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Dynamics of turnover of sugar-lowering drugs in the retail segment of the pharmaceutical market from 2020 to 2024

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A significant part of patients with diabetes purchase sugar-lowering drugs (SLDs) on their own in retail pharmacy chains, and the market trends they generate represent an urgent area for this study.

The aim. To study the turnover of hypoglycemic drugs, including insulins, in the commercial sector of the pharmaceutical market of the Russian Federation (RF) for 2020–2024.

Materials and methods. The data presented in this article is based on a periodic retail audit conducted by the biotech company IQVIA. The period of 5 years (2020–2024) was covered. Data collection covered 33,613 commercial pharmacies in all regions of the RF (about 43% of pharmacies).

Results. In the period from 2020 to 2023, a relatively stable increase in the volume of SLDs purchases was revealed, with small fluctuations, while in 2024 a significant leap in consumption was recorded, both in quantitative (packages) and in value (rubles) terms. During the entire monitoring period, the total volume of SLDs and insulin purchases in the retail market segment increased by more than 1.2 times, from 41.98 million packages in 2020 to 51.70 million in 2024. At the same time, the total procurement budget (at wholesale prices) increased by more than 2 times — from 19.40 to 41.57 billion rubles. The average price per package has also increased significantly, from 462 rubles in 2020 to 923 rubles in 2024, an increase of 1.7 times, reflecting significant inflation in the commercial pharmaceutical sector. In general, the Russian pharmaceutical market offers all variants of modern innovative hypoglycemic drugs (dipeptidyl peptidase-4 inhibitors [iDPP4], sodium-glucose cotransporter 2 inhibitors [iSGLT2], glucagon-like peptide-1 receptor agonists [arGPP-1]), which, according to general trends, demonstrate a steady increase in turnover. Older and less effective sulfonylureas and their combinations with metformin still occupy a significant market share. arGPP-1 group showed the greatest growth in quantity (11 times) and value (5 times), mainly due to the entry of Russian semaglutide analogues into the market. Government measures and investments in import substitution have led to a significant increase in the share of Russian drugs in purchases. Despite the positive dynamics of Russian production, import substitution in the SLDs segment has not achieved complete success and accounts for less than half of the turnover of hypoglycemic drugs.

Conclusion. The growth of SLDs consumption in the retail segment of the RF in 2020–2024 has been revealed, especially due to the innovative drugs arGPP-1 and iNGLT2. Despite maintaining the leading position of metformin, the consumption structure is shifting towards more expensive schemes. The increase in the total procurement budget and the average package price highlights the need to expand preferential security programs. Import substitution has increased significantly over the indicated period, however, the share of domestic drugs is still less than half of the turnover.

Keywords: diabetes; sugar-lowering drugs; hypoglycemic agents; pharmacoepidemiology; insulin

Abbreviations: arGPP-1 —glucagon-like peptide-1 receptor agonists; ATC — Anatomical Therapeutic Chemical classification; GEHI — genetically engineered human insulin; iDPP-4 — dipeptidyl peptidase-4 inhibitors; iSGLT2 — sodium-glucose cotransporter 2 (SGLT2) inhibitors; DM — diabetes mellitus; SLDs — sugar-lowering drugs, FD — federal district; INN — international nonproprietary name; TN — trade name; ADA — American Diabetes Association; IDF — International Diabetes Federation.

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Динамика оборота сахароснижающих лекарственных препаратов в розничном сегменте фармацевтического рынка с 2020 по 2024 гг.

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Значительная доля пациентов с сахарным диабетом приобретает сахароснижающие препараты (ССП) самостоятельно в розничных аптечных сетях, и формируемые ими рыночные тренды представляют собой актуальную область для исследования.

Цель. Изучить оборот гипогликемических препаратов, включая инсулины, в коммерческом секторе фармацевтического рынка Российской Федерации (РФ) за 2020–2024 гг.

Материалы и методы. Данные, представленные в настоящей статье, основаны на периодическом розничном аудите, проводимом биотехнологической компанией IQVIA. Охватываемый период составил 5 лет (2020–2024 гг.). Сбор данных охватил 33 613 коммерческие аптечные организации (АО) на территории всех субъектов РФ (около 43% АО).

Результаты. В период с 2020 по 2023 гг. выявлен относительно стабильный рост объёма закупок ССП, с небольшими колебаниями, тогда как в 2024 году фиксируется значительный скачок потребления, как в количественном (упаковки), так и в стоимостном (рубли) выражении. За весь период наблюдения общий объём закупок ССП и инсулина в розничном сегменте рынка увеличился более чем в 1,2 раза — с 41,98 млн. упаковок в 2020 году до 51,70 млн. в 2024 году. При этом совокупный бюджет закупок (по оптовым ценам) вырос более чем в 2 раза — с 19,40 до 41,57 млрд руб. Средняя цена за упаковку также значительно возросла — с 462 руб. в 2020 году до 923 руб. в 2024 году, увеличившись в 1,7 раза, что отражает существенную инфляцию в коммерческом фармацевтическом секторе. В целом на российском фармацевтическом рынке представлены все варианты современных инновационных гипогликемических лекарственных препаратов (ингибиторы дипептидилпептидазы-4 [иДПП4], ингибиторы натрий-глюкозного котранспортера 2 типа [иНГЛТ2], агонисты рецепторов глюкагоноподобного пептида-1 [арГПП-1]), которые согласно общим тенденциям, демонстрируют стабильное увеличение оборота. Существенную долю рынка до настоящего времени занимали более старые и менее эффективные препараты сульфонилмочевины и их комбинации с метформином. Наибольший рост в количественном (в 11 раз) и стоимостном (в 5 раз) выражении показала группа арГПП-1, главным образом благодаря выходу на рынок российских аналогов семаглутида. Государственные меры и инвестиции в отношении импортозамещения привели к значительному увеличению в закупках доли отечественных препаратов. Несмотря на положительную динамику отечественного производства, импортозамещение в сегменте ССП не достигло полного успеха и составляет менее половины оборота гипогликемических лекарственных средств.

Заключение. Выявлен рост потребления ССП в розничном сегменте РФ за 2020–2024 гг., особенно за счёт инновационных препаратов арГПП-1 и иНГЛТ2. Несмотря на сохранение лидирующих позиций метформина, структура потребления смещается в сторону более дорогостоящих схем. Увеличение совокупного бюджета закупок и средней цены упаковки подчёркивает необходимость расширения программ льготного обеспечения. Импортозамещение заметно выросло за обозначенный период, однако доля отечественных препаратов всё ещё составляет менее половины оборота.

Ключевые слова: сахарный диабет; сахароснижающие препараты; гипогликемические средства; фармакоэпидемиологический анализ; инсулин

Список сокращений: АО — аптечная организация; арГПП-1 — агонист рецептора глюкагоноподобного пептида-1; АТХ — анатомо-терапевтическо-химическая система классификации; ГИЧИ — генно-инженерный человеческий инсулин; иДПП-4 — ингибитор дипептидилпептидазы-4; иНГЛТ2 — ингибитор натрий-глюкозного котранспортера 2 типа; ЛП — лекарственный препарат; ЛС — лекарственное средство; СД — сахарный диабет; ССП — сахароснижающие препараты; ФО — федеральный округ; МНН — международное непатентованное наименование; ТН — торговое наименование; ADA — Американская ассоциация диабета; IDF — Международная диабетическая федерация.

INTRODUCTION

Type 1 and Type 2 diabetes mellitus (T1DM and T2DM) remains a serious global worldwide problem, including the Russian Federation (RF). According to the International Diabetes Federation (IDF), the total number of adults aged 20–79 years suffering from diabetes mellitus (including diagnosed and undiagnosed cases) increased from 537 million (in 2021) to 589 million (11.1% of this age group) in 2025. It is expected that by 2050 this value will reach 852.5 million people [1–3]. January 1, 2024, there were 5 547 879 patients with diabetes mellitus registered in the Russian Federation, 5 168 374 of which had T2DM, 288 020 were adults with T1DM, and 61 318 were children with T1DM under the age of 18 [4]. An important factor contributing to the increase in the incidence of T2DM is the global obesity epidemic. This emphasizes the need to improve the diagnosis and regulation of carbohydrate metabolism, since a significant part of the disorders remains undetected [5].

The high prevalence of diabetes mellitus determines the population's need for sugar-lowering drugs (SLDs). Modern pharmacotherapy of T2DM covers a wide range of medicines that differ in the mechanism of action and type of dosage form. This allows doctors to select individual, personalized treatment regimens, including using rational combinations [6–8]. However, in practice, the availability of modern medicines is often limited.

Patients with diabetes mellitus in the Russian Federation belong to the category of citizens entitled to preferential drug provision. Among the medicines in public procurement, there are also innovative SLDs, however, their share is limited, and the system itself is inert and lags behind current clinical guidelines. In addition, it does not take into account the objective picture and does not cover the real needs of patients [9–11]. In the context of sanctions, there are often cases of supply chain disruptions and shortages of SLDs, and there is a need for compulsory licensing of imported medicines [12–14].

A significant part of citizens are forced to purchase SLDs at their own expense in pharmacies, which emphasizes the relevance of analyzing the structure and volumes of SLDs circulation in the commercial pharmaceutical sector.

THE AIM. To study the circulation of sugar-lowering drugs, including insulin medicines, in the commercial sector of the pharmaceutical market of the Russian Federation for the period from 2020 to 2024. To achieve this aim, the authors formulated the following tasks:

1. Based on data obtained from commercial pharmacies, analyze: the number of purchased SLDs in the context of individual groups and names; the budget allocated for the purchase of these drugs; the weighted average prices per package of drugs;
2. Study the dynamics of the above indicators for 5 years (2020–2024);
3. Identify the main trends in SLDs circulation within pharmaceutical groups and individual names.

MATERIALS AND METHODS

Based on retrospective data, an analysis of SLDs circulation in the retail segment of the pharmaceutical market for 5 years (2020–2024) was carried out.

The initial data were obtained and transferred for research by IQVIA from large pharmacy chains and non-chain POs located in all territorial subjects of the Russian Federation (95 257 pramacies throughout Russia; Table 1) as part of the retail audit project of commercial pharmacies. Data source — database "IQVIA Sell-In Monthly & Quarterly Universe and panel. Retail sector". Classification group — ATC. Selected conditions — ATC3:A10A. Upload dated March 25, 2025. Period — from January 01, 2020 to December 31, 2024.

Information on the number of purchased packages of medicines (pcs), the total budget of purchased medicines by name (rubles) and the weighted average prices for individual medicines (rubles) was analyzed.

During the study, the Anatomical Therapeutic Chemical (ATC) Classification of medicines was carried out.

The representativeness and comparability of the study data are ensured by a unified collection methodology applied by one analytical agency. It is worth noting that during the audit a high coverage of retail pharmacies in the subjects was achieved, on average 43% (see Table 1). The five-year period of

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data analysis was chosen as optimal for assessing the dynamics of sales and the degree of demand for new drugs.

Statistical analysis

Primary data were processed using the MS Office package, namely Microsoft Office Excel 2023 (Microsoft Corp., USA) and presented as arithmetic mean values.

RESULTS

According to the results of the study of the dynamics of retail circulation of SLDs and insulin medicines in Russia over a five-year period, changes in the volume of purchases, total budget and average cost per package for various pharmacological groups were revealed.

In the period from 2020 to 2024, a relatively stable growth in the procurement budget was observed, with slight fluctuations, while in 2024 a significant growth of more than 1.5 times was recorded compared to previous years. Over the entire observation period, the total volume of purchases of SLDs and insulin medicines increased by more than 1.2 times — from 41.98 million packages in 2020 to 51.70 million in 2024. At the same time, the total procurement budget increased from 19.40 to 41.57 billion rubles, which corresponds to an increase of more than 2 times. The average price per package also increased significantly — from 462 in 2020 to 804 rubles in 2024, increasing by 1.7 times, which indicates a pronounced inflationary pressure in the commercial segment of the pharmaceutical market. Table 2 presents the dynamics of retail circulation of SLDs and insulin medicines in Russia for the five-year period from 2020 to 2024.

Insulin drugs

Over the study period, the circulation of insulin medicines increased significantly in quantitative terms from 1.23 million in 2020 to 1.43 million in 2024 (an increase of 16%). Along with this, the total procurement budget increased significantly from 1.38 to 2.22 billion rubles (an increase of 61%), and the average price per package increased from 1 127.36 to 1 557.56 rubles (an increase of 38%).

Analysis of individual subgroups of insulin medicines showed that in 2020, the largest share in terms of the number of packages was occupied by genetically engineered human insulins (GEHI) — 807 820 packages compared to analog insulins (420 097 packages). The lower cost of GEHI preparations allows to significantly reduce the budget (419 444 250 rubles vs 964 850 483 rubles, respectively). In 2024, against the background of the growth of circulation of both groups of medicines, there is a tendency to equalize the number of purchased GEHI and analog insulins in quantitative terms (676 818 and 751 399 packages, respectively; Fig. 1) — while 83% of the budget was accounted for by generics.

It was established that the cost of one package of GEHI and analog insulins is growing comparably. When studying individual international non-proprietary names (INN), it can be assumed that the price remains stable due to the import substitution policy, since a significant increase in the share of domestic medicines was found.

In the subgroup of analog insulins, the most expensive medicine in 2024 were medicines with INN insulin degludec (TN: Tresiba®, manufacturer: Novo Nordisk A/S, Denmark, Novo Nordisk LLC, Russia) and its combination with insulin aspart, (TN: Ryzodeg®, manufacturer: Novo Nordisk A/S, Denmark, Novo Nordisk LLC, Russia); insulin glargine at a dosage of 300 IU/mL (TN: Toujeo Solostar®, manufacturer: Sanofi Vostok JSC, Russia) and its combination with lixisenatide (TN: Soliqua Solostar®, manufacturer: Sanofi-Aventis Deutschland GmbH, Germany, Sanofi Vostok JSC, Russia). At the same time, the largest number of packages purchased drugs with INN: insulin aspart (TN: NovoRapid FlexPen®, manufacturer: Novo Nordisk LLC, Russia) and insulin detemir (TN: Levemir FlexPen®, manufacturer: Novo Nordisk Producao Farmaceutica do Brazil Ltda., Brazil, Novo Nordisk LLC, Russia); insulin glargine at a dosage of 100 IU/mL (TN: Lantus Solostar®, manufacturer: Sanofi Vostok JSC, Russia), insulin lispro (TN: Humalog®, manufacturer: Lilly France, France). Among GEHI, the most expensive medicines in 2024 were medicines with INN: insulin soluble [human genetically engineered] (TN: Rinsulin® R, manufacturer: GEROpharm LLC, Russia) and insulin biphasic [human genetically engineered] (TN: Rinsulin Mix 30/70, manufacturer: GEROpharm LLC, Russia). The largest number of packages purchased SLDs with INN: insulin-isophane [human genetically engineered] (TN: Protaphane® HM Penfill, manufacturer: Novo Nordisk Producao Farmaceutica do Brazil Ltda., Brazil and TN: Biosulin® N, manufacturer: Pharmstandard-UfaVITA OJSC, Russia) and insulin soluble [human genetically engineered] (TN: Actrapid® NM, manufacturer: Novo Nordisk Producao Farmaceutica do Brazil Ltda., Brazil and TN: Biosulin® R, manufacturer: Pharmstandard-UfaVITA OJSC, Russia).

Gliptins

Dipeptidyl peptidase 4 inhibitors (DPP-4 inhibitors) in the form of monopreparations were purchased in

increasing volumes — from 2.45 million packages in 2020 to 4.66 million in 2024 (an increase of 90%). The procurement budget increased from 2.33 to 4.01 billion rubles (an increase of 72%), and the average price per package decreased from 952.79 to 879.11 rubles (a decrease of 7.7%). Purchases are carried out taking into account the following INNs: alogliptin, evogliptin, gozogliptin, linagliptin, saxagliptin, sitagliptin, vildagliptin.

Throughout the entire study period, the original vildagliptin drug (TN: Galvus®, manufacturer: Novartis Neva LLC, Russia) is in the greatest demand, in addition, a high share of purchases is occupied by the preparation with INN alogliptin (TN: Vipidia®, manufacturer: Takeda Ireland Limited, Ireland, Hemopharm LLC, Russia) and generic medicine with INN sitagliptin (TN: Asiglia®, manufacturer: KRKA, d.d., Novo mesto JSC, Slovenia). The highest cost per package was noted for the original DPP-4 inhibitors with INN: linagliptin (TN: Trajenta®, manufacturer: West-Ward Columbus Inc., USA, Dragenopharm Apotheker Püschl GmbH, Germany), and drug with INN saxagliptin (TN: Onglisa®, manufacturer: AstraZeneca UK Limited, Great Britain, AstraZeneca Pharmaceuticals LP, USA).

Glucagon-like peptide 1 receptor agonists (GLP-1 receptor agonists)

A significant increase in the circulation of medicines of the GLP-1 receptor agonist group was revealed. The number of purchases increased by 10.3 times — from 0.20 million packages in 2020 to 2.06 million in 2024. The total procurement budget increased by more than 5.2 times — from 2.30 to 11.90 billion rubles. The average price per package decreased from 11 731.94 to 5 766.36 rubles, which indicates a significant increase in the share of generics in this group.

Among the INNs, it is worth noting medicines with INN: dulaglutide (TN: Trulicity®, manufacturer: Eli Lilly and Company, USA, Eli Lilly Italia S.p.A., Italy), exenatide (TN: Baeta® and Baeta® Long, manufacturer: Baxter Pharmaceutical Solutions LLC, USA, TN: Enestia Belgium N.V., Belgium), liraglutide (TN: Victoza®, manufacturer: Novo Nordisk A/S, Denmark, TN: Saxenda®, manufacturer: Novo Nordisk A/S, Denmark and generic TN: Enligria®, manufacturer: Medsintez Plant LLC, Russia), semaglutide (TN: Ozempic®, manufacturer: Novo Nordisk A/S, Denmark and TN: Rybelsus®, manufacturer: Novo Nordisk A/S, Denmark), as well as generics (TN: Semavik®, manufacturer: GEROpharm LLC, Russia and TN: Kvinsenta®, manufacturer: Medsintez Plant LLC, Russia).

The GLP-1 receptor agonist group belongs to the most expensive and most high-tech medicines for the treatment of T2DM. It is worth noting that against the background of the release of domestic semaglutide generics on the market in 2023, the cost of which is more than two times lower than the original medicine, there is a noticeable and rapid increase in the volume of their purchase. If in 2023 only 8 484 packages of generics were purchased (retail sector of the pharmaceutical market), then in 2024 their number counted 1 941 733 packages, the budget increased from 0.41 to 9.90 billion rubles (in wholesale prices). Note that due to the widespread use of drugs with INN semaglutide by patients with obesity and overweight, these data should be interpreted with caution.

Gliflozins

An increase in the circulation of medicines from the group of sodium-glucose cotransporter type 2 inhibitors (SGLT2 inhibitors) was found, for which, as for GLP-1 receptor agonists, clinical research data are accumulating on their pronounced pleiotropic effects [15]. The number of purchases of SGLT2 inhibitors increased from 0.95 million packages in 2020 to 4.24 million in 2024 (an increase of 4.5 times). The procurement budget increased from 2.30 to 11.33 billion rubles (in wholesale prices, an increase of 4.9 times), and the average package price increased from 2 425.00 to 2 670.93 rubles (an increase of 10%). Among the INNs, only original molecules are represented: canagliflozin (TN: Invokana®, manufacturer: Janssen-Cilag S.p.A., Italy), dapagliflozin (TN: Forxiga®, manufacturer: AstraZeneca Industries LLC, Russia), empagliflozin (TN: Jardiance®, manufacturer: Boehringer Ingelheim Pharma GmbH & Co.KG, Germany), ertugliflozin (TN: Steglatra®, manufacturer: Schering-Plough Labo N.V., Belgium), ipragliflozin (TN: Suglat®, manufacturer: Astellas Pharma Europe B.V., Netherlands, Astellas Pharma Inc., Japan).

Significant changes in prices for medicines of the SGLT2 inhibitor group have not been recorded. The most expensive medicine with TN: Jardiance® (manufacturer: Boehringer Ingelheim Pharma GmbH & Co.KG, Germany). At the same time, drug with TN Forxiga® (manufacturer: AstraZeneca Industries LLC, Russia) is consistently leading in terms of the number of purchases.

Sulfonylurea derivatives

Sulfonylurea derivatives are a relatively old group of medicnes, the use of which is associated with the risk of adverse events [16, 17]. Nevertheless, a moderate increase in circulation is also observed in this group. The number of purchased packages of medicines of this group increased from 12.31 million packages in 2020 to 12.37 million packages in 2024. The

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total procurement budget did not change significantly and amounted 2.84 billion rubles both in 2020 and in 2024 (in wholesale prices), and the average price per package did not change significantly — 230.81 and 229.72 rubles in 2020 and 2024, respectively.

Among the INNs are: glibenclamide, gliclazide, glimepiride, to a lesser extent — gliquidone. All medicines of this group have a significant number of generics, including domestic ones. Medicines are distinguished by a low cost, with the exception of the original medicines of glimepiride (TN: Amaryl®, manufacturer: Sanofi S.R.L., Italy) and gliquidone (TN: Glurenorm®, manufacturer: Boehringer Ingelheim Ellas Single Member S.A., Greece). In terms of the number of packages purchased, medicine with INN gliclazide (TN: Diabeton MV®, manufacturer: SERVIER RUS LLC, Russia) and TN: Gliclazide MV®, manufacturer: Ozone Pharm LLC, Russia) is leading.

Metformin and its combinations with other SLDs

Metformin monopreparations remain the most widely prescribed for T2DM. In addition, numerous pleiotropic properties of metformin and the spectrum of its prescriptions are gradually expanding beyond the hypoglycemic effect [18]. During the study period, the number of purchases in quantitative terms increased from 20.68 million packages in 2020 to 23.73 million packages in 2024 (an increase of 15%). The total procurement budget increased from 5.31 to 5.52 billion rubles (in wholesale prices, an increase of 4%), and the average price per package decreased from 256.67 to 232.52 rubles, which indicates the stability of prices for SLDs with INN metformin. The highest price per package was registered for the original metformin (TN: Glucophage® and Glucophage® Long, manufacturer: Merck Healthcare KGaA, Germany, Nanolek LLC, Russia). At the same time, these medicines are leading in quantitative terms in the structure of purchases of medicines with the above INN. The market presents manufacturers of metformin, among which the most famous Russian manufacturers are: Pharmasintez-Tyumen LLC, Ozone Pharm LLC, Avexima Siberia LLC, Biokhimik JSC, Biosintez PJSC, Marbiopharm OJSC, Rafarma JSC, Canonpharma production CJSC, AKRIKHIN JSC, ALSI Pharma JSC, Northern Star NAO, as well as foreign ones: Merck Healthcare KGaA (Germany), BZMZ OJSC (Republic of Belarus), Teva Pharmaceutical Works Private Limited Company (Hungary), Sanofi India Limited (India). As a basic SLDs, metformin is used in a large number of combined SLDs. Thus, metformin in combination with DPP4 inhibitors shows a slight decrease in the volume of purchases in quantitative terms and a slight increase in the volume of purchases — from 1.07 million packages for 1.72 billion rubles in 2020 and 1.03 million packages for 1.79 billion rubles (wholesale prices) in 2024, which indicates an increase in the cost of packaging SLDs of this group.

Among the INNs, combinations of metformin with alogliptin (TN: Vipdomet®, Takeda Ireland Limited, Ireland, Hemopharm LLC, Russia), saxagliptin (TN: Kombogliz® Prolong, manufacturer: AstraZeneca Pharmaceuticals LP, USA), sitagliptin (TN: Asiglia Met®, manufacturer: KRKA, d.d., Novo mesto JSC, Slovenia; TN: Velmetia®, manufacturer: BERLIN-PHARMA CJSC, Russia; TN: Gliptozan Plus®, manufacturer: Grotex LLC, Russia; TN: Forsiglex®, manufacturer: Pharmaceutical Plant "POLPHARMA" SA, Poland) and vildagliptin (TN: Glipvilo Met®, manufacturer: KRKA, d.d., Novo mesto JSC, Slovenia; TN: Galvus Met®, manufacturer: Novartis Neva LLC, Russia, TN: Agarta Met®, manufacturer: Gedeon Richter Romania A.O., Romania). The most popular in this group of drugs is medicine with TN Galvus Met® (manufacturer: Novartis Neva LLC, Russia).

Table 1 – Data on the number and share of pharmacy organizations in the subject of the federation included in the analysis

Name of the federal district	Total pharmacies in the subject, pcs.	Pharmacies that participated in the study, pcs.	Share of pharmacies, %
Central FD	17 241	7 200	42%
Moscow	5 267	3 065	58%
Northwestern FD	4 828	2 054	43%
St. Petersburg	2 505	1 497	60%
Southern FD including North Caucasian	13 258	4 698	35%
Volga FD	16 074	6 910	43%
Ural FD	6 470	3 148	49%
Siberian FD	8 826	3 466	39%
Far Eastern FD	3 964	1 575	40%
Total:	78 433	33 613	43%

Note: FD — federal district.

Table 2 – Dynamics of circulation of the main groups of sugar-lowering drugs in the retail sector of the pharmaceutical market for 2020–2024

Years	2020	2021	2022	2023	2024
All SLDs, including insulin preparations					
Packages purchased (pcs.)	41 983 620	44 092 338	46 606 690	46 452 922	51 703 809
Total budget (rubles, wholesale prices)	19 399 373 986.66	21 575 658 001.09	27 015 257 500.25	25 496 318 883.57	41 565 371 355
Price per package (rubles, wholesale prices)	462.07	489.35	579.64	548.86	804
Insulin					
Packages purchased (pcs.)	1 227 917	1 213 068	1 527 706	1 282 095	1 428 217
Total budget (rubles, wholesale prices)	1 384 304 733.14	1 423 936 878.49	2 057 003 760.68	1 775 871 765.01	2 224 530 834.92
Price per package (rubles, wholesale prices)	1 127.36	1 173.83	1 346.47	1 385.1	1 557.56
DPP-4 inhibitors (gliptin)					
Packages purchased (pcs.)	2 445 705	2 803 887	3 211 027	3 584 223	4 655 476
Total budget (rubles, wholesale prices)	2 330 243 158.94	2 628 006 414.58	3 079 503 746.92	3 280 956 644.31	4 092 691 843.
Price per package (rubles, wholesale prices)	952.79	937.27	959.04	915.39	879.11
GLP-1 receptor agonists					
Packages purchased (pcs.)	195 933	370 570	630 597	170 268	2 064 523
Total budget (rubles, wholesale prices)	2 298 674 359.95	3 306 719 107.73	6 079 632 584.45	2 130 251 215.79	11 904 776 932
Price per package (rubles, wholesale prices)	11 731.94	8 923.33	9 641.07	12 511.17	5 766.36
SGLT2 inhibitors (gliflozin)					
Packages purchased (pcs.)	948 178	1 346 277	1 930 851	2 846 658	4 241 580
Total budget (rubles, wholesale prices)	2 299 796 632.77	3 167 490 854.00	4 777 290 026.99	7 218 593 997.40	11 328 945 678.92
Price per package (rubles, wholesale prices)	2 425.49	2 352.78	2 474.19	2 535.81	2 670. 93
Sulfonylurea					
Packages purchased (pcs.)	12 306 257	12 580 594	12 613 142	12 279 617	12 372 406
Total budget (rubles, wholesale prices)	2 840 385 182.58	2 607 827 913.07	2 713 904 977.01	2 603 542 377.05	2 842 238 539.74
Price per package (rubles, wholesale prices)	230.81	207.29	215.16	212.02	229.72
Metformin (monotherapy)					
Packages purchased (pcs.)	20 675 298	21 840 725	23 042 793	22 871 633	23 734 275
Total budget (rubles, wholesale prices)	5 306 793 180.00	5 379 580 277.70	4 979 623 537.18	4 963 045 484.13	5 518 641 395.36
Price per package (rubles, wholesale prices)	256.67	246.31	216.10	217.00	232.52
Metformin + DPP-4 inhibitor					
Packages purchased (pcs.)	1 071 421	1 205 614	1 195 155	1 210 329	1 028 425
Total budget (rubles, wholesale prices)	1 719 096 182.76	1 841 016 497.35	1 916 666 004.09	1 949 071 449.41	1 788 161 670.71
Price per package (rubles, wholesale prices)	1 604.50	1 527.04	1 603.70	1 610.36	1 738.74
Metformin + SGLT2 inhibitor					
Packages purchased (pcs.)	78 646	126 104	163 055	195 530	240 374
Total budget (rubles, wholesale prices)	212 852 776.79	347 603 865.15	494 669 209.18	626 600 101.21	778 116 415.33
Price per package (rubles, wholesale prices)	2 706.47	2 756.49	3 033.76	3 204.62	3 237.101
Metformin + sulfonylurea					
Packages purchased (pcs.)	2 928 318	2 517 229	2 161 929	1 767 018	1 573 278
Total budget (rubles, wholesale prices)	985 339 508.09	853 480 931.40	855 044 745.64	724 262 736.02	702 344 128.84
Price per package (rubles, wholesale prices)	336.49	339.06	395.50	409.88	446.42
Another SLDs (repaglinid)					
Packages purchased (pcs.)	105 947	86 520	99 248	119 763	185 021
Total budget (rubles, wholesale prices)	21 888 271.64	20 149 707.81	23 080 289.19	33 646 962.94	68 832 682.91
Price per package (rubles, wholesale prices)	206.60	232.89	232.55	280.95	372.03

Note: GLP-1 receptor agonists — glucagon-like peptide-1 receptor agonists; DPP-4 inhibitors — dipeptidyl peptidase-4 inhibitors; SGLT2 inhibitors — sodium-glucose cotransporter type 2 inhibitors; SLDs — sugar-lowering drugs; TN — trade name.

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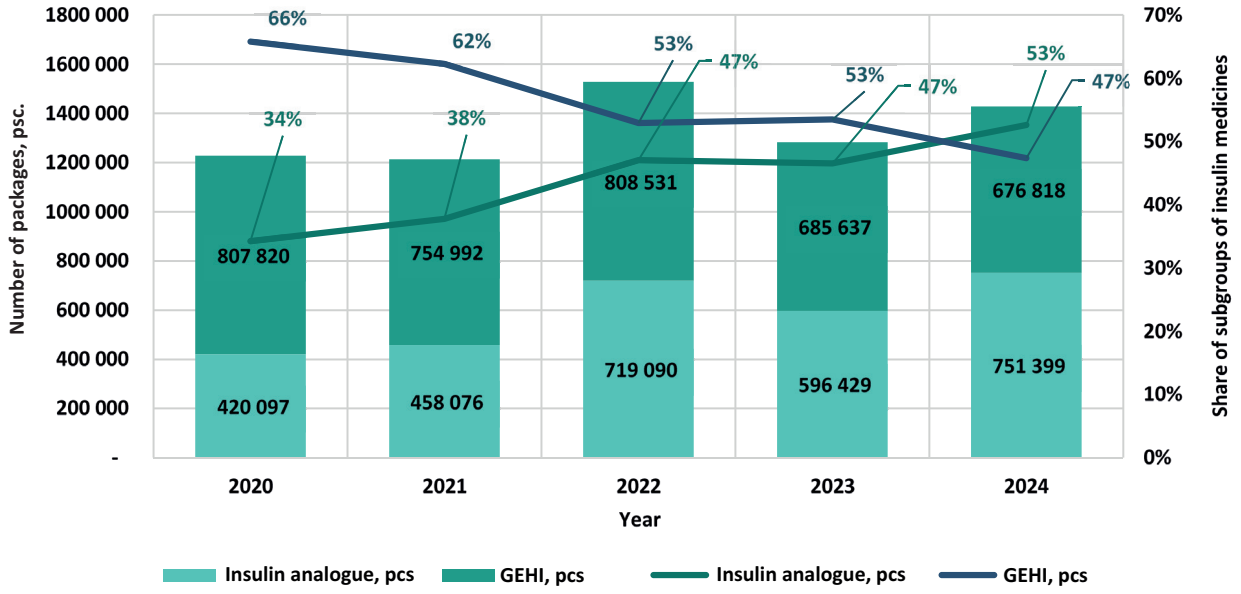

Figure 1 – Dynamics of sales of insulin drugs in the retail segment of the market in quantitative terms for the period from 2020 to 2024

Note: GEHI — genetically engineered human insulins.

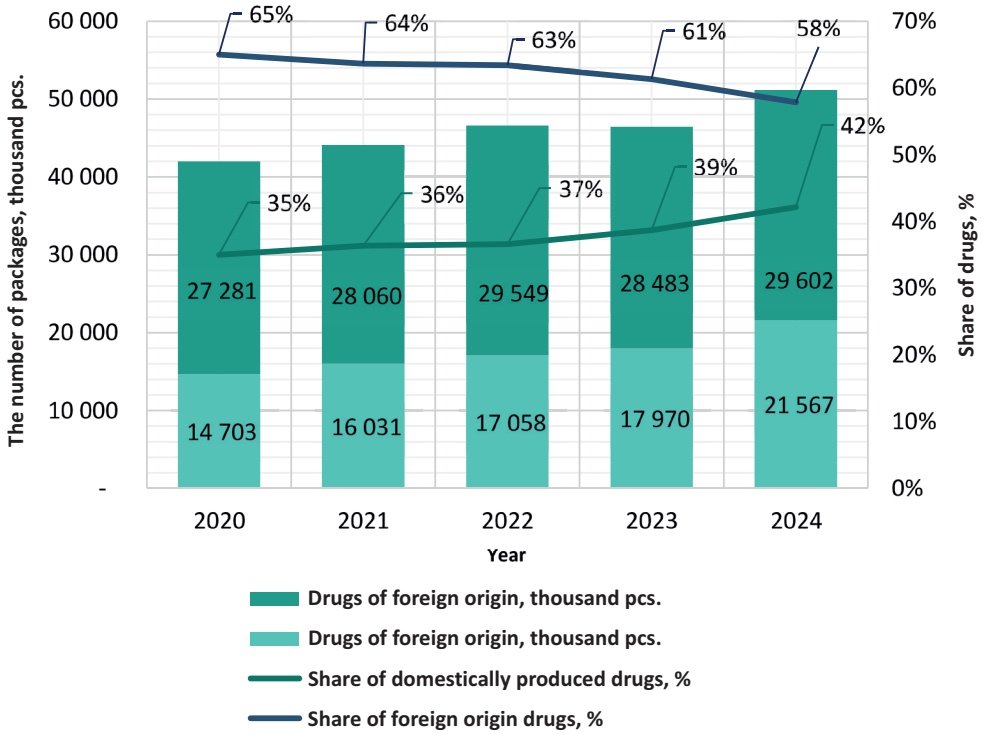

Figure 2 – Dynamics of purchase volumes of sugar-lowering drugs and insulin drugs by country of origin in quantitative terms for the period from 2020 to 2024.

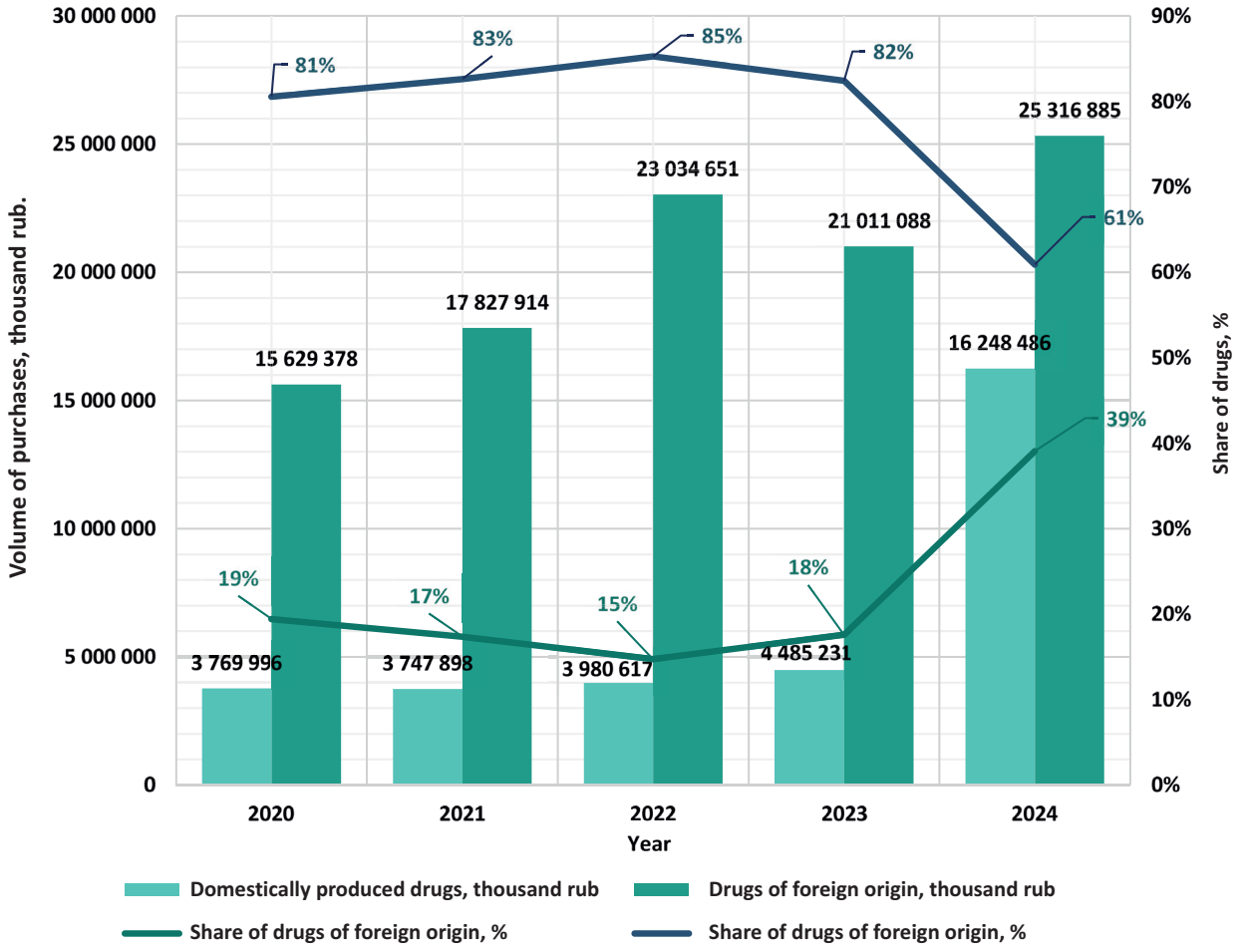

Figure 3 – Dynamics of purchase volumes of sugar-lowering drugs and insulin drugs by country of origin in value terms for the period from 2020 to 2024.

The group of medicines of the combination metformin+SGLT2 inhibitors, namely metformin+dapagliflozin (TN: Sigduo Long®, manufacturer: AstraZeneca Pharmaceuticals LP, USA), metformin + empagliflozin (TN: Synjardy®, manufacturer: Boehringer Ingelheim Ellas Single Member S.A., Greece) occupies a very small market share. Purchases of medicines of this group increased significantly from 78.65 thousand packages in 2020 to 240.37 thousand in 2024 (an increase of 3 times). The total procurement budget increased from 212.85 to 778.12 million rubles (in wholesale prices; an increase of 3.7 times), and the average price per package increased from 2 706.47 to 3 237.10 rubles.

Combined medicines containing metformin and sulfonylurea are still used today, but their share in the market is falling. Purchases decreased from 2.93 million packages in 2020 to 1.57 million in 2024 (a decrease of 46%), and the procurement budget fell from 985.34 to 702.34 million rubles (wholesale prices, a decrease of 29%). There are combinations of metformin with glimepiride (TN: Amaryl® M, manufacturer: Handok Inc, Korea; TN: Glidica M®, manufacturer: Canonpharma production CJSC, Russia), gliclazide (TN: Glimecomb®, manufacturer: AKRIKHIN JSC, Russia) and glibenclamide (TN: Glucovance®, manufacturer: Merck Sante S.a.S., France; TN: Glibomet®, manufacturer: Berlin-Pharma CJSC, Russia; TN: Gluconorm, manufacturer: M.J. Biopharm Pvt. Ltd, India, Pharmstandard-Tomskkhimpharm OJSC, Russia; Russian generics of the above combinations of drugs TN: Glibenfage®, manufacturer: Pharmasintez-Tyumen LLC, Russia; TN: Glibenfor®, manufacturer: Biosintez PJSC, Russia and others. The highest price per package among this group is distinguished by drug with TN Amaryl® M (manufacturer: Handok Inc, Republic of Korea), and the largest volume of purchases in quantitative terms falls on medicine with TN: Glibomet® (manufacturer: Berlin-Pharma CJSC, Russia).

Other hypoglycemic agents

Other SLDs in the commercial sector of the

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pharmaceutical market are represented by medicines with INN repaglinide (TN: Iglinid®, manufacturer: Pharmasintez-Tyumen LLC, Russia; TN: Diaglinid®, manufacturer: AKRIKHIN JSC, Russia; drug with TN: Subetta® (manufacturer: NPF MATERIA MEDICA HOLDING LLC, Russia), a combination of pioglitazone with alogliptin (TN: Incresync®, manufacturer: Takeda Ireland Limited, Ireland). The turnover of SLDs of this group is characterized by a significant increase both in quantitative and in value terms. In general, purchases increased from 105.95 thousand packages in 2020 to 185.02 thousand in 2024 (an increase of 74%), and the total purchase budget of this group increased from 21.89 to 68.82 million rubles (an increase of 75%). The average price per package also increased significantly — from 206.60 to 372.03 rubles.

Ratio of Domestic and Foreign Manufacturers

In addition to studying the dynamics of sales of SLDs and insulin drugs (IDs) by individual groups, the authors considered it important to conduct a comparative analysis of purchases of domestically produced drugs (including manufacturers with a full cycle of drug creation and those whose production is located in the Russian Federation, but the substance is of foreign origin) and foreign manufacturers. It was found that in the period from 2020 to 2024, the volume of purchases of drugs from foreign manufacturers in quantitative and value terms dominates, accounting for more than half of the volume. At the same time, the share of domestically produced drugs, including companies with a full production cycle and those whose production is located in the Russian Federation, but the substance is produced outside of Russia, increased from 35% in 2020 to 42% in 2024. The share of SLDs and IDs produced in a full cycle increased in quantitative terms from 3.6 to 11% (Fig. 2).

Over the same period, budget expenditures on domestic drugs also increased significantly — from 3.8 billion rubles in 2020 to 16.2 billion rubles in 2024. Despite this, their share in the total amount of purchases, including companies with a full production cycle and with a substance of foreign origin, remained lower than that of foreign manufacturers, increasing from 19 to 39% (Fig. 3). The share of full-cycle drugs in monetary terms increased from 1.2% in 2020 to 16% in 2024.

Thus, purchases of domestic drugs (including companies with a full production cycle and those whose production is located in the Russian Federation, but the substance is of foreign origin) increased almost 1.5 times in the number of packages and 4.3 times in terms of budget. Despite the positive dynamics in the growth of the domestic segment, the share of foreign manufacturers remains high.

The results of the analysis of the circulation of SLDs and IDs in the retail sector for the period from 2020 to 2024 allow us to draw a number of key conclusions regarding current trends in pharmacotherapy of diabetes mellitus in Russia and their compliance with both national and international clinical guidelines.

A comparative study of the structure of consumption of SLDs with current clinical guidelines shows significant changes in the management strategy of patients with type 1 and type 2 DM. According to the Russian recommendations of the Endocrinology Research Center, metformin should be preferred as first-line drugs in patients with type 2 diabetes mellitus, and if there are additional indications, SGLT2 inhibitors and GLP-1 receptor agonists [6]. At the same time, international guidelines (American Diabetes Association, ADA) pay considerable attention to a personalized approach, where the choice of drug depends on the presence of cardiovascular diseases, chronic kidney disease, and risk factors for hypoglycemia [19].

The analysis of the sales dynamics of the above-mentioned group of drugs indicates a continuation of the trend towards a gradual abandonment of drugs with a high risk of hypoglycemia (INN: sulfonylurea) in favor of more modern classes [20]. For 2020–2024, the volume of purchases of SGLT2 inhibitors increased 4.5 times in quantitative terms and 4.9 times in value terms, and drugs of the GLP-1 receptor agonist group — 10.5 times in quantitative terms and 5.2 times in value terms, which indicates a wider use of these classes in clinical practice. This growth corresponds to current global treatment standards, in which these drugs are considered preferable for patients with high cardiovascular risk. Nevertheless, despite the general trend towards the use of drugs developed in the last two decades, drugs with the INN metformin remain the most in demand, which in turn fully corresponds to Russian and foreign (ADA) recommendations [6, 19], in which it is designated as the “basis” of the first line. Its share in the total volume of purchases remains at a high level, and consumption increased by 15% in quantitative terms over 5 years. One of the most noticeable trends is a significant increase in the total volume of purchases, which doubled — from 19.40 billion rubles in 2020 to 41.57 billion rubles in 2024. This is due to both an increase in the total volume of consumption and a change in the structure of consumption in favor of more expensive drugs. The largest contribution to the increase in purchases was made by drugs of the SGLT2 inhibitor and

GLP-1 receptor agonist groups, which are among the most expensive drugs. The average price of a package of drugs of the GLP-1 receptor agonist group decreased from 11 731.94 to 5 766.36 rubles, and for drugs of the SGLT2 inhibitor group, on the contrary, increased from 2 425.00 to 2 670.93 rubles. The price of drugs with classic INNs (for example, INN metformin) remained relatively stable.

Among the factors influencing the increase in costs for SLDs and IDs, the following can be distinguished:

- an increase in the number of patients with type 2 diabetes mellitus [1, 4]: according to epidemiological data, the incidence of diabetes mellitus in Russia continues to grow, which increases the need for SLDs;
- a shift in clinical preferences in favor of modern drugs [15]: the inclusion of GLP-1 receptor agonist and SGLT2 inhibitor drugs in the structure of public procurement and their wider use in the practice of doctors;
- an increase in the cost of drug packaging: new classes of drugs remain significantly more expensive than traditional SLDs, which increases the share of costs in the budget [20, 21]. Expansion of the commercial segment: despite the inclusion of new drugs in public procurement programs, a significant number of patients continue to purchase them on their own, which is reflected in the growth of costs / revenue of the retail sector.

Thus, the analysis of the structure of consumption of SLDs confirms the adaptation of clinical practice to modern recommendations, but there remain problems with the availability of expensive drugs, which requires optimization of mechanisms for preferential drug provision.

The data obtained demonstrate a sharp increase in the consumption of SLDs and IDs in Russia, especially in the segment of modern SLDs. Synthetic drugs of the GLP-1 receptor agonist and SGLT2 inhibitor groups show the greatest increase in purchase volumes, both in value and in quantitative terms, which indicates a change in clinical protocols in favor of more innovative treatment methods. Metformin remains the leading drug in the treatment of type 2 diabetes mellitus, but its share in the total turnover is decreasing relative to combined treatment regimens.

A significant increase in the average purchase budget indicates an increase in the cost of treating diabetes mellitus, which may be associated with both the spread of the disease and a change in the structure of pharmacotherapy. High growth rates of budgets for innovative drugs emphasize the need to expand state funding programs to ensure their accessibility to patients.

Government measures and investments in import substitution have led to a significant increase in purchases of domestically produced drugs [22–25]. Despite the positive dynamics of domestic production, import substitution in the SLDs segment has not achieved complete success. In 2020–2024, the share of foreign manufacturers remains steadily high, both in quantitative and in value terms. Thus, for further strengthening of the position of domestic manufacturers, additional measures of state support, investments in the production and development of new drugs, as well as stimulating consumers to switch to domestic products are necessary.

Limitations of the study

Our study covers a significant part of the volume of retail sales of SLDs in Russia, but does not cover the entire drug market of this group. It should be taken into account that information on drug purchases is dynamic, subject to change, and can be difficult to accurately collect and analyze. The calculations are made in wholesale prices, that is, in the purchase prices of drugs by pharmacies. The results obtained can be considered reliable, since the absolute majority of the drugs under consideration are included in the List of Vital and Essential Medicines, therefore, retail markups on them are strictly limited and controlled by the state. Certain variations in the presented data are possible due to the indicated aspects. This analysis is aimed at identifying key trends and general directions of market development, but does not claim to be exhaustive or absolutely accurate in all quantitative indicators.

CONCLUSION

In the period from 2020 to 2024, there is a relatively stable growth in the volume of purchases of SLDs and IDs, with slight fluctuations, while in 2024 there is a significant jump in consumption, both in quantitative and in value terms. Over the entire observation period, the total volume of purchases of SLDs and IDs increased by more than 1.2 times — from 41.98 million packages in 2020 to 51.70 million in 2024. At the same time, the total purchase budget increased from 19.40 to 41.57 billion rubles, which corresponds to a 2-fold increase. The average price per package also increased significantly — from 462 rubles in 2020 to 804 rubles in 2024, increasing by 1.7 times, which reflects significant inflation in the commercial sector of the pharmaceutical market.

In general, the Russian pharmaceutical market

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presents all options for modern innovative SLDs (DPP-4 inhibitors, SGLT2 inhibitors, GLP-1 receptor agonists), which, according to general trends, show a steady increase in turnover. A significant share of the market to date is occupied by older and less effective sulfonylurea drugs and their combinations with metformin. The largest growth in quantitative and value terms of purchases was shown by the GLP-1 receptor agonist group (by 10.3 and 5.2 times, respectively), mainly due to the entry into the market of Russian generics of drugs with the INN semaglutide. Government measures and investments in import substitution have led to a significant increase in purchases of domestically produced drugs. Despite the positive dynamics of Russian production, import substitution in the SLDs segment has not achieved complete success and accounts for less than half of the turnover of sugar-lowering drugs.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

AUTHORS' CONTRIBUTION

Denis V. Kurkin — idea, content planning, design of the graphic material, editing and approval of the final version of the manuscript; Ekaterina V. Makarova — writing a draft of a manuscript; Valentina I. Zvereva, Nazar A. Osadchenko, Anastasia R. Makarova, Dmitry A. Bakulin, Olga V. Marincheva, Yuliya V. Gorbunova, Ivan S. Krysanov, Ksenia N. Koryanova, Daria A. Galkina — collecting of the material; Yury A. Kolosov — editing the final version of the manuscript; Roman V. Drai, Igor E. Makarenko, Anna S. Shuvaeva — consultations on highly specialized issues, approval of the final version of the manuscript. All the authors have made an equivalent and equivalent contribution to the preparation of the publication. All authors confirm that their authorship meets the international ICMJE criteria (all authors made a significant contribution to the development of the concept and preparation of the article, read and approved the final version before publication).

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