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ANALYSIS OF EPIDEMIC SITUATION AND TENTATIVE CALCULATIONS OF ECONOMIC LOSSES FROM INFECTIOUS DISEASES IN UKRAINE IN ASPECTS OF PREVENTIVE HEALTH DIRECTION'S REFORM

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The article estimates the epidemic situation of infectious diseases in Ukraine by analyzing the presence and circulation of pathogens, factors and mechanisms for implementing the epidemic process and state of the managed population immunity to infections. The authors analyzed the main indicators of unstable epidemic situation in Ukraine, which does not favor the medical and economic efficiency of the current state of preventive medicine. Based on some statistics, results of epidemiological forecasting and approximate calculation of future economic burden of infectious diseases authors determined the likelihood of deterioration of the epidemiological situation and increase economic losses from infectious diseases, due to the current political and socio-economic situation in the country. It also analyzed some aspects of reforms on preventive direction in health Ukraine in recent years and concluded on possible negative results of realization of some of them. The current attitude to the problem of infectious diseases, specific preventive, sanitary and epidemiological welfare and preventive medicine in general can lead to significant complications epidemiological situation and new social and economic losses.

Key words: infectious diseases burden, sanitation and epidemic situation, vaccinoprophylaxis, preventive medicine reforms.

Infectious diseases despite advances in modern medical science and practice, the efforts of the medical community remain essential health care, social and economic burden to society globally and within individual countries. In particular, it is very important for Ukraine and, especially in the difficult economic and political times, when the issue of control of the epidemic situation, the management of infectious diseases in the state acquires the status of national security.

In recent years the situation with infectious diseases in Ukraine is complicated, due to several factors. Among them, a sharp decline in immunization coverage of children as well as adults that, in the absence of appropriate urgent measures in the near future could lead to further outbreaks and epidemic spread of polio, diphtheria, measles, mumps and other infections that previously controlled means vaccine. Experts note the intensification of the process of epidemic infectious diseases with

high epidemic potential (tuberculosis, HIV, viral hepatitis), enteroviral infections (acute flabby paralysis, serous meningitis, etc.), number of intestinal infections, etc. (our state is one of the first places in Europe the levels of infectious diseases, primarily HIV, tuberculosis, viral hepatitis B and C). Not to mention the potential risk of skidding and distribution agents of especially dangerous infections to Ukraine from other states. This is reinforced by the worsening socio-economic and health conditions of much of the population, intensification of internal and external migration, etc.

To illustrate the above present the results of epidemiological analysis and forecast epidemic situation of infectious diseases in 2015, carried out by evaluating such things as the availability and circulation of infectious agents in Ukraine; condition factors and mechanisms of implementation epidemic process; state population immunity to infectious diseases.

1. Availability and circulation of pathogens. In 2012 in Ukraine there were 7,332,729 cases of infectious diseases, including those managed by means of specific preventive treatment; in 2013 - 7,843,365 cases; for 9 months of 2014 (no data Crimea, m. Sevastopol, Lugansk region and some districts of Donetsk region) - 5,091,169 cases (Fig.). These data indicate intense circulation of pathogens that cause infectious diseases, primarily among unprotected (neimunizovanoho) population. In particular, for 9 months 2014 first fell ill with tuberculosis respiratory 18,590 people pertussis - 1131, measles - 2201, rubella - 1260, acute hepatitis B - 1164, mumps - 347.

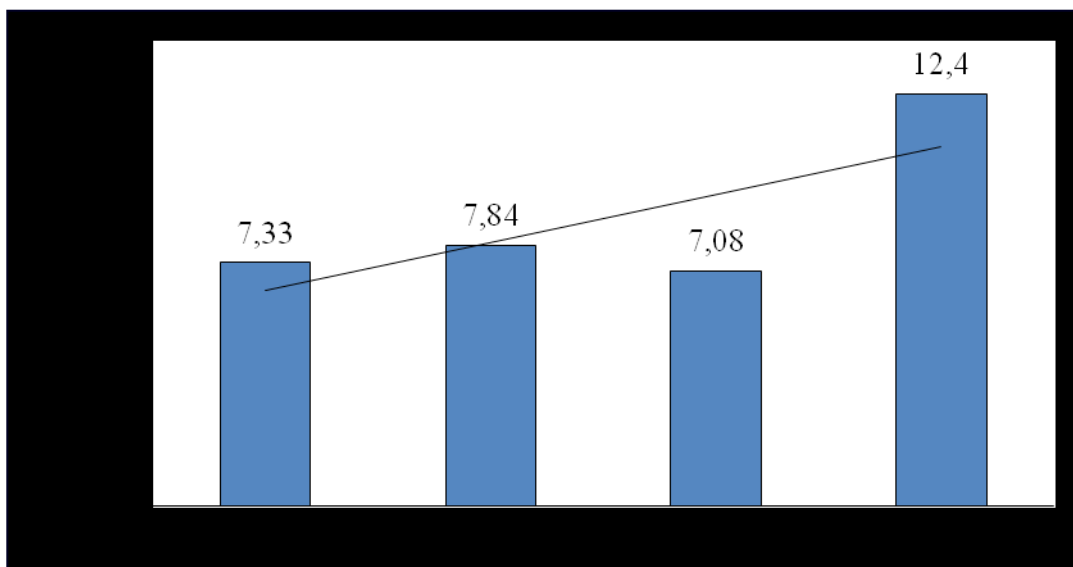


Figure. Infectious morbidity in Ukraine (mln. Cases)

* – Since March 2014 without data of ARC; from April 2014 - no data in Sevastopol.; August - without data from 4 cities and 4 districts of Lugansk region; from September 2014 - from 7 cities and 3 districts of Luhansk region.

** – forecast

2. Factors and mechanisms epidemic process. State communal welfare, social and health conditions of people living in the whole country can hardly be regarded as satisfactory that are complicated by war and terrorism. Emergency in power, poverty and economic decline, poor quality of drinking water and food, the general deterioration in the quality of environmental factors of human activity, significant migration, financial problems of health care and the elimination of the State Sanitary and Epidemiological Surveillance activate all of these factors and mechanisms of implementation epidemic process.

3. State of immunization. Today it makes no sense to discuss the importance of specific preventive treatment of infectious diseases, as one of the most effective preventive and anti-epidemic measures was demonstrated decades of its practical implementation. According to the tenets of classical epidemiology, in the presence of 95% of the population resistant to infectious diseases (ie vaccinated) individuals pathogen circulation stops, and the population is regarded as prosperous epidemic (L.V.Hromashevskyy). Analysis of the plan for preventive vaccination in 2009-2013, the whole Ukraine showed that during these years the state virtually disrupted the formation of population immunity to infectious diseases (Table.).

Table. Implementation of the plan of preventive vaccinations in Ukraine for 2009-2013

Years / Т ^{сеп.}	Indicators of the plan (%)		
	vaccination	revaccination	Total
2009	64,84	78,79	73,97
2010	50,03	60,25	56,72
2011	51,13	43,10	45,91
2012	67,10	61,46	63,02
2013	53,01	47,43	49,50
The average long-term rate of reduction	-1,15%	-10,57%	-7,37%

As you can see, for 5 years analyzed vaccination coverage of children's and adult population of Ukraine decreases on average 1.15% per year (moderate tendency), revaccination - at 10.57% per year (pronounced trend), and the whole plan for the implementation of specific immunization annually reduced by 7.37%. Only during 2013 there were 12,834,344 scheduled to perform vaccinations are not satisfied immunizations 6,486,253 - 50.5%, and for 9 months of 2014 the situation has worsened.

Thus, the population of Ukraine is critically vulnerable to infectious diseases, guided by means of immunization.

4. Calculation of the losses of the country from infectious diseases in 2013 and 9 months of 2014. With an average treatment duration of one case of infection in 7 days in 2013 the country lost 3,574,389 man-days to treat sick people, not the GDP growth (87.75 USD. 1 day); thus the GDP lost about 314 mln. UAH of income. In addition, the cost of intensive treatment of infectious patient was about 250 USD. day

(including costs of diagnosis, medication, food, etc.). Expenditures for treatment of budget and the population was about 894 million. UAH.

Similar calculations for 9 months of 2014 indicate that for the period 35,638,183 countries lost man-days. Accordingly, the loss of GDP for 9 months in 2014 due to infectious diseases accounted for, approximately, 3.127 billion. UAH. Additional costs budget and public funds for the treatment of infectious patients was about 8.9 billion. UAH. Thus, the total cost in the country due to infectious diseases during 9 months of 2014 are more than 12 bln. UAH.

5. Forecast. To begin to define terms. The epidemic situation - a measure epidemiological welfare area (object) in a time characterized by the level and dynamics of human infectious diseases, presence or absence of relevant factors of transmission of infection and other circumstances influencing the spread of infectious diseases. In accordance with the relevant provisions of the Law of Ukraine "On population protection against infectious diseases" (from 06.04.2000 g. № 1645-III), the epidemic situation may be prosperous, unstable and dysfunctional. Prosperous epidemic situation - infectious diseases are not registered or registered their rare cases, there are no favorable conditions for the spread of these diseases; unstable epidemic situation - the level of human infectious disease does not exceed the average long-term performance, but there are favorable conditions for their distribution; unfavorable epidemic situation - the level of human infectious diseases than average long-term performance, recorded outbreaks of infectious diseases. The sanitary and epidemiological situation - the state of the environment and life due to his state of health in a particular area in specifically defined time.

Based on the above analysis, the state of the epidemic and sanitary-epidemic situation in Ukraine called safe no reason.

We should not forget that today in some regions of Ukraine there was an emergency that because of ATO and, in fact, through military action, can not affect the course of a number of epidemic infectious diseases toward its revitalization, as evidenced by history. Therefore, there is every reason to talk about the extraordinary epidemic situation - a progressive increase in the number of infectious patients in epidemic foci, leading to arrhythmias living a certain territory, formed perhaps passing pathogen abroad, burdening the disease and increase the number of adverse effects.

The formation and dynamics of the epidemic situation depends on complex factors, which is especially felt in emergencies. The list of these factors, in particular, include: the intensity of the migration of certain populations, the epidemiological situation in the region; destruction of housing, energy networks, water supply and sewerage, Catering, services; worsening health conditions of the population and so on. Emergencies, in the absence or substantial limitation of relevant and epidemic prevention measures, lead to an increase in the incidence of acute intestinal and respiratory infections, natural focal and dangerous disease, pediculosis, etc; in a number of cases continued threat of diseases, pathogens which form spores. Thus for

outbreaks that occur against the background of emergency, characterized by activation of the mechanism and all modes of transmission of pathogens, simultaneous massive human infection, which can lead to "an explosion of epidemiology." Besides violated established system of epidemic and preventive measures ensuring preventive vaccines and their application procedure; difficult access to health care in the event of infectious diseases or outbreaks; decrease the possibility of infectious hospitals and power (potential source of infectious agents long remain isolation and medical assistance); untimely bury the bodies so on. All this, directly and indirectly affecting all three constituent parts of the epidemic process (active and source of pathogen infection and its transmission mechanism, increasing the susceptibility of the organism), leads to an increase in infectious diseases.

Thus, it is clear that the epidemic situation forecast was calculated the likelihood of infectious diseases (sanitary losses) during emergency situations by the

$$S = K \times I \times (1 - H) \times (1 - P) \times E$$

formula:

, where

S – number of cases (sanitation costs);

K – population (contacting);

I – contagious index;

H – nonspecific protection factor;

P – specific protection factor;

E – emergency prevention factor.

$$S = 45377581 \times 0,6(1 - 0,3) \times (1 - 0,35) \times 1 = 12388079$$

Thus, without proper anti-epidemic work during 2015 can expect about 12.4 million. Cases of infectious diseases (see. Fig.), Leading to a loss of about 86.8 million. Man-days, about 7.616 billion. UAH. GDP losses and cost of treatment (with state funds and public) the sum of 21.7 billion. USD. Expected losses of the country from infectious diseases in 2015 may amount to more than 29 bln. UAH.

For many decades the epidemic situation of infectious diseases in Ukraine controlled by operation based health service established system of epidemiological surveillance of infectious diseases that covered all administrative-territorial national level and coordinated by the Ministry of Health. This subordination allowed to exercise rational preventive and control measures to protect the public from infectious diseases, conduct surveillance for disease control and anti-epidemic preventive measures in a timely manner and smoothly overcome the epidemic

outbreaks and epidemics, to provide control over most infectious diseases, guided by means of specific prevention etc. . All this helped to keep hundreds of thousands of lives and provide much of the population lives full years.

In September 2014 the Cabinet of Ministers of Ukraine adopted a resolution "On optimization of central executive power", under which created the State Service of Ukraine on food safety and consumer protection by merging the State Veterinary and Phytosanitary Service of Ukraine, the State Inspectorate of Ukraine Consumer Protection and the State Sanitary and Epidemiological Service of Ukraine (SSES). And a reform of the health sector in terms of preventive medicine lasts for years. So, Azarov's government made a decision to eliminate a 2013 Health Ministry sanitary and epidemiological service, which worked elimination of harmful factors on health, reduction of disease, including infectious. What gave elimination of sanitary-epidemiological service country? In 2012, when the service was working at full strength, functioning state supervision, preventive measures implemented at the right volume, there were 7,332,729 registered cases of infectious diseases. Since January 1, 2013 Sanitary and Epidemiological ceased to exist. and almost two years of service remains liquidated all Ukraine reorganization measures carried out what has gone million. If you count the expenditures on payments to reduce the number of employees SES (about 20 thousand specialists), namely compensation, severance, unpaid debt capitalization expenditures, expenditures employment services, including retraining redundant workers, the amount of total loss budget ten times higher than the wage fund saved redundant workers. In addition, basic training was suspended medical epidemiologists and hygienists eliminated faculties in universities, underfunded areas of sanitary and epidemiological science. The economic damage caused by ill-conceived reorganization of the country is evident even without taking into account the social component problems and subsequent consequences.

Of course, today the necessary reforms SSES as changes in the health system in Ukraine as a whole. But the distribution functions of sanitary-epidemiological service between different ministries and agencies without a clear definition of the algorithm functioning of the newly created State Service in matters of epidemiology and prevention of infectious disease, including vaccination, investigate outbreaks, in the centers of infectious diseases, etc., against outdated or no regulatory base for many infectious diseases lead to the fact that preventive direction left without due attention. It should not be forgotten that a characteristic feature of infectious diseases is an opportunity for dissemination at the lowest reduction intensity control measures and prevention against the backdrop of deteriorating socio-economic conditions of the population. Speaking at a meeting of the Committee on Health Verkhovna Rada of Ukraine (03.04.2013 g.), Academician of NAMS of Ukraine YI Kundiyeu noted that President Barack Obama within the public health programs in the United States proclaimed the establishment of preventive services based on the model of the State Sanitary and Epidemiological Service of the former Soviet Union which are justified and tested for centuries.

It is clear that you want to restore preventive medicine, establish proper diagnosis at the primary level, to introduce a mandatory clinical examination of the population, restore routine hospitalization. You need to combine the efforts of doctors, managers, economists, population, and with the support of the government to improve and not to break the extremely socially sensitive industry.

It is clear that reforming health care - is actually reforming society, all its constituent relationships and foundations. Therefore, the restructuring should be carried out extremely transparent, reasoned and understanding the processes of transformation as doctors, and every citizen. Everyone must clearly understand that it will reform, where it will receive the necessary assistance and to what extent. Unfortunately, this says little.

Conclusions

1. The reasons for the situation in the country in the field of sanitary and epidemiological welfare is insufficient attention at all levels of government in recent years to the direction in preventive health priority treatment; elimination preventive direction of health care, the actual destruction of the State Sanitary and Epidemiological Service.

2. It is necessary to take immediate measures to improve the system of state sanitary and epidemiological surveillance. Failure to take appropriate measures at the state level in Ukraine is a real threat of epidemics of infectious diseases inevitably impact on the demographic situation in the country, a significant loss of GDP and budget. Would suffer substantial harm to national security, international relations, investment, the country's defense.

АНАЛИЗ ЭПИДЕМИЧЕСКОЙ СИТУАЦИИ И ОРИЕНТИРОВОЧНЫЕ РАСЧЕТЫ ЭКОНОМИЧЕСКОГО УЩЕРБА ОТ ИНФЕКЦИОННЫХ БОЛЕЗНЕЙ В УКРАИНЕ В АСПЕКТЕ РЕФОРМИРОВАНИЯ ПРОФИЛАКТИЧЕСКОГО НАПРАВЛЕНИЯ ЗДРАВООХРАНЕНИЯ

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Статья посвящена оценке эпидемической ситуации по инфекционным заболеваниям в Украине на основе анализа наличия и циркуляции возбудителей болезней, факторов и механизмов реализации эпидемического процесса и состояние иммунитета населения к управляемым инфекциям. Авторы проанализировали основные индикаторы нестабильной эпидемической ситуации в Украине, которые не свидетельствуют в пользу медико-экономической эффективности нынешнего состояния профилактической медицины. На основе некоторых статистических данных, результатов эпидемиологического прогноза и приблизительного расчета будущего экономического бремени инфекционных заболеваний авторы определили вероятность ухудшения эпидемической ситуации, а также увеличения экономических потерь от инфекционных заболеваний, что связано с нынешней политической и социально-экономической ситуацией в стране. В статье также проанализированы некоторые аспекты внедрения медицинских реформ в отношении профилактического направления в здравоохранении Украины в последние годы, и сделан вывод о возможных негативных результатах реализации некоторых из них. Существующее на сегодня отношение к проблеме инфекционных болезней, специфической иммунопрофилактике, санитарно-эпидемического благополучия и профилактической медицины в целом может привести к существенным осложнениям эпидемической ситуации и новым социально-экономическим потерям.

Ключевые слова: *бремя инфекционных заболеваний, санитарно-эпидемиологическая ситуация, вакцинопрофилактика, реформы профилактической медицины.*

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The article is devoted to the estimation of infectious diseases epidemic situation in Ukraine based on analyses of infectious agents presence and circulation, factors and mechanisms for the epidemic process realization, and state of population immunity to vaccine-preventable diseases. The authors have analyzed the key indicators of unstable epidemic situation in Ukraine that not testify the medical-economic efficiency of current state of preventive medicine. On the basis of some statistics, and results of epidemiological prognosis, and tentative calculation of future infectious disease burden authors determine the probability of the deterioration of epidemic situation as well as increasing of economic losses from infectious diseases associated with the present political and socio-economic status in country. In paper some aspects of medical reforms for prevention direction of health care of Ukraine in recent years analyzed also, and made conclusion on possible negative results of some of them implementation. Current attitude to the problem of infectious diseases, specific immunoprophylaxis, sanitation and epidemic wellbeing, and preventive medicine in general can lead to substantial complications of epidemic situation and new socio-economic losses.

Key words: *infectious diseases burden, sanitation and epidemic situation, vaccinoprophylaxis, preventive medicine reforms.*