

CONTENT ANALYSIS OF DRUGS USED IN URINARY TRACT INFECTIONS

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Abstract. Analysis of the range of medicines used for urinary tract infections registered in the Republic of Uzbekistan showed that on the pharmaceutical market of Uzbekistan they are presented in such dosage forms as oral solutions, injection solutions, capsules and tablets. The number of registered medicines in the State Register for 2022 was 80 items. Content analysis was used as a methodology.

The main objective of the ongoing pharmaceutical market research is to determine the share of domestic manufacturers in connection with the adoption by government authorities of appropriate measures for the development of domestic pharmaceutical manufacturers.

Keywords: content analysis, generics, assortment, drugs used for urinary tract infections, list of essential drugs, State Register of Medicines, cystitis, pyelonephritis, urethritis, prostatitis.

INTRODUCTION. Urinary tract infections are one of the most common infectious diseases that are widely encountered in outpatient and hospital practice. Among adults aged 20–50 years, urinary tract infections are 50 times more common in women. In women in this age group, the majority of urinary tract infections are cystitis or pyelonephritis. In men of the same age, the majority of urinary tract infections are urethritis or prostatitis [1]. The incidence of urinary tract infections increases in patients >50 years of age, but the female/male ratio decreases due to an increased incidence of prostate enlargement and instrumental procedures in men.

Of all the drugs for the treatment of dysfunctions of the urinary system, diuretics (diuretics) are used in the widest field of treatment. The modern pharmaceutical market of Uzbekistan is characterized by a steady increase in the product range. Over the past decade, there have been significant expansions, additions and deepening of the range of all major groups of medical and pharmaceutical products. This trend is especially pronounced for drugs used for diseases characterized by high blood pressure [2-3], a range of oncology drugs [4], and lung cancer [5]. The increase in the product range is largely due to the registration on the pharmaceutical market of the Republic of Uzbekistan of a large number of reproduced drugs - generics from foreign and domestic manufacturers. This has significantly increased the possibility of choosing the necessary medications, taking into account modern approaches to pharmacotherapy of various pathological conditions, individual characteristics of the course of diseases, and consumer preferences of end consumers [6].

In this regard, it was relevant to conduct a content analysis of the range of medicines used for urinary tract infections registered in the Republic of Uzbekistan [2, 7, 8, 9]. METHODS. To

conduct this study, we used data provided in the State Register of Medicines, Medical Products and Medical Equipment approved for use in medical practice in the Republic of Uzbekistan in 2022 (No. 26), as well as in the List of Essential Medicines of the Republic of Uzbekistan, approved By order of the Minister of Health of the Republic of Uzbekistan (reg. No. 3289 dated March 23, 2021 [10-11]).

RESULTS. This publication examines the range of drugs used for urinary tract infections registered in the Republic of Uzbekistan using content analysis of registration data for this pharmacotherapeutic group (Code ATC-N05C).

The range of medicines used for urinary tract infections in the State Register for 2022 is represented by 80 assortment items, taking into account trade names of international nonproprietary names of dosage forms of doses and manufacturers of dosage forms such as solutions, capsules, tablets.

Table 1 presents domestically produced drugs used for urinary tract infections included in the State Register of Uzbekistan for 2022 [11].

Table 1

Medicines used for urinary tract infections, domestically produced, registered in the Republic of Uzbekistan (diuretics)

№	Name of the drug	Dosage form	Manufacturer
1	Furosemide	Solution for injection 1% 2 ml N5,N10(2x5;1x10) (ampoules)	Namangan Pharm Plant, OOO
2	Furosemide	Solution for injection 10 mg/ml, 2 ml N5, N10, N25 (ampoules)	UZGERMED PHARM, JV LLC
3	Furosemide	Solution for injection 10 mg/ml 2 ml N5,N10,N20,N40 (ampoules)	REKA-MED FARM, JV LLC
4	Furosemide	Solution for injection 10 mg/ml 2 ml N5 (1*5), N10 (1*10 2*5) (glass ampoules), N5,N10, N20, N40, N50 (polyethylene ampoules)	MerryMed Farm, LLC
5	Furosemide	Solution for injection 1% 2 ml N5 (1*5), N10 (2*5) (glass ampoules), N5,N10, N20, N40, N50 (polypropylene, polyethylene ampoules)	Jurabek Laboratories, JV LLC
6	Furosemide	Tablets 40 mg N10 (1*10), N20 (2*10), N30 (3*10), N50 (5*10) (blister packs); N20, N50 (bottles, jars)	Samo LLC
7	Spironolactone	Capsules 50 mg N30 (3*10) (blisters)	Malika laboratories, LLC
8	Spironolactone	Tablets 25 mg, 50 mg N10 (1*10), N20 (2*10), N30 (3*10) (blister	Nika Pharm, LLC

		packs)	
9	Spirolactone	Capsules 50 mg, 100 mg N10 (1*10), N20 (2*10), N30 (3*10) (blister packs)	Nika Pharm, LLC
110	Acetozalamide	Tablets 250 mg, N10 (1*10, N20 (2*10), N30 (3*10) (blank packs)	Merrymed Farm, LLC
11	Mannitol	Solution for infusion 15% 200 ml, 400 ml (bottles)	Samarkand England Eco-Medical, JV LLC
12	Fructus Rose	Medicinal plant raw materials 80 g, 100 g (polyethylene bags, cardboard packs); 2 g, 3 g N18, N20 (filter bags)	GERBOFARM, PE
13	Herba Equiseti arvensis	Medicinal plant raw materials 30 g, 50 g (plastic bags, cardboard packs); 1 g, 1.5 g, 2 g N20, N25 (filter bags); 15 kg, 20 kg, 25 kg, 40 kg (bales, bags)	Asel, PE
14	Herba Aervae Lanatae	Medicinal plant raw materials 1 g N25 (filter bags); 30 g, 50 g, 100 g (cardboard packs, plastic bags)	Mehrigiyo, MP
15	Herba Aervae Lanatae	Medicinal plant raw materials 30 g (plastic bags, cardboard packs); 1.5 g N20 (filter bags)	Farangiz, PE

As can be seen from the data in Table 1, an analysis of the range of medicines used for urinary tract infections included in the State Register of the Republic of Uzbekistan in 2022 showed that medicines from domestic manufacturers amount to 15 types of medicines, of which 6 are liquid dosage forms (injection solutions and infusions), 5 solid dosage forms (tablets, capsules), medicinal plant raw materials from 4 items (packages, packs).

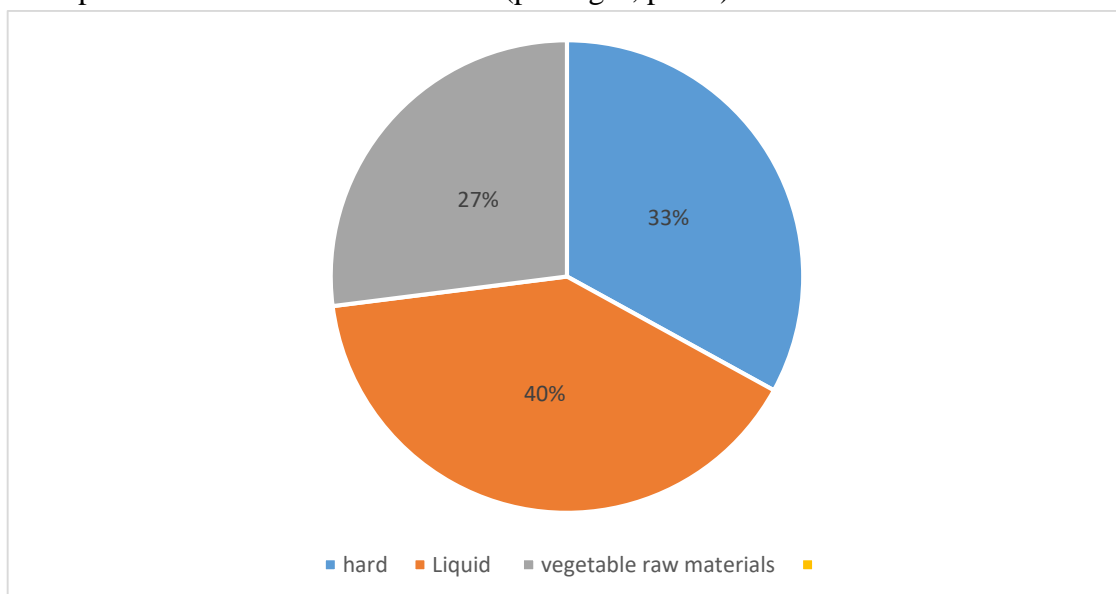


Fig. 1 Share of dosage forms in the range of medicines of domestic manufacturers

Table 2 presents medicines used for urinary tract infections produced in the CIS countries, included in the State Register of the Republic of Uzbekistan for 2022.

Table 2

Medicines produced by CIS countries used for urinary tract infections, registered in the Republic of Uzbekistan (diuretics)

№	Name of the drug	Dosage form	Manufacturer
1	Furosemide	Tablets 40 mg No. 50 (5x10) (blisters)	GNTsLS, OZ, LLC, produced by Pharmex group, LLC Ukraine
2	Furosemide	Solution for injection 10 mg/ml 2 ml No. 10 (1x10) (ampoules)	GNTsLS, OZ, LLC, produced by Health, FC, LLC Ukraine
3	Furosemide	Solution 1% for injection 2 ml No. 10 (ampoules)	Biopharm, JSC Georgia
4	Furosemide	Solution for injection 10 mg/ml 2 ml No. 10 (1x10) (ampoules)	Borisov Medical Preparations Plant, OAO Belarus
5	Furosemide	Solution for intravenous and intramuscular administration 10 mg/ml 2 ml No. 10 (1x10) (ampoules)	Dalkhimfarm, OJSC Russia
6	Furosemide	Tablets 40 mg No. 50 (5x10) (blister packs)	Irbitsky Chemical Plant, JSC Russia
7	Furosemide	Tablets 40 mg No. 50 (5x10), No. 50 (2x25) (blister packs)	Borisov Medical Preparations Plant, OAO Belarus
8	Mannitol	Solution for injection 15% 200 ml, 400 ml (bottles)	Infusion, ChAO, Ukraine
9	Indapamide	Long-acting tablets 1.5 ml N20 (1x20) (blisters)	GM Pharmaceuticals Ltd.

10	Torasimide	Solution for injection 5 mg/ml 4 ml N5 (ampoules)	Farmak, JSC, Ukraine
11	Torasimide	Tablets 40 mg No. 50 (5x10), (blisters)	Farmak, PAO, Ukraine
12	Hydrochlorothiazide*	Tablets 25 mg N20 (2x10), (blister packs)	Borisov Medical Preparations Plant, OAO, Belarus
13	Hydrochlorothiazide	Tablets 25 mg No. 20 (2x10), (blisters)	Borshchagovsky
14	Lespefril	Herbal solution for oral administration, bottles, jars of 100 ml	Chemical Plant, PJSC, SPC Ukraine
15	Uronephron	Tablets, film-coated of plant origin N30 (3x10), N60 (6x10) (blisters)	JSC "Lubnyfarm", Ukraine Ukraine, Farmak, JSC
16	Nephrosten	Film-coated tablets of plant origin: 20, 40, 60, 80, 100, 120 pcs.	EVALAR, JSC, Russia
17	Tolofitin	Vegetable film-coated tablets, 0.05 g: 10 or 30 pcs.	VIFITECH, JSC, Russia
18	Uriflorin	Herbal tablets 300 mg: 10, 20 or 30 pcs.	MOSCOW PHARMACEUTICAL FACTORY, JSC, Russia
19	Felozilit	Paste for preparing a suspension of plant origin for oral administration: tube 50 g, 60 g, 70 g, 80 g, 90 g or 100 g	TULA PHARMACEUTICAL FACTORY, LLC
20	Phytonefrol	Chopped collection: packs of 30 g, 50 g or 100 g	KRASNOGORSKLEKSR EDSTVA, JSC, Russia

21	Uvae Ursi folia	Vegetable raw materials - powder 1.5 g: filter bags 10 or 20 pcs.	APEX, LLC, Russia
22	Orthosiphonis staminei folia	Ground vegetable raw materials: packs of 30 g, 40 g, 50 g, 75 g or 100 g	St.- MEDIFARM, JSC, Russia
23	Juniperi fructus	Vegetable raw materials 50 g: packs	Traditional Medicine Medical Company, LLC, Russia
24	Polygoni avicularis herba	Chopped grass 50 g: pack	FITOFARM PKF, LLC, Russia
25	Equiseti arvensis herba	Vegetable raw materials - powder 1.5 g: filter bags 10 or 20 pcs.	KRASNOGORSKLEKSR EDSTVA, JSC, Russia
26	Aervae lanatae herba conciso-pressum	Vegetable raw materials 100 g: packs	FITO-EM agro-industrial company, JSC, Russia

As can be seen from the data in Table 2, an analysis of the range of medicines used for urinary tract infections included in the State Register of the Republic of Uzbekistan in 2022 showed that medicines from the CIS countries comprise 26 items, of which 7 are liquid dosage forms (oral solution, injection solutions, solution for intramuscular and intravenous administration) of which 1 liquid dosage form of herbal origin (oral solution), 1 soft dosage form of herbal origin (paste for preparing a suspension), 7 hard dosage forms (tablets), 4 solid dosage forms of herbal origin (tablets), 6 names of medicinal plant raw materials (packages, packs).

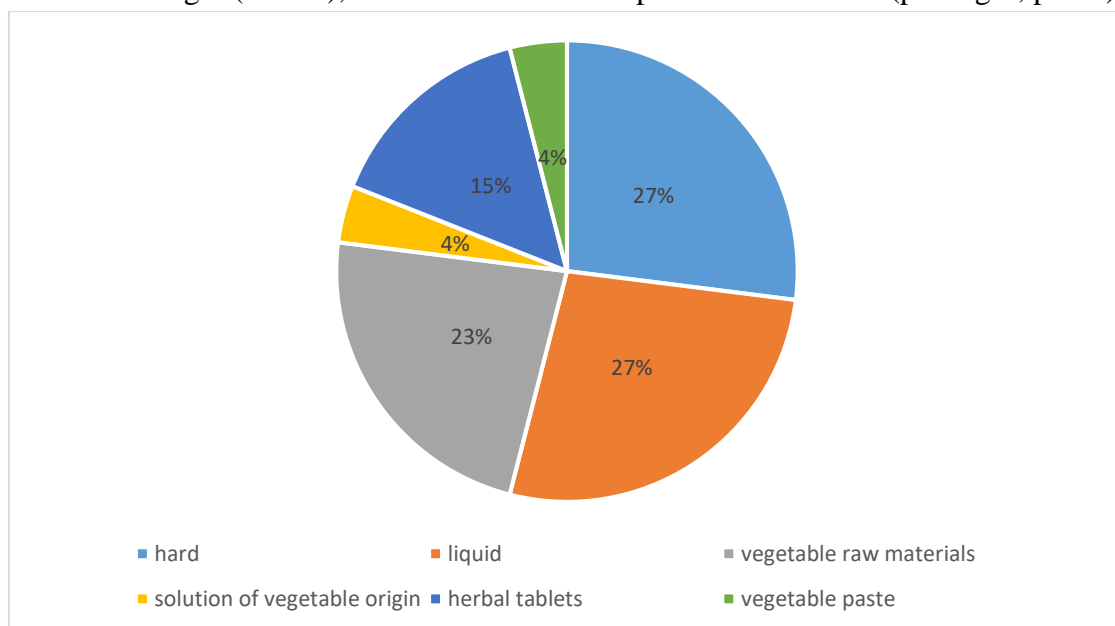


Figure 2. Share of dosage forms in the assortment of medicines from manufacturers in the CIS countries

The results of the study showed that the range of drugs used for domestically produced urinary tract infections includes solid, liquid and soft dosage forms, but the dominant number of drugs are produced in the form of solid dosage forms.

Therefore, we can conclude that the pharmaceutical market of the Republic of Uzbekistan offers the target segment of consumers a significant range of domestically produced drugs used for urinary tract infections.

The purpose of the study was to study the range of composition of medicines used for urinary tract infections produced in the CIS countries, registered in the Republic of Uzbekistan. For a more in-depth and comprehensive study of the range of drugs used for urinary tract infections, registered drugs used for urinary tract infections in foreign countries were also studied.

Table 3

Medicines from foreign manufacturers used for urinary tract infections, registered in the Republic of Uzbekistan (diuretics)

№	Name of the drug (INN)	Dosage form	Manufacturer
1	Furosemide	Solution for injection 10 mg/ml 2 ml No. 10 (ampoules)	Sanofi India Limited, Индия
2	Furosemide	Solution for intravenous and intramuscular administration 20 mg/ml 2 ml N10 (ampoules)	M.J. Biopharm Pvt. Ltd., India
3	Furosemide	Tablets 40 mg N50 (5x10), N100 (10x10), (blisters)	Sandoz Pharmaceuticals d.d., Slovenia produced: Salutas Pharma GmbH, Germany
4	Spironolactone	Film-coated tablets 25 mg, 50 mg, 100 mg N30 (10x10), (blisters)	Relax Biotech Pvt. Ltd, India
5	Spironolactone	Capsules 50 mg 100 mg N30 (3x10), (blisters)	Gedeon Richter PLC, Hungary
6	Spironolactone	Tablets 25 mg N20 (1x20), (blisters)	Gedeon Richter PLC, Hungary
7	Acetazolamide	Tablets 250 mg N30 (3x20), (blisters)	Pharmaceutical Works “POLPHARMA SA” Poland
8	Indapamide	Long-acting film-coated tablets 1.5 mg N30 (2x15), (blisters)	Ali Raif Ilac San. A.S., Turkey
9	Indapamide	Tablets 0.625 mg 1.25 mg, 2.5 mg N30 (3x10); N60 (6x10); (blisters)	Pro. Med. CS Praha a.s., Czech Republic

10	Indapamide	Capsules 2.5 mg N30 (3x10), (blisters)	Pro. Med. CS Praha a.s., Czech Republic
11	Indapamide	Extended-release tablets, film-coated 1.5 mg N30 (2x15), (blisters)	Pharmaceutical Works “POLPHARMA SA”, Poland
12	Indapamide	Extended-release tablets, film-coated 1.5 mg N30 (3x15), (blisters)	Lek d.d., Slovenia
13	Indapamide	Extended-release tablets, film-coated 1.5 mg N20 (2x10), N30 (3x10) N60 (6x10) (blisters)	KRKA d.d., Slovenia
14	Torasemide	Film-coated tablets 5 mg, 10 mg, N28 (2x14) (blisters)	Edge Pharma Private Limited, India
15	Torasemide	Tablets 5 mg 10 mg N20 (2x10) (blister packaging)	Belinda Laboratories Pvt. Ltd., India made: Aurochem Laboratories (India) Pvt. Ltd., India
16	Torasemide	Tablets 2.5 mg 5.0 mg, 10 mg, 20 mg N30 (3x10) (blisters)	Sandoz Pharmaceuticals d.d., Slovenia made: Lek S.A., Poland
17	Torasemide	Tablets 5 mg 10 mg, 20 mg. 200 N30 (3x10) (blisters)	Rotapharm Ilaclari Limited Sirketi, Turkey made: World Medicine Ilac San. Ve Tic. A.S., Poland
18	Torasemide	Film-coated tablets 25 mg, 50 mg, N30 (3x10) (blisters)	Pharmaceutical Works POLPHARMA SA Poland
19	Hydrochlorothiazid e*	Tablets 2.5 mg 5 mg, 10 mg N30 (3x10); (blisters)	Sandoz Pharmaceuticals d.d., Slovenia made: Salutas Pharma GmbH, Germany
20	Hydrochlorothiazid e	Tablets 25 mg N100 (4x25), (blisters)	Sanofi- Aventis Groupe, France produced: Chinoin Pharmaceutical Chemical Works Private Co. Ltd., Hungary
21	Hydrochlorothiazid e	Tablets 25 mg N20 (1x20), (blisters)	Sanofi- Aventis Groupe, France produced: Chinoin Pharmaceutical Chemical

			Works Private Co. Ltd., Hungary
22	Chlorthalidone	Tablets 100 mg N20 (1x20), (blisters)	Ipca Laboratories Limited India
23	Eplerenone	Tablets 12.5 mg; 25 mg N30 (3x10), (blisters)	Grand Medical Group AGb Switzerland produced: Synthon Hispania SL, Spain
24	Eplerenone	Film-coated tablets 25 mg, 50 mg, N30 (3x10) (blister packs)	Pharmaceutical Works Polfa in Pabianice Joint Stock Company, Poland
25	Eplerenone	Film-coated tablets 25 mg, 50 mg, N10 (1x10), N20 (2x10), N30 (3x10), N50 (5x10), N90(9x10)N28 (2x14) (blisters)	Pharmaceutical Works POLPHARMA SA, Poland
26	Tutukon	Oral solution, combined preparation of herbal origin, 300 ml or 600 ml in a polypropylene bottle	Miguel and Garriga, S.L. Spain
27	Canephron [®] N	Vegetable film-coated tablets N60 (3x20), N120 (6x20) (blisters)	Bionorica SE, Germany
28	Canephron [®] N	Oral solution of herbal origin 100 ml (bottles)	Bionorica SE, Germany
29	Semilact	Film-coated tablets of plant origin 50/20 mg, 100/20 mg, N10 (1x10) (blisters)	Rotapharm Ilaclari Limited Sirketi, Turkey, World Medicine Ilac San. Ve Tic. A.S., Turkey
30	Phytolysin	Vegetable capsules: 40 pcs.	MEDANA PHARMA, SA (Poland)
31	Phytolysin	Paste for oral administration, herbal origin 100 g (tubes)	Pharmaceutical Works POLPHARMA SA, Poland produced: Herbapol Warszawa Sp.zo.o.
32	Uriclar	Vegetable capsules N30 (2x15) (blister packs)	Rotapharm Limited, Great Britain, Adipharm Ltd

33	Urosept-Herbapol	Tablets, vegetable origin, film-coated N30 (2x15); N60 (4x15) (blisters)	Poznań Medicinal Herbal Factory Herbapol, A.O.
34	Sistukon	Oral solution of herbal origin 200 ml (bottles)	Harasha Pharma Pvt. Ltd
35	Enurayz	Drops for oral administration of herbal origin 30 ml (dropper bottles)	Bhargava Phytolab Pvt. Ltd
36	N205 Renaton	Vegetable capsules N30 (2x15) (blisters)	SUPREME PHARMATECH UK LTD., Great Britain, SUPREME PHARMATECH Co LTD
37	Arstifen	Effervescent tablets, herbal origin N80 (4x20) (tubes)	Kusum Healthcare Pvt Ltd., Indore
38	Renolit	Herbal capsules N30 (bottles)	Sahajanand Life Sciences Pvt. Ltd
39	Rovatineks/Rowati nex®	Enteric capsules of plant origin N50 (5x10), N100 (10x10) (blisters)	Rowa® Pharmaceuticals Ltd

As can be seen from the data in Table 3, an analysis of the range of medicines used for urinary tract infections included in the State Register of the Republic of Uzbekistan in 2022 showed that medicines from foreign manufacturers amount to 39 items, 2 liquid dosage forms (solutions for injections, solutions for intravenous and intramuscular administration), 4 liquid dosage forms of herbal origin (drops, oral solution), 1 soft dosage form of plant origin in the form of a paste, as well as 23 solid dosage forms (tablets, capsules), 9 solid dosage forms of plant origin (tablets, capsules).

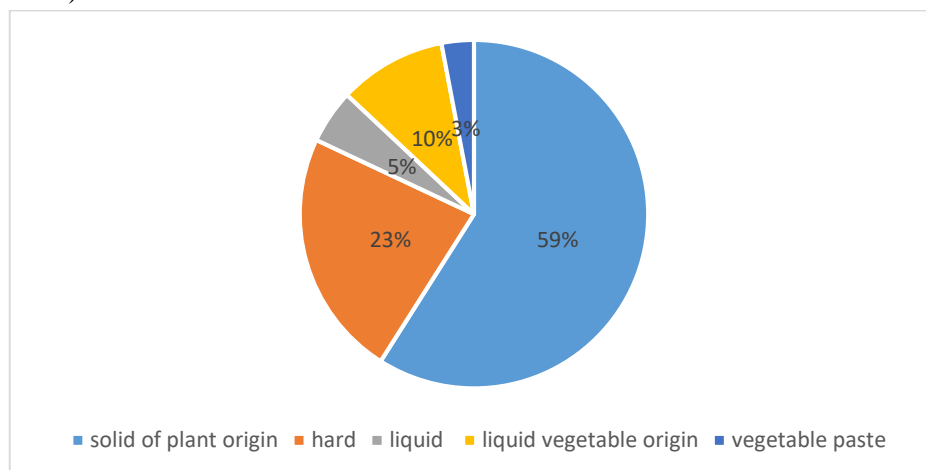


Figure 3. Share of dosage forms in the assortment of medicines from foreign manufacturers

DISCUSSION.

Thus, a study of the data from the “State Register of Medicines, Medical Products and Medical Equipment Approved for Use in Medical Practice of the Republic of Uzbekistan for 2022 No. 26) showed that the share of medicines used for urinary tract infections of domestic production in countries is up to 15 names of medicines, medicines, manufacturers of CIS countries, 26 medicines are registered, medicines of manufacturers of foreign countries amounted to 39 names.

CONCLUSIONS.

1. An analysis of the market for drugs used for urinary tract infections showed that on the pharmaceutical market of Uzbekistan, herbal products are presented in such dosage forms as oral solutions, injection solutions, drops, tablets, capsules, and preparations.

2. The total number of registered medicines was 80 items.

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