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## Medical-economic reasonings on the reform in the field of state surveillance of public health

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### Abstract

**Background:** The functional organization of the service, institution or organization requires adjustment to challenges of the social, economic, and professional environment that intervene development stages of society. This is also true for the Public Health Supervision Service.

**Material and methods:** The results are based on evidence of historical achievements, statistical activity data in public health surveillance, the disease prevention, data on managers' opinion about ways to streamline institutional work, including some results of the economic activity of the institutions.

**Results:** The diminished activity in the prevention of non-communicable diseases is determined by the scarce budget for public health surveillance activities, the lack of staff and the inappropriate approach of the methodology for monitoring environmental factors in relation to the health of the population. Service overloading 1.2-1.4 times to the functional standard, driven by low wages and as a result of staff exodus, has a negative impact on effective indicators of public health coverage. The current model of non-communicable disease prophylaxis, with a particular focus on increasing healthcare investment, does not contribute to improving the population's health indicators.

**Conclusions:** The functioning of the Public Health Surveillance Service under the conditions of insufficient budget with dispersion of the existing number of institutions does not contribute to the efficiency of public health surveillance.

The results of the study, also the health and economic indicators in the health system point to the need for institutional reform to adjust the public health surveillance and financial support for disease prevention activities under the new conditions.

**Key words:** health surveillance, legislation, indicators, prophylaxis, efficiency, reform, budget.

### Introduction

Activities of primary prophylaxis of diseases, protection and promotion of health are declared by law as basic fields in functioning of public health surveillance institutions of our country. In the world, every country defines its own "social institute" – or a system to achieve the mission of public health. Legislation in force of the Republic of Moldova sets the general requirements regarding the public health surveillance, the rights and obligations of individuals and organizations and the way of organizing the system in this field [1].

The foundation of a nationwide system, with tasks in prevention and prophylaxis of undesirable health events, comes out of the necessity to diminish the negative impact, the social, economical and medical burden that diseases impose on society.

The history of the development of the service of public health surveillance has its own stages of evolution, being a part of health system and the successor of the ex-Soviet sanitary-antiepidemic service, organized in the country in the far postwar years. The activity of the sanitary-antiepidemic, or sanitary-epidemiological service (later) in the soviet period (years 1944-1991) was governed by party decisions (The CPSU<sup>1)</sup>) and decisions of the Council of Ministers of the USSR<sup>2)</sup>, that approved the operating rules of the service,

through modifications and further adjustments – a mandatory act for all former union republics.

Thus, the development and efficiency of this system functioning, under such conditions (structures and institutions), were meant to be directly connected with population health, preventive measures undertaken, the level of science development, and last, but not the least, in relation to the economic capabilities of the state, provided for these purposes.

During this period (years 1944-2018) a series of stages followed, marked by certain achievements depending on the level of social– economic development of the state, such as:

- creation of primary sanitary-antiepidemic structures, including sanitary inspection, elimination of the consequences of war, prophylaxis and fight outbreaks of communicable diseases and epidemics, liquidation or reduction of the incidence of infectious diseases (years 1944-1956)<sup>3)</sup> [2,3];
- the integration of preventive and current health surveillance – as a fundamental principle in the functioning of the Service (1956-2016);
- the creation of a self-sustaining service within the

<sup>3)</sup> Establishing the first anti-epidemic organizational structures in the country: – Republican Station for the control of malaria, 1944, – Republican sanitary-bacteriological laboratory, 1944, – Institute of scientific researches in epidemiology and microbiology, 1947, – Sanitary– epidemiologic Republican Station, 1948.

<sup>1)</sup> CPSU – The Communist Party of the Soviet Union

<sup>2)</sup> USSR – The Union of Soviet Socialist Republics

health system<sup>4)</sup>, along with the development of its technical and material basis and the strengthening of the professional potential, the creation of the sanitary and hygiene faculty within Nicolae Testemitsanu State University of Medicine and Pharmacy;

- strengthening and developing the Service infrastructure, continuing the development and implementation of progressive forms of activity by: extending the sanitary and antiepidemic surveillance measures, improving the administration of the Service, (years 1968-1973);
- extending the powers of the Service representatives in health surveillance, including by regulating the application of administrative measures and sanitary-epidemiological restrictions (through prescriptions, prohibitions and / or stopping the exploitation of the objectives) (years 1974-1990);
- organizing the State Sanitary and Epidemiological Service of the Republic of Moldova (the period of independence of the country), the economic crisis with its consequences: in financing, in the gradual decrease of the units in the Service, the exodus of personnel, the evolution of the reformation of the contents and tasks of the state sanitary-epidemiologic service, evolving from sanitary-epidemiological stations to hygiene and epidemiology centers, to preventive medicine centers and to public health centers, years 1991- 2009 [4];
- the adoption of the Law of the Republic of Moldova no. 10 of 2009 – with the subsequent organization of the State Public Health Supervision Service under conditions of community association of the country (years 2009-2016);
- finally, reforming the Service with the creation of the National Public Health Agency and centers of excellence in public health – optimizing the number of institutions and staff (year 2017-present) [5].

The period of domination, in the past, of infectious pathologies in the structure of morbidity and mortality, frequently, with epidemic character and the effect of “depopulation” of territories (by typhoid fever, cholera, dysentery, malaria, trachoma, exanthematic typhus, anthrax, etc.) determined medical science and practice to propose governments to establish certain forms and methods of organizing and fighting these epidemics and hazards. The knowledge of the particularities of the manifestation and spread of these health phenomena, has contributed to hygienic and epidemiologic argumentation of ways and forms of intervention for the localization, stopping, treating and eliminating epidemics, epidemic outbreaks and cases of diseases extremely dangerous for the society.

An important role of success in this fight was due to the complex approach of the antiepidemic measures and the prophylactic principle, implemented through the creation of

<sup>4)</sup> Until this stage, profile structures functioned within medical-sanitary institutions.

certain structures and institutions, eventually – of the state functioning system in order to combat these phenomena.

The dissolution of the Soviet state in the 90s (XX century) and the achievement of the country's independence – a process accompanied by the dysfunction of the professional relations with the profile institutions of the former USSR, followed by the economic crisis [5], as well as the transition of the branches of the national economy to new economic relations, on the whole, dictated the need to adjust institutions to operate the system under the new conditions, including the public health sphere. Thus, the way of financing the sanitary-antiepidemic service, at that stage, according to the ex-Soviet model – only from the limited state budget, over the time, has caused gaps in adjusting the technical-material basis to the occurring events, including the lack of resources for the purchase of vaccines and provision of possibilities for diseases' diagnostics, of identification of new chemical substances in products and materials etc. [6,7]. Their negative result has not been long awaited, undesirable phenomena occurring in the country in the form of epidemic outbreaks and outbreaks of infectious diseases (of diphtheria, measles and rubella, mumps, cases of anthrax, increased number of cases of hepatitis and HIV/AIDS etc.). As a result, during this period, the main health indicators, manifested by high morbidity and mortality, including the infants, are significantly worsening, creating a considerable decline in demographic indices in society.

The created situation imperatively dictated the search for solutions for the recovery of the population's health. The only relevant solution, undertaken by the management of the State Sanitary-Epidemiological Service (SES), at that time, was to appeal to international institutions and bodies, to grant the Republic of Moldova <sup>5)</sup> a help in recovery of the situation. Thus, starting from year '93 (XX century) and up till now, the country was supported financially (and materially) through WHO<sup>6)</sup>, USAID<sup>7)</sup>, GAVI<sup>8)</sup>, UNICEF<sup>9)</sup>, SDC<sup>10)</sup>, European Council and others, in the purchase of vaccines, in fortification of the technical-material basis of the Service, in the implementation of sanitation projects, but also in organizing population surveys (MICS<sup>11)</sup>, MICS4, STEPS<sup>12)</sup> and others). Subsequently, the results of these population surveys represented the main arguments and evidence in the development of National Programs, Regulations and Sanitary Standards, The National Public Health Strategy, etc.

<sup>5)</sup> Republic of Moldova became a member of the World Health Organization on 4th May 1992.

<sup>6)</sup> WHO – World Health Organization;

<sup>7)</sup> USAID – U.S. Agency for International Development;

<sup>8)</sup> GAVI – Global Alliance for Vaccines and Immunisation

<sup>9)</sup> UNICEF – United Nations International Children's Emergency Fund;

<sup>10)</sup> SDC – The Swiss Agency for Development and Cooperation;

<sup>11)</sup> MICS – Multiple Indicator Cluster Survey;

<sup>12)</sup> STEPS – Study of the prevalence of risk factors for non-communicable diseases

### Material and methods

The purpose of the study consisted in identification of the judgments on developing and institutional – functional adjusting of public health service to new conditions created in the sphere of health, including the period of community association of the country. The research is based on the complex analysis of the results of the activities of the institutions of the State Service of Public Health Surveillance (in the period 1995-2016) and the results of the opinion poll of the managers, on the aspects of institutional management. Complimentary research was based on the results of the human and material potential analysis of the Institutions in the Service. The opinion of managers (of institutions and structures) was studied on the basis of the questionnaire<sup>13)</sup> consisting of 62 closed and open questions with 247 variables. The survey comprised 71 managers of level one and two (i.e. chief physicians and heads of departments from 35 territorial CPH), which accounted for 57.3% of the total number of managers (n = 124) of the Service. The lot consisted of respondents with great practical experience as managers; the share of respondents that had a 15 year experience in management represented 80%.

In the research we have used the methods: historical, epidemiological, statistical, questionnaire (survey) and economic. The study also used statistical databases of the National Bureau of Statistics ([www.statistica.md](http://www.statistica.md)) and the National Public Health Center (NPHC) [www.cnsp.md](http://www.cnsp.md).

### Results and discussion

The activities carried out by the specialized institutions of the Public Health Surveillance Service, according to its tasks [1,8,11], during the period 1995-2016, had the expected effect, contributing to the stability of the epidemiological state concerning communicable diseases. As a result, communicable diseases in the general morbidity structure currently account for 11%, compared to year 1990, while the share of transmissible diseases was about 29.6%<sup>14)</sup>.

The results of the analysis of the planned measures and those carried out during this period by the institutions, were mainly focused on prevention and prophylaxis of communicable diseases and less in the field of non-communicable disease prevention (tab. 1).

Thus, insufficient approach to non-communicable disease prevention methodology, along with managerial aspects, through which cross-sectoral health promotion activities are underdeveloped – all on the whole, does not contribute to improving health indices. Therefore, the conditions created continue to maintain the high rate of general morbidity (8118.8‰) and mortality, including that of working age (about 50.6‰) [9]. The process of gradual decrease of

<sup>13)</sup> Questionnaire approved by the Scientific Council of NCPH and through the Provision No 667d of 01.11.2016 "On the organization of the survey on the assessment of managerial aspects in public health surveillance".

<sup>14)</sup> Database, on infectious diseases, 1993-2016 // Form 2, NCPH (without pneumonia, acute bronchopneumonia).

Table 1

Share of preventive and prophylactic activities of communicable and non-communicable diseases in the activity of the SSSP Service institutions (years 2010-2016)

Indices	In the prevention and prophylaxis of communicable diseases	In the prevention and prophylaxis of non-communicable diseases
Share of planned activities by institutions, (in %) <sup>15)</sup>	68.2	31.8
Share of activities carried out according to annual reports /statistical reports /, (in %)	80.9	19.1

[Source: made up by the author based on the analysis of planned activities in 36 territorial CPH and statistical reports]

communicable diseases incidence (due to specific and non-specific prophylaxis measures) and increasing prevalence of non-communicable diseases modified the structure of general morbidity, placing in the foreground the morbidity and mortality caused by non-communicable diseases (fig. 1).

In our opinion, there are several reasons for this situation, and the first one is caused by the "old working habits" of the Service's specialists, who are oriented towards prevention of communicable diseases, which implies a well-known methodology practiced for a long time, compared to the more complex methodology for preventing non-communicable diseases. The methodology of prevention of non-communicable diseases is carried out through a multidirectional spectrum of measures, with intervention in risk factors and determinants of health [10,11]; they are demanding major effort in undertaking of intersectoral and extended measures over time. Measures of preventing and prophylaxis of non-communicable diseases must be substantiated by evidence based on special research (of interrelation), where the values of the environmental factors must be co-reported in the time, space and specific population of the research area. Currently, the values of the factors of the external and internal environment [12], although managed, monitored (investigated, measured, evaluated) daily and/or monthly, their values are not reported in time to the medical centers about the state of health of the population in a specific environment.

Nowadays, research of the health state in relation to the factors that determine it, is carried out with deviation from the classical methodology, the reason, according to answers of respondents, is the lack of possibilities and institutional potential capable of carrying out a sampled research and complying with unanimously accepted regulations, according to the rules of health research outlined in the literature.

Actually in this situation, another reason cannot be

<sup>15)</sup> Based on the assessment of the territorial PHC activity plans (years 2010-2016).

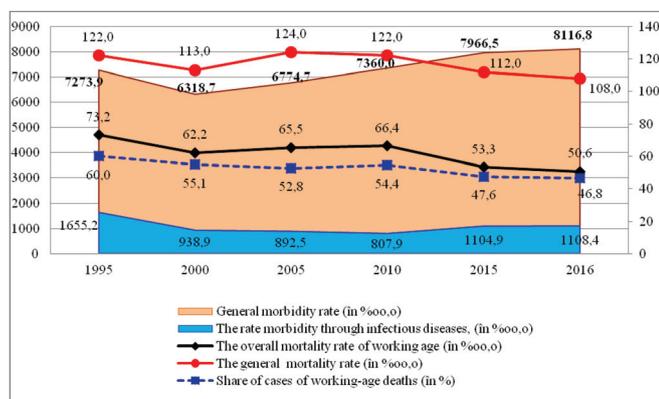


Fig. 1. The dynamics of some indicators of the morbidity and mortality rate, in the period 1995-2016.

[Source: made up by the author, on the basis of the data: <http://www.statistica.md/category.php?l=ro&idc=198> and the database on communicable diseases CNSP: [www.cns.md](http://www.cns.md), years 1995-2016]

omitted (no less important), manifested through the incoherence of adjustment of the organizational forms and the insufficiency of human potential in achieving the increased number of tasks of the Service, stipulated in the new health policies [13,14,15]. Thus, the results of the study conducted in the Service, show a presence of a functional load per staff unit 1.2-1.4 bigger than the average value per country in over 62.8% of institutions, with an uneven territorial distribution (fig. 2). Functional overload is determined, first of all, by staff insufficiency, occurred by its exodus due to low and unattractive wages during the last 20 years. The impact of this phenomenon, first of all, negatively affects the indicators of quantitative and qualitative coverage of public health services provided to the population. Secondly, the efficiency of services provided under these conditions, do not correspond to the principles of economic and effective management of institutions, as well as to the requirements recommended by international bodies.

Thus, it has been established that in the territories where the number of hygienically supervised units is lower than the national average (1061 units) – the prime cost of a unit

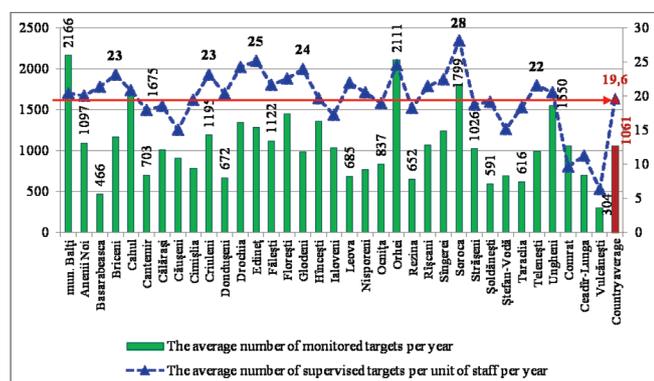


Fig. 2. The non-uniform allocation of the functional load per unit of personnel in the territorial PHC, (except PHC of mun. Chişinău, average and absolute data).

[Source: made up by the author based on statistical multiannual data (form18), NCPH years 2005-2016]

of state surveillance of public health (in lei/per unit of supervised objective) is much higher comparatively to the national average (2674.2 lei) (fig. 3). Territorial difference of prime cost of state surveillance activities in public health, accompanied by a functional load lower than the national average, along with unfavorable indices of health, denote the presence of management problems, determined by inefficient expenditures admitted in 31.4% of territorial institutions.

Improvement of these indicators predominantly requires the implementation of a new paradigm and new principles of functioning of the health system, oriented “de facto” towards the prevention and prophylaxis of diseases, the widespread implementation of measures that differ from the prophylaxis of communicable diseases.

It is well-known, that non-communicable diseases, through their etiology and manifestation, have a polyetiologic aspect of genesis, which is largely determined by the complex impact of environmental risk factors, by the determinants of health, as well as by individual behavior. In addition to this, for non-communicable pathologies it is characteristic a latent evolution and, most often, a late diagnosis.

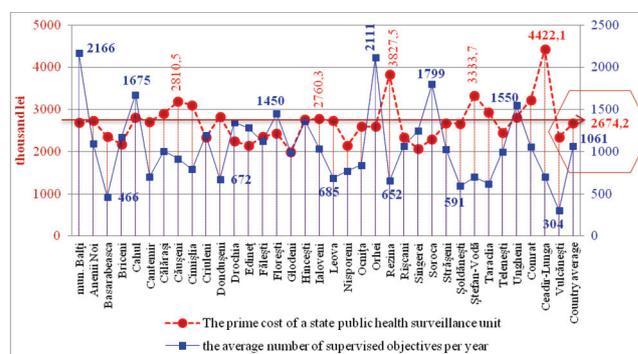


Fig. 3. The prime cost of a state public health surveillance unit in terms of administrative territories (except CPH Chisinau), (in abs. values, thousand lei and surveillance units).

[Source: made up by the author based on statistical multiannual data (form 18), NPHC years 2005-2016]

The epidemiology of non-communicable diseases, their prevention and prophylaxis, requires a rather complex approach and a coherent normative and organizational-methodological support. According to the Law No 10, art. 50, point 3 “...the primary actions of prevention and control of non-communicable diseases are aimed at supporting the aspirations of individuals and the community for assuring and forming a healthy living behavior” – we would add, “with early identification and prevention of the harmful impact of health risk factors”. Actually, there is a need for individual awareness of responsibility for one’s own health.

It is necessary to note, that nowadays the range of environmental risk factors for health, includes all areas of activity and behavior of the population. Thus, the call of WHO and the specialists in public health, for the application of the

principle “Health in All Policies”, “comes to create a potential for improving the health of the population by exploiting the energy of multiple areas of interest through intersectoral governance” [16,17]. Realizing the idea of this principle or postulate, the state/society is going to create coherent conditions in the sphere of development of capacities and complex interventional structures for health protection, institutional capacities that would promote a healthy living and would educate the population about the need of being healthy. Furthermore, based on the fact that health is not only the prerogative and responsibility of the health system, the state/society has to create conditions for a broad perception of health as its “treasure”, as a driving force for the sustainable development of the country [18]. Therefore, the individual’s health is a “good” of his own, as well as of society – and it has a price. This “good” also requires investment – investing in the “healthy man”. Investing in healthy people contributes substantially to reducing the economic burden of disease on society. In this context we would like to recall that, the establishment of mandatory health insurance (Compulsory Medical Insurance) provided allowances for those who were healthy (for prophylactic measures in volume of 4% out of Compulsory Medical Insurance Fund), which subsequently, through certain administrative mechanisms and “interventions”, were diminished and / or partially used inefficiently.

According to respondents’ opinions, financing medical institutions according to the principle “...depending on the number of patients treated and the number of visits to the family doctor”, nowadays does not contribute to the motivation of specialists and corresponding structures to have fewer patients or a healthy society. Increased investment of 11.2 times of the public health budget, compared to 2004<sup>16)</sup>, did not contribute to a significant improvement of population health indices (fig. 4).

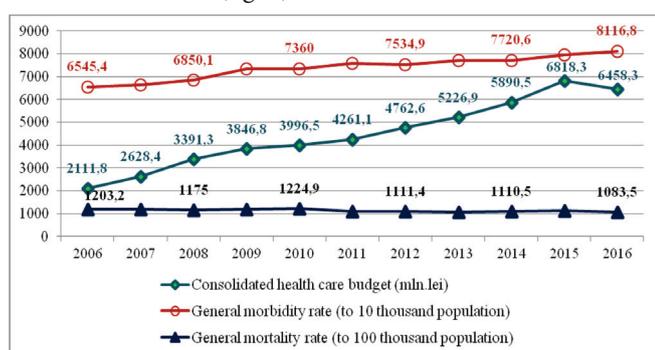


Fig. 4. Dynamics of morbidity and mortality rates in relation to the public health budget (years 2006-2016).

[Source: drawn up by the author based on data www.stratistica.md]

Overall morbidity in this period increased by 18.1% (compared to 2004), and the overall mortality rate is “a contour line” with a slight decrease, or reduction by one case to

<sup>16)</sup> Compared with the initial period of implementation of compulsory health insurance (year 2004)

one hundred persons (respectively, from 1160.0 to 1083.5 at 100 thousand persons). Consequently, it is considered relevant to propose adjusting this principle of financing sanitary institutions, including by increasing the annual number of healthy people, or the growing annual share of the healthy population – who, due to preventive and prophylactic measures, did not need to address for medical assistance.

Also respondents consider, that state budget allocations for public health activities, or activities for the implementation of disease prevention and prophylaxis measures, are not objectively adjusted to the health status of the population. So, the ratio between the budget for mandatory health insurance for patients and the budget of public health surveillance institutions, aimed at implementing preventive/prophylactic measures for diseases and promoting health, the latter was on average 30.3 times smaller, constituting in 2016 only 2.7% (fig. 5). Here, we must point out that its value is 3-6 times smaller compared to the share of public health spending in some countries (Romania – 7%, Italy – 9%, France – 10%, Russian Federation – 10%, Germany – 14% and USA – up 18%).

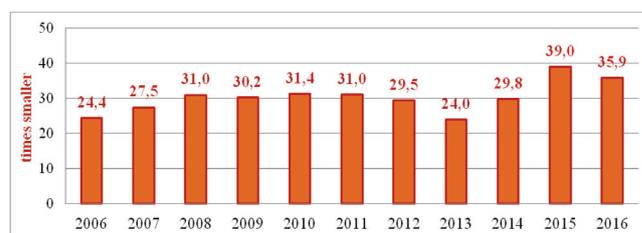


Fig. 5. The difference (times smaller) of the budget aimed at implementation of measures of prevention and prophylaxis of diseases – compared to the budget for medical care for patients.

[Source: drawn up by the author based on data www.stratistica.md]

Therefore, the results of the opinion poll of the Service managers, and also the resulting medical-social indices (of the researched period), point to the need to carry out institutional reforms to adjust the state health surveillance system and financial support for disease prevention and prophylaxis activities to the current conditions.

A regrouping of professional resources and functional efforts of the Service is required, oriented towards consistent adjustment of the structures for operation under newly-created conditions in society. In this context, respondents propose a restructuring of the effort (tab. 2), setting in the forefront the strengthening of health promotion activities among the population (response rate of 39.4±5.8%), surveillance and prophylaxis of communicable diseases (with a rate of 27.6±5.3%) and the organization of immunoprophylaxis (response rate of 19.7±4.7%), followed by the achievement of the target activities for prevention and prophylaxis of non-communicable diseases (the summary response constituting a rate of 18.3±4.6). The latter activities are required to be based on a profound analysis of health state versus risk factors, applying sampled study programs instead of collect-

Table 2

**Respondents' opinion on public health measures considered as priorities for planning and implementation in the territory**

Rank according to respondents	Priority measures (in domains)	Rate of response to the 8 variants (%±m)	Share of cases of response (%)	Number of answers opted for 8 variants (abs.)
I	Promoting health	39.4±5.8	24.1	28
II	Surveillance and prophylaxis of communicable diseases	27.6±5.3	16.4	19
III	Immunoprophylaxis of decremented contingents	19.7±4.7	12.1	14
IV	Surveillance and control of non-communicable diseases	18.3±4.6	11.2	13
V	Quality of drinking water and sewerage	15.5±4.3	9.5	11
VI	Children and young people's health / rational nutrition	11.3±3.8	6.9	8
VII	Ensuring proper management of the institution	11.3±3.8	6.9	8
VIII	Other measures	21.1±4.8	12.9	15
	Total	-	100.0	116

[Source: made up by the author based on managers' opinion data]

ing and analyzing routine data separately.

The respondents also propose to strengthen and improve the institutional management of the Service (by 11.3±3.8%), including by ensuring a consistent funding of workload and tasks, also by equitable remuneration of the staff at the level of healthcare specialists. The massive exodus of specialists from the Service, as a result of insufficient and unattractive remuneration, plus inefficient personnel policy applied in the field, can ultimately compromise the achievement of the 10 operational public health tasks; endanger the epidemiological safety of the country, as well as its sustainable development.

### Conclusions

The functioning of the State Service of Population Health Surveillance, under conditions of an austere budget and dispersion of limited resources to the existing number of institutions, does not contribute to efficiency in management of public health surveillance according to the standards and recommendations of international bodies.

Sanitary-hygienic and antiepidemic activities carried out in the researched period, have contributed to epidemiological stability of communicable diseases accompanied by a significant change in the structure of general morbidity, placing in the foreground morbidity and mortality through non-communicable diseases. Simultaneously, it was found that the activities carried out by the specialists of the Service on the prevention of non-communicable diseases, were and are mainly focused on control actions, restrictions (prohibitions) and constraints, which do not lead to diminishing their morbidity in society.

Research of the health state in relation to the factors that determine it, at the moment, is deviating from the classical methodology, the reason for which is the lack of institutional capacities and potential capable of carrying out sampled research and complying with the unanimously accepted regulations.

Analyzing the dynamics of statistics data, the health

system's indicators related to the health status of the population, activities based on their financing according to the principle «... depending on the number of patients treated and the number of visits to the family doctor», the latter does not contribute to the motivation of specialists and structures to have fewer patients, or does not contribute to disease prevention and / or improving health of the population. Society faces an accumulation of chronically ill people on a background of diminishing primary registered cases of diseases.

The results of the study, as well as managers' opinion, point out the necessity of regrouping the professional resources and the functional effort of the State Service of Public Health Surveillance, with the adjustment of institutional structures for functioning according to identified priorities, the health state of the population and an equity in the allocation of budget resources to the Service, as well as for ensuring a coherent motivation of the staff and a fair protection of the health of the population.

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