

# PROCESS MODELS FOR THE DEVELOPMENT OF THE TRIAD OF HEALTHCARE SUBSYSTEMS: «CLINICAL AND INPATIENT CARE», «OUTPATIENT AND POLYCLINIC CARE», «MEDICAL AND SOCIAL ASSISTANCE»

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## Abstract

**Objective.** To assess the process model of development of the triad of health sub systems: clinical and inpatient care (K-SP), «outpatient care (A-PP), medical and social assistance» (M-SP). The results of the assessment of the process model for the development of such health sub systems as «clinical and inpatient care», «outpatient and polyclinic care», «medical and social assistance» are presented. «A-PP» takes a significant part of the load of «K-SP» on itself, in connection with which, for the development of stationary replacement technologies, it is necessary to seek a redistribution of funding from «K-SP» to «A-PP».

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## Keywords:

clinical and inpatient care; outpatient and polyclinic care; medical and social assistance; quality of medical care; process model

Денсаулық сақтау ішкі жүйесі триадасы дамуының процестік үлгілері:  
«Клиникалық-ауруханалық көмек», «Амбулаторлық-емханалық көмек»,  
«Медициналық-әлеуметтік көмек»

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## Аңдатпа

**Мақсаты.** Денсаулық сақтаудың ішкі жүйелерінің триадасының даму үдерісінің моделін бағалау: «клиникалық және ауруханалық көмек» («К-АК»), «амбулаториялық-емханалық көмек» («А-ЕК»), «медициналық-әлеуметтік көмек» («М-ӘК»).

«Клиникалық және ауруханалық көмек», «Амбулаториялық-емханалық көмек», «медициналық-әлеуметтік көмек» сияқты денсаулық сақтаудың ішкі жүйелерін дамытудың үдерістік моделін бағалау нәтижелері ұсынылған. «А-ЕК» «К-АК» ауыртпалығының айтарлықтай бөлігін өзіне алады, сондықтан аурухананы алмастыратын технологияларды дамыту үшін қажетті нәтижеге қол жеткізуде, «К-АК»-тен және «А-ЕК»-ке қаржыландыруды қайта бөлу қажет.

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## Түйін сөздер:

клиникалық және ауруханалық көмек; амбулаториялық көмек; медициналық-әлеуметтік көмек; медициналық көмектің сапасы; процесс үлгісі

Процессные модели развития триады подсистем здравоохранения:  
«Клинико-стационарная помощь», «Амбулаторно-поликлиническая помощь»,  
«Медико-социальная помощь»

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### Аннотация

**Цель.** Оценить процессную модель развития триады подсистем здравоохранения: «клинико-стационарная помощь» («К-СП»), «амбулаторно-поликлиническая помощь» («А-ПП»), «медико-социальная помощь» («М-СП»).

Изложены результаты оценки процессной модели развития таких подсистем здравоохранения, как «клинико-стационарная помощь», «амбулаторно-поликлиническая помощь», «медико-социальная помощь». «А-ПП» берет значительную часть нагрузки «К-СП» на себя, в связи с чем, для развития стационарзамещающих технологий необходимо добиваться перераспределения объемов финансирования со «К-СП» на «А-ПП».

**Ключевые слова:**

клинико-стационарная помощь;  
амбулаторно-поликлиническая  
помощь; медико-социальная помощь;  
качество медицинской помощи;  
процессная модель.

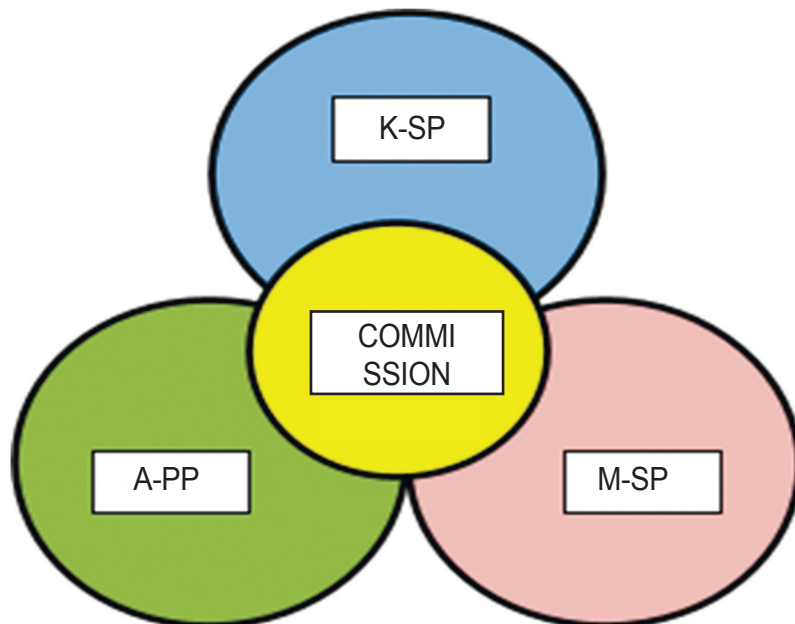
The problem of managing the quality of medical care (ILC) throughout all the years of independence of the Kyrgyz Republic is in the center of attention of society and the health care system [1-12]. In fact, when justifying any reform of the health care system and training of medical personnel, the same main goals are declared - to improve the ILC, to optimize the costs of it.

The corporate model is a description of health care as an integral system with all the subsystems interconnected in it, endowed with organizational and managerial, material, technical, scientific and

educational functions. In these models, the corresponding activity is a set of certain processes, after analyzing which it is possible to determine its impact and contribution to the achievement of final results, and by managing the characteristics of the processes, it is possible to purposefully influence the resulting components of the entire activity.

Purpose of the work: To assess the process model of development of the triad of health subsystems: clinical and inpatient care (K-SP), «outpatient care (A-PP), medical and social assistance (M-SP).

**Figure 1.**  
Triad model of the health  
care system



The process model of the health care system aimed at increasing the ILC can be presented in the form of a figure 1. We consider it important to trace the parallelism between these components of the health system of the Kyrgyz Republic. We proceeded from the fact that the cardinal issue of the modern systemic healthcare complex is precisely the determination of the optimal ratio of the components of the triad: 1) «K-SP»; 2) «A-PP»; 3) «M-SP».

### Results and discussion

We analyzed the results of the phased reforms of the health care system. It was established that the increase in the prevalence of diseases among the population of the Kyrgyz Republic in 2006-2012 compared to that in 1997-2000. Thus, the prevalence of diseases per 100,000 adult population of the republic in 2006 was  $71.0 \pm 0.2$ , and in 2010 -  $94.4 \pm 0.3$  ( $R < 0.001$ ),

which corresponds to an increase of 1.3 times, that the primary incidence by reversibility has increased significantly compared to the previous period (1997-2000). It should be noted that a particularly significant increase in 2010-2012 is observed in the prevalence of iron deficiency anemia (3.2 times), arterial hypertension (AH) (2.8 times) and bronchial asthma (1.7 times).

The analysis showed that in 2006-2012 the most common causes of disability among the adult population are diseases of the cardiovascular system (CVS) - 15.5%, mental disorders - 13.1%, injuries of all localizations - 11.2%, malignant neoplasms - 10.3%, respiratory diseases - 9.8%. Despite the general trend towards a decrease in the primary level of disability, adults suffering from CVS diseases are significantly more likely to go to disability. Thus, in 2006-2007, the level of primary disability per 10,000 adult population for

diseases of the CVS was  $5.7 \pm 0.24$ , and in 2009-2011 -  $10.6 \pm 0.3$  ( $R < 0.001$ ). Of the diseases of the CCC, the largest share in increasing the level of disability of the able-bodied population has coronary artery disease and hypertension. Thus, their indicators for the compared periods increased from  $2.9 \pm 0.17$  per 10,000 adult population to  $4.6 \pm 0.18$  ( $P < 0.001$ ) and from  $1.6 \pm 0.11$  to  $2.9 \pm 0.18$  ( $R < 0.05$ ), respectively.

In general, despite the general trend towards a decrease in the primary level of disability, adults suffering from CVS diseases are significantly more likely to go to disability. Thus, in 2006-2007, the level of primary disability from CVS diseases per 10,000 adult population was  $5.7 \pm 0.24$ , and in 2009-2011 -  $10.6 \pm 0.3$  ( $R < 0.001$ ).

Working-age mortality in rural areas in general for 2008-2011 was  $7.37 \pm 0.1$  (per 1000 adults) and was significantly higher than the mortality rate in 2006-2007, when its level was  $6.46 \pm 0.09$  ( $P < 0.05$ ). It was established that the leading causes were diseases of the CVS, respiratory organs, injuries and poisoning, as well as neoplasms. Thus, in 2006-2007, the proportion of CVS diseases was 44.9% among all causes of death, respiratory diseases - 17.6%, neoplasms - 7.7%.

The mortality rate in the working age from diseases of the CVS in 2006-2008 was characterized by a value of  $1.48 \pm 0.02$  per 1000 population, and in 2009-2011 -  $2.78 \pm 0.05$ , which is significantly higher in comparison with the previous period ( $R < 0.05$ ). From respiratory diseases in 2006-2008, the mortality rate of the able-bodied population was  $0.36 \pm 0.01$  per 1000 population, and for the subsequent three-year period (2009-2011)  $0.59 \pm 0.02$ , which is significantly more ( $P < 0.05$ ). It should be emphasized that the mortality rate in men is higher than in women: from diseases of the CVS by 2.6 times, in particular, from myocardial infarction - by 4.6 times, and from respiratory diseases - by 3.0 times.

So, it was revealed that 25% of all deaths in the republic are people of working age, and the increase in disability is 31.5%. The analysis showed that the primary incidence by reversibility during 2006-2012 increased significantly compared to previous periods.

Unfortunately, the programs mentioned above have not had a significant impact on the prevalence of diseases and disability rates.

The level of chronic diseases (HZ) in the Kyrgyz Republic is gradually increasing. If in 1990 they were detected in 9 out of 100 examined, then in 1995 - in 9.9, and in 2000 - in 14.3. In the group of children, there was a tendency to reduce Cholesterol. Thus, if in 2000 the level of CZ was 24.3%, then in 2002 - 23.2%. When analyzing the materials, it turned out that among the patients who first sought medical help, HZ, about whom patients learned for the first time, amounted to 13%. In the age group of 25-35 years, the proportion of Cholesterol is  $> 23\%$ .

It should also be noted that the morbidity according to preventive examinations in the Kyrgyz Republic exceeds that of 40% according to the data of circulation. This fact indicates that a significant proportion of patients are either self-medicating or not treating at all. This attitude of people to their health is the main reason for the increase in the number of HZ. Another cause

of HZ in the CR is that the patient is given inadequate treatment or it is cut off. According to our data, of the total number of residents who applied to A-PP, 42.9% suffer from HZ, including 24.3% among children  $< 14$  years old, and 50.0% among adults and adolescents.

The infant mortality rate according to the National Statistical Committee for 2012 is 20.0 per 1000 live births. The highest infant mortality rate in comparison with the republican one is observed in Osh. (50.9). The main causes of infant mortality are conditions occurring in the perinatal period - 64.9%, congenital anomalies - 15.1%, respiratory diseases - 11.9%, infectious diseases - 3.4%. The infant mortality rate at the age of  $< 5$  years also has a tendency to decrease, amounting, according to preliminary data, to 22.5 per 1000 live births (2012 - 23.4%).

Unfortunately, the rates of death of children at home and before the daily mortality rate remain quite high, which during 2006-2010 did not tend to decrease due to late treatment, underestimation of the severity of the disease by doctors, unqualified emergency care at the pre-hospital stage and in the hospital. In general, in the Kyrgyz Republic in 2013, there was a high proportion of deceased children aged 1-2 years in the period of  $< 24$  hours after admission to the hospital - 20.9% (in 2012 - 14.4%,  $r = + 45.1$ ), the maximum increase in such mortality was observed in Osh region (21.3%). In 2012, the proportion of daily mortality = 14.7% ( $r = + 44.7$ ), in Osh - 71.4 (in 2012 - 60.0%,  $r = + 19.0$ ).

In general, in the Kyrgyz Republic in 2013, the share of deceased children of the first year of life at home was 7.7% (in 2012 - 7.2%,  $r = + 7.0$ ), while there is an increase in Chui region - 5.0% (in 2012 - 3.0%), Issyk-Kul - 14.4% (in 2012 - 9.7%), Naryn - 14.2% (in 2012 - 12.8) regions, which indicates a deterioration in the work of primary care and the resuscitation service of hospitals. Unacceptably high proportion in Zhail district - 9.1% (in 2012 - 2.6%), Tyup - 25.0% (in 2012 - 9.1%), Aktalinsky - 37.5% (in 2012 - 8.3%) districts. In 2012, 95% of birth support organizations were covered by effective perinatal care (EPA). The maternal mortality rate in 2012-2013 was 78 and 50.3 per 100,000 newborns, respectively, a decrease of 22.1%.

In 2012, the highest rate remains in Issyk-Kul region (88.3), Batken (50.7), Naryn (70.3) regions. The growth of the indicator in 2012 compared to 2011 is noted in Naryn and Batken regions (10.4%) and Bishkek (16.0%). Of the total number of deaths, the number of women who were not observed in hospitals due to pregnancy increased - 13.5% (2012). The lowest rate of observations of pregnant women is in the Ton district of the Issyk-Kul region (50.0%), the Batken district of the Batken region (50.0%), the Kara-Suu district of the Osh region (40.0%), the Aksy district of the Jalal-Abad region (33.3%).

In the first place in terms of causes of death is bleeding - 32.8% (20 cases), in second place - extragenital diseases - 21.3% (13 cases), preeclampsia - 16.4% (10 cases), other causes - 11.5% (7 cases), sepsis - 11.5% (7 cases). At the same time, in the structure of extragenital diseases, 84.6% (11 cases) are not associated with pregnancy (heart defects - 7, diabetes mellitus - 2, systemic lupus erythematosus - 1,

viral hepatitis -1 patient). The percentage of autopsies of maternal deaths in 2013 compared to 2012 decreased by 7.2% and amounted to 55.7% (34 cases), unopened - 44.3% (27 cases) of deceased women. The lowest rate of autopsies in Jalal-Abad region - 27.3%.

In 2012, under the Additional Compulsory Health Insurance Program for Drug Provision of Insured Citizens at the outpatient level, 901.1 thousand prescriptions were sold to prescription drugs for 2012. The development of funds aimed at providing medicines to the insured population under this compulsory health insurance program amounted to 101%, in Osh region - 116%, Talas region - 101%, in Bishkek, Chui, Jalal-Abad, Naryn and Issyk-Kul regions - in the range of 92-97%. For the period 2010-2012, a low percentage of development is noted for healthcare organizations of Batken region (88%), but it is necessary to note the improvement of this indicator compared to previous years (2006-2009), when the development was 50-70%.

Expertise of kmp «K-SP». It was established that the number of treated cases in the republic increased from 854047.0 (in 2008). to 944720.0 (in 2011). For the period 2006-2010 the number of identified defects, both in diagnosis and in treatment, steadily decreased. If in 2006 the proportion of defects in the examination of patients was 9.1%, then in 2008 - 5.2%, and in 2010 - 3.2%, that is, almost 2 and 3 times, respectively. The same dynamics can be traced in relation to the proportion of defects in treatment: 13.6% in 2006, 10.6% in 2008 and 9.5% in 2010.

In subsequent years (2011-2012), the number of defects in the examination remained at the same level (in 2012 - 2.8%, in 2011 - 2.6%). The level of defects in treatment in the republic has not changed either (in 2012 - 7.4%, in 2011 - 7.1%). Fluctuations in the level of defects in treatment by region are significant - from 3.1% in Naryn region (in 2011 - 3.6%) to 9.6%, in Bishkek (in 2011 - 13.2%). The rate of treatment defects decreased in Talas region (in 2012 - 7.3%, in 2011 - 9.1%) and in Chui region (in 2012 - 6.3%, in 2011 - 5.8%).

It was established that the proportion of unjustified hospitalizations in Osh was 0.8% in 2010, in Talas region - 0.7% in 2009, and in 2010 - 0.3%. In general, in the republic this indicator increased from 2009 to 2010 by 0.4%. At the inpatient level in 2012, the number of defective cases increased by 28.0%, of which defects in the examination increased by 22.0%, and in treatment - by 17.0%. The number of unjustified hospitalizations increased by 2 times. It should be noted that in 2012, financial sanctions were imposed on Examination of the ILC at the primary level (in % of the number of examined medical records).

Defects in the examination in the republic also decreased from 9.2% in 2006 to 5.6% in 2010 Defects in treatment in the republic also decreased from 14.7% in 2006 to 11.6% in 2010. 3488 defective cases, when for the same period of 2011 - on 1917 cases.

Examination of the ILC at the level of PHC (in % of the number of medical records examined). It is established that the indicator of the number of cards with defects ranges from 12.2- 28.8% and the average

for the republic is 19.9%. The highest detectability of defects is noted in Naryn (28.8%) and Issyk-Kul (26.4%) TU FOMS. In general, at the primary level, the number of defective cases in 2012 increased by 6.1% compared to the same period in 2011, moreover, in the examination - by 17.0%, in treatment - by 15.0%, in medical examination - by 43.5%. The number of unjustified referrals for hospitalization increased by 3 times. In 2011-2012, financial sanctions were imposed on 6425 defective cases by the Compulsory Medical Insurance Fund.

An important criterion for assessing the quality of medical care is the performance indicator. Analysis of defects in the provision of medical care in accredited hospitals made it possible to establish that the largest proportion of medical defects in medical care for the population is due to violations of the organizational and treatment-diagnostic processes during medical examination and the provision of planned care. A significant difference is observed between the volume of defects in the organization of the medical service and defects in the provision of emergency and planned medical care.

The following parameters for compliance with the standards of technology for the provision of medical care in TB by region (in %) were established: 71.8% - Chuiskaya; 73.2% - Issyk-Kul; 77.0% - Naryn; 73.4% - Osh; 75.3% - Jalal-Abad; 72.0% - Batken; 74.8% - Talas. Thus, the greatest compliance with the standards of technology for the provision of medical care is observed in Naryn and Talas regions. On the contrary, the relatively lowest correspondence is observed in the Chui and Batken regions.

The defects in the organization of medical care in general, according to the expert assessment, included: the preservation of the old district principle of service; ineffective implementation of the principles of continuity and interchangeability between hospitals; untimely referral of the patient to the next stage; unreasonable hospitalization; ineffective conduct of the ILC's internal controls; low level of introduction of new medical technologies.

Comparative data on the effectiveness of treatment of patients (in %) showed that the proportion of patients with recovery or with improvement, the proportion of patients without change in condition, the proportion of patients with deterioration in GSV, amounted to 78.2%, 29.9% and 12.0%, respectively. Their share in the TRC was 46.0%, 38.9 percent and 26.6 per cent, respectively, while in TB it was 91.2%, 10.0% and 8.6%, respectively. Thus, defects of the above nature are more common in the provision of medical care in the TSRP (12.1%) than in the GSV (29.6%) and in the TB (8.3%).

All defects found in the diagnostic examination of patients can be divided into 3 main groups:

- 1) Studies were not conducted at all; 2) Absolutely uninformative studies were conducted; 3) The surveys were not carried out in full. Defects in the diagnostic process were detected in 87.4% of those hospitalized in the TsPP, while in the GSV their proportion was 36.6%, and in TB - 13.6%. In our opinion, such a proportion of defects at the first



stage of medical care is due to the understaffing of hospitals with the necessary equipment and medical equipment. Especially in the newly created TBs, as well as in the TSCPs.

As you know, an important criterion for the quality of diagnosis is the indicator of discrepancy in diagnoses. According to expert assessment, the share of erroneous diagnoses in all channels of referrals in TB was an average of 18.5%. Its value is maximum in the directions from the TSRC (32.7%), while in the case of delivery of patients by the SMP service, the discrepancy of diagnoses was 21.8%.

The level of misdiagnoses is relatively low in the directions from the CSM (15.6%), which, for sure, indicates an increase in the qualification of GSV. At the same time, the share of discrepancies in diagnoses is noticeably less with planned (12.2%) and timely (13.1%) hospitalization than with emergency (20.8%) and unscheduled care (20.6%). It was found that the greatest difficulties for diagnosis are diseases of the CVS (18.8%), organs of the genitourinary system (16.5%), digestive organs (15.6%), nervous system and sensory organs (9.1%). According to the results of the study, it turned out that the CSM could not ensure the proper ILC in 49.0% of cases, and as for the CSR, on average, every third (33.1%) hospitalized person did not receive an ILC. At the TB level, CMP is better, as evidenced by a 19.1% reduction in the incidence of defective treatment.

Defects in medical technologies that reduce the quality of the treatment process should be considered the following: 1) Unreasonable and ineffective use of drug and non-drug methods of treatment; 2) Low efficiency and formality of preventive measures among the population; 3) Low level of knowledge and skills in the clear justification and interpretation of clinical diagnoses; 4) Failure to comply with the principles of completeness of objectivity and dynamism in the description of the patient's condition and the correctness of the maintenance and execution of primary documentation.

Analysis of the causes of defects in the provision of medical care allows us to classify them as follows: 1) «Uncontrollable» (independent of the doctor's actions or associated with insufficient funding and a low level of supply of consumables and equipment, with a severe or malignant course of the disease); 2) «Manageable» (insufficient level of qualification of the doctor; insufficient knowledge of the full course of diseases; unscrupulous attitude to the performance of functional duties; lack of continuity in work; organizational shortcomings). Thus, according to our data, the share of these reasons was, respectively, 42.2% and 57.8%.

It has been established that the proportion of organizational defects exceeds the totality of defects of a diagnostic and therapeutic nature, the impact of the latter on the quality of medical care provided to patients in TB is the most significant.

Diagnostic defects amounted to 22.0% (calculation: 249 ist.diseases x 100:1136). Defects in therapeutic measures amounted to 20.0% (calculation: 227 ist. diseases x100:1136). Organizational defects accounted

for 58.0% (calculation: 660 ist.diseases x100:1136). So, the most pronounced correlation coefficient of the influence on the quality of treatment and diagnostic processes at the primary level is noted in cases of insufficient level of qualification of the doctor and incomplete knowledge of the course of diseases.

The insufficient qualification of the doctor is 4.1% (calculation: 4.1x100: 100), nonfulfillment of functional duties is 16.2% (calculation: 16.2x100: 100), the malignant course of the disease is - 22.1% (calculation: 22.1x100: 100), organizational shortcomings -58.0% (calculation: 58.0x100: 100). The insufficient qualification of the CSM doctor is 8.2% (calculation: 8.2x100: 100), the incomplete amount of knowledge of the course of diseases is 9.1 (calculation: 9.1x100: 100), nonfulfillment of functional duties is 17.4% (calculation: 17.4x100: 100), the malignant course of the disease is 23.0% (calculation: 23.0x100: 100), organizational shortcomings - 43.1% (calculation: 43.1x100: 100).

In order to improve the «M-SP», elderly and senile patients, lonely and other persons suffering from HZ and for health reasons in need of supportive treatment, it is necessary to organize nursing care departments (OSU) and gerontological hospitals on the basis of rural district hospitals, the need for which is increasing every year. However, the OSU, despite the release of nurses with higher education, does not yet exist in the Kyrgyz Republic.

Meanwhile, the need for OSU beds in the republic is about 1500-2000 beds or 2-3 beds per 1 family doctor. It is necessary to develop day hospitals (DS) for the elderly and senile in the form of boarding houses. Order of the Ministry of Health of the Kyrgyz Republic (No. 561, 15.10.2012) «On the approval of the model provision on the stationary substituting department (ward) of the CSM / GSV, the functioning of the GSV with beds is allowed.

Based on the foregoing, it can be considered that in the reformed system of medical care there is a need for a close relationship between the implementation of preventive, diagnostic, therapeutic and rehabilitation measures by the forces and means of each stage, with the possibility of obtaining at each stage an optimal ILC. Otherwise, there is an imbalance in the system, expressed in duplication of work at the stages or a lack of full volume of therapeutic and preventive measures, ultimately leading to a decrease in the ILC.

By 2011-2012, despite the more rational use of the bed fund, the number of patients with K-SP decreased by 24.0% (from 1034.2 thousand (in 1991). to 785.7K (in 2007), and the shower of hospitalization - from 23.1 to 15.1 per 100 people . Such a positive trend is due to the fact that A-PP has taken a significant part of the load of K-SP on itself. Therefore, for the further development of hospital replacement technologies, it is necessary to seek a redistribution of funding from K-SP to A- PP.

Unfortunately, at present this process is extremely slow, which leads to an imbalance in the structure of financing of hospitals. 71.8% of the budget is spent on the maintenance of K-SP, and only 17.4% on

A-PP, including 7.1% on sanitary-epidemiological and educational services and 1.0% on the maintenance of NSR stations. From these data it follows that the current financing system does not contribute to the redistribution of the volume of medical services from an expensive link, which is «K- SP» to a cheaper «A-PP» and requires its reform.

Summing up, it should be noted that the process model for the development of the health care system of the Kyrgyz Republic should be built on a triad basis as an interaction of three subsystems:

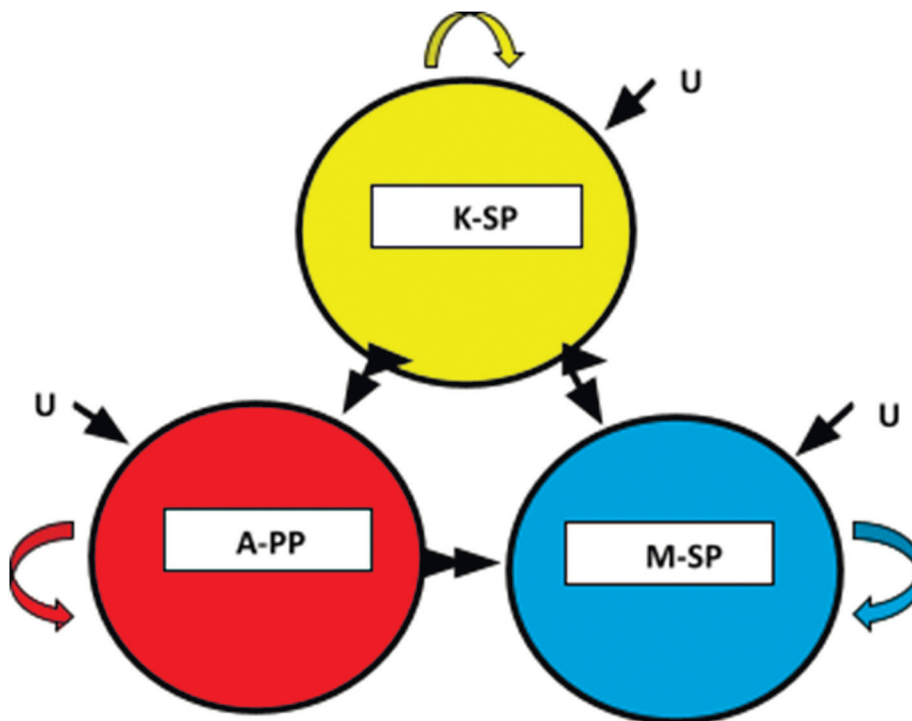
1) Effective implementation of the K-MP; 2) Effective implementation of «A-PP»; 3) Effective implementation of «M-SP». The triad structure can be

represented as an oriented graph of three elements, which are characterized by connections and relations. It is a dynamic structure, and the relationships between the elements are time-dependent, so it can be defined by a system of three differential equations in the normal Cauchy form.

The mathematical model of the dynamics of the health care system of the Kyrgyz Republic can be described by the following system of differential equations:

$K-SP = f_1(K-SP, A-PP, M-SP, U)$ ;  $A-PP = f_2(K-SP, A-PP, M-SP, U)$ ;  $M-SP = f_3(K-SP, A-PP, M-SP, U)$ , where  $U$  is the control action,  $f_n$  is generally nonlinear functions.

**Figure 2.**  
 Model of development of  
 the triad of health subsystems  
 of the Kyrgyz Republic



*The graph-scheme of such a structure is presented in Figure 2.  
 Three functional segments in a single structure must interact intensively and effectively with each other,  
 and health care appears to us as a single system.*

### Conclusions

1. The process model indicates the existence of a certain parallelism in the development of components of the health care system of the Kyrgyz Republic aimed at increasing the ILC: 1) «K-SP»; 2) «A-PP»; 3) «M-SP». Trends in their ratio of components in the country has a clear focus on improving the effectiveness of the health system as a whole. The obvious positive dynamics of the health care system of the Kyrgyz Republic is due to the fact that A-PP has taken a significant part of the load of K-SP on itself. Therefore, for the further development of hospital- substituting technologies, it is necessary to seek a redistribution of funding from «K-SP» to «A- PP»;

2. The licensing and accreditation examination of the activities of doctors of the GSV/CSM, TSRP, TB, showed a significantly lower level of compliance with the quality standards of medical care, and

consequently the low level of the ILC. The main defects in the activities of medical institutions that provide a low ILC are organizational and medical and diagnostic miscalculations of doctors due to the low level of personnel potential, the material and technical base of hospitals, as well as their insufficient financing. The proportion of organizational defects exceeds the totality of defects of a diagnostic and therapeutic nature, and the impact of the latter on the quality of medical care provided to patients in TB is the most significant in comparison with the CSM / GSV, TSIP;

3. The developed management model of the ILC, first of all, includes a new methodology for planning and forecasting medical care, which presents modern priorities and methods for improving it with the allocation of indicators of final results. Its hallmark is the ILC's reasonable criteria.

## References:

1. Abilov, B.A. The state of the infectious disease service and the optimization of its activities in the context of the health care reform of the Kyrgyz Republic / Abilov, B.A., Sultanmuratov M.T. – B., 2002. - 123 p.
2. Abdiev, A.Sh. Assessment of the quality of medical care by the organizer of practical health care / Surgery of Kyrgyzstan / A.Sh. Abdiev, B.A. Abilov, Zh.O. Belekov. -2005. – №2. – S. 3-10.
3. Accreditation of medical institutions in the Kyrgyz Republic / Ed. Ibraimova A.S. - Bishkek, 2002. - 205 p.
4. Health of the population and the activities of health care institutions of the Kyrgyz Republic in 2000. - Bishkek, 2001. - S.185-190.
5. Health of the population and the activities of health care institutions of the Kyrgyz Republic in 2002. - Bishkek, 2003. - S.278-283.
6. Health of the population and health care of the Kyrgyz Republic in 1991- 2000. - Bishkek, 2001. - P.48-51.
7. Health care of Kyrgyzstan in the 21st century: a strategy for achieving health for the population of the Kyrgyz Republic care for everyone, health for all) / Sb. Ministry of Health of the Kyrgyz Republic. - Bishkek, 2001. - P.128-130
8. Karataev, M.M. Scientific substantiation of the health financing system in the context of transition to a market economy (on the example of Kyrgyzstan): autoref. dis. doktor.med.nauk / M.M. Karataev. – Moscow, 2000. – 45 p.
9. Kasiev, N.K. Scientific substantiation of the main directions of health care reform and its implementation in the Kyrgyz Republic [Text]: autoref. Dis. doktor.med.nauk /N.K. Kasiev. – M., 1999. – 45 p.
10. Meymanaliev, T.S. Financing health care in Kyrgyzstan in the context of the transition to a market economy / T.S. Meymanaliev, M.M. Karataev, A.S. Ibraimov. – B., 2001. – 201 p.
11. Savash, S. Health Care Reforms in Kyrgyzstan: Per. s eng. / S. Savash. - Copenhagen: WHO Regional Office for Europe, 2000. - 58 p.
12. Sultanmuratov M.T. Socio-economic substantiation of the restructuring of the system of medical services in the Kyrgyz Republic: autoref. dis. doct. med.nauk / M.T. Sultanmuratov. - B., 2002. – 44