INFOGRAPHIC REPORT

PHARMACEUTICAL INDUSTRY IN UKRAINE











INTRODUCTION

Why did we create this Report?

Citizens' health is one of the key indicators of the state's success. High-quality medicines are one of the main factors of a long and healthy life. The steady development of technologies in this area can radically transform the process of the treatment itself and improve the general standards of living.

We designed this guide in order to explain how the pharmaceutical industry in Ukraine functions — an innovative, dynamic, non-monopolized industry that creates high value-added products. Over the past three years, this industry has made significant progress: companies have received European manufacturing certificates, the intensity of investment remains one of the highest among other industries, while investment itself is increasing. The structure of the market also changes, the share of prescription and high-priced medicines increases, while the overall market volume is growing.

The pharmaceutical industry of Ukraine increases the availability of advanced medicines for citizens and serves as the booster of technological development of the economy.

Content

PHARMACEUTICAL INDUSTRY IN UKRAINE:

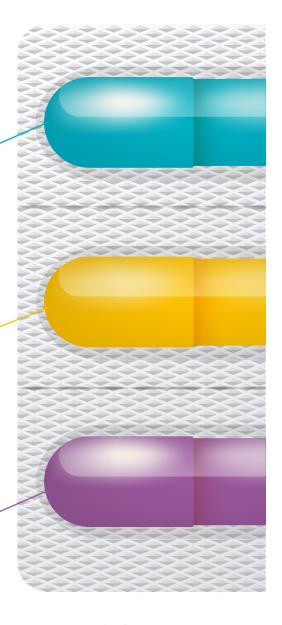
- role in economy
- investment
- manufacturers
- clinical trials
- registration of medicines

PHARMACEUTICAL MARKET OF UKRAINE

- pharmaceutical consumption
- market dynamics
- market structure
- leading companies
- launches
- pharmaceutical retail chain

GLOBAL PHARMACEUTICAL MARKET AND INTERNATIONAL TRADE

- global market dynamics
- biopharmaceutics
- markets regulation
- healthcare system
- international trade

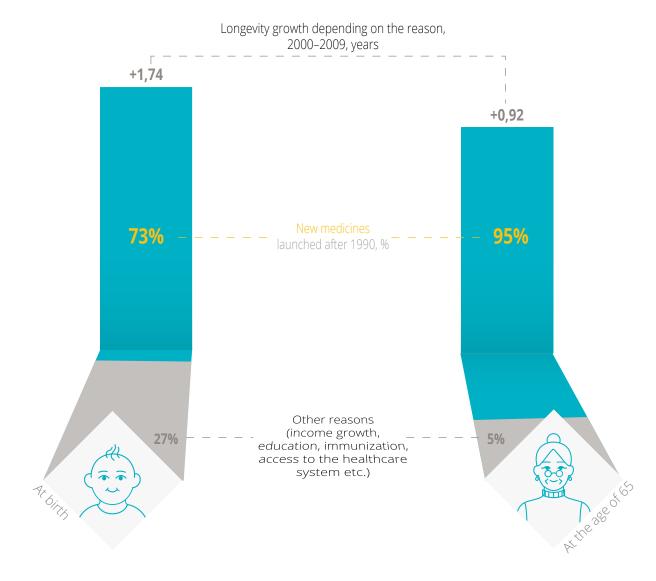






PHARMACEUTICAL INNOVATIONS AND LONGEVITY

New medicines are the basis for life expectancy increase

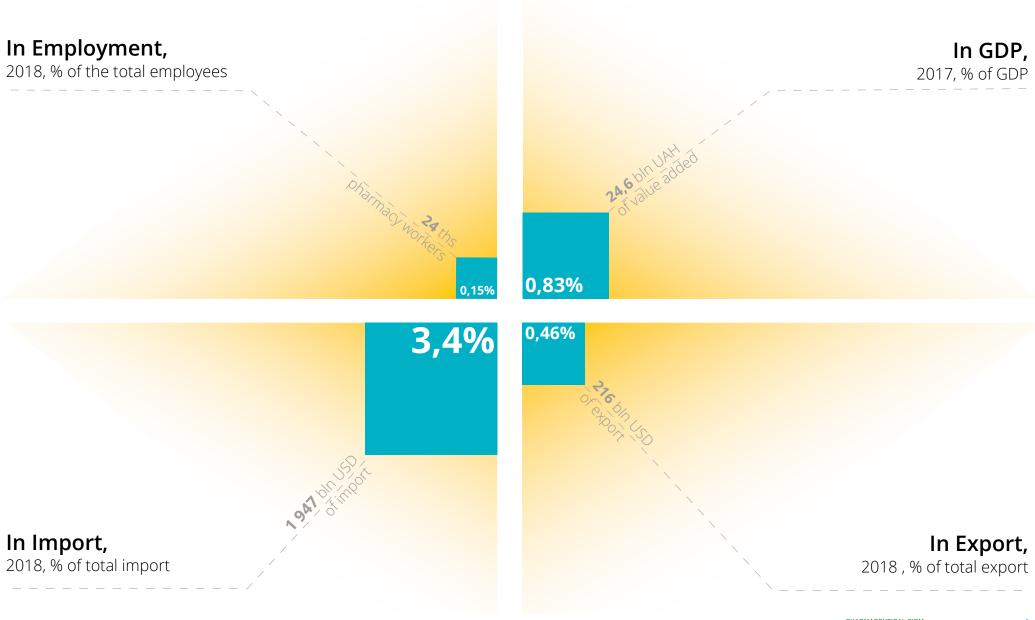




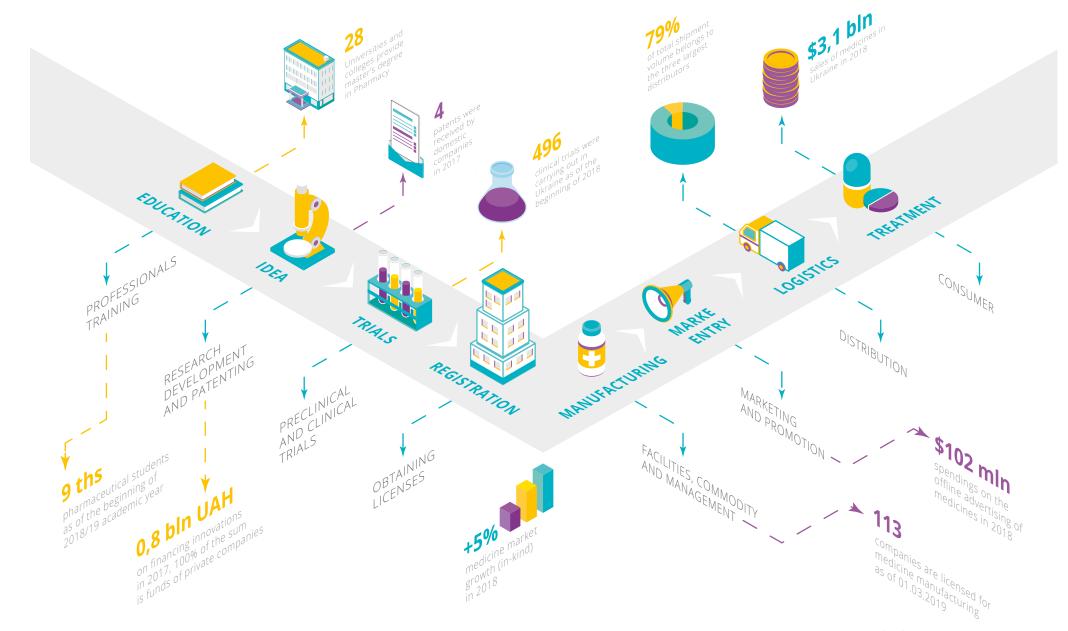




ROLE OF PHARMACEUTICAL INDUSTRY IN ECONOMY



MEDICINES: FROM EDUCATION TO TREATMENT

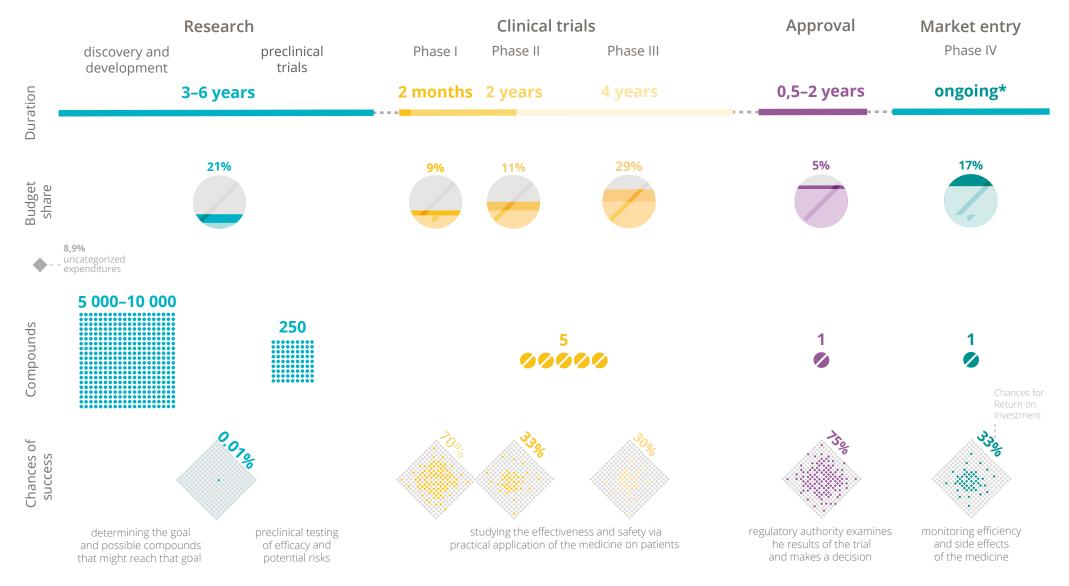






HOW ARE NEW MEDICINES DEVELOPED

Innovative medicines research and development process







INVESTMENT IN PHARMACEUTICAL INDUSTRY

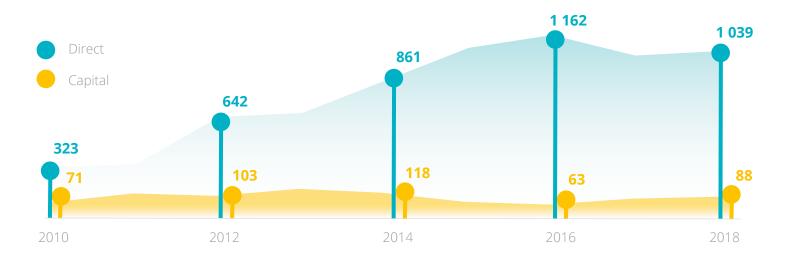
Average investment intensity by industries,

2015–2017, kopiyok of capital investments per 1 UAH of value added



Direct and capital investments,

2010-2018, mln USD*



The volume of investment in the pharmaceutical industry has not recovered to the pre-crisis level yet

However, the intensity of investment is higher than the average in other industries of the Ukrainian economy



PHARMACEUTICAL MANUFACTURERS

Ukrainian companies holding GMP certificate for manufacturing sites from an EU-member state regulatory authority, 2016–2018

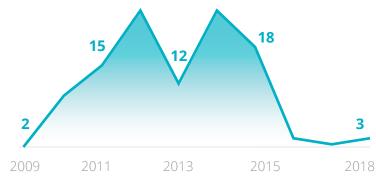
201620172018♦ Borshchahivskiy CPP♦ Darnitsa♦ Borshchahivskiy CPP♦ Farmak♦ Technolog♦ Synbias Pharma♦ Yuria-Pharm♦ Farmak♦ Ukrvetprompostach

Issued licenses for medicine manufacturing, 2009–2018, pcs (excluding cancelled and expired licenses)



Issued GMP certificates for manufacturing sites from an EU-member state regulatory authority by countries,





GMP establishes quality-control standards for medicine manufacturing. GMP certificate, received from an EU member state regulatory authority, is necessary if a company wants to enter the European market



PHARMACEUTICAL MANUFACTURING DEVELOPMENT

Road to innovative pharmaceutical industry in Ukraine

TOP-20 global pharmaceutical companies by origin*, pcs



Growth as the result of domestic market development



Enter the global market with low and medium price categories



Accumulation of human, technological and financial capitals to develop innovative medicines

Current challanges

High level of competition withmanufacturers of both innovativeand generic medicines

I Thin domestic market

I Incomplete healthcare I financing system reform

Competition with manufacturers which have economies of scale in a low price segment

Legal and marketing difficulties of entering foreign markets

Lunfavorable business climate

Ukraine has a weak technologicaland professional base

High competition for capital in the global market



Great Britain



Germany



Switzerland



Denmark



Ireland



France



apan

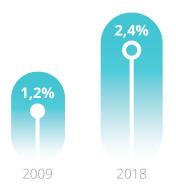


Switzerland is a leader in productivity in the life sciences sector, 2016, ths CHF of income per workplace



*in terms of prescription medicines sales

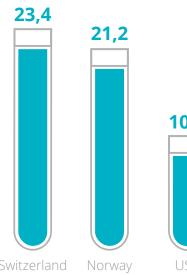
Share of India in global export of pharmaceutical products, 2009 and 2018, %



CLINICAL TRIALS

Clinical trials,

as of 26.02.2019, pcs per 100 ths of population













0,8

Opportunities provided by clinical trials

• get a free treatment via the newest, yet not registered



contribute to •

• understand the nature of a disease better and find safe ways to treat it

• implement the best



confirm the effectiveness • and safety of a new drug

to society

to MOH

get investments for • technical re-equipment,

Phases of clinical trials

20-80 healthy volunteers



studying of bioavailability, 100-300 patients



determination of effective treatment safety

Thousands of patients with specific diseases



confirmation of the efficacy and safety of a medicine

Postmarketing surveillance



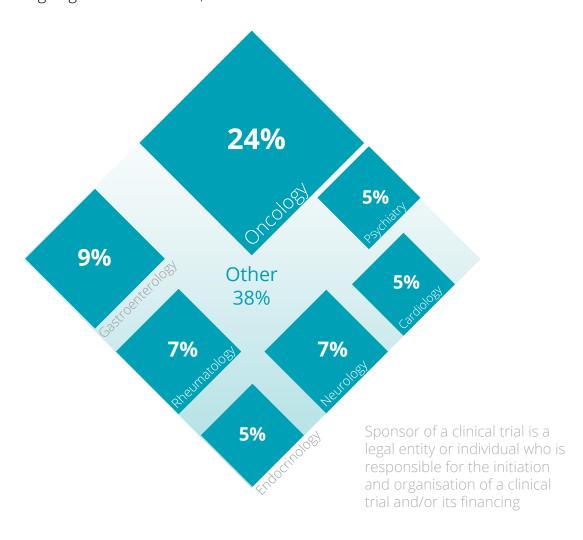
about medicine effectiveness, usage and its safeness



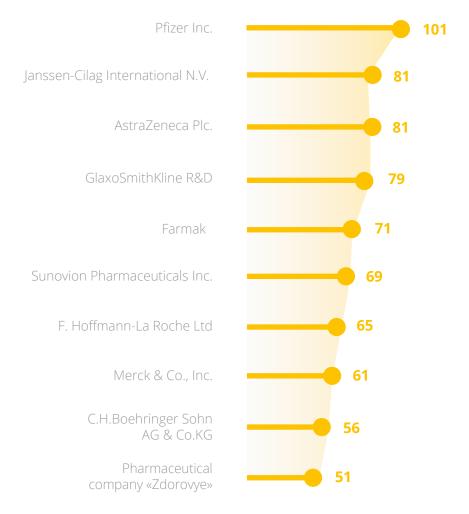


CLINICAL TRIALS IN UKRAINE

Structure of clinical trials in Ukraine by the field, ongoing as of 26.02.2019, %



Main sponsors of clinical trials in Ukraine, as of 26.02.2019, the number of approved, initiated, closed, and completed clinical trials *

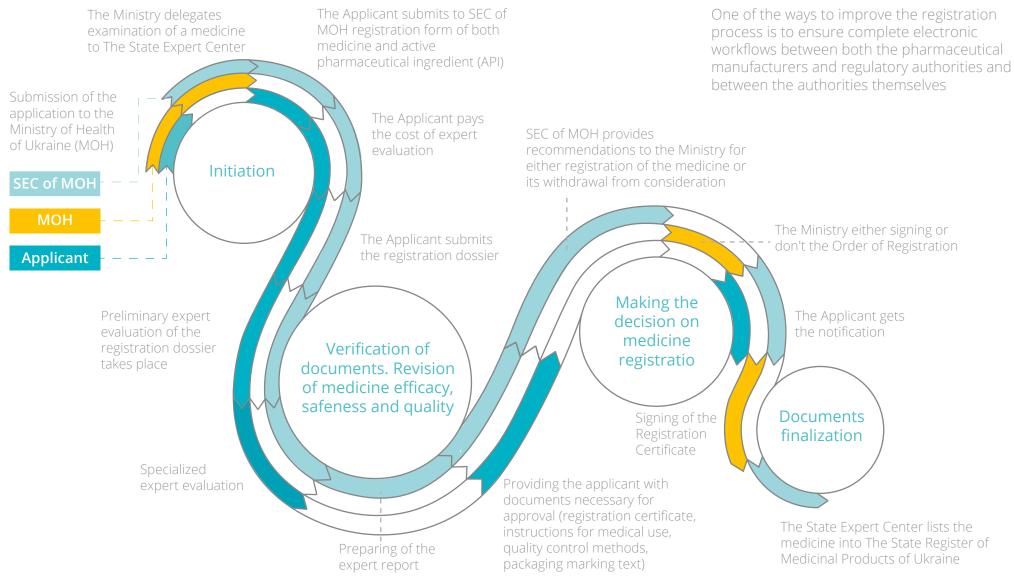






REGISTRATION OF MEDICINES

Process of registration in Ukraine







DISTRIBUTION OF MEDICINES



Why should pharmaceutical companies be concerned about the distribution system?

law, which violation may result in the necessity to change the business model of relations with contractors and in substantial penalties (one of the fines imposed by the AMCU totalled almost

Who is subject to liability?

producer or importer \diamondsuit distributor \Diamond



Preventive measures to avoid violations:

pharmaceutical companies have an opportunity to have their distribution systems approved by the AMCU by means of obtaining its opinion in the form of informative clarifications

Drugs pricing mechanisms that may constitute a violation



Involving a higher risk level





Individual discounts for certain



A target level for a discount to be granted, which level is specified in



Significant purchase volume and a long period of time for granting a discount



Combination of several types of that some other drugs are purchased

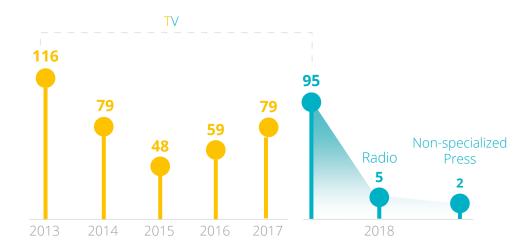




ADVERTISEMENT IN PHARMACEUTICAL INDUSTRY

Advertisment by offline channels,

mln USD, excluding taxes*



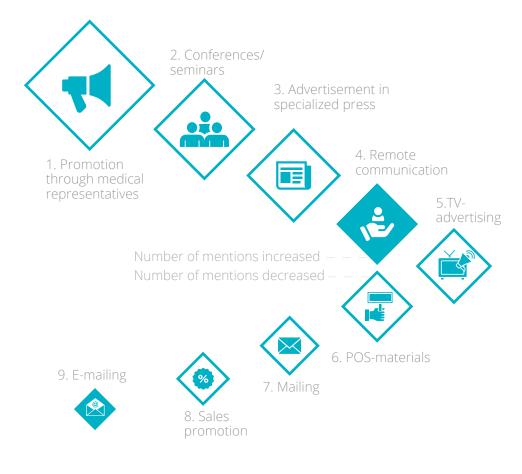
Growth of online advertising,

graphics and video, mln appearances**



The multichannel promotion of the pharmaceutical industry. continue to invest in TV advertising. The main trend is the development and increase of the share of digital channels of promotion

Promotion among experts, based on a survey of former experts in the field of healthcare







^{*}Promotion of «pharmacy basket», the share of medicines is about 75%

^{**}estimated data

ADVERTISING OF MEDICINES: THE ANTITRUST ASPECT

Why should pharmaceutical companies be concerned about the advertising of medicines?

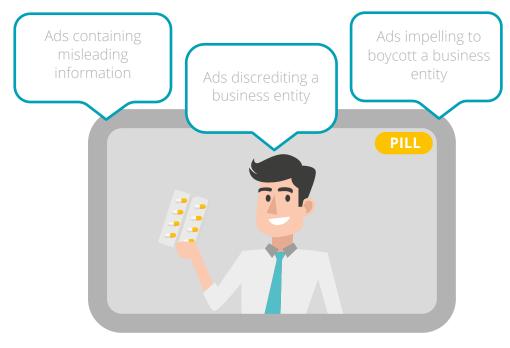
Own medicines

In order not to violate the competition law, which violation may result both in substantial fines and other expenses

Medicines of competitors

In order not to allow the competitors to obtain undue preference on the account of

What advertising of medicines is prohibited?



Mechanisms for the protection of rights against unfair competitors



Filing an application regarding the violation of the laws on protection against unfair competition:

whose rights are being violated

Initiation of an investigation by the AMCU on its own initiative





Consideration of the application by the AMCU:

Within 1 year

The offence has not been established by the AMCU, the proceedings in case shall be terminated

The offence has been established:

imposition of obligation to stop the violation •

imposition of a fine \diamond







MANUFACTURING AND MARKET

Value Added

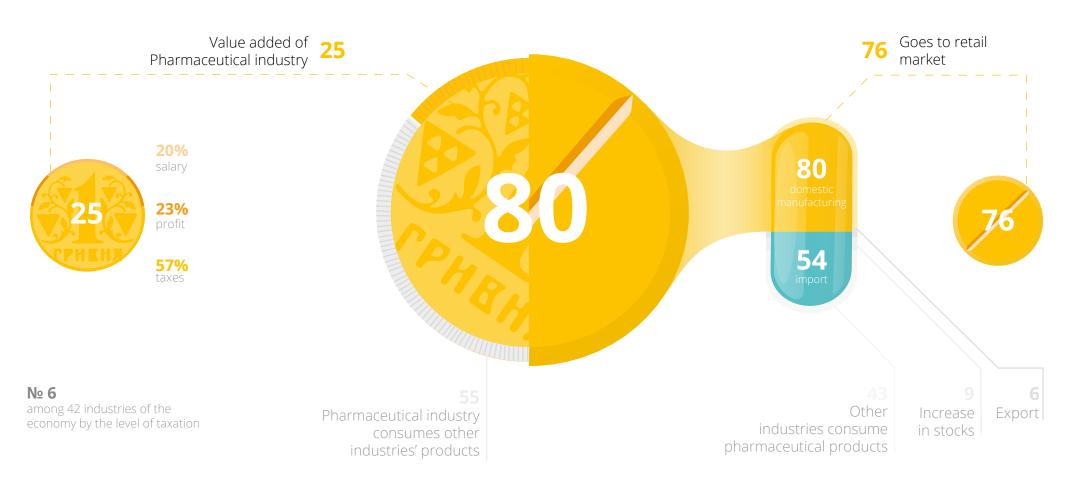
Output of pharmaceutical products

2017, bln UAH (at consumer prices)

Market

0,8% of GDP

is created by Pharmaceutical industry 9% share of pharmaceutical products in retail turnover





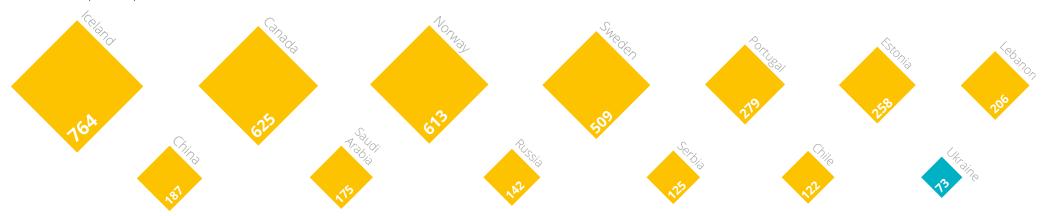




PHARMACEUTICAL CONSUMPTION

Pharmaceutical consumption by countries,

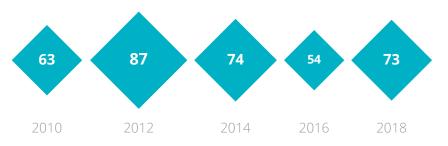
2017, USD per capita



of pharmaceutical expenditures in Ukraine (in the pharmacy retail segment) is out-of-pocket expenditure. In Europe, a significant share of costs is covered by health insurance and government programs*

Pharmaceutical consumption in Ukraine,

2010-2018, USD per capita



^{*} Expenditures on pharmaceuticals and medicines

Pharmaceutical consumption structure,

% (money term)**

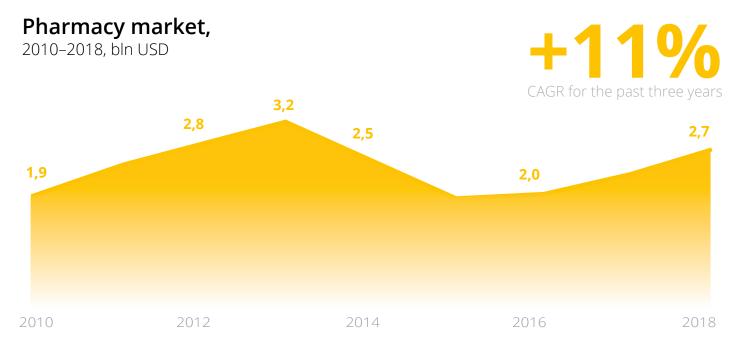


^{**} The structure includes only pharmacy retail sales, Poland and Germany - costs in Euros for PPPs





PHARMACY MARKET DYNAMICS



The pharmacy sector is the basis of Ukraine's pharmaceutical market

Pharmacy segment has been growing four years in a row, both in-kind and money term

Pharmacy sales,

2010-2018, mln pc



Share of pharmacy segment in pharmaceutical market,

2018 p., % (money term)

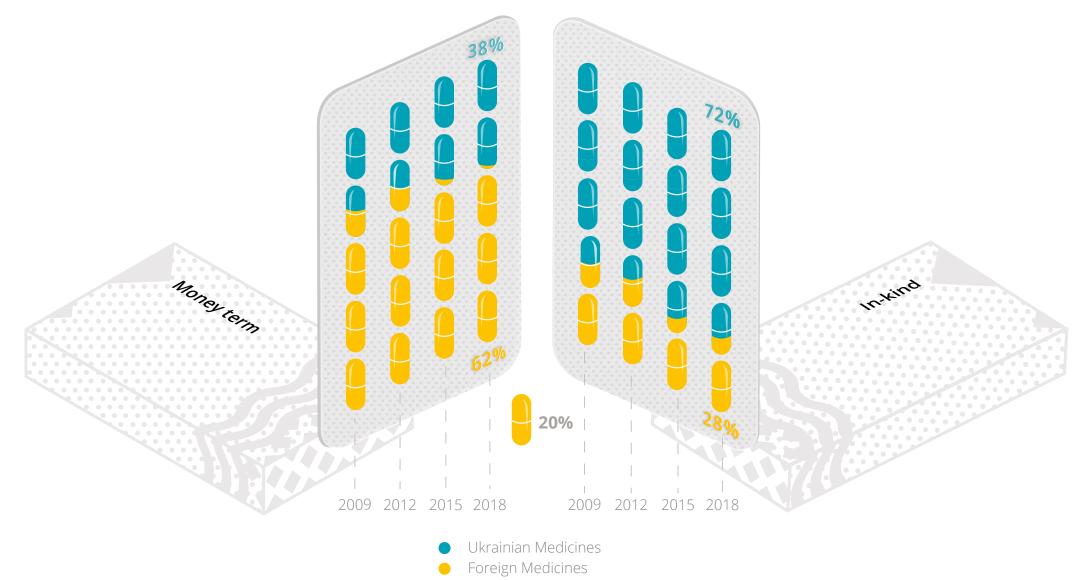






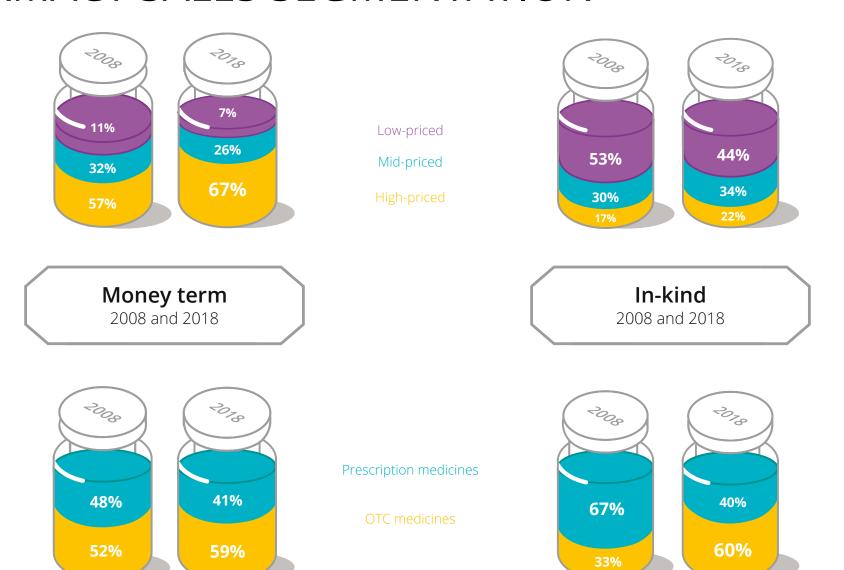
PHARMACY MARKET STRUCTURE

Pharmacy sales split by origin, %





PHARMACY SALES SEGMENTATION



The market has a tendency towards an increase in the share of prescription and high-priced medicines





MOST POPULAR MEDICINES IN UKRAINE

Pharmacy sales leaders, 2016–2018, ranked by sales (money term)

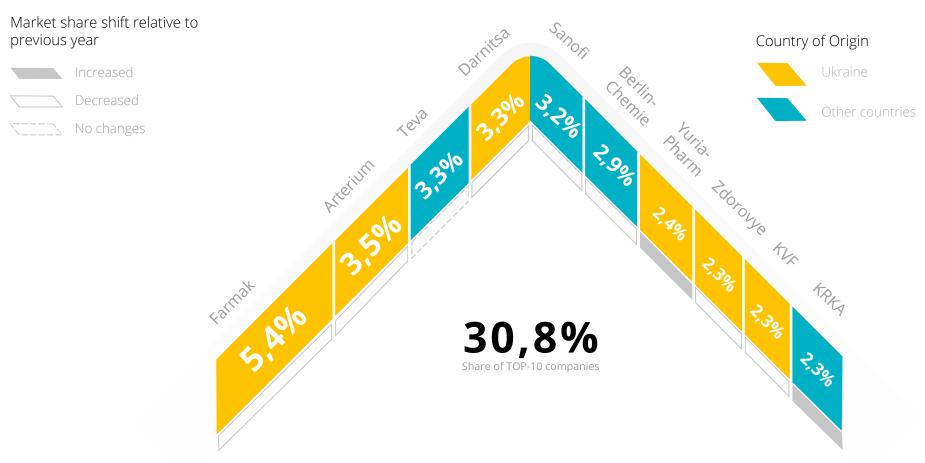
Area of application						
Area of application (ATC1)		Brand	2018	2017	2016	
⇒3>=	Musculo-skeletal system	NUROFEN	1	2	2	– OTC medicines
$\Rightarrow \triangleright$		NIMESYL	2	3	4	– Prescription medicines
\Diamond	Blood and blood forming organs	NATRIIU KHLORYD	3	4	3	
ط	Alimentary tract and metabolism	AKTOVEHIN	4	1	1	
		SPAZMALHON	5	9	9	3% of total pharmacy retail sales go to TOP-5 brands
(36)	Respiratory system	SYNUPRET	6	10	(11)	
	Blood and blood forming organs	REOSORBILAKT	7	7	12	
	Alimentary tract and metabolism	NO-SHPA	8	5	5	
\bigcirc	Blood and blood forming organs	TIVORTIN	9	11	10	
23 Sour	Nervous system ce: Apteka Weekly 18	TSYTRAMON	10	8	8	Darnitsa AEQUO*

PHARMACY MARKET LEADERS

TOP-10 companies based on sales of «pharmacy basket» products,

2018, share of market, % (money term)

The pharmacy sales market is highly competitive, the share of TOP-20 companies is 47%, and it is almost equally distributed among Ukrainian and foreign manufacturers





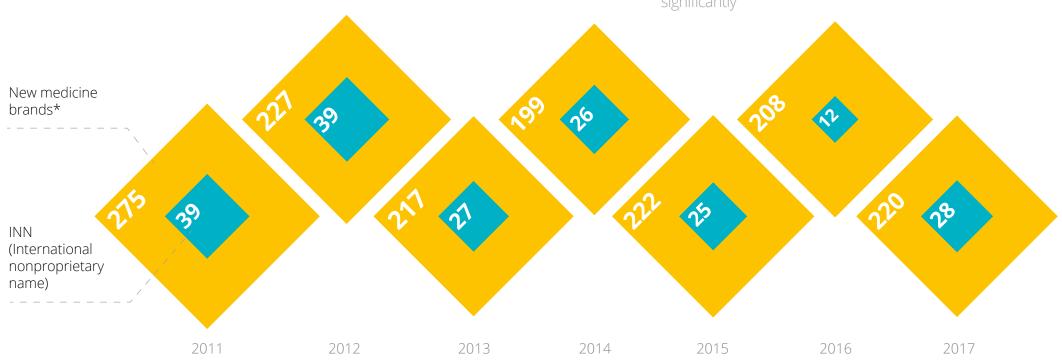


LAUNCH OF NEW MEDICINES

Dynamics of launches,

2011–2017, pcs.

The number of new brands launched by pharmaceutical companies on the Ukrainian market has not changed much over the last years, but the number of new INNs dropped significantly





Share of launches in pharmacy market,

2017 (money term)



Share of domestic manufacturers in launches structure, average for 2013-2017 (money term)



Share of prescription medicines in launches structure, average for 2013-2017 (money term)





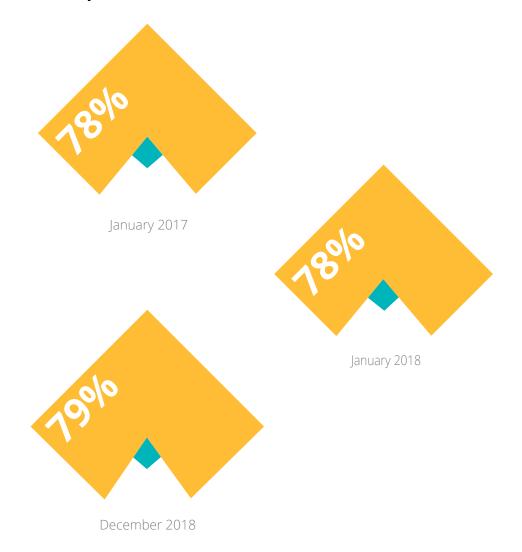
PHARMACY SALES SEASONALITY

Medicine sales in pharmacy segment, 2017–2018, % relative to January of a specific year 140% 2018 In-kind Money term 130% 2017 In-kind Money term 120% 110% 100% November September 90% July May The monthly dynamics shows that from March to August there is a decline March in medicine sales, then there is a stable growth with a peak in December. 80% The overall dynamics of trade over the past two years is quite similar lanuary

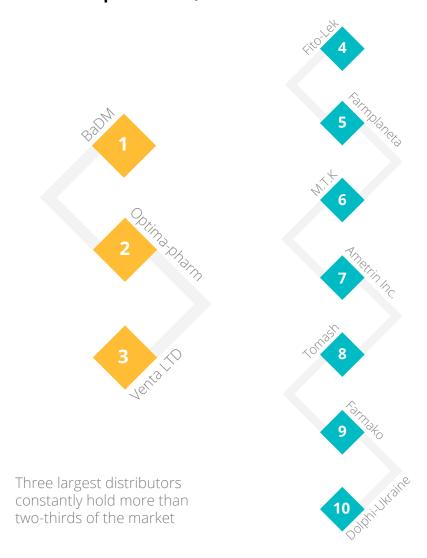


PHARMACY MARKET WHOLESALE CHAIN

Share of TOP-3 distributors in «pharmacy basket» products shipment, January 2017 – December 2018, %



TOP-10 distributors of «pharmacy basket» products, December 2018



PHARMACY RETAIL STRUCTURE

Breakdown of pharmacy chains by size,

2015 and 2018, as of 01.01, %



We can see a steady consolidation of business in the pharmacy segment. The share of mega pharmacy chains has been increased by 13.6% over the past four years

Structure of pharmacy shops by type of settlement, as of 01.01.2019, %



Share of TOP-100 pharmacy chains, 2017–2018, % (money term)



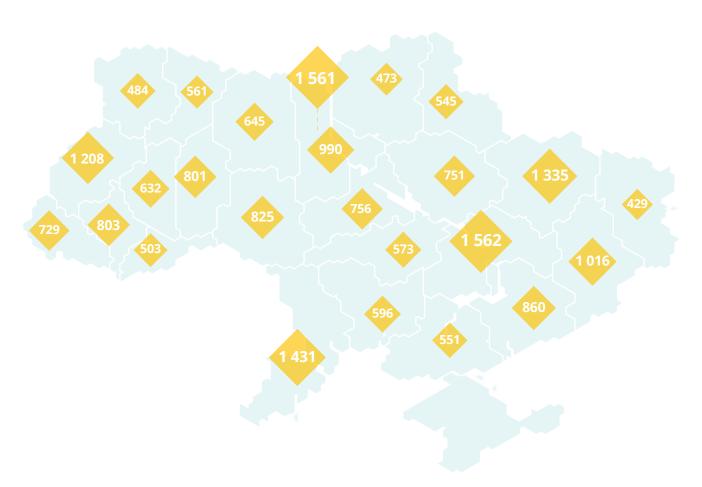




PHARMACY TRADE INFRASTRUCTURE

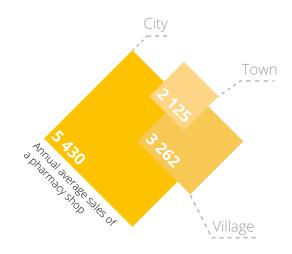
Number of pharmacy shops in regions,

as of 01.01.2019



Sales per pharmacy shop in the city are the largest, as expected. Meanwhile, sales per pharmacy shop in the town are lower than in the village

Pharmacy retail sales by type of settlement, 2018, ths UAH

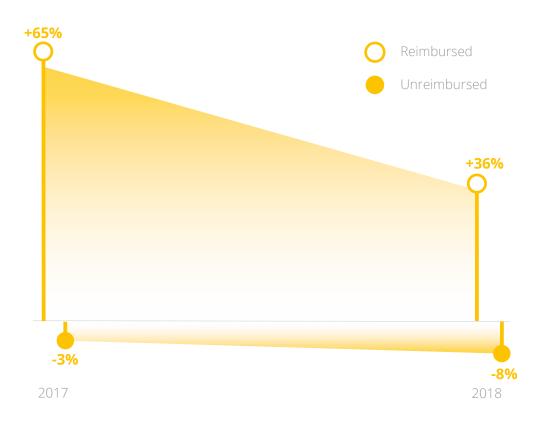






AFFORDABLE MEDICINES PROGRAM

Dynamics of pharmacy sales of medicines from the INN list, 2017–2018, % relative to previous year (In-kind, DDD*)

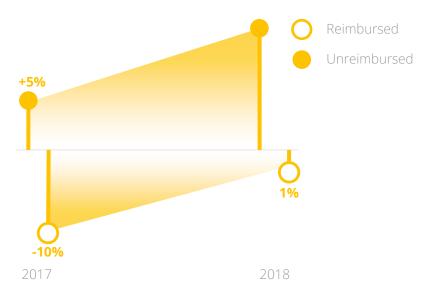


In 2018, the program contributed to the increase in consumption of medicines, the cost of which is fully or partially reimbursed by the state

Prices for reimbursed medicines have been stabilized, while prices for unreimbursed medicines continue to grow

Dynamics of weighted average cost of one

DDD, medicines from the INN list, 2017–2018, %



Financing of the program,

2017-2018, % (mln UAH)







MEDICAL TREATMENT IN UKRAINE

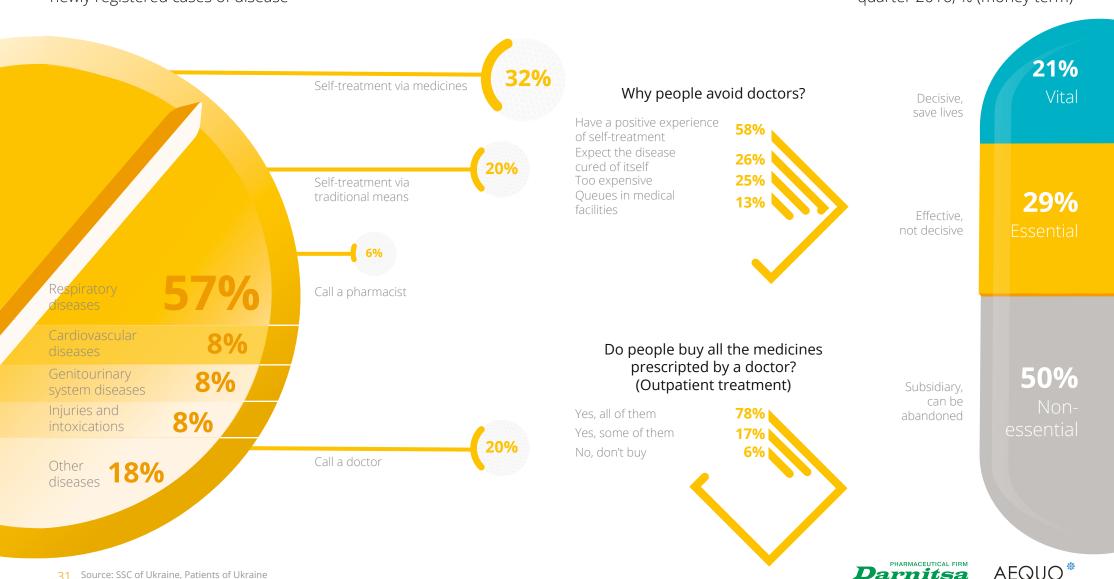
Common diseases,

2017, % of the total number of newly registered cases of disease

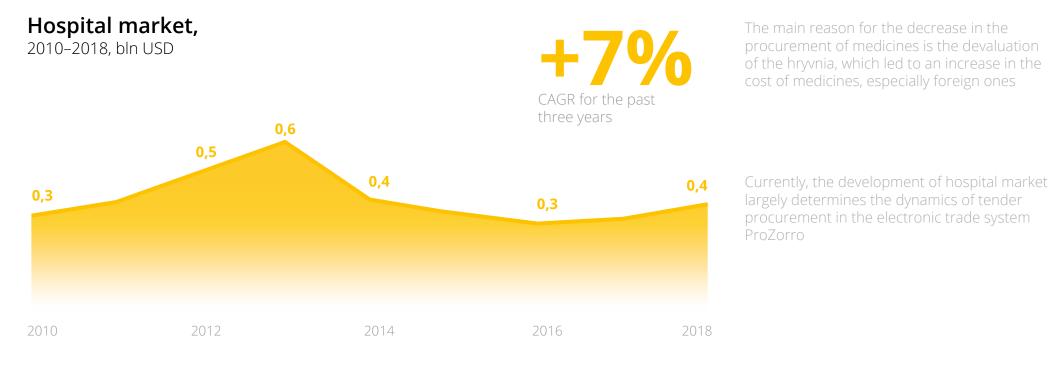
Ways of treatment,

probability, %

TOP-10 medicines by importance, pharmacy market, I-III quarter 2016, % (money term)



HOSPITAL MARKET DYNAMICS

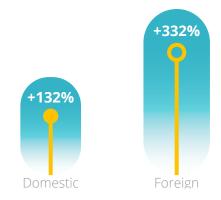


Hospital procurements,

2010-2018, mln pcs



Dynamics of weighted average cost of medicines, 2012-2018, %

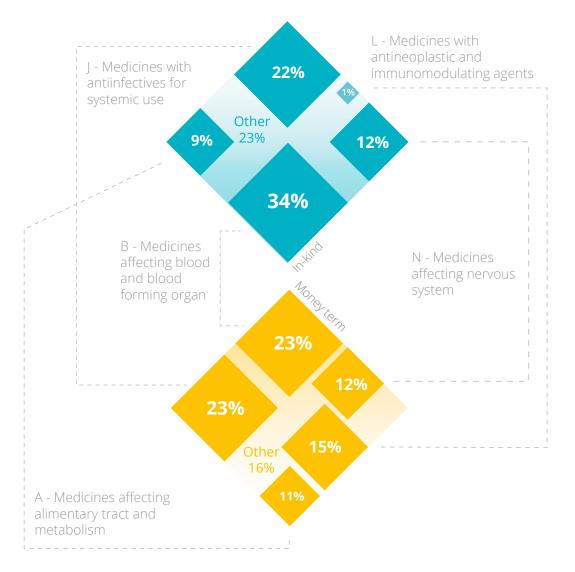




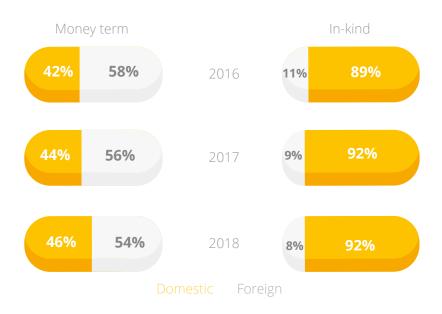


HOSPITAL MARKET STRUCTURE

Structure of medicines in the context of ATC-groups, 2018, %*



Structure of hospital supplies, 2016–2018, %



In the structure of hospital supplies, there is a tendency of the share of domestic medicines increase both in money term and in-kind



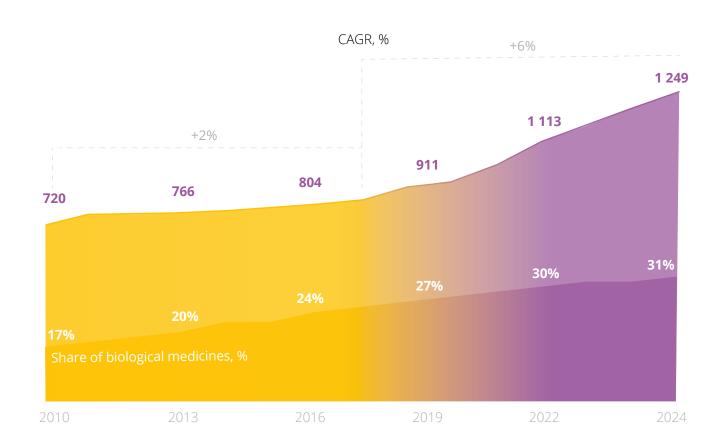


GLOBAL PHARMACEUTICAL MARKET

Global sales of medicines,

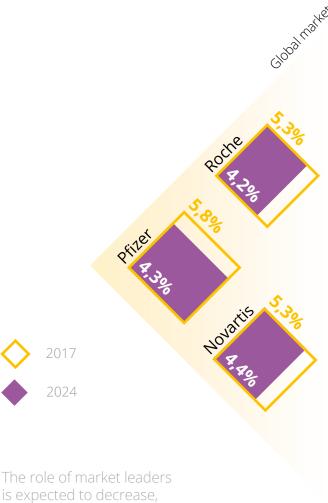
2010-2024, bln USD*

It is expected that CAGR for 2017-2024 will be significantly higher than for the equivalent previous period. The basis for growth will be the increase in sales of prescription medicines



The Biggest market participants,

share of global sales, 2017 and 2024, %**



competition will continue to grow





GROWTH OF BIOPHARMACEUTICS

Global biopharma leaders,

2017, bln USD, %*



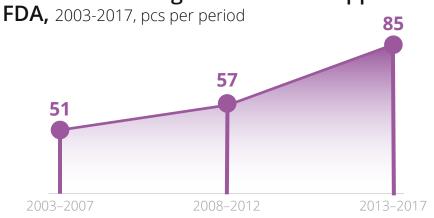
CAGR forecast, 2018–2024, %



Number of biological medicines approved by

Biopharmaceutics is the way of medicine manufacturing by obtaining

complex macromolecules, identical to those found in living organisms.







R&D INVESTMEN IN PHARMACEUTICAL INDUSTRY

Cost-effectiveness of R&D expenditures by pharmaceutical companies,

the number of new medicines per one billion dollars of private R&D investments (2014 prices)



Due to the increase in the cost of new medicines developing the productivity of R&D expenditures has been reduced

Pharmaceutical companies of the US and Japan spend the most on R&D

R&D intensity by industries,

share of R&D in value added, 2014 or nearest one, %*

R&D intensity in pharmaceutical industry,

share of R&D in industry value added, 2014 or nearest one, %



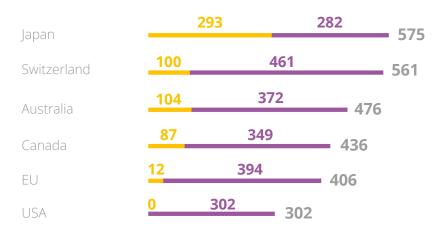




MEDICINES APPROVALS

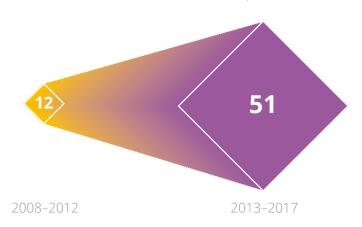
Medicines median approval time,

2017, days



Number of new medicines,

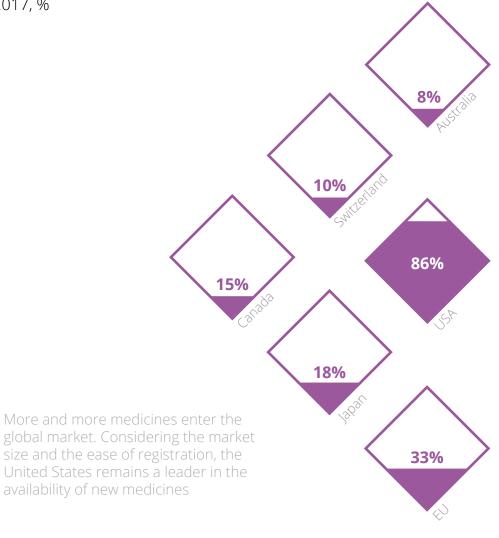
new active substance approved in above-mentioned states, 2008-2017, pcs



Availability of medicines by countries,

medicines approved for the first time or within one month of their approval in another country from the total number of approved,

2017, %



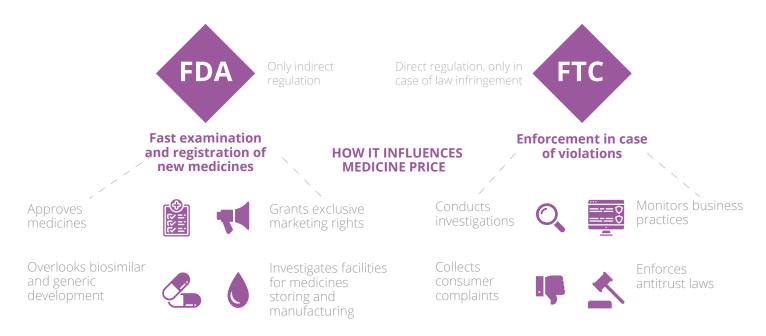




38 Source: CIRS

PHARMACEUTICAL MARKET REGULATION

The authority of the U.S. Government in medicine price regulation, 2018*



To a great extent, medicine prices in the US are not regulated

U.S. antitrust law allows lawful monopolists, and a fortiori other market participants, to set their prices as high as they choose

Legislators believe that regulation reduces incentives for competition and innovation. As a result, the number of new medicines in the United States is significantly higher than in other countries

Number of new medicines available by country,

new medicines registered for the fist time, 2011–2017, pcs

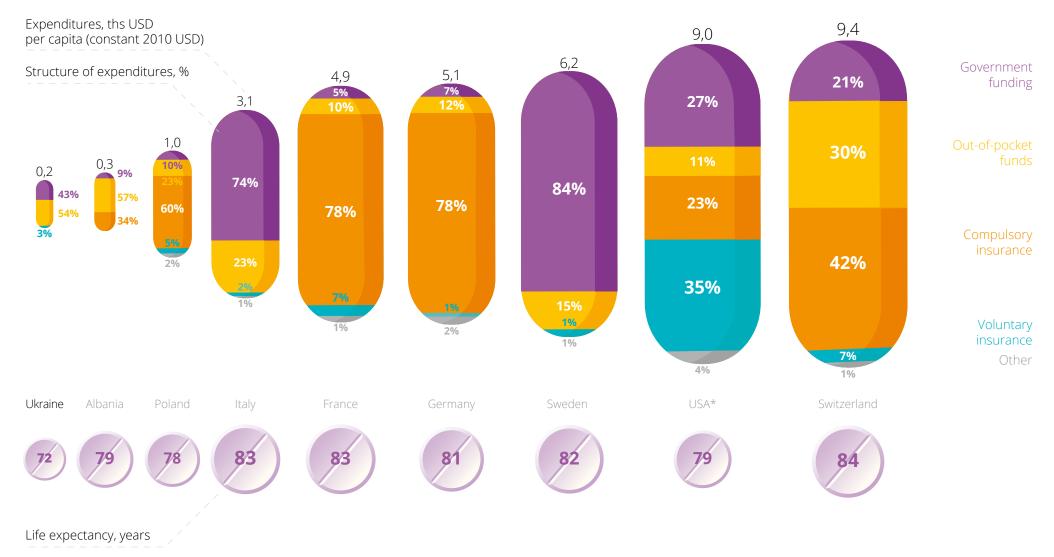




HEALTHCARE SYSTEM

Breakdown of healthcare financing and life expectancy,

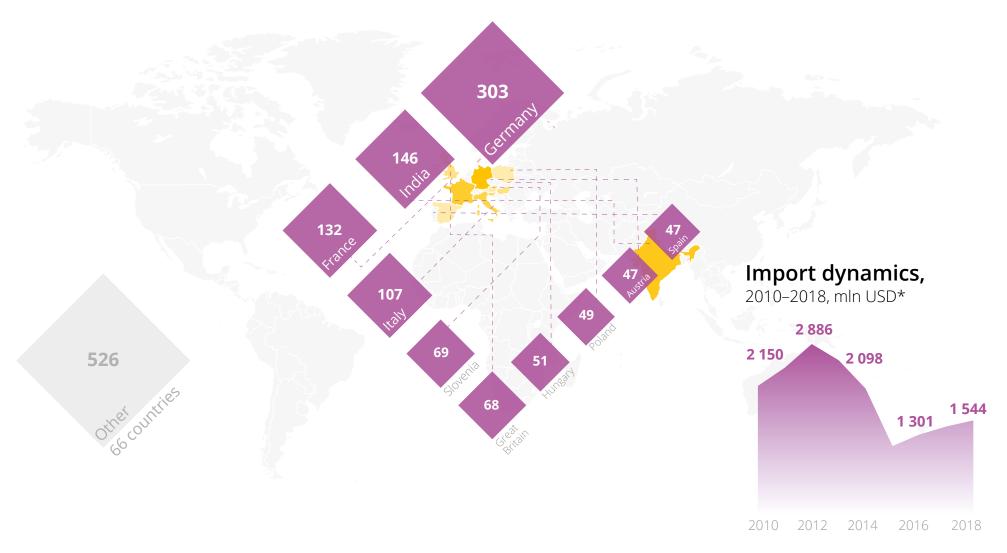
2016 or nearest one





MEDICINE IMPORT IN UKRAINE

TOP-10 Medicine Import Directions in Ukraine, 2018, mln USD









MEDICINE EXPORT FROM UKRAINE

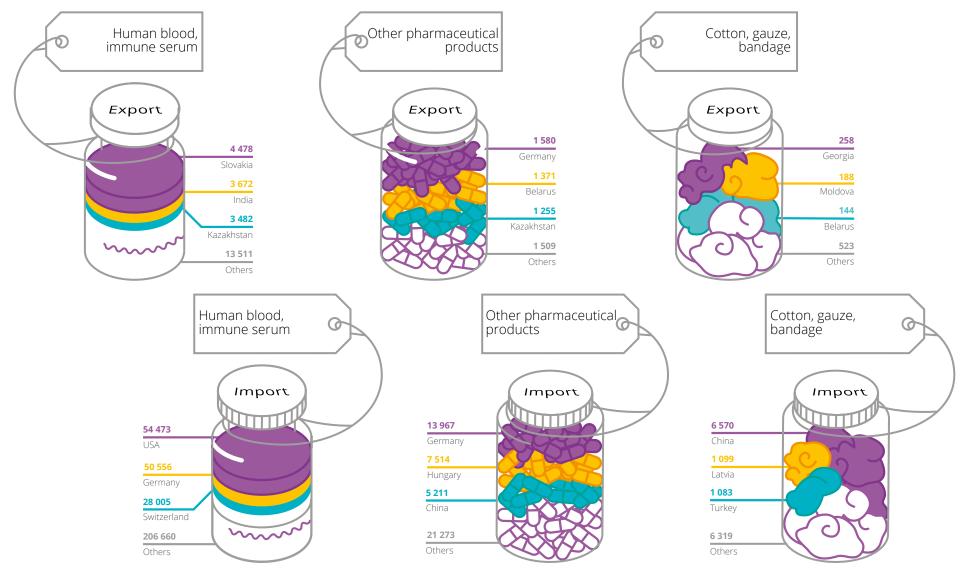
TOP-10 Medicine Export Directions from Ukraine in 2018, mln USD





OTHER PHARMACEUTICAL PRODUCTS TRADE

Main state-partners, 2018, ths USD



SOURCES

- CF «Patients of Ukraine», Research "Cost(less) Medicine"
- World Health Organization (WHO)
- State Statistics Service of Ukraine (SSC of Ukraine)
- State Service of Ukraine on Medicines and Drugs Control (SMDC)
- The State Expert Center of the Ministry of Health of Ukraine, PE (SEC of MOH)
- The Law of Ukraine "On medicinal products"
- Order of the Ministry of Health of Ukraine of 26.08.2005, No. 426 "On approval of the procedure for the examination of the materials for medicinal products which are submitted for the state registration (re-registration), as well as for the examination of materials on changes to registration materials during the validity of the Registration Certificate"
- Order of the Ministry of the Healthcare of Ukraine of 15.04.2015, No. 220 "On cooperation between the Ministry of the Healthcare of Ukraine and the State Expert Center of Ukraine"
- Decree of the Cabinet of Ministers of Ukraine of 26.05.2005, No. 376 "On approval of the procedure for state registration (re-registration) of medicines and fees for their state registration (re-registration)"
- Apteka Weekly:
 - 1. Apteka Weekly № 3 (824) 23 January 2012
 - 2. Apteka Weekly № 8 (829) 27 February 2012
 - 3. Apteka Weekly № 4 (875) 28 January 2013
 - 4. Apteka Weekly № 10 (881) 11 January 2013
 - 5. Apteka Weekly № 5 (926) 3 February 2014
 - 6. Apteka Weekly № 11 (932) 17 March 2014
 - 7. Apteka Weekly № 3 (974) 26 January 2015
 - 8. Apteka Weekly № 9 (980) 9 March 2015
 - 9. Apteka Weekly № 2 (1023) 25 January 2016
 - 10. Apteka Weekly № 13 (1034) 11 April 2016
 - 11. Apteka Weekly № 2 (1073) 23 January 2017
 - 12. Apteka Weekly № 7 (1078) 27 February 2017
 - 13. Apteka Weekly № 22 (1093) 12 June 2017

- 14. Apteka Weekly № 3 (1124) 22 January 2018
- 15. Apteka Weekly № 5 (1126) 5 February 2018
- 16. Apteka Weekly № 12 (1133) 26 March 2018
- 17. Apteka Weekly № 27 (1148) 16 July 2018
- 18. Apteka Weekly № 2 (1173) 21 January 2019
- 19. Apteka Weekly № 3 (1174) 28 January 2019
- 20. Apteka Weekly № 4 (1175) 4 February 2019
- 21. Apteka Weekly № 5 (1175) 11 February 2019
- 22. Apteka Weekly № 9 (1180) 11 March 2019
- 23. Apteka Weekly № 10 (1181) 18 March 2019
- AEQUO Law Firm (AEQUO Law Firm)
- ClinicalTrials.gov
- DBS Bank (DBS)
- EudraGMDP database (EudraGMDP)
- European Federation of Pharmaceutical Industries and Associations (EFPIA)
- Evaluate Ltd. (Evaluate)
- Export.gov
- Federal Trade Commission (FTC)
- Food and Drug Administration (FDA)
- International Federation of Pharmaceutical Manufacturers & Associations (IFPMA)
- International Trade Centre (ITC)
- Lichtenberg F. R.: How many life-years have new drugs saved? A 3-way fixed-effects analysis of 66 diseases in 27 countries, 2000-2013 (Lichtenberg F. R.)
- Organisation for Economic Co-operation and Development (OECD)
- Pharmaceutical Research and Manufacturers of America (PhRMA)
- The Centre for Innovation in Regulatory Science (CIRS)
- Verband der forschenden pharmazeutischen Firmen der Schweiz (Interpharma)





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