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MAIN TENDENCIES OF THE GLOBAL PHARMACEUTICAL MARKET

The pharmaceutical market is a dynamically deve-loping sector of the global economy. This is due to the growing market capacity of drugs in the world and the rapid expansion of the range of drugs. Therefore, despite the general downturn in the global economy of recent years, the pharmaceutical market continues to grow. The study of the pharmaceutical market is relevant since its capacity is increasing every year due to the fact that the demand for drugs is increasing, especially in developed countries because the aging population in these coun-tries is increasing. According to the United Nations fore-cast, by 2050, the world's population at the age over 60 years will reach 2.09 billion people. And the projected life expectancy will be 82 years by 2050, which will lead to an increase in the usage of drugs. Also, the pharma-ceutical market is increasing due to the emerging econ-omies of countries such as Latin America, Asia, Qatar, Bahrain, Kuwait, the United Arab Emirates and others. According to IMS Health, the capacity of the pharma-ceutical market has increased by 2-6% per year in the period between 2013-2017 by $205– 235 billion. Also, the number of the world's leading pharmaceutical and biotechnological companies was 4,800 in 2013, and in 2017 it grew to 6,500 companies [1]. Companies such as Roche and Bristol-Myers Squibb are developing new drugs with research and development (R&D) annually to treat various types of diseases, such as oncology, dia-betes, rheumatism, etc. with global sales of $25,026 and

$3,279 respectively. As a result, it is necessary to study the main trends in the global pharmaceutical market more thoroughly in order to identify important factors affecting its development, such as R&D and sickness rate.

Organizations such as the European Federation of Pharmaceutical Industries and Associations (EFPIA), Evaluate Pharma, The Business Research Company, IQVIA Institute, International Federation of Pharma-ceutical Manufacturers & Associations (FPMA), PESTEL Analysis of Pharmaceutical industry etc. Are studying the tendencies of the global pharmaceutical market. Scientists such as Adriana Petryna, Arthur Kleinman, Andrew Lackoff made a significant contribu-tion to the study of problems connected with the global pharmaceutical market in the book Global Pharmaceuti-cals. The operating system of the pharmaceutical com-panies was disclosed by Marshia Angela, Ray Moyni-hen, Alan Cassels, Melody Petersen and others. The aim of the work is to identify the main trends of the global pharmaceutical market. The global pharmaceutical mar-ket in 2017 was up to $934,8 billion and is estimated to reach $1170 billion in 2021, an increase of 5,8%, ac-cording to the latest report from the pharmaceutical mar-ket research conducted by The Business Research Com-pany [2]. Sales analysis of medicines for all continents for the period of 20-13-2017. (Fig. 1) shows that the largest sales volume in the North American market is
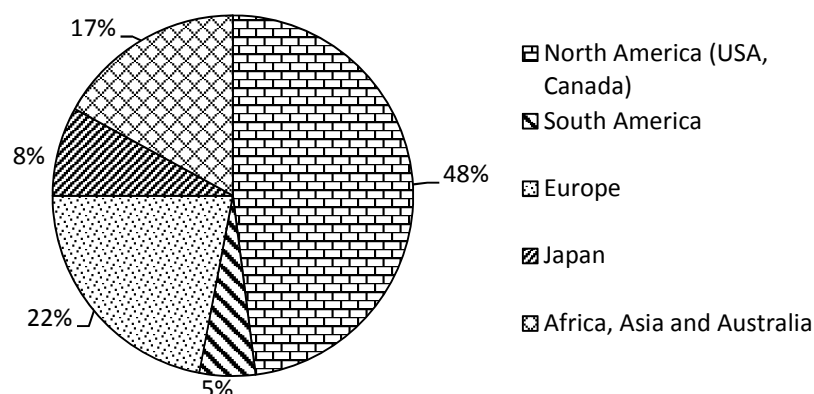

Fig.1. Drug sales in the World Pharmaceutical Market (2013-2017)

48%, which is due to geographical factors since 25 mil-lion people in these countries suffer from diabetes and 80 million people are in the pre-diabetic stage. They also suffer from cancer and hyperthermia, making the US

pharmaceutical market the most important market in the world, together with Canada and Mexico, it represents the largest continental pharmaceutical market. It is fol-lowed by Europe with a share of 22%, which is associ-

ated with the influx of migrants who brought with them various diseases. Also, according to the World Health Organization, in Europe, the spread of epidemic diseases is observed in 28 countries, with 76% of cases of local transmission of infection. Africa followed with a share of 17%, which is due to the fact that medicine is paid in most African countries, and the standard of living is low. For example, in Africa, the average monthly salary before taxes made up to $402 in 2016. Then comes Japan with a share of 8%, and the Japanese nation is ahead of all nations in terms of healthy life expectancy worldwide. [3].

World sales of drugs for the period between 2013-2017 (Table 1) indicates that the annual increase in prescripted drugs for the period 2013-2017 increased by 19 times, due to the fact that the population is increasing and the number of patients who visit doctors for treatment of diseases that require receiving a prescription for the use of a certain drug is growing. It should be mentioned that there are two types of dominant drugs – pa-

tented (original) and generic drugs. And also, there are orphan drugs. Orphan drugs are pharmaceuticals developed for the treatment of rare diseases, which are called orphan diseases. Sales of generic and orphan drugs are growing steadily, as shown in the table. For the period 2013-2017. The global volume of generic drugs has grown 15 times, indicating that the demand for generic drugs is growing due to the cheapness of these drugs compared to the original ones, and due to the ease of their entry into the market. In addition, according to IFPMA forecasts [4], by 2018, revenues from the sale of generic drugs in the world will reach $666 – 668 billion per year. Taking into account that the total volume of the world market of medicines reached $1,31 trillion, today generics occupy more than half of the market as a whole. In some regions, this figure is higher – in South America (61% of all spending on medicines) and Asian countries (59%). Also, orphan drugs increased by 2 times. This is due to the fact that the number of patients with rare diseases is growing.

Table 1

Worldwide Drug Sales

Worldwide Prescription Sales ($bn)										
Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Prescription drugs	649	664	686	732	719	727	750	741	768	774
Patented (original)	535	547	556	587	568	567	579	562	574	567
Generic drugs	54	54	60	66	67	70	75	77	79	84
Orphan drugs	60	63	70	79	84	90	96	102	115	123
Prescription Generic & Orphan %	536	547	556	587	568	567	579	563	575	587

The main threat to the worldwide sales of drugs is the forthcoming of the expiration of the patented (original) drugs. This can create what, according to experts, is called «patent cliff». The term Patent cliff explains the phenomenon when, due to the expiration of a group of drugs which occupy a high percentage of sales, sales in the entire world market fall sharply. Usually this phenomenon manifests itself when patents on «blockbusters» drugs end – «blockbusters» in pharmaceuticals are drugs with sales of more than $1 billion a year. For example, let us consider the worldwide sales volume, which was under the threat of patent expiration for the

period 2008-2017 (Table 2). The data in the table indicate that the period of the most demanded patented drugs is coming to an end, which contributes to an increase in the production of generic drugs, and this will result in large losses from sales of original drugs. The total sales volume at risk is fluctuating. For example, in 2008. The losses were estimated to be $18 billion, and in 2017 This figure increased by 1,83 times. Therefore, it can be said that if the total sales volume at risk of expected losses is inspected, then companies on average lose between 3 to 7% per year [4].

Table 2

Worldwide sales at risk of patent expiration

Worldwide Prescription Sales ($bn)										
Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Total sales at risk	18	24	29	34	52	31	48	52	52	33
Expected sales loss	12	12	13	20	37	24	20	15	14	23
Market at risk, %	+3	+4	+4	+5	+7	+4	+4	+6	+7	+4

Analysis of the global pharmaceutical sales market suggests that it is necessary to study the influence of the main factors that affect it. The first factor affecting this market is Research and Development, which is an important step in drug development in the pharmaceutical industry. According to the annual report of the Evaluate Pharma organization, currently pharmaceutical biotech-

nologies are replacing traditional technologies in drug manufacturing, opening up new opportunities. Pharmaceutical biotechnology is a relatively new and growing area in which the principles of biotechnology apply to drug development. There is an increase in R&D expenditures by pharmaceutical and biotech companies

worldwide in 2017 compared with 2008 by 23% (Table 3) [4]. Also, there is an increase in R&D expenditure on prescription drugs by 0,5% while non-prescription drugs expenditures increased by 1,3%. This suggests that there has been an increase in the size of the research that is carried out to help cure various diseases, along with the development and the introduction of new drugs and technologies into clinical practice for the treatment of diseases with steady growth tendencies, such as oncology, cardiovascular and infectious diseases.

Table 3

Worldwide R&D spend by pharma & biotech companies

Worldwide prescription sales ($bn)										
Year	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Pharma R&D spend	128,3	126,5	128,4	136,3	135,5	137,8	143,2	148,0	156,7	157,5
R&D of worldwide prescription sales, %	19,8	19,1	18,7	18,6	18,8	19,0	19,1	20,0	20,4	20,3
R&D of worldwide prescription in generic, %	21,5	20,8	20,5	20,5	20,8	21,0	21,2	22,3	22,7	22,8

Biotech companies have much higher costs due to the fact that they are focused on the extension of R&D (as opposed to the production of pharmaceutical companies), as well as on the duration and complexity of testing and creating new products. (Fig. 2) The top 20 global pharmaceutical companies in R&D in pharmaceuticals shows that the market is developing dynamically and new leaders are emerging. For example, the company Novartis ranked first in 2013. R&D expenditures with a market share of 9,4%, whereas in 2017 its position deteriorated to the third place with a market share of 7,8%. Second place in 2013 with a share of 8,30% is occupied by Roche, as in 2017 it ranked first in R&D expenditures with a market share of 9,2%. The third is Merck&Co. with a market share of 7,10% in 2013 whereas in 2017 its position deteriorated to the fourth place with a market share of 7,6% [4].
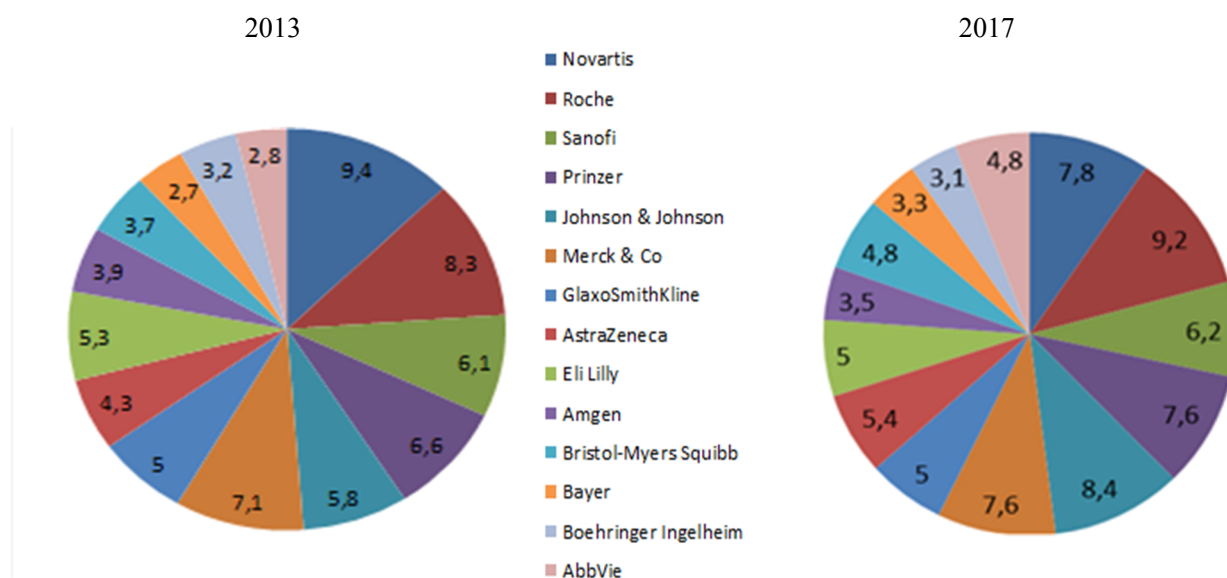

Fig.2. Top 15 Global Pharmaceutical Companies in R & D in Pharmaceutical Industry in 2013 and in 2017, $bn

Analysis of the development of the pharmaceutical market suggests that pharmaceutical companies and enterprises engaged in biotechnology play an active role in forecasting analytics in order to identify the key patterns and treatment methods designed to cure a specific patient segment. In 2017 compared with 2008, the use of biotechnology increased by 9%. While traditional technologies for this period were reduced by 9% because pharmaceutical companies typically use artificial materials to create drugs, while biotech companies use living organisms or their products, such as bacteria or enzymes, to manufacture their medicines.

Table 4

Worldwide sales of prescription drugs by technology

Technology	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Biotechnology, %	17	17	18	18	20	22	23	24	25	26
Conventional, %	83	83	82	82	80	78	77	76	75	74

The second major factor affecting this market is sickness rate. World experience shows that the developing areas of therapy are oncology, Anti-rheumatics and anti-virals. These areas significantly increase sales of prescription drugs. (Table 5) analysis of worldwide sales and global market share by areas of pharmaceutical therapy 2013 and 2017, suggests that oncology is the fastest growing field of therapy in the pharmaceutical industry with worldwide sales, which increased by 42% in 2017 comparing with 2013. And with a global market share of 2,9% in 2017 and continuing to grow due to the fact that the life expectancy of population is increasing, as well as due to the unhealthy lifestyle, smoking, unhealthy diet, and drinking big amounts of alcohol. While the sickness rate in hyperliqidaemics has decreased, and sales have decreased by 5% respectively for the period 2013-2017.

Table 5

Analysis of worldwide sales and global market share by areas of therapy in 2013 and 2017.

Rank	Areas of Therapy	Worldwide sales ($bn)		Market share ($bn), %	
		2013	2017	2013	2017
1	Oncology	72,8	104,0	9,7	12,6
2	Anti-diabetics	38,4	46,1	5,1	5,6
3	Anti-rheumatics	44,9	55,7	6,0	6,8
4	Vaccines	25,6	27,7	3,4	3,4
5	Anti-virals	27,8	42,4	3,7	5,1
6	Immunosuppressants	7,9	13,7	1,1	1,7
7	Bronchodilators	32,6	27,2	4,3	3,3
8	Dermatologicals	13,5	12,9	1,8	1,6
9	Sensory Organs	17,5	21,6	2,3	2,6
10	Anti-hypertensives	33,7	23,0	4,5	2,8
11	Anti-coagulants	8,9	16,8	1,2	2,0
12	MS therapies	16,2	22,7	2,2	2,7
13	Anti-fibrinolytics	11,1	12,7	1,5	1,5
14	Anti-hyperliqidaemics	19,3	11,3	2,6	1,4
15	Anti-anaemics	-	7,6	-	0,9
16	Top 15	385	445	51,0	54,0
17	Other	369	379	49,0	46,0
18	Total WW Prescription & OTC Sales	754	825	100,0	100,0
20	WW Generic Sales	68,5	80,7	9,1	9,8
21	OTC Pharmaceuticals	36,8	36,1	4,9	4,4

Analysis of the top 10 global pharmaceutical companies selling drugs for the treatment of diseases in the field of oncology (Table 6) indicates that in 2013 Roche was the dominant company in the field of oncology with a market share of 34,3%, the company retained its position in 2017 with a market share of 26,4%. In second place in 2013. comes Novartis with a market share of 10,8%, and in 2017 worsened it's position of taking fifth place with a market share of 5,9%. The third place is taken by Celgene in 2013 holds a market share of 8,7%, retaining its position in 2017 with a market share of 8,2%. These companies occupy leading positions because they invest annually in R&D and in the development of biotech drugs in the field of oncology.

Table 6

Top 10 global pharmaceutical companies selling drugs for the treatment of diseases in the field of oncology in 2013 and 2017

Rank	Company	Worldwide market share, %		Company	Worldwide Sales ($m)	
		2013	2017		2013	2017
1	Roche	34,3	26,4	Roche	25,026	27,453
2	Bristol-Myers Squibb	4,5	11,2	Celgene	3,279	11,649
3	Celgene	8,7	8,2	Bristol-Myers Squibb	6,336	8,520
4	Novartis	10,8	5,9	Johnson & Johnson	7,871	6,153
5	Pfizer	4,0	5,6	Pfizer	2,947	5,861
6	Johnson & Johnson	5,1	3,9	AstraZeneca	3,705	4,024
7	Astellas Pharma	1,0	4,0	Merck & Co	757	4,111
8	AstraZeneca	4,4	7,6	Novartis	3,193	7,884
9	Eli Lilly	3,9	3,0	AbbVie	2,875	3,090
10	Merck & Co	1,0	2,7	Astellas Pharma	752	2,847
	Top 10	77,9	78,5	Top 10	56,741	81,592
	Other	22,1	21,5	Other	16,123	22,396
	Total Industry	100,1	100,0	Total Industry	72,864	103,988

According to the World Health Organization [5] up to 25% of cancer cases appeared in low- and middle-income countries in 2015; this is due to cancer-causing infections like hepatitis and human papillomavirus (HPV). Also, the inaccessibility of cancer diagnosis and treatment is a common problem, for example, in 2017, only 26% of low-income countries had accessible medical services, while 90% of high-income countries had them. Studies of the global cancer sickness rate suggest that Australians are diagnosed with cancer at a faster rate than in any other country in the world (Fig. 3). For example, for every 100,000 Australians, there are 743,8 new cases of cancer, followed by 532,9 in the United States. It can be concluded that newer cases of cancer appear in the richer countries, in most cases due to improper lifestyle. Also, the most common type of cancer found in Australia and America was skin cancer, followed by the prostate for men, bowel cancer, malignant skin melanoma, and breast cancer in women. Only one of the five low- and middle-income countries has the data needed to develop a protecting cancer policy.
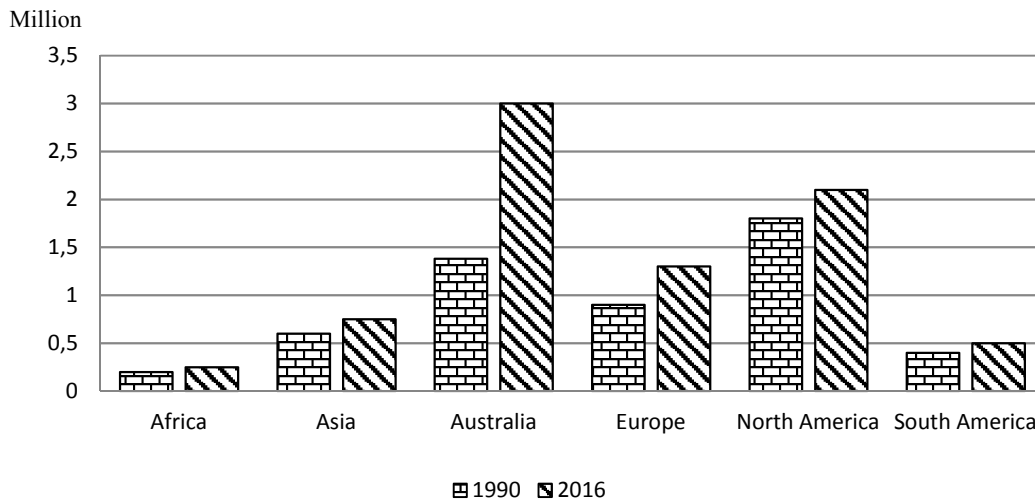

Fig. 3. The proportion of the population suffering from cancer worldwide

Analysis of cancer types in 2016 (Fig. 4) suggests that breast cancer is the most common case of cancer and the leading cause of cancer death for women – 1,7 million incidents [6]. By 2030, scientists predict further growth of this indicator to 9.9 million, of which 5,5 million will suffer from incurable forms of cancer. Cases of mortality prevail in poor and less developed countries, with limited access to diagnostic and treatment resources. The most common case of cancer for men is prostate cancer – 1,4 million cases. Overall, the main cause of cancer deaths was trachea, bronchus and lung cancer – 1,2 million deaths [7].
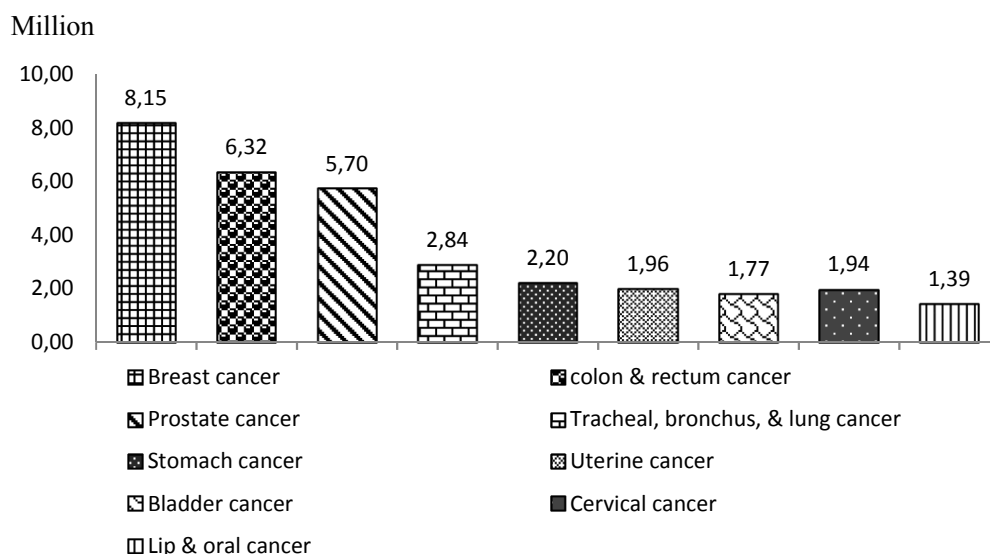

Fig. 4. Number of people with cancer of different types worldwide in 2016

Analysis of the global pharmaceutical market was conducted in the article and the main influencing factors on it were revealed which are the research factor and sickness rate. Their interrelation has been revealed since the most common diseases, such as oncology, requires high-tech drugs that can be manufactured using R&D. Therefore, leading companies in the pharmaceutical market are those companies that invest in R&D because these companies produce more effective drugs. Also, it was found that drugs which cure cancer will be more in demand, due to the increase in this area of diseases.

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Шабаліна Л. В., Хумран Р. В. Основні тенденції світового фармацевтичного ринку
У статті проведено аналіз світового фармацевтичного ринку, визначено, що основними факторами, які на нього впливають, є науково-дослідна робота та захворюваності населення. Виявлено, що лідерами на фармацевтичному ринку є компанії, що вкладають значні кошти в розвиток НДДКР, внаслідок чого їх ліки є більш ефективними в лікуванні онкологічних захворювань.
Ключові слова: світовий фармацевтичний ринок, світові продажі, НДДКР, захворюваність, онкологія.

Шабалина Л. В., Хумран Р. В. Основные тенденции мирового фармацевтического рынка
В статье проведен анализ мирового фармацевтического рынка, определено, что основными факторами, которые на него влияют, является научно-исследовательская работа и заболеваемости населения. Выявлено, что лидерами на фармацевтическом рынке являются компании, вкладывающие значительные средства в развитие НИОКР, вследствие чего их препараты являются более эффективными в лечении онкологических заболеваний.
Ключевые слова: мировой фармацевтический рынок, мировые продажи, НИОКР, заболеваемость, онкология.

Shabalina L., Khumran R. Main tendencies of the global pharmaceutical market
Analysis of the global pharmaceutical market was conducted in the article as well as the main factors influencing its development, such as the research factor and the sickness rate of population. It was revealed that the market leaders are companies that have invested a significant amount of its funds in R&D. Accordingly, their drugs are more effective in treating the most common diseases, such as oncology.
Keywords: global pharmaceutical market, worldwide sales, R & D, sickness rate, oncology.