

Modern problems of reproduction of public health of the population

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Abstract

The study is based on the development of the basic provisions for the implementation of sustainable development, namely one of its goals: “Overcoming poverty in all its forms”, which were approved in 2015 at the UN Summit on Sustainable Development. Reproduction of the public health of the population is the basis of the mechanism for the prevention of poverty in the territories, presented in doctoral dissertation Martynovych Nataly. Also, modern problems of reproduction of public health of the population form the conceptual foundations of the applied state theme “Economic and legal support of the strategic development of newly formed territorial communities”. This topic was approved by the Decree of the Bureau of the Department of Economics of the National Academy of Sciences of Ukraine and is carried out by the staff of the department of problems of interregional cooperation of the Institute of Economic and Legal Research of the NAS of Ukraine Martynovych Nataly, Boichenko Elina. The purpose of the research is to determine by the empirical way modern problems of reproduction of public health of the population and the development of comprehensive measures to overcome them. The findings showed an integral assessment of the state of public health of the population was carried out, as a result of which it was established that only three-quarters of the population of Ukraine can be considered healthy. Empirically, an increase in the deficit of the average life expectancy of the population is determined, and the main reasons for such dynamics are also indicated. The proposed measures to promote an increase in the life expectancy of the population of the region.

Keywords: *health, life expectancy, mortality, morbidity, medical, integral assessment.*

JEL classification : I15, I18,

INTRODUCTION

One of the most important indicators of socio-economic development of the state is the condition of public health of the population. The ability of a person to live a long life and maintain his health depends on socio-economic factors such as material conditions of life, the level of development of health care, as well as on the man-made load on the natural environment. The state of human health determines the future and is regarded as the highest social value of society. Modern crisis phenomena in the

domestic economy have a negative impact on the processes of development of the health sector, the effectiveness of which depends on the health of citizens. The medical sector, which receives funding from the budget, is characterized by low wages of medical personnel, lack of funds for the renewal of medical equipment and the purchase of medicines, and other problems that prevent the possibility of solving the issue of providing medical care to the population in full. The problem of health deteriorating is also exacerbated by the declining living standards of most population and the man-caused burden on the natural environment. Thus, the health condition of the population of the state can be considered not only as one of the most important indicators of the quality of life, but also as one of the important indicators of its socio-economic development.

The purpose of the study is to determine empirically the modern problems of reproduction of the public health of the population and to develop comprehensive measures to overcome them. Based on the objective of the study, the following tasks were set and solved: 1) To establish the main causes of negative trends in the reproduction of public health; 2) Develop a set of measures to overcome the negative manifestations in the reproduction of the public health of the population.

METHODOLOGY

The methodological basis of the study is primarily a set of methods of scientific knowledge, general scientific and special research methods. The theoretical basis was the fundamental principles of economic theory, regional economics, sociology, strategic management of the socio-economic development of regions, scientific works of domestic and foreign scientists concerning the production of public health. For example, the research of the health of the population and its influence on the current demographic situation are depicted in the works of scientists (Borodavchenko, Kononova., & Pashchenko, 1990; Libanova, 2014). However, despite a significant number of scientific publications and achievements in this field, the individual aspects of this multifaceted problem remain controversial and require further study.

To form the definition of the “reproduction of public health of the population” category, the judgments of such authors as: (Pérez, Ravasi, Figuera, Grinsztejn, Kamb, Sued, & Massimo, 2016) were analyzed; (Etienne 2017); (Hirani & Richter, 2017); (Chiappero-Martinetti 2014); (Hall, Taylor, & Barnes, 2013), (Arah, 2009) and others. Summarizing the scientific points of view came to the conclusion that under the reproduction of public health of the population should be understood the process of continuous renewal and preservation of the viability of the population.

The public health of the population was assessed using a synthetic method that combines the results obtained during the analysis and contributes to determining the strength (measure) of intensity and the direction (trend) of the influence of some components of the social life of the population on others. For example, the synthetic method allows to determine the strength of the influence of population reproduction on the processes of formation of labor resources or the level of public health. Or, on the contrary, to determine the strength and direction of the impact of the components of the reproduction of public health on the formation, distribution, redistribution and use of labor resources, the number and age structure of the population, and the like. This allowed us to identify negative processes and phenomena in reproduction. The list of

indicators, with the help of which the state of public health was assessed, is given in Table 1.

Table 1. The matrix of the selection of indicators for assessing the reproduction of the public health

Indicators	Methodical tool kit
Mortality by main reasons, from some external causes, children under the age of 1	Assessment of the level of public health of the population
Number of doctors; number of middle medical personnel	Mortality structure of the population; morbidity; infectious disease; hospitalization by classes, groups and forms of diseases for certain groups of the population; average; modal and median age of the deceased.
Number of workers employed in areas with harmful working conditions; disabled people	Mortality rates: general, special (differentiated), age, individually for each sex, infants, children under the age of 5, stillbirth, maternal, for certain cause of death. The level of age-related mortality; the proportion of premature deaths in the total mortality of the population; index table mortality of men or women.
Number of hospitals; outpatient clinics and beds; planned capacity of outpatient clinics.	Birth rate: general, special, total, age. The ratio of the number of deaths and births.
Primary incidence (frequency of diseases), seasonal, infectious, according to medical examinations; by classes of diseases; the incidence of certain infectious diseases, active tuberculosis, venereal diseases, mental and behavioral disorders, HIV-infected people and AIDS patients; disability.	Mortality rate: total; by separate groups and forms of illness; the proportion of individual groups of diseases, infectious diseases, the incidence rate of different population groups.
The number of injured and injured in production, by city and district.	Level of hospitalization of the population of age, sex, professional; average length of stay in a hospital for a particular disease (group and class of disease); multiplicity and hospitalization – by separate forms, groups and classes of diseases for certain groups of the population; the capacity of outpatient clinics.

The assessment of reproduction of public health was carried out on the basis of a systematic approach, the use of which is justified by the need to determine the impact of both external and internal factors of influence on the health of the individual.

The analytical basis was compiled by official statistical information obtained from publications of the State Statistics Service of Ukraine. The following materials were used: statistical yearbook ‘Statistical Yearbook of Ukraine’, statistical collections ‘Ukraine in Figures’, ‘The number of available population of Ukraine’, ‘Distribution of permanent population of Ukraine by sex and age’, demographic yearbook ‘Population of Ukraine’, statistical bulletin ‘Healthcare institutions and morbidity of the population

of Ukraine', 'Traumas in the workplace', 'Birth rate tables, mortality and average life expectancy', as well as some information from the official website of the State service of statistics of Ukraine.

RESEARCH RESULTS

According to previous theoretical studies, it has been established that the notion of 'individual health' is not clearly determined, but is associated with a multitude of factors affecting a person. Human health is one of the most important factors in the conditions of its existence. The state of public health of the population significantly influences the dynamics of economic development of the country (or its separate region) through the impact on the quality of human resources. In this context, the 'need for health' already goes beyond the scope of the individual and is of a general nature – 'public health', which is the property of the state and serves as an indispensable condition for the successful use of its productive forces (Glushakov 2011). Based on the above, let us note that the reproduction of the public health should be understood as the process of continuous renewal and preservation of the viability of the population.

The assessment of the reproduction of the public health should be considered as a process consisting of two interconnected components. Firstly, the assessment allows a comprehensive study of trends and patterns of development of the health of the population. At the same time, living conditions, industrial relations, as a rule, are crucial for the health of people. Secondly, the study cannot be considered objective without taking into account trends in the development of the health care system, namely, the forms and methods of work of various medical institutions, the quality of medical care, etc.

Obtaining an assessment of reproduction of the public health of the population is possible on the basis of a systematic approach, the use of which is justified by the need to determine the impact of both external and internal factors of action on the state of health of the individual. The external ones include those that are formed depending on the level of economic and social development of society. These should include the financing of health facilities, the development of the diagnostic system, the prevention and treatment of diseases, the level of technology-related loading of the territory, etc. The internal factors are physiological features of the human body such as age, sex, the presence of certain types of diseases, hereditary predisposition to disease; provision of high-quality food products to the population; social status, education, occupation of the individual, conditions of his work, cultural level, etc.

As it has been already stated, the health care system of Ukraine is based mainly on the state funding. The most important problem in this branch is its underfunding, which does not allow providing the volumes of medical care that are necessary for citizens. Medical institutions are the providers of medical services, the quantity and quality of which is directly dependent on the amount of funding. It should be noted that consumers of health services have different health conditions, different attitudes to the prevention and treatment of diseases, and unequal opportunities for paying medical care.

The analysis of the change in the number of physicians of all specialties suggests that since 1990 (Mineva 2003) in Ukraine their number has decreased by 17.6%, from 227 thousand people to 187 thousand people in 2016, that is, 40 thousand people. But it should be noted that, on the basis of 10 thousand people, the reduction of doctors almost have not changed and makes 44 people. Significant changes can be noted in the

structure of the average medical staff, the number of which for the analyzed period sharply decreased – by 240 thousand people (almost 40%), and this trend is observed throughout the analyzed period. Also, there is a reduction of average medical personnel per 10 thousand population by 31 persons (compared with 1990). The number of hospital beds has decreased almost twice – from 700 thousand units to 315 thousand units for the period of 1990 – 2016. For the population of 10 thousand, this reduction was 45.2% (61.2 thousand units).

The experience of the developed countries regarding the containment of health care expenditures shows the reduction of the share of doctors in the total number of employed, delegating part of their duties to the lower skilled workers (nurses, medical assistants and so on). However, as it has already been noted, in Ukraine during the analyzed period there is a decrease in the number of not only doctors, but also middle medical personnel. Thus, there is an increase in the burden on health workers in the country, which, in turn, can affect the quantity and quality of services rendered.

The next problem of reproduction of the public health is the high mortality rate of the Ukrainian population, especially in the working age, which affects the expected life expectancy of the population and becomes one of the urgent problems of society. On that basis, modern studies of the structure and dynamics of the life expectancy of the population, as well as the identification of the reasons influencing it, are of particular importance.

The expected life expectancy at birth is one of the main integral indicators that characterizes the health status and causes of mortality in a certain area, quality of life and the level of health care. UN selection of this component as one of the three components that characterize the welfare of the population, due to the fact that the average life expectancy depends on the conditions of existence of society.

In the beginning of 2015, Ukraine ranked 148th out of 192 countries in terms of life expectancy (71.5 years old). So, the deficit of the expected life expectancy at birth was 18.02 years old, that is, there is a backwardness in this category from economically prosperous states for almost 18 years. For life expectancy, Ukraine was even ahead of underdeveloped and developing countries such as Ecuador (82nd place, 76.56 years old), Libya (88th place, 76.26 years old), Egypt (126th place, 73.70 years old), Uzbekistan (128th place, 73.55 years old), Brazil (129th place, 73.53 years old) and dozens of others (Health economics 2008).

The main reasons for such a situation are the low level and unfavorable living and working conditions of a large part of the population of Ukraine, low efficiency of the existing health care system, pollution of a large part of the territory by industrial waste, prevalence of bad habits and neglect of healthy lifestyle standards.

The key problems of the health of the population of Ukraine are related to the morbidity and mortality of the so-called ‘socially dangerous diseases’ as AIDS (HIV) and tuberculosis, which reflect, first of all, the way and conditions of a person’s life. Despite the fact that the number of patients with active tuberculosis has a stable tendency to decrease from 31.3 thousand people in 2010 to 23.3 thousand people in 2016, the total number of patients remains very significant. Every year, on average, about 20 thousand patients with tuberculosis are found in Ukraine. Most often people of working age and reproductive age are affected. This negative tendency can be explained by the deterioration of the conditions of treatment and complications of tuberculosis.

The number of people infected with HIV and AIDS patients who are registered in medical institutions of Ukraine in 2016 is 133.1 and 38.8 thousand persons, respectively (Ukraine in figures in 2017).

It should be noted that the health of the population is affected by the consumption of alcoholic beverages, narcotic drugs, as well as tobacco products. According to the analysis of the consumption of alcoholic beverages in Ukraine, it has been established that there is a negative tendency to increase their consumption volumes. This is especially true of the consumption of strong alcoholic beverages, which have the most harmful effects on the health of the population and lead to negative social and economic consequences. Thus, for the purchase of alcoholic beverages and tobacco products, households spend 4.7% of the total cash expenditures per month, for example, about 2.7% spend on the health care of the household, 2.3% – on recreation and culture. It should also be taken into account the fact that there is no direct statistics on the consumption of alcohol and narcotic drugs in Ukraine, such an assessment can only be made on the basis of an analysis of the volume of registered alcohol sales or according to relevant sociological studies. The reliability of official statistical reporting is questionable, since it does not reflect the true capacity of the Ukrainian alcohol market, the size of which is much larger than the declared. The corresponding expert estimates of alcohol consumption among Ukrainians vary by an average of 10 – 13 liters per capita. It is worth remembering that, according to the WHO, alcohol consumption of more than 8 liters per year is dangerous and detrimental to health. So, the increase in average per capita consumption of alcohol by 1 liter adds 8 men and 1 female suicide per 100 thousand men and 100 thousand women. The population with alcohol addiction has the risk of suicide 9 times higher than for the rest (Ukraine in figures in 2008).

In Ukraine, during the 90's of the twentieth century, the rate of drug addiction and substance abuse increased fourfold, in addition, the number of patients (per 100 thousand people) who are being registered about mental and behavioral disorders due to the use of narcotic and other psychoactive substances increased more than three times. Thus, the spread of drug addiction in Ukraine remains, along with alcoholism, one of the most important and serious problems. If we take into account the fact that the official statistics do not give a real picture of the drug use by the population, the scale of this problem in the country is not defined. Drug use leads not only to the physical and social degradation of a person, but also poses a threat to the negative consequences for society as a whole. Among them, one can identify such as raising the level of crime, increasing the number of serious and especially grave crimes; the spread of a wide range of concomitant diseases (hepatitis, tuberculosis, HIV, AIDS, which requires the state to increase the cost of prevention and treatment of these diseases).

Other illnesses (HIV, hepatitis viruses, etc.) are common among drug addicts, which considerably decrease the life expectancy of a person. It has been established that the average life expectancy of a drug addict used by heroin does not exceed 7 years since the beginning of drug addiction. In fact, the vast majority of them are doomed to early death.

It is also important to consider that the health of the individual changes over time. With age there is a process of accumulation of certain types of diseases, which are caused by the way of human life, working conditions, physiological characteristics of the human body and other factors. Consequently, its support requires appropriate investments, that is, the cost of medical services.

For the integral assessment of the state of public health, the following formula is proposed:

$$I_3 = \left(1 - \frac{\sum_{i=1}^n k_n}{n} \right), (1)$$

where k_1 – the mortality rate of children under the age of 1;

k_2 – the mortality rate of the population for the main reasons, except mortality from accidents;

k_3 –rate of morbidity of the population;

k_4 – rate of patients who were registered in medical establishments with HIV and AIDS, malignant neoplasm, mental and behavioral disorders, active tuberculosis and sexually transmitted diseases

k_5 – rate of disability

An integrated assessment of the state of public health is given in Table 2.

Table 2. Integral assessment of the state of the public health of the population of Ukraine

Indicator	Years					
	1995	2000	2005	2010	2015	2016
Assessment of the state of public health of the population	0.853	0.848	0.846	0.842	0.844	0.844

Source: Ukraine in figures in 2017

Thus, according to the results of calculations, it can be stated that only three quarters of the population of Ukraine can be considered healthy.

As the level of reproduction of the public health of the population of the region, it is expedient to use the indicator of the average life expectancy at birth, which is one of the main integral indicators that characterizes the health status and causes of mortality of the population of a certain territory, quality of life and the level of medical care. The dynamics of the deficit index of the average life expectancy at birth can be considered a reflection of the efforts of society aimed at reducing mortality and improving the population.

The average expected life expectancy of a future life is calculated on the basis of mortality rates by mortality (or survival) tables. The indicator of the expected life expectancy at birth is calculated both for the entire population of the region (for women and men together), and separately. Determination of the deficit of the average life expectancy at birth as a result of mortality from the main and external causes allows to establish a change in the value of this indicator, provided that the complete elimination of mortality from a specific cause.

Changes in the reproduction of the public health of the population are manifested in the deficit of the average life expectancy associated with changes occurring in the social life of the regional society and the state of health of the individual. In order to determine the direction of change, such gradations of a qualitative state are highlighted: growth, stagnation, reduction. The results of quantification public health are shown in Table 3.

Table 3. Results of quantification of reproduction of public health of population of Ukraine.

Indicator	Trend model	Trend direction			Result	Consequences	
		Abbreviation	Stagnation	Growth			
Functioning of the health care system							
The number of physicians of all specialties, one thousand people	$y=241-4.509x$ $R^2=0.691$	+			Real danger	Increased deficiency of life expectancy at birth	
per 10 thousand inhabitants	$y=48.01-0.248x$ $R^2=1$	+					
Average number of medical personnel, one thousand people	$y=623.13-26.061x$ $R^2=0.952$	+			Real danger		
per 10 thousand inhabitants	$y=117.83-3.412x$ $R^2=0.965$	+					
Number of hospitals, one thousand institutions	$y=4.11-0.248x$ $R^2=0.963$	+			Real danger		
Number of hospitals, one thousand beds	$y=653-35.782x$ $R^2=0.803$	+			Real danger		
in the amount of 10 thousand inhabitants	$y=114.02-4.28x$ $R^2=0.724$	+					
Number of doctor's outpatient clinics establishments, one thousand institutions	$y=0.406x+6.27$ $R^2=0.735$			+	No danger		
The state of public health							
Population incidence, one thousand cases	$y=35.786-1.382.6x$ $R^2=0.654$	+			No danger		
per 100 thousand dpopulation	$y=68,271-481.51x$ $R^2=0.047$	+					
HIV-infected persons	$y=28.466x-21.213$ $R^2=0.923$			+	Real danger		
per 100 thousand population	$y=67.44x-58.773$ $R^2=0.935$			+			
AIDS patients, people	$y=7.89x-13.027$ $R^2=0.894$			+	Real danger		
per 1,000 inhabitants	$y=18.583x-31.607$ $R^2=0.885$			+			
Incidence of active tuberculosis, persons	$y=29,468-250.23x$ $R^2=0.005$			+	Real danger		
per 100 thousand inhabitants	$y=1.506x+56.513$ $R^2=0.039$			+			
Number of disabled people	$y=299.7-37.2x$ $R^2=0.891$	+			Real danger		
per 1,000 inhabitants	$y=51.1+0.9x$ $R^2=0.931$			+			
Mortality of children under the age of 1, one thousand persons	$y=3.68-0.36x$ $R^2=0.986$	+			No danger		
per 1,000 births	$y=13.38-0.74x$ $R^2=0.772$	+					

Thus, the negative trend of reproduction of the public health of the population is revealed that there is a problem situation in the state of the public health of the population, in financing and functioning of the health care system and social assistance. The consequences of the existence of these problems are an increase in the deficit of the expected life expectancy at birth, which characterizes the adverse development of population reproduction processes.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

The main causes of negative trends in the reproduction of the public health are the existing problems in the economic (income level of the population), social (living conditions) and environmental (state of the environment) development of the country. The formation of national tendencies depends on the individual (the individual's health), which is confirmed by an increase in the deficit of the average life expectancy;

Overcoming negative manifestations in the reproduction of the public health of the population requires the development of complex measures, such as the transition to new technological forms of production, which will help minimize the occurrence of man-made risks; development of innovative programs on immune prophylaxis, prevention of the spread of AIDS, early diagnosis of infectious and cancer diseases, reduction of cardiovascular diseases; strengthening the promotion of a healthy lifestyle through the formation of motivation for the population to preserve and strengthen health, etc.

All this will increase the life expectancy of the population of the region and the country as a whole.

Recommendations

Suggest that, as a first step, overcoming negative manifestations in the reproduction of public health of the population should be considered as a transition to new technological forms of production, which will help minimize the occurrence of technological risks; secondly, to develop innovative monoprophyllaxis programs that would help prevent the spread of AIDS, early diagnose infectious and oncological diseases, and reduce cardiovascular diseases; thirdly, to strengthen the promotion of healthy lifestyles through the formation of motivation among the population to preserve and promote health.

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