Moscow Healthcare Department.*

Conclusion. *It is shown that in the subject area "Transplantation" during the period under review, positive growth and changes in scientometric indicators such as the total number of publications, the number of publications in 1st–2nd quartiles, the number of publications in national and intraorganizational collaboration are observed for the Moscow Healthcare Department organizations.*

Keywords: scientometrics, transplantation, Moscow Healthcare Department, types of collaboration, topic clusters

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TC, topic clusters

Introduction

Bibliographic analysis for the period 2017–2022 showed a small number of literature sources (scientific publications) both in foreign and homeland periodicals, which would cover issues related to the consideration, study and/or analysis of any aspects of publication activity in the field of Transplantation at the global, national and regional levels or in relation to specific organizations, journals and authors. In foreign sources (especially when expanding the time interval of the search), one can find publications devoted, for example, to bibliometric analysis of narrow specialized topic areas [1], countries [2] or journals [3] in the field of Transplantation. In Russian periodicals, the main attention is paid to the consideration of issues of publication activity for specific topic areas or subject areas [4–9], where the objects of research are often either various countries of the world (characterized as compared to Russia), or medical universities of the Russian Federation, or scientific medical organizations of federal jurisdiction, while there is a complete absence or a small number of publications covering the issues of the publication activity of Moscow organizations and institutions. It should be noted that in foreign studies the main source of data is the international scientific citation database Web of Science and/or Scopus , and in the vast majority of studies in Russia, the preference is given to the Russian Science Citation Index (RSCI) database, but there are also analytical works based on the Web of Science and/or Scopus data, one of which is an analytical review [10], which, using the SciVal online platform, examined the dynamics over a three-year period (2018–2020) and made a statistical

analysis of the main quantitative and qualitative scientometric indicators characterizing the publication activity in the subject areas "Health Management" and "Public Health".

In connection with the foregoing, the conduct of a scientometric study, which would present the characteristics, analysis and evaluation of the publication activity of metropolitan healthcare organizations in the field of Transplantation is of certain relevance.

Material and methods

The study was conducted using the analytical platform SciVal, which data source is the international scientific citation database Scopus. Data collection (all types of publications were taken into account) was carried out as of June 22, 2022. The time period was three years: from 2019 to 2021.

The following were chosen as scientometric parameters (indicators): the total number of publications (*scholarly output*), number of post views (*views count*), post views level (*field-weighted views impact, FWVI*), the number of publications in scientific journals of various quartiles (*publications in journal quartiles*), average citations per publication (*citations per publication*), *domain-normalized* citation score (*field weighted quote impact*, FWCI, or "the level of citation" for the ease of further use), as well as indicators characterizing the four types of cooperation: international (*international collaboration*), national (*national collaboration*), intraorganizational (*institutional collaboration*), and without collaboration, i.e. having one author (*no collaboration, single authorship*). When considering topic clusters (*topic cluster*), the main indicators that characterize them are: the number (*topic cluster number*), English and Russian names (*topic cluster name*), number of publications, citation rate,

and *prominence percentile*.

The mean citation index is calculated as the ratio of the number of citations received by publications for the selected period to the number of these publications for the same period of time and thus represents the mean number of citations per 1 (one) publication. The citation rate is calculated as the ratio of the number of citations per article to the total number of citations to all articles of the same type published in that subject area in the same year. If the FWCI value is equal to one, this means compliance with the world mean; a value greater than one is above the world mean, and the FWCI value less than one is below the world mean.

The objects of the study were a set of publications on transplantation of organizations/institutions subordinate to the Moscow City Healthcare Department (DZM), which included 4 research institutes (NII), 11 scientific and practical centers (NPO) and 40 city clinical hospitals (GKB) of various profile. Of the organizations selected for the study, five are involved in rendering medical care in the field of Transplantation: *City Clinical Hospital n.a. S.P. Botkin of the Moscow City Healthcare Department (DZM)*; *N.V. Sklifosovsky Research Institute for Emergency Medicine, DZM*; *Research Institute of Emergency Pediatric Surgery and Traumatology, DZM*; *Moscow Clinical Scientific Center n.a. A.S. Loginov, DZM*; and *Morozovskaya Children's City Clinical Hospital, DZM*.)

Results

The subject area *Transplantation* is a part of the topic "Medicine" of the *All Science Journal Classification (ASJC)* which includes 27 topics and 334 subject areas. It should be noted that the topic "Medicine" is the leading one in the number of subject areas included in it (total 49).

Over a three-year period (2019–2021), the total number of publications of organizations subordinate to the DZM increased by 66.7%, the number of publications on the subject under consideration in scientific journals of the 1st–2nd quartiles increased 6 times, and the number of publications in the national and intra-institutional cooperation increased by 62.5% and 50.0%, respectively. Positive dynamics has also been observed for indicators related to views of publications: for example, the views count increased by 9.5%, the level of views did by 58.3%. There is also an increase in the contribution of DZM institutions to the publication flow (for 2019–2021) of Moscow in the subject area "Transplantation". Thus, the share of publications of the entire network of DZM organizations in the publication flow of Moscow increased by 4.4 p.p. (percentage point) (from 8.2% in 2019 to 12.6% in 2021) for the total number of publications, increased by 3.0 p.p. (from 2.7% in 2019 to 5.7% in 2021) for the number of publications in scientific journals of the 1st-2nd quartiles, by 22.4 p.p. (from 12.7% in 2019 to 35.1% in 2021) for publications in national collaboration and by 6.8 p.p. (from 4.3% in 2019 to 11.1% in 2021) for publications in intra-insitutional collaboration (Fig. 1).

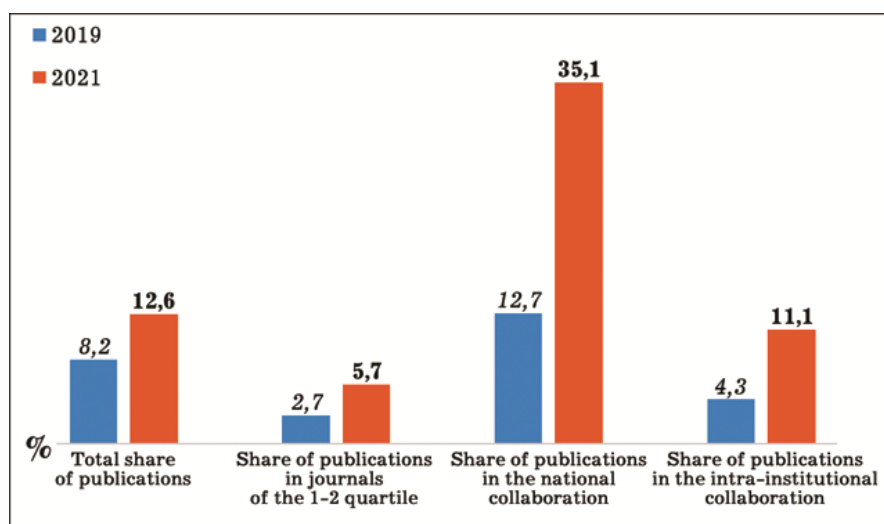


Fig. 1. Share of publications of the Moscow Healthcare Department organizations in overall Moscow publication flow for the subject area "Transplantation" (2019–2021)

One should also note that for 2019-2021, the mean citation per 1 publication (3.8) and the level of citation (0.67) of publications from DZM organizations on transplantation generally exceed those for the Russian Federation (2.3 and 0.38, respectively) and Moscow (2.8 and 0.43, respectively).

Share distribution of publications on transplantation from DZM organizations for 2019–2021, stratified by types of collaboration has the following structure: international collaboration 12.2%, national collaboration 56.1%, intra-institutional collaboration 30.5%, without cooperation (single author) 1.2%. Field-weighted citation impact of international publications on transplantation of DZM organizations for the specified three-year period was 4.97 and exceeds the world mean by more than 4.9 times. As a reference, we give the figures of the citation level of international publications in the subject area "Transplantation" for the same period for the Russian

Federation and Moscow, which were 2.51 and 2.72, respectively.

For the specified three-year period (2019-2021), the most cited international publication on transplantation from DZM organizations was the research *COVID-19-related mortality in kidney transplant and dialysis patients: Results of the ERACODA collaboration* published in 2020 in the *Nephrology Dialysis Transplantation* scientific journal, which was in the 1st quartile in 2021. The number of authors in this research was 188 who were affiliated with 85 organizations from 27 countries. The City Clinical Hospital n.a. S.P. Botkin represented the organizations under the DZM jurisdiction. According to Scopus international scientific citation database (as of 09/08/2022), the citation level of this publication is 24.97, which is significantly higher than the global mean citation level of 1, and indicates that the document has been cited more than expected. This publication also has the largest number of citations at the regional and national levels, that is, at the level of Moscow and the Russian Federation.

For 2019–2021, the most cited publication in the national collaboration was "*Transplantation in oncology – the future of a multidisciplinary approach*" published in 2020 in the scientific publication *Transplantologiya. The Russian Journal of Transplantation*, which in 2021 referred to the 3rd quartile. The number of authors of this work was 8, and they were affiliated with two organizations from the Russian Federation. From organizations subordinated to the DZM, there was the N.V. Sklifosovsky Research Institute for Emergency Medicine.

The TOP-10 foreign countries in terms of the number of joint international publications with DZM organizations in the field of Transplantation for 2019-2021 includes USA, Czech Republic, Italy, Netherlands, Poland, UK, Austria, Belgium, Finland and France. In terms of

the total number of publications for the specified period in the subject area "Transplantation", the Russian Federation ranks the 14th and is thus included in the TOP-20 countries, while the top five countries are the USA, Great Britain, Italy, France and Japan.

The TOP-10 scientific publications (by the number of publications for 2019–2021), which published main results of the scientific research of DZM organizations in Transplantation, includes the following (in decreasing order of the number of publications):

- Transplantologiya. The Russian Journal of Transplantation.
- Russian Journal of Transplantology and Artificial Organs (Vestnik Transplantologii i Iskusstvennykh Organov).
- Genes and Cells.
- Annals of Hepato-Biliary-Pancreatic Surgery.
- Nephrology Dialysis Transplantation.
- Transplantation.
- Journal of Stem Cells.
- Cellular Therapy and Transplantation.
- CKJ: Clinical Kidney Journal .
- Transplantation Reports.

The largest number of publications on transplantation for 2019–2021. from o DZM organizations referred to the scientific publication *Transplantologiya. The Russian Journal of Transplantation*, meanwhile the largest number of citations referred to *Nephrology Dialysis Transplantation*, and the mean citation maximum of was observed in *CKJ: Clinical Kidney Journal*. We also note that in terms of the number of publications in the subject area under consideration for the specified three-year period

throughout the Russian Federation, the scientific publication *Russian Journal of Transplantology and Artificial Organs (Vestnik Transplantologii i Iskusstvennykh Organov)* was in the 1st place, and *Transplantologiya. The Russian Journal of Transplantation* was in the 4th.

Structural-functional and semantic-linguistic analysis of publications of DZM organizations for 2019–2021 for the subject area *Transplantation* showed that the TOP-10 keywords (in order of decreasing use in scientific publications) included: *Kidney transplantation; Transplant recipients; Liver transplantation; Transplants; Kidney Graft; Lung Transplantation; Dialysis; Recipient; Everolimus; Graft Survival* (Fig. 2).

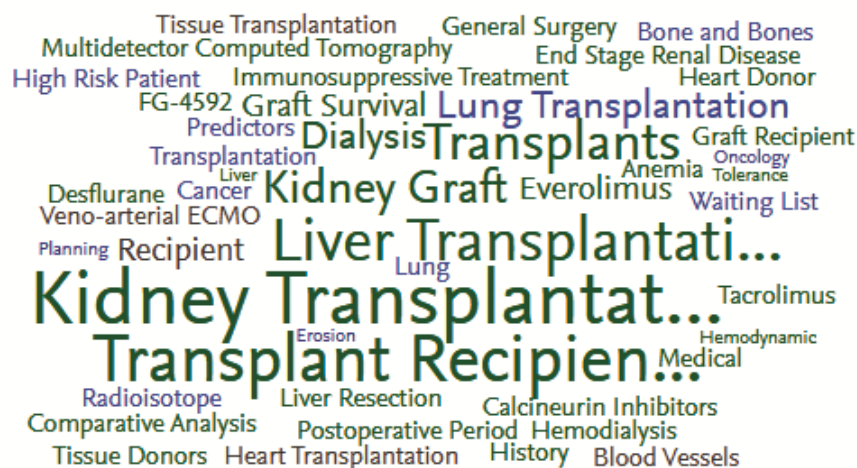


Fig. 2. Key word cloud based on publications of Moscow Healthcare Department organizations for the subject area "Transplantation" (2019–2021)

Discussion

Topic (research) clusters (TC) are formed by combining topics (Ts) with similar research interests [11]. Topic clusters are formed using the same direct quotation algorithm that creates topics. To characterize topics and topic clusters, a term such as “*prominence percentile*” (“degree of

prominence”, “percentile of relevance”), which value varies from 0 to 100 and indicates the dynamics and popularity (relevance, fame) of a topic or a topic cluster. This index is calculated by using the values of such parameters as the citations count, the views count, and the average Citescore of scientific publications ("quality" of journals). Prominence reflects the current attention to the topic in the scientific community, but does not determine its importance and/or quality. There are 4 ranges (or quartiles) that has been set for the relevance percentile: 0–25, 25–50, 50–75, and 75–100. The higher the relevance percentile value, the more relevant the topic cluster is.

The SciVal analytical tool contains data on 1,500 topic clusters and more than 95,000 topics that form them. In this case, it is possible to select a topic cluster for each of 27 topics or 334 subject areas. It should be noted that this analytical tool also makes it possible to form samples of clusters included in the TOP-1%, TOP-5%, TOP-10% and TOP-25% in terms of "prominence percentile" value.

Publications of DZM organizations on transplantation for 2019–2021 distributed over 5 topic clusters (Table, listed in decreasing order of the number of publications in them).

Table. Topic clusters (2019-2021) in the subject area "Transplantation" for the Moscow Healthcare Department organizations

Topic cluster	Name of the topic cluster		Prominence percentile
TC.98	Transplants; Tissue Donors; Kidney Transplantation	Трансплантации; Доноры Тканей; Трансплантация Почек	78.997
TC.144	Liver transplantation; Liver; Fibrosis	Трансплантация печени; Печень; Фиброз	80.736
TC.307	Hematopoietic Stem Cell Transplantation; Graft Vs Host Disease; Transplants	Трансплантация Гемопозитических Стволовых Клеток; Болезнь "Трансплантат Против Хозяина"; Трансплантаты	62.007
TC.1206	Merkel Cell Carcinoma; polyomavirus; BK Virus	Карцинома клеток Меркеля; Полиомавирус; Вирус ВК	26.957
TC.1293	Heterologous transplantation; Swine; Transplants	Гетерологичная Трансплантация; Свиньи; Трансплантаты	10.903

Only two topic clusters: **TC.98** *Transplants; Tissue Donors; Kidney Transplantation* and **TC.144** *Liver Transplant; Liver; Fibrosis* are included to TOP-25%, according to percentile relevance (i.e. relating to highly relevant) includes.

The largest number of publications in Transplantation for 2019–2021 from DZM organizations refers to the topic cluster **TC.98** *Transplants; Tissue Donors; Kidney Transplantation*, while DZM organizations make the largest contribution (41.1%) in this topic cluster to the publication flow of Moscow. The highest citation level of publications is observed in the topic cluster **TC.144** *Liver transplantation; Liver; Fibrosis*, which also has the highest prominence percentile (80.736).

The most cited publication in the topic cluster **TC.98** *Transplants; Tissue Donors; Kidney Transplantation* (for the period from 2019 to 2021)

was the research *Perioperative omega-3 fatty acids fail to confer protection in liver surgery: Results of a multicentric, double-blind, randomized controlled trial* published in 2020 in the scientific *Journal of Hepatology*, which was in the 1st quartile in 2021. The number of authors of this work (which refers to the international type of collaboration) is 21, and they are affiliated with 5 organizations from 4 countries: Switzerland, Great Britain, Russia, and Romania. DZM-subordinated organizations were represented by the *Moscow Clinical Scientific Center named after A.S. Loginov*.

For the specified three-year period (2019–2021), the highest number of citations in the **TC.144 topic cluster** *Liver transplantation; Liver; Fibrosis* was won by the publication *Relationship of Liver Stiffness With Congestion in Patients presenting With Acute decompensated Heart Failure* published 2019 in the scientific *Journal of Cardiac Failure*, which was in the 1st quartile in 2021. The number of authors of this work (also referred to the international type of collaboration) was 8; they were affiliated with 3 organizations from 2 countries: the USA, and the Russian Federation. From DZM subordinated t organizations, there was the City Clinical Hospital n.a. V.V. Vinogradov, DZM). According to Scopus international scientific citation database (as of 09/08/2022), the citation level of this publication is 1.47, which is 47% higher than the global mean citation level of 1, which indicates that the document is cited more often than expected.

Conclusion

The study for a three-year period (2019–2021) provides a brief description of some scientometric indicators that reflect the publication activity of organizations subordinate to the Moscow City Healthcare Department in the subject area "Transplantation".

It is shown that in the specified subject area for the period under review for organizations included in the DZM network, there is a positive growth and change in such scientometric indicators as the total number of publications, the number of publications in scientific sources of the 1st–2nd quartile and their number in the national and intra-institutional collaboration.

Citation rates of publications on Transplantation from DZM organizations for 2019–2021 (especially for international publications) are higher than similar averages for the Russian Federation and Moscow.

Basically, the results of scientific research on Transplantation from DZM organizations are published in two Russian journals (which belong to the 3rd-4th quartiles): *Transplantologiya. The Russian Journal of Transplantation* and *Vestnik Transplantologii i Iskusstvennykh Organov*. Meanwhile, according to the total number of publications for the specified period in the subject area under consideration, the Russian Federation is included in the TOP-20 countries for this parameter

Publications on transplantation from DZM organizations for 2019–2021 were distributed over 5 topic clusters, of which only two were highly relevant: TC.98 Transplants; Tissue Donors; Kidney Transplantation, and TC.144 Liver transplantation; Liver; Fibrosis. These two topic clusters contain 85% of the publications of DZM organizations on Transplantation during this period; and for one of them, the maximum contribution that DZM organizations make to the publication flow of Moscow is observed.

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