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ORGAN DONATION AND TRANSPLANTATION IN THE RUSSIAN FEDERATION IN 2023

16th Report from the Registry of the Russian Transplant Society

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Objective: to study current trends and advancements in organ donation and transplantation in the Russian Federation based on data from the year 2023. **Materials and methods.** Heads of organ transplant centers were surveyed through questionnaires. The Russian Ministry of Health's information accounting system was used for data control. A comparative analysis of data collected over years from various federal subjects of the Russian Federation and transplant centers was conducted. **Results.** Based on data retrieved from the National Registry in 2023, there were 50 kidney, 34 liver and 22 heart transplant programs existing in the Russian Federation as of the year 2023. Organ donation activity in 2023 was 6.3 per million population (p.m.p.), with a 77.2% multi-organ procurement rate and an average of 2.9 organs procured from one effective donor. In 2023, 3,057 organ transplants were performed in the Russian Federation, which included 1,817 kidney, 829 liver and 388 heart transplants. Same year, the number of transplant surgeries performed in the Russian Federation increased by 19.6% compared to 2022. Organ donation activity in Moscow was 29.1 p.m.p. The city of Moscow and Moscow Oblast alone had a total of 12 transplant centers, which accounted for 50.2% of all kidney transplants and 63.1% of all extrarenal transplants nationwide. There are more than 143.4 p.m.p. organ recipients in the Russian Federation. **Conclusion.** The geographic spread of transplant centers in the Russian Federation continues to expand. In 2023, five new centers were opened. Over the past year, the country has seen an increase in the number of effective donors and organ transplants. Because medical facilities still have untapped resources, the number of organ transplants performed is expected to rise. Moscow is the powerhouse of Russian transplantology. Shumakov National Medical Research Center of Transplantology and Artificial Organs and its branch perform 27.4% of the total number of organ transplants in the country. Among the successful regional initiatives, the following should be noted: the Republic of Tatarstan, Kemerovo Oblast (Kuzbass), St. Petersburg, Tyumen Oblast, Irkutsk Oblast. In the Russian Federation, pediatric transplant care is prioritized.

Keywords: organ donation, kidney, liver, heart, lung transplantation, transplant center, waiting list, registry, Shumakov National Medical Research Center of Transplantology and Artificial Organs.

INTRODUCTION

The National Registry tracks current trends and developments in organ donation and transplantation in Russia under the auspices of a dedicated transplantology commission that was established in collaboration between the Russian Ministry of Health and the Russian Transplant Society. Previous reports have been published in 2009–2023 [1–14].

Information contained in the Registry has been previously presented in the following international registries:

– International Registry of Organ Donation and Transplantation (IRODaT);
– Registry of the European Renal Association – European Dialysis and Transplant Association (ERA–EDTA Registry);
– Registries of the International Society for Heart and Lung Transplantation (ISHLT Registries).

Since 2016, the National Registry has served as a mechanism for ensuring quality control and data collection integrity in the information system used to register donated human organs and tissues, donors and recipients. The system operates under executive order No. 355n of the Russian Ministry of Health, dated June 8, 2016.

In addition to statistical data for the reporting period, the Registry's annual reports include a systematic analysis with an assessment of the current status of transplantation care in the Russian Federation, as well as trends and prospects for future advancements in this branch of healthcare.

Since 2019, the National Registry has been used to monitor the implementation of the departmental target

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program "Organ Donation and Transplantation in the Russian Federation", approved by the Ministry of Health of Russia on June 4, 2019, No. 365 (from 2022 – a set of process measures).

Questionnaires are administered to the relevant officials at all transplant centers in the Russian Federation in order to gather data for the Registry. All of the data collected over the years from Russian regions, transplant centers and international registries is compared.

The working group would like to thank all regular and new participants in the Registry who have provided data. Our gratitude also goes to the Russian Ministry of Health and the Central Research Institute for Healthcare Organization and Informatization.

TRANSPLANT CENTERS

There are transplant centers in 38 federal subjects of the Russian Federation (see Fig. 1).

In order to comply with the regional principle in assessing the status and trends in transplant care and organ donation in the federal subjects of the Russian Federation, the activities of the Shumakov National Medical Research Center of Transplantology and Artificial Organs, Moscow (Shumakov Center) and its Volzhsky branch are further presented in the Registry separately as for two transplant centers.

In 2023, kidney transplantation (KTx) was performed in 50 centers, liver transplantation (LTx) in 34, heart transplantation (HTx) in 22, pancreas transplantation (PTx) in 2, and lung transplantation (LnTx) in 2 centers.

In 2023, 59 medical facilities carried out a variety of transplant interventions. Of these: 20 were federal institutions, including 13 institutions under the Russian Ministry of Health, 2 institutions under the Russian Ministry of Science and Higher Education, 4 institutions under the Federal Medical and Biological Agency, 1 institution under the Russian Ministry of Defense, and 39 are institutions run by federal subjects of the Russian Federation.

In the new territories of the Russian Federation, in 2023 there was one transplant center functioning in the Donetsk People's Republic (DPR) at the Donetsk Clinical Territorial Medical Association of the DPR Ministry of Health (known as Kalinin Republican Clinical Hospital since 2024), Donetsk. Three living-donor kidney transplants were performed last year.

In 2023, 3,057 organ transplants were performed in Russia, 281 were pediatric transplants (see Tables 1 and

Table 1

Organ donation and transplantation in the Russian Federation in 2023

Indicator	Number (units)
Organ donation	
Total number of organ donors	1274
Deceased donors	917
Living (related) donors	357
Organ transplantation	
Total number of organs transplanted	3057
share of pediatric transplants	281
Kidney	1817
from deceased donors	1620
from living-related donors	197
share of pediatric transplants	133
Liver	829
from deceased donor	669
from living-related donors	160
share of pediatric transplants	130
Heart	386
share of pediatric transplants	17
Heart-lung	2
Lungs	19
share of pediatric transplants	1
Pancreas	3

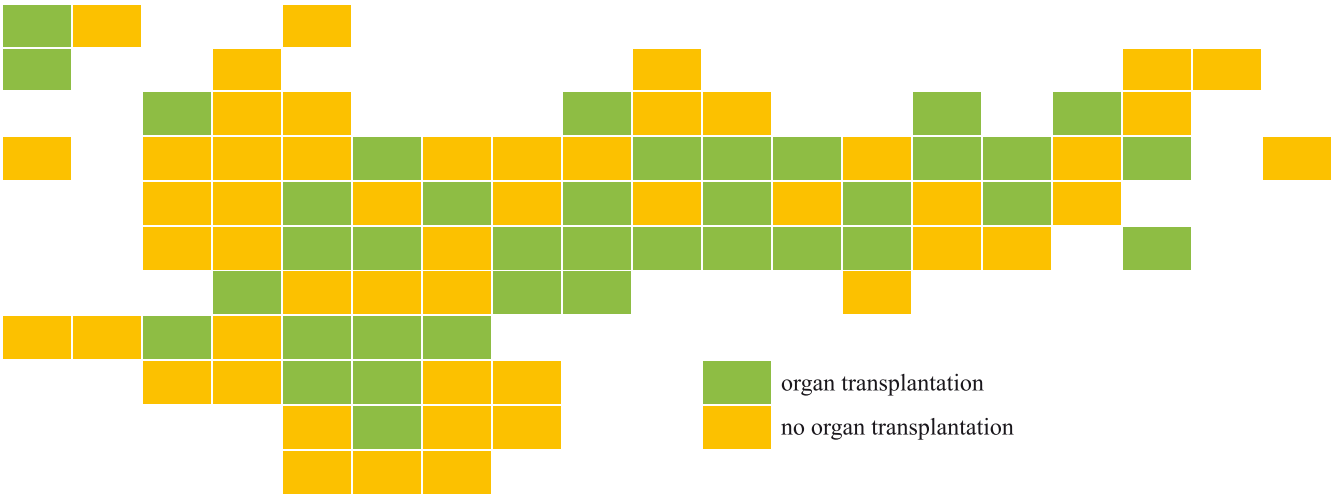

Fig. 1. Geographic spread of organ transplant centers in the Russian Federation in 2023

Table 2

Transplant activity in the Russian Federation in 2023

№	Transplant center, region, federal district	**Total**	**Kidney (total)**	Kidney (cadaver)	Kidney (living related)	**Liver (total)**	Liver (cadaver)	Liver (living related)	**Heart**	**Pancreas**	**Lungs**	**Heart-lungs**	**Small intestine**
1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.1	Shumakov National Medical Research Center of Transplantology and Artificial Organs, **Moscow, Central Federal District**	**760**	**311**	215	96	**197**	95	102	**238**	**0**	**12**	**2**	**0**
1.2	Volzhsky Branch of Shumakov National Medical Research Center of Transplantology and Artificial Organs, **Volzhsky, Southern Federal District**	**77**	**48**	39	9	**17**	17	0	**12**	**0**	**0**	**0**	**0**
2	Lopatkin Research Institute of Urology and Interventional Radiology, a branch of the National Medical Research Center for Radiology, **Moscow, Central Federal District**	**76**	**76**	71	5	**0**	0	0	**0**	**0**	**0**	**0**	**0**
3	Russian Children's Clinical Hospital, **Moscow, Central Federal District**	**41**	**41**	35	6	**0**	0	0	**0**	**0**	**0**	**0**	**0**
4	Petrovsky National Research Centre of Surgery, **Moscow, Central Federal District**	**26**	**16**	8	8	**10**	0	10	**0**	**0**	**0**	**0**	**0**
5	Burnazyan Federal Medical and Biophysical Center, **Moscow, Central Federal District**	**45**	**8**	7	1	**37**	13	24	**0**	**0**	**0**	**0**	**0**
6	Bakulev Scientific Center of Cardiovascular Surgery, **Moscow, Central Federal District**	**2**	**0**	0	0	**0**	0	0	**2**	**0**	**0**	**0**	**0**
7	National Medical Research Center for Children's Health, **Moscow, Central Federal District**	**20**	**20**	9	11	**0**	0	0	**0**	**0**	**0**	**0**	**0**
8	Botkin Hospital, **Moscow, Central Federal District**	**173**	**118**	118	0	**51**	51	0	**4**	**0**	**0**	**0**	**0**
9	Sklifosovsky Research Institute of Emergency Care, **Moscow, Central Federal District**	**387**	**238**	237	1	**132**	128	4	**7**	**2**	**7**	**0**	**1**
10	Moscow Clinical Scientific Center, **Moscow, Central Federal District**	**51**	**1**	1	0	**50**	50	0	**0**	**0**	**0**	**0**	**0**
11	Vladimirsky Moscow Regional Research and Clinical Institute, **Moscow Oblast, Central Federal District**	**94**	**63**	63	0	**31**	31	0	**0**	**0**	**0**	**0**	**0**
12	Federal Clinical Center for High Medical Technologies, Federal Biomedical Agency (No. 119), **Moscow Oblast, Central Federal District**	**20**	**20**	16	4	**0**	0	0	**0**	**0**	**0**	**0**	**0**
13	Ivanovo Regional Clinical Hospital, **Ivanovo, Central Federal District**	**2**	**2**	2	0	**0**	0	0	**0**	**0**	**0**	**0**	**0**
14	St. Joasaphus Belgorod Regional Clinical Hospital, **Belgorod, Central Federal District**	**10**	**6**	6	0	**3**	3	0	**1**	**0**	**0**	**0**	**0**
15	Voronezh Regional Clinical Hospital No. 1, **Voronezh, Central Federal District**	**9**	**9**	8	1	**0**	0	0	**0**	**0**	**0**	**0**	**0**
16	Tula Regional Clinical Hospital, **Tula, Central Federal District**	**5**	**5**	4	1	**0**	0	0	**0**	**0**	**0**	**0**	**0**
17	Ryazan Regional Clinical Hospital, **Ryazan, Central Federal District**	**14**	**12**	11	1	**2**	2	0	**0**	**0**	**0**	**0**	**0**
18	Kursk Regional Multidisciplinary Clinical Hospital, **Kursk, Central Federal District**	**1**	**1**	0	1	**0**	0	0	**0**	**0**	**0**	**0**	**0**
19	Stavropol Regional Clinical Hospital, **Stavropol, North Caucasian Federal District**	**6**	**5**	4	1	**1**	1	0	**0**	**0**	**0**	**0**	**0**
20	Ochapovsky Regional Clinical Hospital No. 1, **Krasnodar, Southern Federal District**	**37**	**22**	19	3	**9**	8	1	**6**	**0**	**0**	**0**	**0**

Continuation table 2

1	2	3	4	5	6	7	8	9	10	11	12	13	14
21	Volzhsky Regional Center of Urology, **Volzhsky, Southern Federal District**	**1**	**1**	0	1	**0**	0	0	**0**	**0**	**0**	**0**	**0**
22	Rostov Regional Clinical Hospital, **Rostov-on-Don, Southern Federal District**	**65**	**40**	40	0	**18**	17	1	**6**	**1**	**0**	**0**	**0**
23	Russian Research Center of Radiology and Surgical Technologies, **St. Petersburg, Northwestern Federal District**	**17**	**0**	0	0	**17**	17	0	**0**	**0**	**0**	**0**	**0**
24	Almazov National Medical Research Centre, **St. Petersburg, Northwestern Federal District**	**33**	**0**	0	0	**0**	0	0	**33**	**0**	**0**	**0**	**0**
25	Pavlov University, **St. Petersburg, Northwestern Federal District**	**47**	**36**	31	5	**11**	11	0	**0**	**0**	**0**	**0**	**0**
26	St. Petersburg Research Institute of Emergency Medicine, **St. Petersburg, Northwestern Federal District**	**42**	**32**	32	0	**10**	10	0	**0**	**0**	**0**	**0**	**0**
27	Mariinskaya Hospital, **St. Petersburg, Northwestern Federal District**	**25**	**25**	25	0	**0**	0	0	**0**	**0**	**0**	**0**	**0**
28	St. Luke's Clinical Hospital, **St. Petersburg, Northwestern Federal District**	**29**	**29**	27	2	**0**	0	0	**0**	**0**	**0**	**0**	**0**
29	Kirov Military Medical Academy, **St. Petersburg, Northwestern Federal District**	**19**	**0**	0	0	**19**	19	0	**0**	**0**	**0**	**0**	**0**
30	Leningrad Regional Clinical Hospital, **St. Petersburg, Northwestern Federal District**	**37**	**36**	36	0	**1**	1	0	**0**	**0**	**0**	**0**	**0**
31	Volosevich First City Clinical Hospital, **Arkhangelsk, Northwestern Federal District**	**2**	**2**	2	0	**0**	0	0	**0**	**0**	**0**	**0**	0
32	Meshalkin National Medical Research Center, **Novosibirsk, Siberian Federal District**	**9**	**0**	0	0	**0**	0	0	**9**	**0**	**0**	**0**	**0**
33	State Novosibirsk Regional Clinical Hospital, **Novosibirsk, Siberian Federal District**	**75**	**33**	27	6	**42**	31	11	**0**	**0**	**0**	**0**	**0**
34	Research Institute for Complex Issues of Cardiovascular Diseases, **Kemerovo, Siberian Federal District**	**13**	**0**	0	0	**0**	0	0	**13**	**0**	**0**	**0**	**0**
35	Belyaev Kemerovo Regional Clinical Hospital, **Kemerovo, Siberian Federal District**	**68**	**64**	63	1	**4**	4	0	**0**	**0**	**0**	**0**	**0**
36	Irkutsk Regional Clinical Hospital, **Irkutsk, Siberian Federal District**	**69**	**39**	39	0	**28**	24	4	**2**	**0**	**0**	**0**	**0**
37	Altai Regional Clinical Hospital, **Barnaul, Siberian Federal District**	**20**	**20**	18	2	**0**	0	0	**0**	**0**	**0**	**0**	**0**
38	Federal Center for Cardiovascular Surgery, **Krasnoyarsk, Siberian Federal District**	**1**	**0**	0	0	**0**	0	0	**1**	**0**	**0**	**0**	**0**
39	Federal Siberian Research and Clinical Center, **Krasnoyarsk, Siberian Federal District**	**14**	**13**	13	0	**1**	1	0	**0**	**0**	**0**	**0**	**0**
40	Krasnoyarsk Clinical Hospital, **Krasnoyarsk, Siberian Federal District**	**38**	**19**	19	0	**10**	10	0	**9**	**0**	**0**	**0**	**0**
41	Sverdlovsk Regional Clinical Hospital No. 1, **Yekaterinburg, Ural Federal District**	**58**	**38**	38	0	**17**	17	0	**3**	**0**	**0**	**0**	**0**
42	Chelyabinsk Regional Clinical Hospital, **Chelyabinsk, Ural Federal District**	**30**	**18**	18	0	**8**	8	0	**4**	**0**	**0**	**0**	**0**
43	Regional Clinical Hospital No. 1, **Tyumen, Ural Federal District**	**36**	**32**	32	0	**2**	2	0	**2**	**0**	**0**	**0**	**0**
44	District Clinical Hospital, **Khanty-Mansiysk, Ural Federal District**	**16**	**11**	10	1	**4**	4	0	**1**	**0**	**0**	**0**	**0**
45	Samara State Medical University, **Samara, Volga Federal District**	**54**	**51**	50	1	**2**	2	0	**1**	**0**	**0**	**0**	**0**
46	Saratov State Medical University, **Saratov, Volga Federal District**	**7**	**7**	0	7	**0**	0	0	**0**	**0**	**0**	**0**	**0**
47	Regional Clinical Hospital, **Saratov, Volga Federal District**	**9**	**9**	9	0	**0**	0	0	**0**	**0**	**0**	**0**	**0**

End of table 2

1	2	3	4	5	6	7	8	9	10	11	12	13	14
48	Volga Regional Medical Center, **Nizhny Novgorod, Volga Federal District**	**30**	**20**	16	4	**10**	9	1	**0**	**0**	**0**	**0**	**0**
49	Republican Clinical Hospital, **Kazan, Volga Federal District**	**188**	**116**	112	4	**72**	71	1	**0**	**0**	**0**	**0**	**0**
50	Interregional Clinical Diagnostic Center, **Kazan, Volga Federal District**	**26**	**0**	0	0	**0**	0	0	**26**	**0**	**0**	**0**	**0**
51	Republican Clinical Hospital, **Ufa, Volga Federal District**	**44**	**38**	38	0	**6**	6	0	**0**	**0**	**0**	**0**	**0**
52	Republican Cardiology Clinic, **Ufa, Volga Federal District**	**5**	**0**	0	0	**0**	0	0	**5**	**0**	**0**	**0**	**0**
53	Sukhanov Federal Center for Cardiovascular Surgery, **Perm, Volga Federal District**	**1**	**0**	0	0	**0**	0	0	**1**	**0**	**0**	**0**	**0**
54	Perm Regional Clinical Hospital, **Perm, Volga Federal District**	**8**	**8**	6	2	**0**	0	0	**0**	**0**	**0**	**0**	**0**
55	Municipal Clinical Hospital for Emergency Medical Care No. 1, **Orenburg, Volga Federal District**	**24**	**24**	20	4	**0**	0	0	**0**	**0**	**0**	**0**	**0**
56	Republican Hospital No. 1 – National Center of Medicine, **Yakutsk, Far Eastern Federal District**	**2**	**1**	0	1	**1**	0	1	**0**	**0**	**0**	**0**	**0**
57	Semashko Republican Clinical Hospital, **Ulan-Ude, Far Eastern Federal District**	**4**	**4**	0	4	**0**	0	0	**0**	**0**	**0**	**0**	**0**
58	Primorsky Regional Clinical Hospital No. 1, **Vladivostok, Far Eastern Federal District**	**19**	**14**	14	0	**5**	5	0	**0**	**0**	**0**	**0**	**0**
59	Regional Clinical Hospital No. 1", **Khabarovsk, Far Eastern Federal District**	**16**	**15**	12	3	**1**	1	0	**0**	**0**	**0**	**0**	**0**
Total		**3057**	**1817**	**1620**	**197**	**829**	**669**	**160**	**386**	**3**	**19**	**2**	**1**

2). The number of organ transplants in Russia increased by 19.6% (+502) compared to 2022.

In 2023, between 192 (July) and 335 (April) organ transplants were performed per month (average of 255); see Fig. 2.

In the past year, between 114 and 192 KTx per month, 54 to 95 LTx and 19 to 46 HTx were performed.

Based on data obtained from the Federal Registry for High-Tech Medical Care, 2,683 (87.8%) organ transplant surgeries were performed in 2023, using funds from the mandatory health insurance system that were allocated for provision of high-tech medical care for organ transplantation; there were 2,186 (85.5%) of such surgeries in 2022; see Fig. 3. Another 374 (12.2%) organ transplants

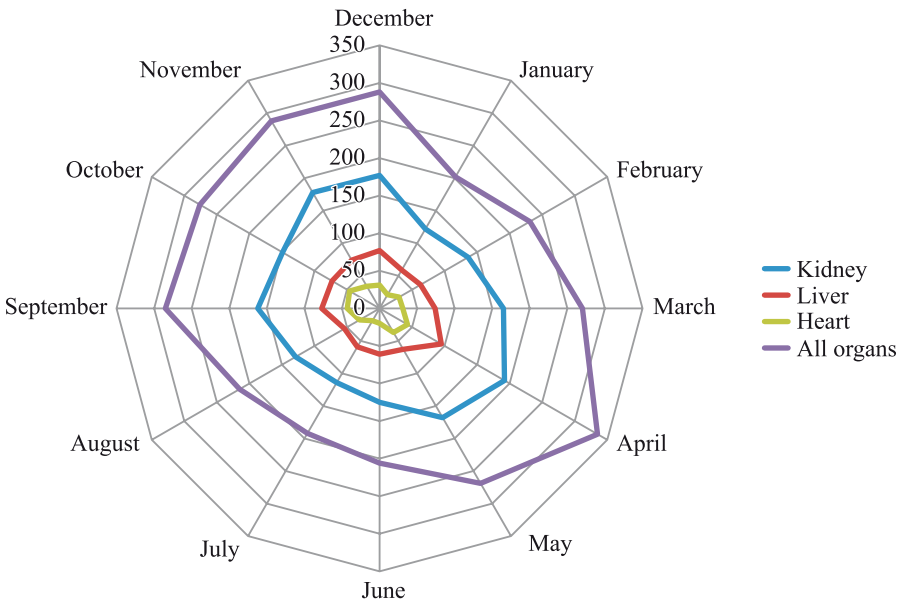

Fig. 2. Organ transplantation by months in 2023

were performed using funds from the federal subjects of the Russian Federation and from the federal budget (369 (14.5%) in 2022.

Thus, the increase in the number of organ transplants in 2023 became possible due to an adequate increase in funding from the mandatory health insurance system that was allocated for provision of high-tech medical care for organ transplantation.

Since 2010, when this indicator was included in the Registry, the number of organ transplants performed using the funds allocated for provision of high-tech medical care for organ transplant has increased 3.4-fold. Meanwhile, there has been a 29.6% increase in the number of organ transplants carried out with these funds.

The financial costs per unit of high-tech medical care for transplantation in 2023 were approved by the Government of the Russian Federation on December 29, 2022 via Resolution No. 2497.

ORGAN DONATION

In 2023, donor programs were implemented in 35 federal subjects of the Russian Federation.

Over the past year, two living donor programs were launched at:

– in Kursk Oblast (kidney),
– in Irkutsk Oblast (liver).

The number of effective deceased donors in 2023 was 917 or 6.3 p.m.p. (see Table 3). The number of effective deceased donors in the Russian Federation was 20.2% more than in 2022 (+154).

The proportion of effective deceased organ donors older than 60 years of age in 2023 was 22.3% (16.0% in 2022); see Fig. 4. At the same time, in 6 regions where

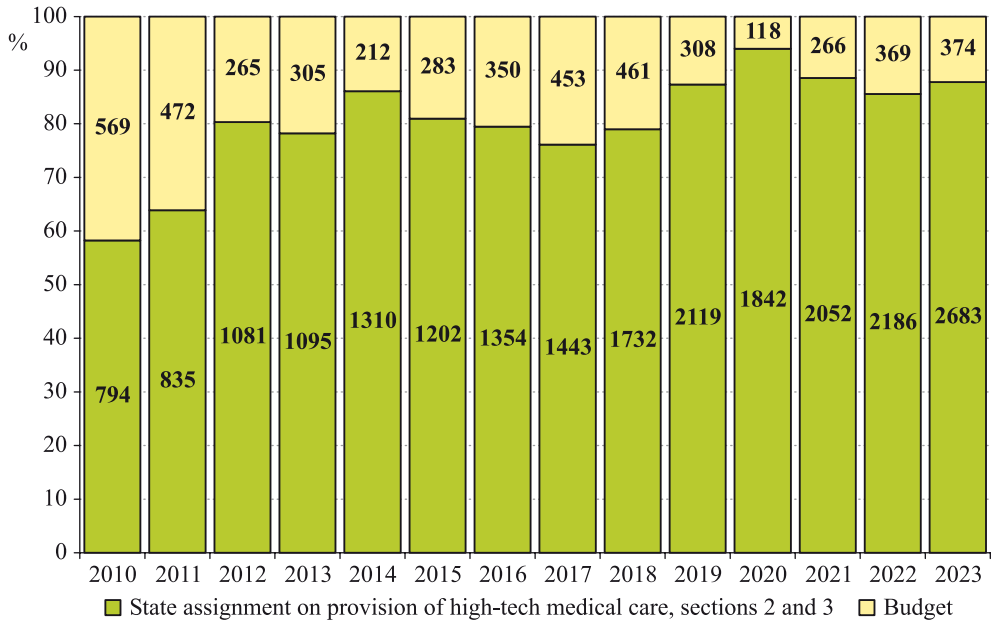

Fig. 3. Funding for organ transplantation in the Russian Federation between 2010 and 2023

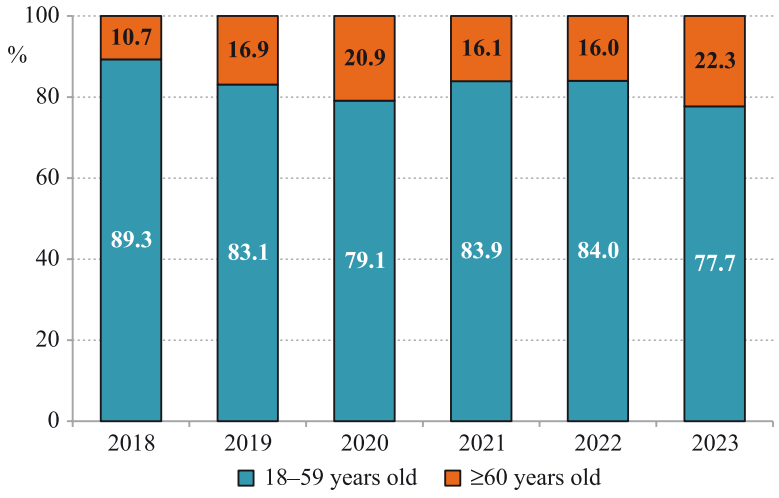

Fig. 4. Age structure of effective organ donors between 2018 and 2023

Table 3

Indicators associated with deceased organ donation across the Russian Federation in 2023

S/N	Region	Organ Donation Coordinating Center	Population (million)	Number of active donor bases	Donors (absolute, per million population)		including brain-dead donors (absolute, %)		including multi-organ donors (absolute, %)	
1	2	3	4	5	6	7	8	9	10	11
1	Moscow	Botkin Hospital	13.1	21	381	29.1	355	93.2	324	85.0
2	Moscow Oblast	Vladimirsky Moscow Regional Research and Clinical Institute	8.6	13	42	4.9	42	100.0	38	90.5
3	Ivanovo Oblast	Ivanovo Regional Clinical Hospital	1.0	1	2	2.0	2	100.0	2	100.0
4	Belgorod Oblast	St. Joasaph Belgorod Regional Clinical Hospital	1.5	1	3	2.0	3	100.0	3	100.0
5	Voronezh Oblast	Voronezh Regional Clinical Hospital No. 1	2.3	3	4	1.7	4	100.0	0	0.0
6	Tula Oblast	Tula Regional Clinical Hospital	1.5	1	5	3.3	4	80.0	4	80.0
7	Ryazan Oblast	Ryazan Regional Clinical Hospital	1.1	1	9	8.2	9	100.0	9	100.0
8	Krasnodar Krai	Ochapovsky Regional Clinical Hospital No. 1	5.8	1	13	2.2	12	92.3	9	69.2
9	Volgograd Oblast	Volzhsky Branch of Shumakov National Medical Research Center of Transplantology and Artificial Organs	2.5	3	15	6.0	15	100.0	11	73.3
10	Rostov Oblast	Rostov Regional Clinical Hospital	4.2	1	24	5.7	24	100.0	24	100.0
11	Stavropol Krai	Stavropol Regional Clinical Hospital	2.9	1	2	0.7	2	100.0	1	50.0
12	St. Petersburg	St. Petersburg Research Institute of Emergency Medicine	5.6	6	62	11.1	62	100.0	53	85.5
13	Leningrad Oblast	Leningrad Regional Clinical Hospital	2.0	1	18	9.0	18	100.0	14	77.8
14	Arkhangelsk Oblast	Volosevich First City Clinical Hospital	1.0	1	3	3.0	3	100.0	3	100.0
15	Novosibirsk Oblast	State Novosibirsk Regional Clinical Hospital	2.8	4	27	9.6	25	92.6	22	81.5
16	Kemerovo Oblast (Kuzbass)	Belyaev Kemerovo Regional Clinical Hospital	2.6	10	35	13.5	29	82.9	14	40.0
17	Irkutsk Oblast	Irkutsk Regional Clinical Hospital	2.3	2	26	11.3	26	100.0	24	92.3
18	Altai Krai	Altai Regional Clinical Hospital	2.1	1	9	4.3	9	100.0	2	22.2
19	Krasnoyarsk Krai	Krasnoyarsk Regional Clinical Hospital	2.8	3	13	4.6	12	92.3	9	69.2
20	Sverdlovsk Oblast	Sverdlovsk Regional Clinical Hospital No. 1	4.2	2	18	4.3	18	100.0	16	88.9
21	Chelyabinsk Oblast	Chelyabinsk Regional Clinical Hospital	3.4	1	13	3.8	13	100.0	10	76.9
22	Tyumen Oblast	Regional Clinical Hospital No. 1	1.6	3	17	10.6	17	100.0	3	17.6
23	Khanty-Mansi Autonomous Okrug – Yugra	District Clinical Hospital	1.7	3	5	2.9	5	100.0	4	80.0
24	Samara Oblast	Samara State Medical University	3.1	4	27	8.7	23	85.2	3	11.1
25	Saratov Oblast	Regional Clinical Hospital	2.4	1	9	3.8	9	100.0	7	77.8
26	Nizhny Novgorod Oblast	Volga Regional Medical Center	3.1	4	9	2.9	9	100.0	8	88.9
27	Republic of Tatarstan	Republican Clinical Hospital	4.0	3	68	17.0	68	100.0	60	88.2
28	Republic of Bashkortostan	Kuvatov Republican Clinical Hospital	4.1	6	20	4.9	20	100.0	8	40.0
29	Orenburg Oblast	Municipal Clinical Hospital for Emergency Medical Care No. 1	1.8	2	11	6.1	11	100.0	11	100.0
30	Primorsky Krai	Primorsky Regional Clinical Hospital No. 1	1.8	1	7	3.9	7	100.0	5	71.4
31	Perm Krai	Perm Regional Clinical Hospital	2.5	1	3	1.2	3	100.0	1	33.3

End of table 3

32	Khabarovsk Krai	Sergeev District Clinical Hospital	1.3	1	7	5.4	7	100.0	1	14.3
33	Departmental program of the Federal Biomedical Agency of the Russian Federation	Burnasyan Federal Medical Biophysical Center	-	2	1	-	1	100.0	1	100.0
34	Departmental program of the Federal Biomedical Agency of the Russian Federation	Federal Siberian Research and Clinical Center	-	3	9	-	9	100.0	4	44.4
		Total	**146.4**	**112**	**917**	**6.3**	**876**	**95.5**	**708**	**77.2**

the level of donor activity was higher than 10.0 effective donors p.m.p., their share was 25.8%.

Among other factors, expansion of organ transplant from donors over 60 years of age contributed to the rise in donor activity in 2023.

Donor activity per population of the regions implementing donor programs (100.7 million) amounted to 9.1 p.m.p. (see Tables 4 and 5).

Male donors made up 65.0% of the total, while female donors made up 35.0%.

Moscow posted the highest DA with 29.1 p.m.p. (26.3 in 2022). In the Republic of Tatarstan, DA was 17.0 effective donors p.m.p. (13.3). DA exceeded 10.0 p.m.p. in four more federal subjects of the Russian Federation – Kemerovo Oblast, Irkutsk Oblast, St. Petersburg and Tyumen Oblast.

In 2023, 25 federal subjects of the Russian Federation recorded increased DA, with Moscow, Moscow Oblast, St. Petersburg, Irkutsk Oblast and the Republic of Tatarstan posting the most dynamic growth (≥10 effective donors).

Five federal subjects of the Russian Federation witnessed a drop in DA; in Krasnodar Krai, Stavropol Krai and Belgorod Oblast, the decline was more severe than in other regions (by ≥25% decrease). However, given the consistently low DA in these regions, the decrease in 2023 did not have a significant impact on DA in the Russian Federation overall.

In 2023, 46.1% (423) of effective donors came from Moscow and Moscow Oblast alone (362, 47.4% in 2022). As a result, the Moscow agglomeration accoun-

Table 4

Rating of regions by donor activity in 2023

S/N	Federal Subject of the Russian Federation (Region)	Population in 2023 (million)	Donor count (per million population)	
			2023	2022
1	Moscow	13.1	29.1	26.3
2	Republic of Tatarstan	4.0	17.0	13.3
3	Kemerovo Oblast	2.6	13.5	15.8
4	Irkutsk Oblast	2.3	11.3	6.3
5	St. Petersburg	5.6	11.1	8.0
6	Tyumen Oblast	1.6	10.6	10.7
7	Novosibirsk Oblast	2.8	9.6	6.8
8	Leningrad Oblast	2.0	9.0	8.9
9	Samara Oblast	3.1	8.7	7.4
10	Ryazan Oblast	1.1	8.2	6.4
11	Orenburg Oblast	1.8	6.1	2.6
12	Volgograd Oblast	2.5	6.0	3.2
13	Rostov Oblast	4.2	5.7	5.0
14	Khabarovsk Krai	1.3	5.4	0.0
15	Republic of Bashkortostan	4.1	4.9	5.0
16	Moscow Oblast	8.6	4.9	3.8
17	Krasnoyarsk Krai*	2.8	4.6	3.4
18	Altai Krai	2.1	4.3	4.3
19	Sverdlovsk Oblast	4.2	4.3	2.3
20	Primorsky Krai	1.8	3.9	3.7
21	Saratov Oblast	2.4	3.8	2.9
22	Chelyabinsk Oblast	3.4	3.8	2.6
23	Tula Oblast	1.5	3.3	2.1
24	Arhangelsk Oblast	1.0	3.0	2.7
25	Nizhny Novgorod Oblast	3.1	2.9	2.2
26	Khanty-Mansi Autonomous Okrug – Yugra	1.7	2.9	1.8
27	Krasnodar Krai	5.8	2.2	3.0
28	Belgorod Oblast	1.5	2.0	3.3
29	Ivanovo Oblast	1.0	2.0	0.0
30	Voronezh Oblast	2.3	1.7	1.3
31	Perm Krai	2.5	1.2	1.0
32	Stavropol Krai	2.9	0.7	1.1
	Russia (85 federal subjects of the Russian Federation)	146.4	6.3	5.2

Note: The donor program of Federal Siberian Research and Clinical Center in Krasnoyarsk is excluded.

Table 5

Deceased organ donors (effective donors) between 2006 and 2023

S/N	Region	2006	2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		2017		2018		2019		2020		2021		2022		2023	
		Donor count	Donor count	Year-over-year change (abs.)	Donor count	Year-over-year change (abs.)	Donor count	Year-over-year change (abs.)	Donor count	Year-over-year change (abs.)	Donor count	Year-over-year change (abs.)	Donor count	Year-over-year change (abs.)	Donor count	Year-over-year change (abs.)	Donor count	Year-over-year change (abs.)	Donor count	Year-over-year change (abs.)	Donor count	Year-over-year change (abs.)	Donor count	Year-over-year change (abs.)	Donor count	Year-over-year change (abs.)	Donor count	Year-over-year change (abs.)	Donor count	Year-over-year change (abs.)	Donor count	Year-over-year change (abs.)	Donor count	Year-over-year change (abs.)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
1	Moscow	87	126	+39	135	+9	136	+1	151	+15	135	–16	111	–24	125	+14	151	+26	142	–9	183	+41	195	+12	218	+23	277	+59	263	–14	298	+35	332	+34	381	+49
2	Moscow Oblast	24	45	+21	59	+14	52	–7	71	+19	82	+11	61	–21	56	–5	51	–5	44	–7	39	–5	75	+36	68	–7	41	–27	21	–20	36	+15	30	–6	42	+12
3	Belgorod Oblast		2	+2	3	+1	2	–1	5	+3	6	+1	3	–3	1	–2	2	+1	5	+3	4	–1	4	0	4	0	4	0	2	–2	2	0	5	+3	3	–2
4	Voronezh Oblast	6	2	–4	8	+6	2	–6	0	–2	1	+1	6	+5	6	0	5	–1	7	+2	4	–3	1	–3	8	+7	8	0	4	–4	3	–1	3	0	4	+1
5	Tula Oblast																										2	+2	3	+1	4	+1	3	–1	5	+2
6	Ryazan Oblast																								2	+2	13	+11	6	–7	11	+5	7	–4	9	+2
7	Ivanovo Oblast																														1	+1	0	–1	2	+2
8	Krasnodar Krai						3	+3	39	+36	52	+13	42	–10	41	–1	23	–18	25	+2	24	–1	19	–5	20	+1	23	+3	13	–10	13	0	17	+4	13	–4
9	Volgograd Oblast	5	0	–5	11	+11	15	+4	16	+1	17	+1	19	+2	15	–2	18	+3	8	–10	8	0	9	+1	9	0	10	+1	10	0	10	0	8	–2	15	+7
10	Rostov Oblast																		1	+1	7	+6	13	+6	19	+6	21	+2	18	–3	21	+3	21	0	24	+3
11	Stavropol Krai																								2	+2	3	+1	13	+10	5	–8	3	–2	2	–1
12	St. Petersburg	30	45	+15	47	+2	47	0	41	–6	34	–7	22	–12	13	–9	23	+10	31	+8	29	–2	31	+2	34	+3	53	+19	25	–28	25	0	43	+18	62	+19
13	Leningrad Oblast	12	8	–4	11	+3	11	0	13	+2	10	–3	10	0	10	0	9	–1	7	–2	12	+5	11	–1	15	+4	7	–8	11	+4	12	+1	17	+5	18	+1
14	Arkhangelsk Oblast																								5	+5	5	0	1	–4	1	0	3	+2	3	0
15	Novosibirsk Oblast	17	11	–6	18	+7	29	+11	35	+6	25	–10	20	–4	17	–3	11	–6	14	+3	9	–5	14	+5	17	+3	23	+6	15	–8	15	0	19	+4	27	+8
16	Kemerovo Oblast	16	13	–3	18	+5	18	0	22	+4	12	–10	26	+14	26	0	31	+5	28	–3	34	+6	22	–12	30	+8	40	+10	27	–13	28	+1	41	+13	35	–6
17	Irkutsk Oblast				4	+4	6	+2	10	+4	9	–1	8	–1	6	–2	9	+3	4	–5	3	–1	2	–1	7	+5	16	+9	16	0	8	–8	15	+7	26	+11
18	Omsk Oblast	10	15	+5	13	–2	19	+6	19	0	14	–5	11	–3	14	+3	16	+2	11	–5	4	–7	4	0	3	–1	2	–1	2	0	0	–2	0	0	0	0
19	Altai Krai														3	+3	5	+2	4	–1	4	0	8	+4	8	0	8	0	9	+1	7	–2	10	+3	9	–1
20	Krasnoyarsk Krai																3	+3	6	+3	18	+12	27	+9	16	Note	13	–3	10	–3	12	+2	10	–2	13	+3
21	Sverdlovsk Oblast	14	13	–1	12	–1	13	+1	14	+1	15	+1	14	–1	18	+4	23	+5	18	–5	15	–3	22	+7	24	+2	24	0	6	–18	14	+8	10	–4	18	+8

End of table 5

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37
22	Chelyabinsk Oblast								6	+6	2	–4	7	+5	6	–1	10	+4	9	–1	11	+2	8	–3	4	–4	4	0	3	–1	3	0	9	+6	13	+4
23	Tyumen Oblast																						4	+4	13	+9	13	0	5	–8	8	+3	16	+8	17	+1
24	Khanty-Mansi Autonomous Okrug – Yugra																						3	+3	4	+1	5	+1	3	–2	2	–1	3	+1	5	+2
25	Samara Oblast	4	17	+13	24	+7	18	–6	20	+2	21	+1	19	–2	21	+2	20	–1	18	–2	26	+8	28	+2	23	–5	25	+2	24	–1	24	0	23	–1	27	+4
26	Saratov Oblast														4	+4	7	+3	7	0	7	0	7	0	8	+1	10	+2	0	–10	6	+6	7	+1	9	+2
27	Nizhny Novgorod Oblast						7	+7	11	+4	12	+1	10	–2	8	–2	12	+4	10	–2	11	+1	10	–1	12	+2	12	0	5	–7	7	+2	7	0	9	+2
28	Republic of Tatarstan		3	+3	1	–2	3	+2	12	+9	16	+4	9	+7	6	–3	6	0	4	–2	1	–3	3	+2	4	+1	15	+11	21	+6	35	+14	52	+17	68	+16
29	Republic of Bashkortostan								2	+2	7	+5	14	+7	18	+4	19	+1	14	+5	20	+6	22	+2	20	–2	24	+4	18	–6	21	+3	20	–1	20	0
30	Orenburg Oblast																		3	+3	8	+5	9	+1	8	–1	11	+3	1	–10	4	+3	5	+1	11	+6
31	The Republic of Sakha (Yakutia)																				2	+2	4	+2	4	0	3	–1	0	–3	0	0	1	+1	0	–1
32	Primorsky Krai																														3	+3	7	+4	7	0
33	Perm Krai																																1	+1	3	+2
34	Khabarovsk Krai																																		7	+7
35	Burnasyan Federal Medical and Biophysical Center, Moscow														6	+6	11	+5	14	+3	16	+2	9	–7	5	–4	1	–4	1	0	3	+2	2	–1	1	–1
36	Burnasyan Federal Medical and Biophysical Center, Krasnoyarsk																								24	Note	16	–8	8	–8	10	+2	13	+3	9	–4
	TOTAL in the Russian Federation	**225**	**300**	**+75**	**364**	**+64**	**381**	**+17**	**487**	**+106**	**470**	**–17**	**412**	**–58**	**420**	**+8**	**465**	**+45**	**434**	**–31**	**499**	**+53**	**565**	**+78**	**639**	**+74**	**732**	**+93**	**564**	**–168**	**652**	**+88**	**763**	**+111**	**917**	**+154**

Note: The donor activity of Federal Siberian Research and Clinical Center in Krasnoyarsk is presented as a separate program.

ted for 39.6% of the 2023 growth in DA, while the other regions of the country accounted for 60.4%.

There were 876 effective brain-dead donors, making up 95.5% of the entire pool of effective donors (see Fig. 5). In 24 federal subjects of the Russian Federation, the centers worked only with brain-dead donors. For the first time, no donor programs had a brain-dead donor percentage lower than 80.0%.

There were 708 multi-organ procurements in 2023, accounting for 77.2% of the total number of procurements. In 20 federal subjects, the percentage of multi-organ procurements was ≥70.0%.

In Voronezh Oblast, Kemerovo Oblast, Altai Krai, Tyumen Oblast, Samara Oblast, Republic of Bashkortostan, Perm Krai, and Khabarovsk Krai, the percentage of multi-organ donors is less than 50.0%, indicating underutilization of donor resources.

In 2023, Moscow and Moscow Oblast alone accounted for 362 multi-organ donors (51.1% of the total number of multi-organ donors) in the country (294 and 38.5% in 2022).

An average of 2.9 organs were procured from a single donor in 2023 (2.8 in 2022). Donor kidney utilization rate was 88.3% (compared to 87.4% in 2022).

In 2023, the number of organ procurements (kidney, part of liver) from living related donors was 357 organ procurements or 28.0% of the total 1,274 procurements (386, 33.6% in 2022).

KIDNEY TRANSPLANTATION

A total of 1,817 KTx were performed in 2023 (see Fig. 6).

Fifty centers performed KTx. The number of KTx increased by 16.3% (+255) in comparison to the year 2022. A new living-related-donor KiT program was launched in Kursk Oblast (Kursk Regional Multidisciplinary Clinical Hospital, Kursk).

In 2023, there were 1,620 deceased-donor KTx and 197 living-related-donor KTx (see Fig. 6).

The KTx centers that carried out the highest number of kidney transplants in 2023 are listed in Table 6 and Fig. 7.

The rating demonstrates the leadership and advancement of the transplant programs at top transplant centers in the capital city Moscow, which is a result of effective efforts by the Moscow Coordinating Center for Organ Donation.

However, in other federal subjects of the Russian Federation, KTx centers showed a significant increase in transplant activity in 2023: St. Petersburg (+40), Republic of Tatarstan (+33), Moscow Oblast (+24), Irkutsk Oblast (+21), Sverdlovsk Oblast (+18), Volgograd Oblast (+12), Samara Oblast (+10) and others.

Eight KTx centers performed more than 50 surgeries in 2023. They are Shumakov Center (311), Sklifosovsky Research Institute for Emergency Medicine (238), Botkin Hospital (118), Republican Clinical Hospital, Kazan (116), Lopatkin Research Institute of Urology (76), Kuzbass Regional Clinical Hospital (64), Vladimirsky Moscow Regional Research Clinical Institute (63), and Samara State Medical University (51). Eleven transplant centers performed from 30 to 49 operations during the year and another 12 centers performed between 15 and 29. The remaining 19 (38%) performed less than 15 kidney transplants in the year.

In 2023, 30 transplant facilities (60%) performed related-donor KTx, carrying out a total of 197 transplants. Just four kidney transplant centers performed 7

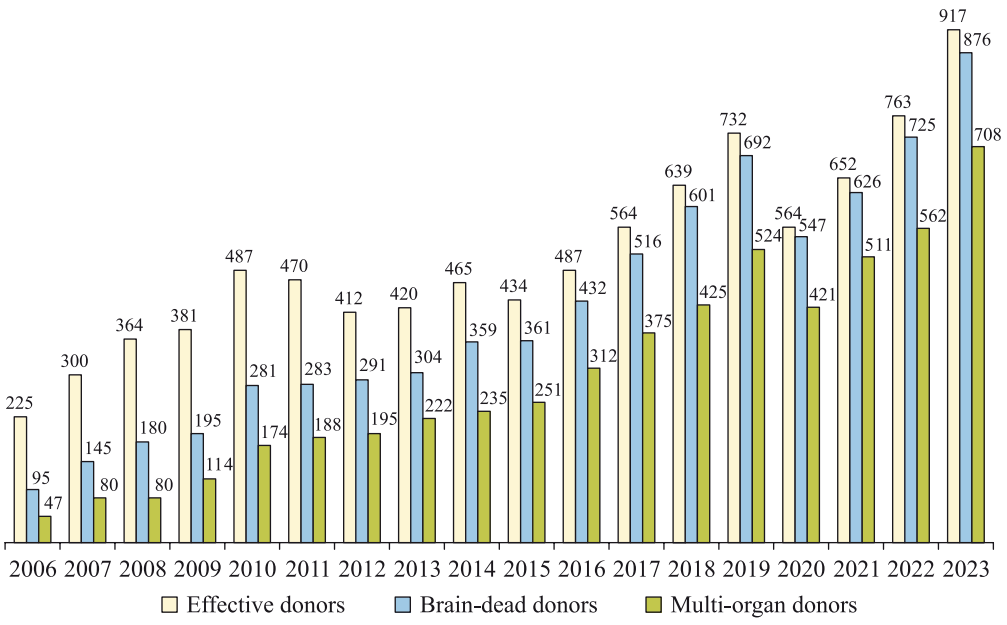

Fig. 5. Structure of effective organ donors in the Russian Federation in 2006–2023

or more operations in the year – Shumakov Center (96) and its branch (9), National Medical Research Center for Children's Health (11), Petrovsky National Research Centre of Surgery (8), and St. Petersburg State Medical Center (8). At the same time, Shumakov Center and its branch performed 53.3% (105) of all related-donor kidney transplants in the Russian Federation. The average utilization of living kidney donation in 2023 was 10.8% of the total number of kidney transplants (14.6% in 2022).

Pediatric KTx (minors ≤17 years of age) in 2023 were performed in 6 centers, a total of 133 transplants were performed (118 in 2022). Among the institutions involved were Shumakov Center (61), Russian Children's

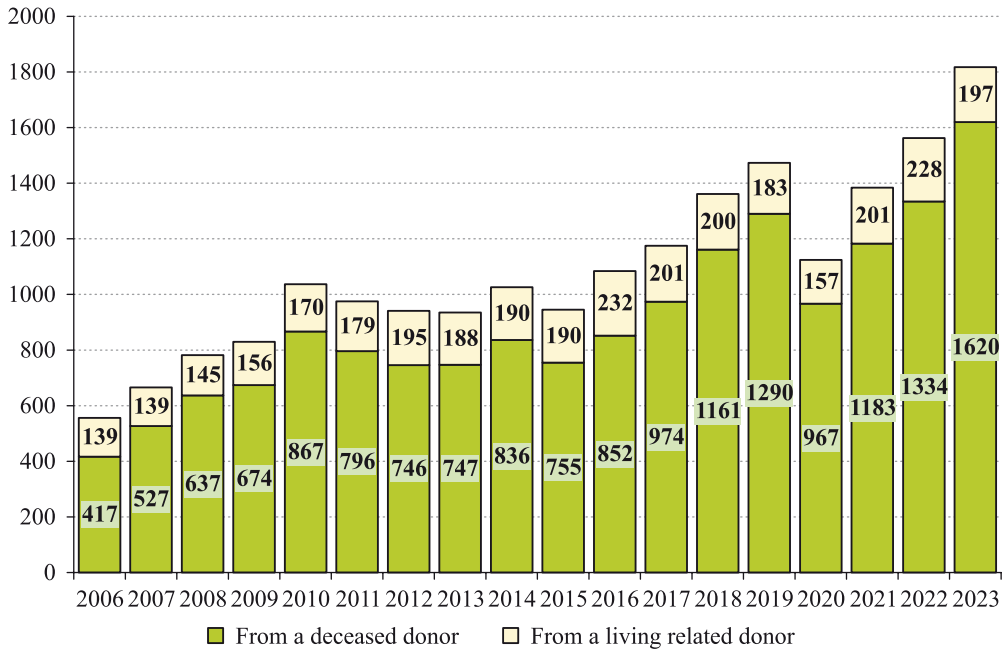

Fig. 6. Kidney transplantation in the Russian Federation in 2006–2023

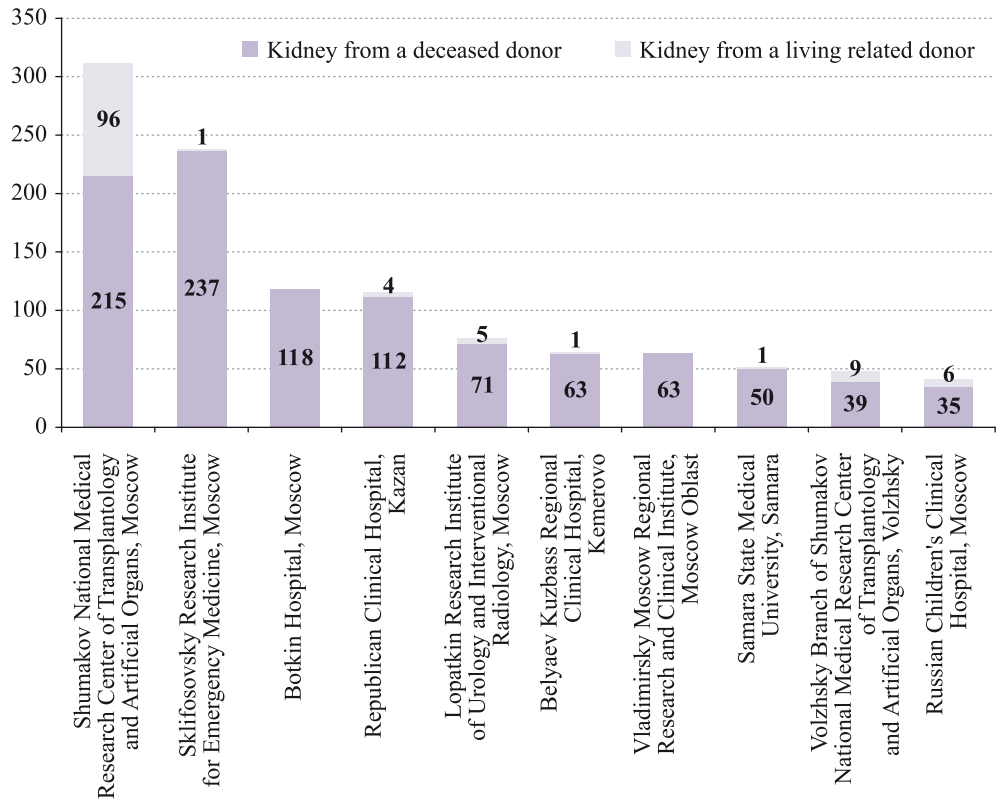

Fig. 7. Leading centers by number of kidney transplants performed

Table 6

Leading centers by number of kidney transplants performed

Rank	Leading institutions in terms of number of kidney transplants performed	Number of kidney transplants in 2023
1	Shumakov National Medical Research Center of Transplantology and Artificial Organs, Moscow	311
2	Sklifosovsky Research Institute for Emergency Medicine, Moscow	238
3	Botkin Hospital, Moscow	118
4	Republican Clinical Hospital, Kazan	116
5	Lopatkin Research Institute of Urology and Interventional Radiology, a branch of the National Medical Research Radiological Center, Moscow	76
6	Belyaev Kuzbass Regional Clinical Hospital, Kemerovo	64
7	Vladimirsky Moscow Regional Research and Clinical Institute, Moscow Oblast	63
8	Samara State Medical University, Samara	51
9	Volzhsky Branch of Shumakov National Medical Research Center of Transplantology and Artificial Organs, Volzhsky	48
10	Russian Children's Clinical Hospital, Moscow	41
	TOTAL	**1126**
	62.0% of the total number of kidney transplants in the Russian Federation (1817)	

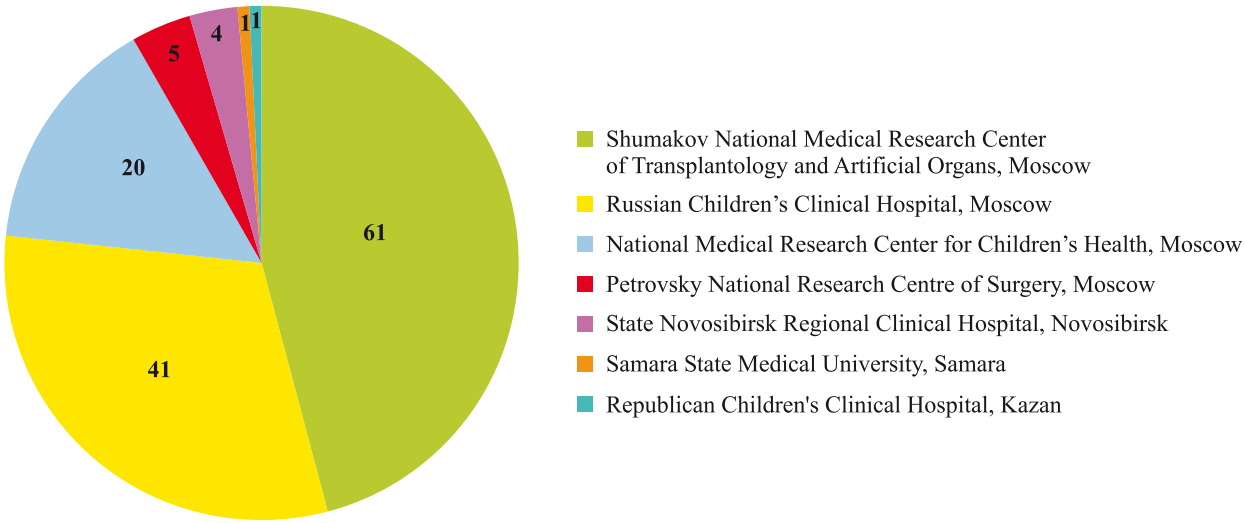

Fig. 8. Pediatric kidney transplantation in the Russian Federation in 2023

Clinical Hospital (41), and National Medical Research Center for Children's Health (20); see Fig. 8.

EXTRARENAL ORGAN TRANSPLANTATION

Of the 388 heart transplants performed in 2023, 17 were pediatric transplants and 2 were heart-lung transplants (at Shumakov Center). Compared to 2022, the number of HTx increased by 25.3% (+78).

Twenty-two centers performed heart transplants. A new HTx program was launched in Perm Krai (Sukhanov Federal Center for Cardiovascular Surgery).

Shumakov Center (240), including its Volzhsky branch (12), accounted for 64.9% of the total number of heart transplants in the Russian Federation (252, including 2 heart-lung transplants). The HTx program at this center continues to drive the level of availability of this type of transplant care in the country.

The thoracic organ transplant centers that performed the highest number of heart-lung transplants in 2023 are listed in Table 7 and Fig. 9.

Apart from Shumakov Center (Moscow), more than 10 heart transplants in the Russian Federation were performed at Almazov National Medical Research Centre, St. Petersburg (33), the Interregional Clinical Diagnostic Center in Kazan (26), the Research Institute for Complex Issues of Cardiovascular Diseases in Kemerovo (13) and the branch of Shumakov Center in Volzhsky (12).

It should be noted that the number of heart transplants performed increased from 8 to 26 in the Republic of Tatarstan, from 2 to 12 at the branch of Shumakov Center in Volzhsky (12) and from 28 to 33 in St. Petersburg.

Meshalkin National Medical Research Center (Novosibirsk), Regional Clinical Hospital (Krasnoyarsk), Sklifosovsky Research Institute for Emergency Medici-

ne (Moscow), Ochapovsky Regional Clinical Hospital No. 1 (Krasnodar), Rostov Regional Clinical Hospital (Rostov-on-Don), and Republican Clinical Hospital (Ufa) were the other six transplant centers that conducted 5 to 9 heart transplants in 2023. The remaining 11 (50%) performed less than 5 HTx in the year.

Lung transplants were performed in 2 transplant centers in 2023. A total of 19 lung transplants and 2 heart-lung transplants were performed: 12 lung transplants and 2 heart-lung transplants at Shumakov Center, 7 LnTx were performed at Sklifosovsky Research Institute for Emergency Medicine.

A total of 829 liver transplants, including 130 pediatric transplants, were performed in 2023. Liver transplants were performed at 34 centers. Compared to 2022, the number of liver transplants rose by 170 or 25.8% (659 in 2022).

Three new liver transplant programs were launched in 2023: from a living-related donor at Irkutsk Regional Clinical Hospital and from a deceased donor at Regional Clinical Hospital No. 1 in Khabarovsk and Kuzbass Regional Clinical Hospital in Kemerovo.

In 2023, two transplant centers – Shumakov Center (197) and Sklifosovsky Research Institute for Emergency

Table 7

Leading centers by number of heart transplants performed

Rank	Leading institutions in terms of number of heart transplants performed	Number of heart transplants in 2023
1	Shumakov National Medical Research Center of Transplantology and Artificial Organs, Moscow	240*
2	Almazov National Medical Research Centre, St. Petersburg	33
3	Interregional Clinical and Diagnostic Center, Kazan	26
4	Research Institute for Complex Issues of Cardiovascular Diseases, Kemerovo	13
5	Volzhsky Branch of Shumakov National Medical Research Center of Transplantology and Artificial Organs, Volzhsky	12
6	Meshalkin National Medical Research Center, Novosibirsk	9
7	Krasnoyarsk Regional Clinical Hospital, Krasnoyarsk	9
	TOTAL	**342**
	88.1% of the total number of heart transplants performed in the Russian Federation (388)	

*, including two heart-lung transplants.

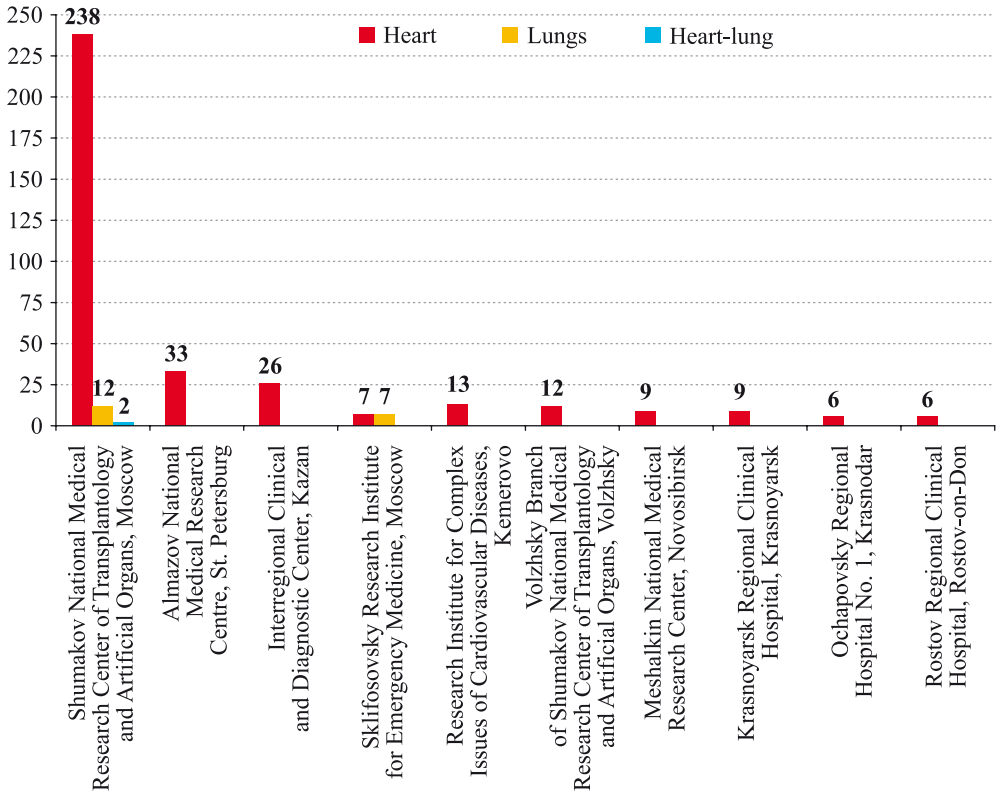

Fig. 9. Leading centers by number of heart transplants performed

Medicine (132) – performed over 100 liver transplants. Four other transplant centers – Republican Clinical Hospital, Kazan (72), Botkin Hospital (51), Moscow Clinical Scientific Center (50), and State Novosibirsk Regional Clinical Hospital (42) – carried out 40 or more liver transplants each. Nine centers performed 15 to 40 liver transplants.

The remaining 19 (57.6%) performed less than 15 liver transplants in the year.

The transplant centers that performed the highest number of liver transplants in 2023 are listed in Table 8 and Fig. 10.

The rating demonstrates the leadership of transplant programs at top transplant centers in the capital city Moscow, which is a result of effective efforts by the Moscow Coordinating Center for Organ Donation and the use of living-donor liver transplant. It is important to highlight the successful transplant programs in the Republic of Tatarstan, Sverdlovsk Oblast, Irkutsk Oblast, and

Table 8

Leading centers by number of liver transplants performed

Rank	Leading institutions in terms of number of liver transplants performed	Number of liver transplants in 2023
1	Shumakov National Medical Research Center of Transplantology and Artificial Organs, Moscow	197
2	Sklifosovsky Research Institute of Emergency Care, Moscow	132
3	Republican Clinical Hospital, Kazan	72
4	Botkin Hospital, Moscow	51
5	Moscow Clinical Scientific Center, Moscow	50
6	State Novosibirsk Regional Clinical Hospital, Novosibirsk	42
7	Burnazyan Federal Medical and Biophysical Center, Moscow	37
8	Vladimirsky Moscow Regional Research and Clinical Institute, Moscow Oblast	31
9	Irkutsk Regional Clinical Hospital, Irkutsk	28
	TOTAL	**640**
	77,2% of the total number of liver transplants performed in the Russian Federation (829)	

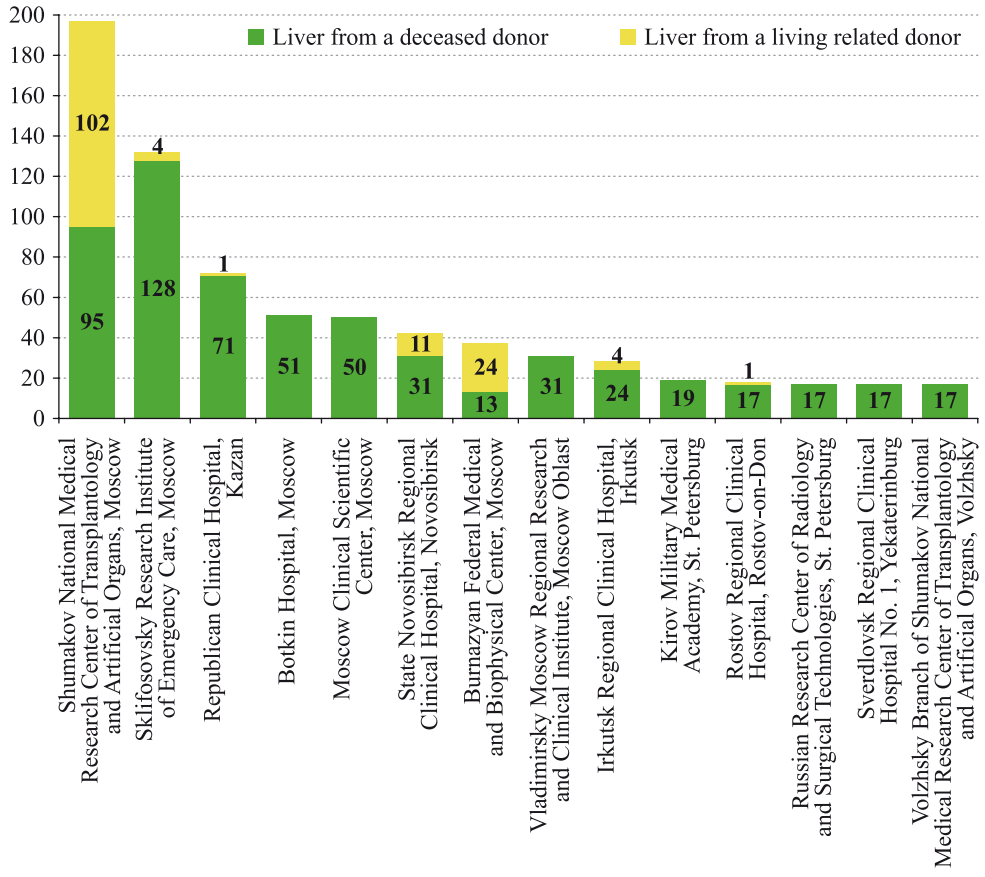

Fig. 10. Leading centers by number of liver transplants performed

the Volzhskiy branch of Shumakov Center. Additionally, the pediatric living related LTx program at Shumakov Center (Moscow) plays should also be noted.

A total of 160 related liver transplant procedures were performed at 11 centers (32.4%). Shumakov Center (102), Burnazyan Federal Medical and Biophysical Center (24), State Novosibirsk Regional Clinical Hospital in Novosibirsk (11), and Petrovsky National Research Centre of Surgery (10), were the only four liver transplant centers that conducted ten or more procedures during the year. Meanwhile, the Shumakov Center performed 63.7% of all related liver transplants in the Russian Federation. The average utilization of living kidney donation in 2023 was 19.3% (24.0% in 2022) of the total number of liver transplants.

In 2023, 130 pediatric liver transplants (mostly in tender-age children) were performed. Pediatric LTx were carried out at 4 centers: Shumakov Center (117) and its Volzhsky branch (1), Petrovsky National Research Centre of Surgery (9), State Novosibirsk Regional Clinical Hospital in Novosibirsk (2), and Irkutsk Regional Clinical Hospital (1). Shumakov Center accounted for 90.8% of all the pediatric liver transplants performed. The pediatric program at this facility continues to drive the level of availability of this type of transplant care in the nation.

In 2023, pancreas transplants were performed at 2 transplant centers: Sklifosovsky Research Institute for Emergency Medicine (2) and Rostov Regional Clinical Hospital in Rostov-on-Don (1). Three pancreas transplant surgeries were performed (10 in 2022), all of them being kidney-pancreas transplants. One small intestinal transplant was also done at Sklifosovsky Research Institute for Emergency Medicine.

Thus, there were 1,240 extrarenal transplants in 2023 or 40.6% of the total number of 3,057 transplants (993, 38.9% in 2022). Transplant facilities in the Moscow agglomeration alone accounted for 63.1% (783) of extrarenal organ transplants in 2023.

Over the follow-up period beginning in 2006, the number of extrarenal organ transplant procedures in the Russian Federation increased by 1,134 (11.7-fold); see Figs. 11 and 12.

The number of organ transplants carried out in the Russian Federation between 2006 and 2023 is presented in Table 9.

ORGAN TRANSPLANT RECIPIENTS

As of December 2022, there were about 21,000 organ transplant recipients in the Russian Federation; see Table 10.

Over 9 years of follow-up, the number of organ recipients in the Russian Federation increased 2.5-fold; the number of kidney recipients is estimated at 14,258 (97.4 p.m.p.); liver recipients, 4,644 (31.7 p.m.p.); heart recipients, 2,084 (14.2 p.m.p.).

CONCLUSION

The Russian Federation saw a 19.6% (+502) increase in organ transplants in 2023 compared to 2022. At the same time, there was a:

– 16.3% (+255) increase in kidney transplants performed;
– 25.3% (+78) increase in heart transplants;
– 25.8% (+170) increase in liver transplants.

The number of effective deceased donors in the Russian Federation rose by 20.2% (+154) compared to 2022.

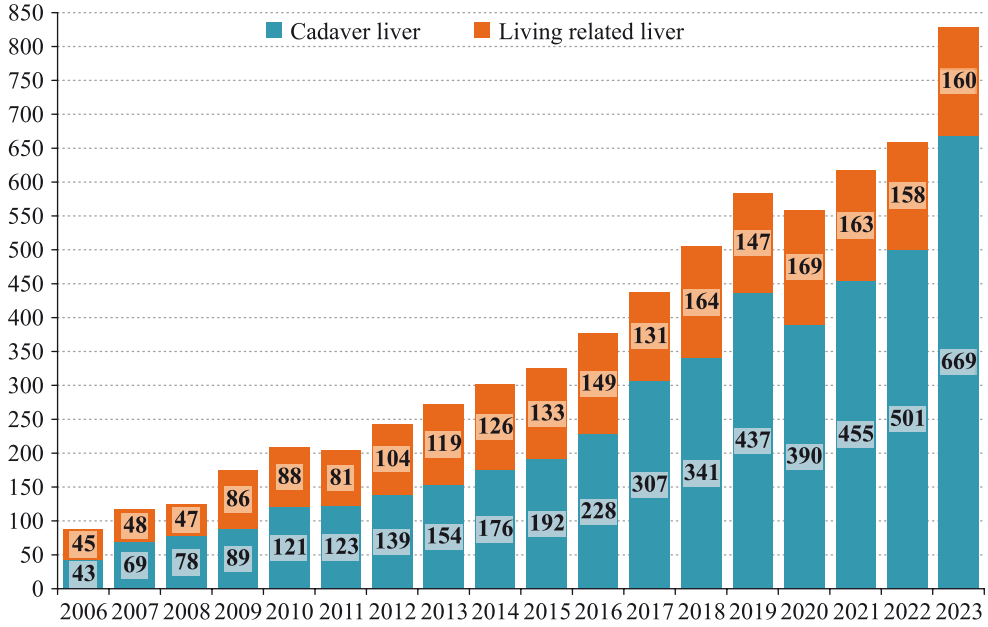

Fig. 11. Liver transplantation in the Russian Federation between 2006 and 2023

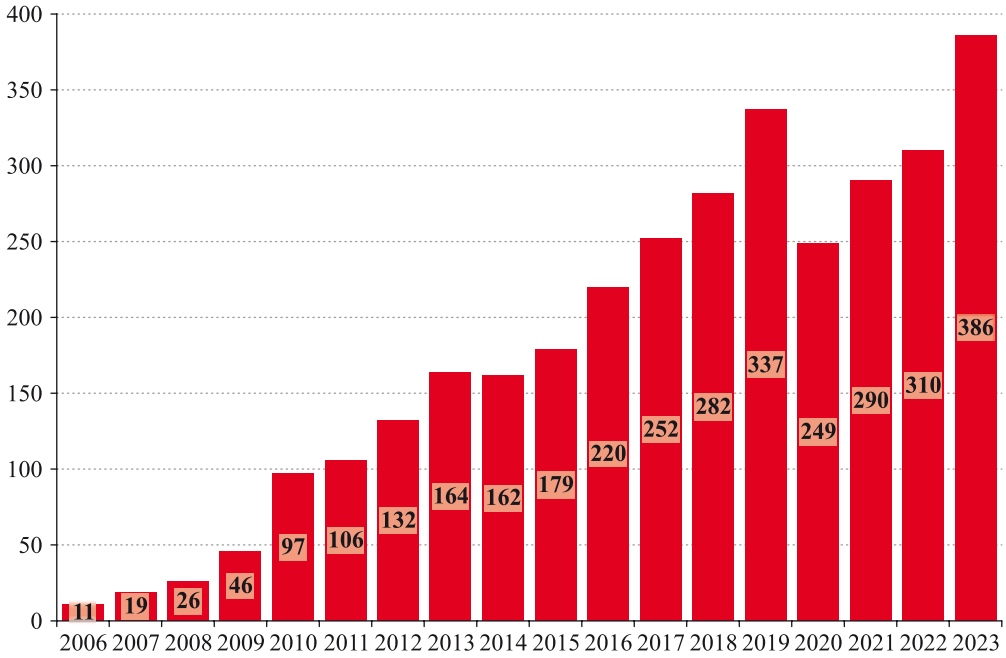

Fig. 12. Heart transplantation in the Russian Federation between 2006 and 2023

In 2023, the primary goals and trends in the evolution of organ donation and transplantation across federal subjects in the Russian Federation remained the same and did not lose their relevance:

– expansion of the geographic footprint and increase in the number of transplant centers;
– efficient identification of patients in need and their placement on the organ transplant waiting list;
– increase in the number of deceased organ donors in proportion to available donor resources, increase in the proportion of multi-organ donors;
– increase in organ transplants in proportion to the needs of the population;
– a focus on providing transplant care to the pediatric population;
– 100.0% coverage of medical screening, including medication supply, for transplant recipients.

Five new organ donation and transplantation programs were opened in 2023:

– living-related-donor kidney transplant was performed in Kursk Oblast (Kursk Regional Multidisciplinary Clinical Hospital);
– heart transplant was performed in Perm Krai (Sukhanov Federal Center for Cardiovascular Surgery);
– two living-related-donor kidney transplants were performed in Irkutsk Oblast (Irkutsk Regional Clinical Hospital);
– deceased-donor liver transplant was performed in Khabarovsk Krai (Regional Clinical Hospital No. 1);
– four deceased-donor liver transplants were carried out in the Kemerovo Oblast (Kuzbass Regional Clinical Hospital).

Moscow remains the undisputed leader in terms of organ donation and transplant in the Russian Federation, demonstrating a high level of donor and transplant activity in global practice. Other regional programs showing high activity include the Republic of Tatarstan, Kemerovo Oblast (also known as Kuzbass), Irkutsk Oblast, St. Petersburg, Tyumen Oblast and the branch of Shumakov Center (Volgograd Oblast, Volzhsky).

In Shumakov Center and its Volzhsky branch accounted for 27.4% of all organ transplant procedures performed in the country; 53.3% of related kidney transplants; 61.8% of heart transplants; 63.7% of related liver transplants.

The number of patients on waiting lists across transplant centers remains at approximately the same level, increasing when new facilities and organ transplant programs are established anywhere in the Russian Federation, as well as when the transplant activity at these centers increases.

Results from donor programs in Moscow (29.1 effective donors p.m.p.), the Republic of Tatarstan (17.0), and Kemerovo Oblast (also known as Kuzbass, 13.5) indicate a high potential for increasing the number of deceased donors in other federal subjects in the nation with proper organization of this activity, including control by the executive authorities of federal subjects in the nation in the field of health care; adequate financial support for medical activities related to organ donation for transplantation; active engagement with expanded criteria donors, including donors over 60 years of age.

The average proportion of effective brain-dead organ donors in the Russian Federation is above 95.0%, while that of multi-organ donors is above 75.0%. This indi-

Table 9

Organ transplantation in the Russian Federation between 2006 and 2023

S/N	Organ	2006	2007		2008		2009		2010		2011		2012		2013		2014		2015		2016		2017		2018		2019		2020		2021		2022		2023	
		Absolute number	Absolute number	Year-over-year change	Absolute number	Year-over-year change	Absolute number	Year-over-year change	Absolute number	Year-over-year change	Absolute number	Year-over-year change	Absolute number	Year-over-year change	Absolute number	Year-over-year change	Absolute number	Year-over-year change	Absolute number	Year-over-year change	Absolute number	Year-over-year change	Absolute number	Year-over-year change	Absolute number	Year-over-year change	Absolute number	Year-over-year change	Absolute number	Year-over-year change	Absolute number	Year-over-year change	Absolute number	Year-over-year change	Absolute number	Year-over-year change
1	Kidney (total)	556	666	+110	782	+116	830	+48	1037	+207	975	–62	941	–34	935	–6	1026	+91	945	–81	1084	+139	1175	+91	1361	+186	1473	+112	1124	–349	1382	+258	1562	+180	1817	+255
2	*from a deceased donor*	417	527	+110	637	+110	666	+29	867	+201	796	–71	746	–50	747	+1	836	+89	755	–81	852	+97	974	+122	1161	+187	1290	+129	967	–323	1183	+216	1334	+151	1620	+286
3	*from a living related donor*	139	139	0	145	+6	156	+11	170	+14	179	+9	195	+16	188	–7	190	+2	190	0	232	+42	201	–31	200	–1	183	–17	157	–26	201	+44	228	+27	197	–31
4	Liver (total)	88	117	+29	125	+8	175	+50	209	+34	204	–5	243	+39	272	+29	302	+30	325	+23	378	+53	438	+60	505	+67	584	+79	559	–25	618	+59	659	+41	829	+170
5	*from a deceased donor*	43	69	+26	78	+9	89	+11	121	+32	123	+2	139	+16	154	+15	176	+22	192	+16	229	+37	307	+78	341	+34	437	+96	390	–47	455	+65	501	+46	669	+168
6	*from a living related donor*	45	48	+3	47	–1	86	+39	88	+2	81	–7	104	+23	119	+15	126	+7	133	+7	149	+16	131	–18	164	+33	147	–17	169	+22	163	–6	158	–5	160	+2
7	Heart	11	19	+8	26	+7	46	+20	97	+51	106	+9	132	+26	164	+32	162	–2	179	+17	220	+41	252	32	282	+30	335	+53	249	–86	290	+41	308	+18	386	+78
8	Pancreas	6	11	+5	9	–2	8	–1	19	+11	14	–5	23	+9	14	–9	19	+5	12	–7	6	–6	6	0	17	+11	10	–7	16	+6	10	–6	10	0	3	–7
9	Lungs	1	0	–1	0	0	1	+1	1	0	6	+5	5	–1	10	+5	12	+2	14	+2	16	+2	25	+9	25	0	23	–2	9	–14	13	+4	14	+1	19	+5
10	Heart-lung										2	+2	2	0	1	–1	0	–1	0	0	0	0	0	0	3	+3	2	–1	2	0	2	0	1	–1	2	+1
11	Small intestine														1	+1	1	0	0	–1	0	0	0	0	0	0	0	0	1	+1	1	0	0	–1	1	+1
	Total	662	813	+151	942	+129	1060	+118	1363	+303	1307	–56	1345	+38	1400	+55	1522	+122	1485	–37	1704	+219	1896	+192	2193	+297	2427	+234	1960	–467	2318	+358	2555	+237	3057	+502

Table,10

Number of organ transplant recipients in the Russian Federation between 2013 and 2023

ICD-10 code	Patient count in the Registry (persons)																			
	2013	2014		2015		2016		2017		2018		2019		2020		2021*		2022*		2023*	
		Absolute	YoY change (%)	Absolute	YoY change (%)	Absolute	YoY change (%)	Absolute	YoY change (%)	Absolute	YoY change (%)	Absolute	YoY change (%)	Absolute	YoY change (%)	Absolute	YoY change (%)	Absolute	YoY change (%)	Absolute	YoY change (%)
Z94.0 Kidney transplant status	6651	7502	12.8	8164	8.8	9063	11.0	9658	6.6	10,851	12.4	11,880	9.5	12,563	5.7	12,969	–	13,514	–	14,258	–
Z94.1 Heart transplant status	416	520	25.0	639	22.9	803	25.7	952	18.6	1164	22.3	1355	16.4	1524	12.5	1687	–	1855	–	2084	–
Z94.2 Lung transplant status	2	3	50.0	4	33.3	5	25.0	8	60.0	28	250.0	26	–7.1	24	–7.7	–	–	–	–	–	–
Z94.4 Liver transplant status	1150	1406	22.3	1649	17.3	1948	18.1	2152	10.5	2632	22.3	3032	15.2	3489	15.1	3820	–	4165	–	4644	–
Z94.8 Other transplanted organ and tissue status (bone marrow, intestines, pancreas)	334	467	39.8	654	40.0	808	23.5	909	12.5	1135	24.9	1344	18.4	1497	11.4	–	–	–	–	–	–
TOTAL	8553	9898	15.7	11,110	12.2	12,627	13.7	13,679	8.3	15,810	15.6	17,637	11.6	19,097	8.3	–	–	–	–	–	–

* *Note*. The number of organ transplant recipients is estimated as it is calculated from the figures of the previous year based on data on the number of organ transplants in 2021-2023 and data on the average patient survival.

cates that there is efficient donor resource utilization in most federal subjects in Russia that are involved in organ donation activities. The failure to achieve the above values in Tyumen Oblast, Kemerovo Oblast (Kuzbass), Republic of Bashkortostan, and Samara Oblast should be viewed by healthcare managers and specialists as the unsatisfactory outcome of their activities. Based on this information, they should develop and implement a plan of appropriate measures to improve the efficiency of donor programs in their respective regions.

The number of organ transplants in the Russian Federation continues to increase systematically, and the existing capacities at healthcare facilities that operate on both donors and recipients allow for the potential expansion of transplant care, provided sufficient funding is available and waiting lists and donor support are in place.

The necessary conditions have been created in the Russian Federation to prioritize the provision of transplant care to the pediatric population. All identified children in need of organ transplantation receive such care as soon as possible, usually at federal centers (Shumakov Center, Russian Children's Clinical Hospital, National Medical Research Center for Children's Health, Petrovsky National Research Centre of Surgery) and at a number of regional medical facilities. The efficiency of locating and directing such patients from the federal subjects of the Russian Federation will determine whether or not the number of pediatric transplants continues to rise. To address this issue, the Shumakov Center is in continuous interaction with tertiary children's hospitals and with chief freelance pediatricians collaborating with healthcare executive authorities at federal subjects of the Russian Federation.

In 2023, specialists at Shumakov Center regularly went on field trips in order to study and analyze how transplant care in the regions are organized. They also held daily telemedicine consultations, educational conferences and methodological seminars. These measures created favorable conditions and the necessary focus for further implementation of transplant technologies across Russia. Also, healthcare authorities and medical institutions involved in the provision of organ transplant care and in medical activities related to organ donation for transplantation, received methodological assistance while developing regional road maps (development plans) for transplant care. These plans have shown to be a useful tool for multi-year planning of donor and transplant initiatives.

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