



Research of the market of antiviral drugs in Ukraine: marketing aspect

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Viral infections are a serious public health problem and they place a significant burden on healthcare systems worldwide. Antiviral drugs play a crucial role in the treatment of viral infections, and the development of new antiviral drugs continues in response to the growing threat of viral diseases.

According to the ATC (Anatomical Therapeutic Chemical) classification, J05 antiviral agents for systemic use belong to the group of Antimicrobial agents for systemic use J. Analysis of the data of the State Register of Medicines of Ukraine as of January 2023 showed that the group of J05 antiviral agents for systemic use has 277 trade names. The most common representative is acyclovir, which is the basis for 26 names are produced on the basis of which, accounting for 9.38% of all antiviral drugs. However, there is no obvious leader among the drugs that would occupy the lion's share of the market. The distribution of all subgroups is presented in Table 1.

Table 1. Distribution of antiviral agents for systemic use by subgroups

Name of the subgroup of medicines	ATC code	The number of registered trade names of drugs		The number of trade names of drugs			
		absolute number, units	share in the total amount, %	Foreign production		Domestic production	
				absolute number, units	share in the total amount, %	absolute number, units	share in the total amount, %
Acyclovir	J05AB01	26	9,38	18	69,23	8	30,77
Ribavirin	J05AB04	5	1,8	4	80	1	20
Ganciclovir	J05AB06	3	1,08	0	0	3	100
Famciclovir	J05AB09	11	3,97	10	90,91	1	9,09
Valacyclovir	J05AB11	10	3,61	9	90	1	10
Valganciclovir	J05AB14	4	1,44	4	100	0	0
Rimantadine	J05AC02	4	1,44	4	100	0	0
Ritonavir	J05AE03	1	0,36	1	100	0	0
Atazanavir	J05AE08	6	2,16	2	33,33	4	66,67
Darunavir	J05AE10	8	2,88	7	87,5	1	12,5
Zidovudine	J05AF01	10	3,61	3	30	7	70
Lamivudine	J05AF05	7	2,52	7	100	0	0
Abacavir	J05AF06	4	1,44	4	100	0	0
Tenofovir disoproxil	J05AF07	6	2,16	5	83,33	1	16,67
Entecavir	J05AF10	2	0,72	2	100	0	0
Tenofovir alafenamide	J05AF13	2	0,72	1	50	1	50
Nevirapine	J05AG01	6	2,16	6	100	0	0
Efavirenz	J05AG03	6	2,16	6	100	0	0
Etravirine	J05AG04	2	0,72	1	50	1	50
Rilpivirine	J05AG05	1	0,36	1	100	0	0
Zanamivir	J05AH01	1	0,36	1	100	0	0
Oseltamivir	J05AH02	17	6,13	11	64,70	6	35,30
Raltegravir	J05AJ01	2	0,72	2	100	0	0

An analysis of the pharmaceutical market for antiviral drugs by country of origin showed that the largest market share is held by drugs of Indian origin - 44.2%, which corresponds to 122 names. In contrast, Ukrainian-made drugs account for only 19.9% of the market and are represented by 55 names.

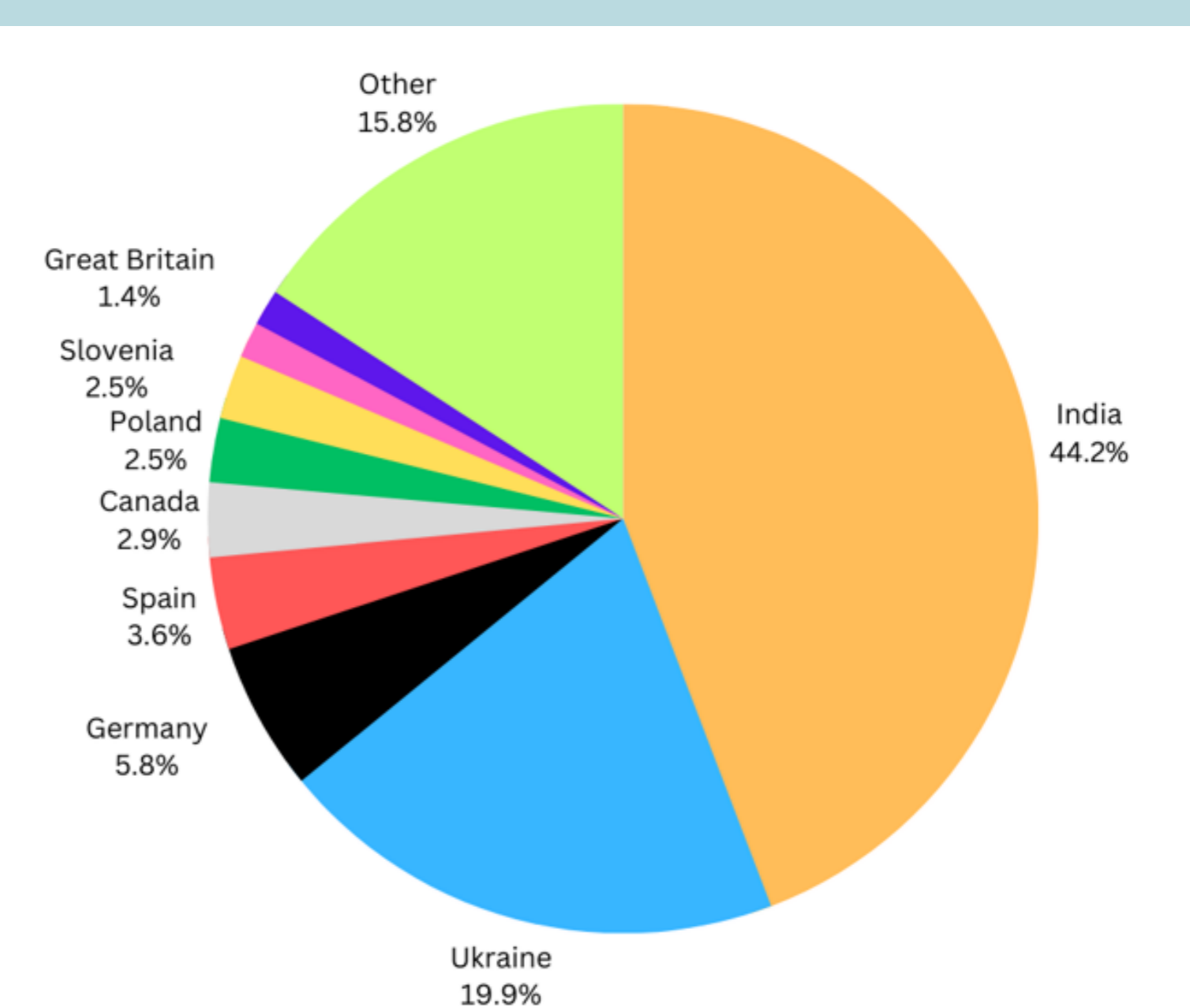


Fig. 1. Distribution of antiviral drugs by country of origin

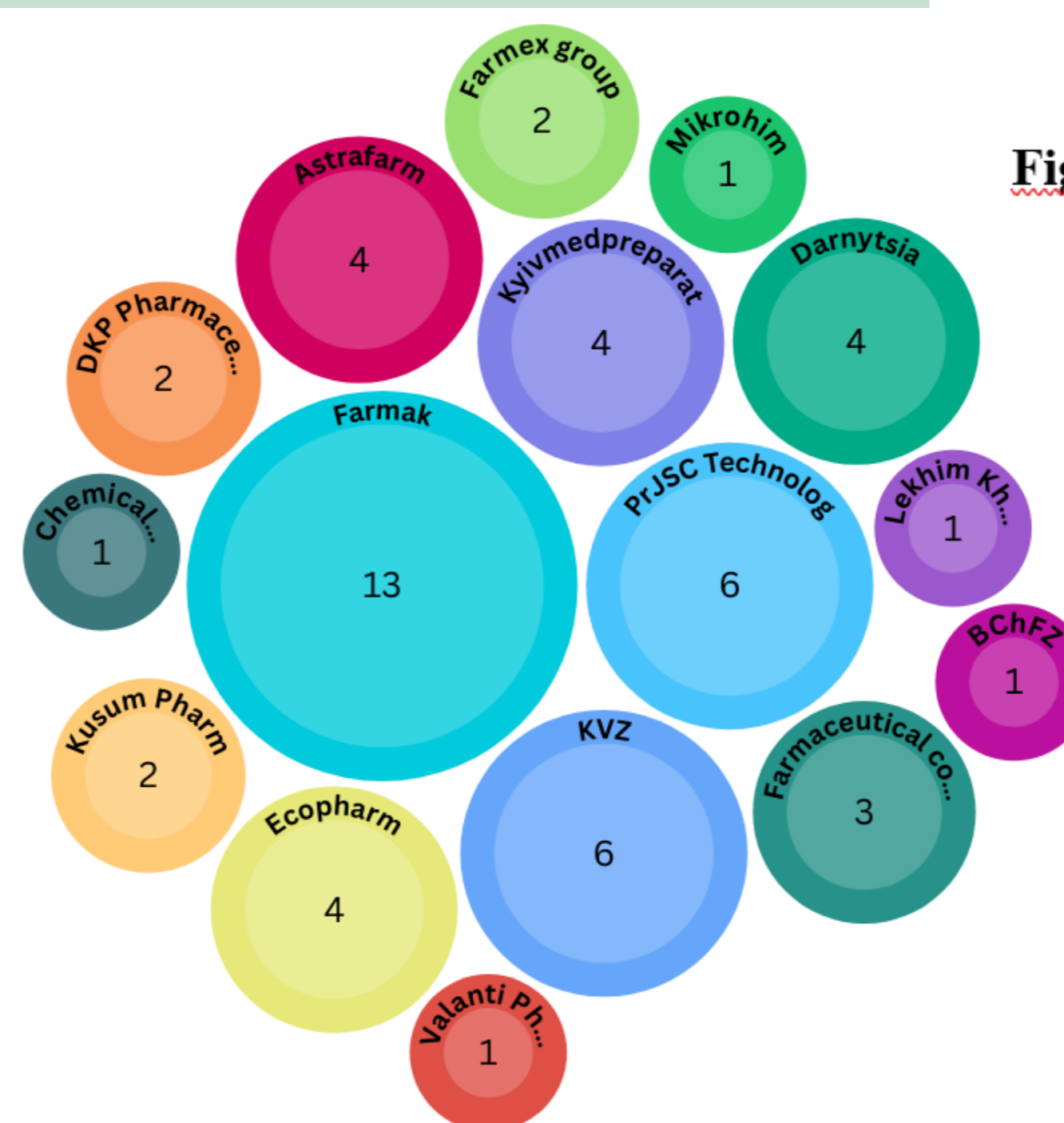


Fig. 2. Number of names of antiviral agents for systemic use by the manufacturer.

After analyzing antiviral drugs for systemic use by the number of names manufactured by a particular domestic manufacturer, we obtained the results presented in Fig 2. The results show that Farmak is the leader in terms of the number of names, which, according to Proxima Research, as of November 2022, remains the leader of the Ukrainian pharmaceutical market, just like in pre-war times

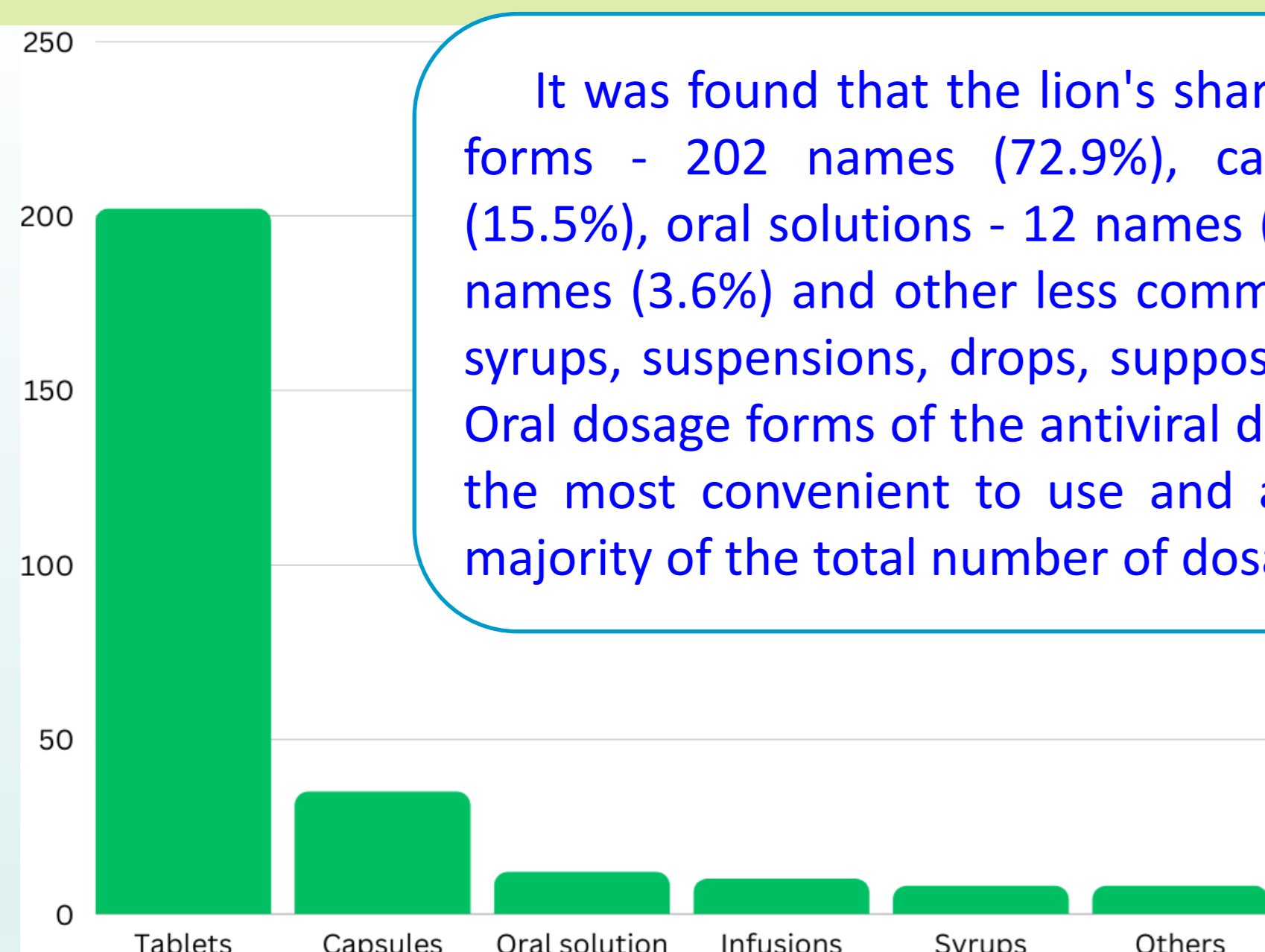


Fig. 3. Distribution of antiviral drugs by release form

It was found that the lion's share of drugs are tablet forms - 202 names (72.9%), capsules - 35 names (15.5%), oral solutions - 12 names (4.3%), infusions - 10 names (3.6%) and other less common forms of release: syrups, suspensions, drops, suppositories and granules. Oral dosage forms of the antiviral drugs of this study are the most convenient to use and account for the vast majority of the total number of dosage forms.

It has also been established that the only subgroup of drugs that contains a medicinal form that is convenient in the prescription of children is J05AX05 - Inosine Pranobex (8 names). Of these, 3 names are represented by Ukrainian manufacturers: Ecopharm LLC and Pharmaceutical Company "Darnitsa" PrJSC.

Table 2. Marketing indicators of socioeconomic availability of antiviral drugs

Drug name	Drug release form	Producer, country	C _{liq}	C _{a.s.}
Acyclovir-Darnytsia	tablets of 200 mg No. 20 (10x2)	Ukraine	0.71	0.59
Acyclovir	tablets of 200 mg No. 20 (10x2)	Ukraine	0.93	0.53
Acyclovir 200 Stada	tablets of 200 mg No. 25 (5x5)	Germany	0.82	1.44
Tamiflu	capsules of 75 mg No. 10	Switzerland	1.1	5.07
Azelta	capsules of 75 mg No. 10	Ukraine	0.72	3.31
Flucap	capsules of 75 mg No. 10	India	1.67	2.15

$C_{liq} = \frac{P_{max} - P_{min}}{P_{min}}$ - liquidity ratio of the drug price;

P_{max} - the maximum price of drugs on the market for a certain period of time, hryvnias;
 P_{min} - the minimum price of drugs on the market for a certain period of time, hryvnias.

$C_{a.s.} = \frac{P_{r.p.}}{W_{a.w.}} \cdot 100\%$ - solvency adequacy ratio;

$P_{r.p.}$ - the average retail price of drugs for the corresponding period of time;
 $W_{a.w.}$ - average salary for the relevant period of time. [9, 10]

As can be seen from the analysis, the cost of domestic drugs in most cases is lower than that of imported drugs with the same active ingredient, so the logical step to improve the socio-economic affordability of antiviral drugs for Ukrainian citizens is to develop domestic production of drugs of this class.