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Development Dynamics of Hospitalization Replacement Technologies in the Frames of Unified National Health System

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ABSTRACT

The use of hospital-replacing forms of medical care lets increase the intensity and improve the performance efficiency of medical organizations, as well as to increase the volume of medical care rendered to patients while reducing its financial cost. Cross-sectional, full study was carried out in 76 medical organizations in Almaty. Inclusion criterion was medical organizations providing hospital-replacing care, exclusion criterion - organizations not providing hospital-replacing care. Emergency hospitalization in RoK decreased to 61% (2011-65.4%), the planned hospitalization increased up to 39% (2011-35%). Hospitalization in DNCH: 35.78% appointed from PHC, 33.8% delivered with ambulance, 12.5% of their own accord, 12.5% other, 5.51 % from diagnostic centres. The average duration of patients stay in DNCH in 2014 was 9.5 days (2010 – 11.1). In 2014 the flow of patients to DCH in Almaty increased, the growth rate was 28%. In Almaty, hospital replacement care was provided to 58.1% in DCH of out-patient clinic, less than 20% were provided a home care, 24.1 % were treated in DCH of hospitals. On HRT, hospitalization level increased up to 54.5 per 1000 of population. HRT bed support of population increased up to 9.1 per 10 000 of population, HRT coverage of population increased up to 57.3 per 1000 of population, average length of patient 's stay in day care hospital was 7.6 bed days. UNHS implementation in RoK increased the availability and quality of medical care and contributed to active development and widespread implementation of hospital-replacing forms of medical care.

Keywords: Unified national health system (UNHS), hospitalization replacement technologies (HRT), day care hospital (DCH), day and night care hospital (DNCH), primary health-care (PHC).

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INTRODUCTION

Consolidation of primary health-care (PHC) is considered of high priority for effective and responsive health-care systems.[1] Hospital-replacing forms of medical care allow increasing PHC intensity and effectiveness, increasing the volume of provided care, intensively use health-care resources. In addition, there are ample opportunities for active improvement of patients from dispensary groups. In general, day care hospitals (DCH) contribute to the development of succession between specialists and out-patient services, ensuring continuity of the treatment process.[1,2]

It is also necessary to understand that day care hospitals will never replace day and night care; their aim is different. Their task is to reduce the load to hospitals and become an interlink between out-patient and inpatient medical care.[2] Recently European health-care system had to take measures to contain costs, whilst maintaining or even enhancing high quality medical care.[3] According to foreign colleagues, paying for performance in the primary link is effective in enhancing the quality of medical care and reducing costs.[4] Some researchers have studied the citizens' priorities on the improvement of primary health care in one of the countries of European union. The average rating of contentment with primary health-care was 3.22 (SD = 0.816). Only 15% of citizens are interested in evaluating the quality and indicators of health-care organizations. More than half of the respondents (55.6%) answered the open questions and they were older, better educated and they used PHC services more often ($p < 0.001$) than the rest of the respondents.[5]

Thus politicians believe that PHC consolidation can expect the enhancement of health-care system effectiveness. Over the period of consolidating the primary health-care sector in Turkey, the citizens reported an increase in quality, availability, contentment and service in primary health-care.[1,7]

From the experience of industrialized countries, distinctive aspects of patient-centred primary care are the work with needs in medical care, established personal relationships, comprehensive, continuous and personal responsibility for health and determinants of health throughout the life cycle, as well as the people as partners in creating their conditions»[9-12]

Patient-oriented medical care can also be realized in conditions of limited financial resources. The specified model is realized both in industrialized countries like England, Denmark, Canada and in developing countries – El Salvador, Malaysia, Rwanda, Thailand.[13,14]

Normative documents of The Ministry of Health of RoK specify that hospitalization replacement care (HRC) is a form of medical care provided to the patients with diseases that require continuation of curative measures with medical supervision after discharge from day and night care hospital, the diseases that require continuation of medical rehabilitation and remedial treatment after hospital treatment, and patients with chronic diseases during exacerbations, requiring treatment staying in day care hospital.

The work of day care hospital is regulated by the prikaz of Minister of health and social development of the Republic of Kazakhstan dated August 17, 2015 No. 669 «On approval of the rules of providing hospital-replacing care», registered in state register of regulatory-legal acts on September 23, 2015 under No. 12106.

Medical indications and contraindications for the provision of hospital-replacing care are determined by nosological entities of disease, stage and severity of disease, prior disease and comorbidities.[6]

The duration of treatment in day care hospital depends on the patient's condition and is determined by the period not exceeding 8 working days, except for patients on hemodialysis, chemotherapy and radiation therapy, medical rehabilitation and restorative treatment. Home care - at least 3 working days and acute disases – less than 5 working days, exacerbation of chronic diseases – less than 8 working days.[6]

It should be noted that day care facilities as a part of hospital and out-patient organizations have common objectives, tasks and functions, meanwhile in day care facilities based on hospitals it is typically possible to carry out more complex laboratory and diagnostic examinations, it's easier to organize two-three meals a day than in day care facilities of out-patient organizations (OPO). The advantage of day care facilities of OPO may be a great opportunity to use a wide range of restorative treatment.[7,8,16-19]

Thus, treatment of patients in day care hospitals is economically profitable for medical and preventive treatment facilities, has the advantage in deontological regard – most of the time the patient is at home, in a familiar comfortable environment, surrounded by close ones, which increases the effectiveness of treatment.[8] In addition, the average duration of treatment in day care hospital is less than the duration of treatment in day and night care hospital.[2,7,14]

Aims of investigation: evaluation of development of HRT in Almaty, Kazakhstan.
The object of investigation - day hospitals, statistical data for 2010–14.

METHODS

According to the stated goals and tasks we carried out the sampling of medical organizations according to the criteria of inclusion and exculusion from the study.

The investigation was carried out in 76 medical organizations providing hospital-replacing care in Almaty.

The investigation material was based on analytical tables registry of RSE «Republican center of eHealth» MOH of RoK, output forms of the portals of Unified health-care information system (UHIS), annual statistical report on the activities of medical organizations for the period from 2010 to 2014. (Form 24 «A report on contingent of patients who were provided hospital-replacing care», Form 21 «On the use of bed fund of medical organizations providing hospital and hospital-replacing care»).

During the study a comparative analysis of development dynamics of hospital and hospital-replacing forms of medical care to Almaty population was carried out. Economic effectiveness of using HRT in out-patient clinics, hospitals, at home was evaluated. The intensity of using bed fund of day care hospital was investigated. The degree of using HRT was studied on sex-age structure as well as nosology. Analytical derivatives of the indicators of dynamics were calculated. Calculations are transferred into table. Calculations of dynamic series were carried out in accordance with the common methods in medical statistics.

Statistical processing of data was carried out on the basis of a complex of modern methods of automated storage and processing of information on personal computers using MS Excel and «SPSS» standard software package.

RESULTS

Monitoring and analysis of the development of hospital-replacing technologies in Almaty for the last 10 years shows the increase of the number of day care hospitals, including an increase in the number of hospital organizations with day care facilities. According to statistics there are approximately 78 medical organizations providing hospital-replacing care (including AOC) in Almaty, including 55 city, 5 republic, 17 private and 1 institutional organization. Taking into account development dynamics of day care hospitals, there is a trend of DCH bed fund growth in inpatient and out-patient organizations from 718 (2010) to 1434 beds in 2014.

The analysis of hospital care development dynamics

According to statistics of UIHS hospital and hospital-replacing care provided in 2010-14 in Almaty in RoK structure was analysed. Analyzing the structure of patients treated in day and night care hospitals in RoK on appointment and hospitalization type, it's necessary to note that the level of emergency hospitalization still oversteps the planned hospitalization (Figure 1). However, there are trends of reduction of emergency hospitalization, which constituted 61% of the level of all patients hospitalized in 2014 (2011-65.4%) and increase of planned hospitalization up to 39% (2011-35%). On the structure of hospitalization to day and night care hospital on appointment type in 2014, 35.78% of patients were appointed by PHC organizations, 33.8% of hospitalized patients were delivered by emergency response team, 12.5% were hospitalized on their own accord, and 12.5% - other types of appointment, 5.51 % were appointed by diagnostic centres. The average duration of the patient's stay in day and night care hospital in 2014 was 9.5 days (in 2010-11.1 days).

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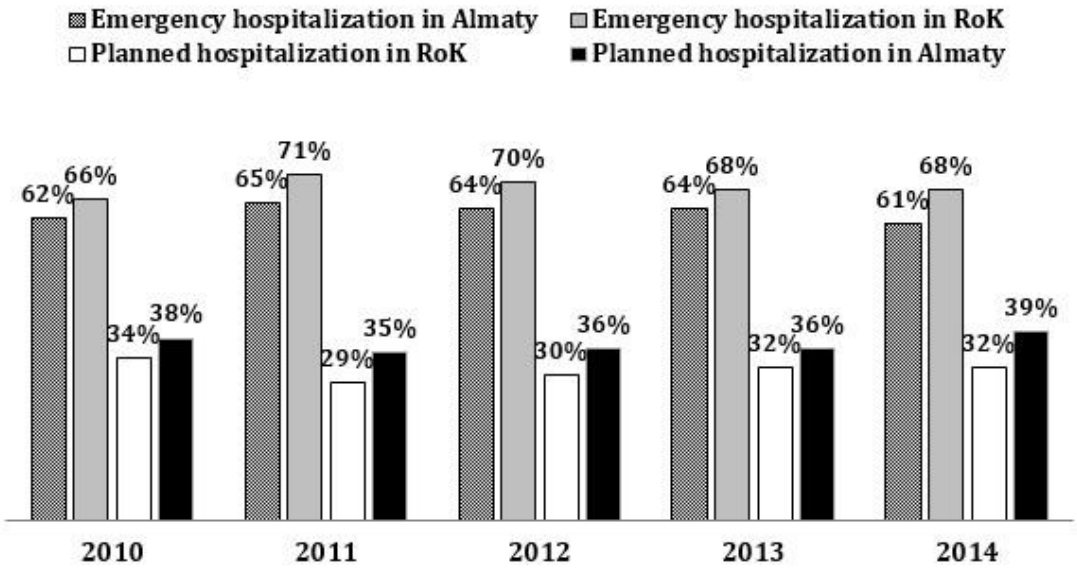

Figure 1 Dynamics on the type of hospitalization in Almaty and in Kazakhstan in 2010-14.

The evaluation of the frequency of the coincidences and discrepancies of directional and final diagnosis among the patients accepted in planned order in 2014, coincidence of diagnoses showed 62.1% (76.1%-2010), discrepancies – 37.9% (23.95%-2010), among emergency hospitalization patients coincidence of diagnoses showed 71.3% (82.9%-2010), discrepancies-28.7% (17.1%-2010).

According to the chart the growth rate of hospitalization shoud be noted per 1000 of population (Figure 2), the analysis of the volume of hospital care in Almaty and Kazakhstan shows that there is a declining dynamics of the growth rate of patients treated in day and night care hospital (DNC) in RoK level - 34%, and in Almaty level with the growth rate -1%, which is probably associated with the increase of the patients flow on HRT in 2014 as compared to 2010, the growth rate was 28% in Almaty level, this indicator in RoK shows the dynamics of decrease and is equal to-18%.

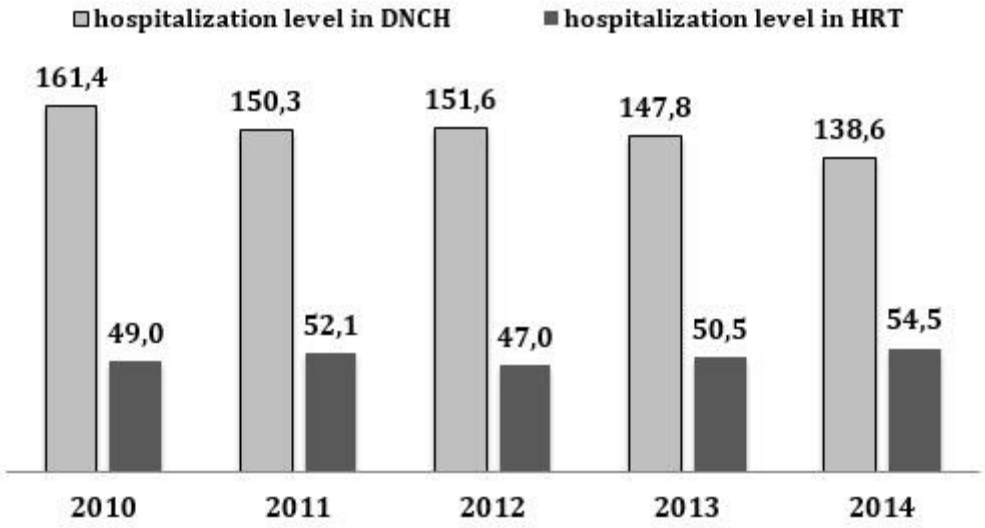

Figure 2 The level of hospitalization in DNCH and HRT per 1000 of population. (Almaty 2010-14.)

Abbreviations:
hospitalization replacement technologies (HRT),
day and night care hospital (DNCH).

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Analysis of the hospital-replacing care development dynamics

The analysis of statistical data for 2014 campared to 2010 demonstrates the growth dynamics of the number of treated cases in hospital replacing technologies which constituted 88 318 patients in Almaty, the growth rate (bas.) was 28.45%.

In the structure of all the treated cases in Amaty, the number of patients who were provided care on hospital-replacing technologies in Almaty increased significantly, Almaty share in RoK was 15.9%, whereas in 2010 the specific weight was only 10%.

Among the patients who were treated in conditions of day care hospital of Almaty, more than half of the patients were provided hospital-replacing care in out-patient organizations (58.1%), and less than 20% - home care, and the remaining 24.1 % were treated in day care facilities of the hospitals (Figure 3).

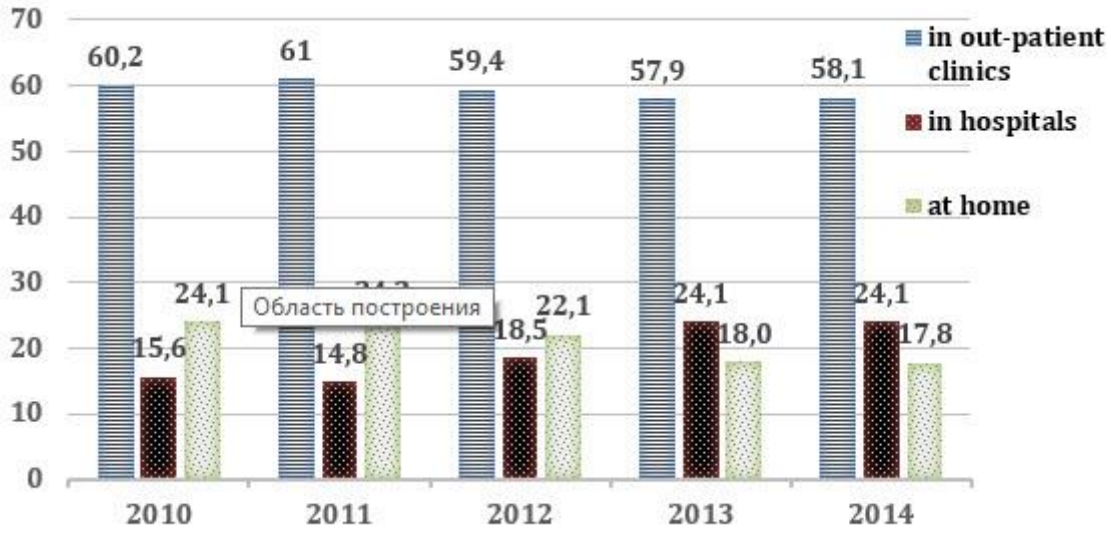

Figure 3 The specific weight of treated cases on HRT types in Almaty from 2010 to 2014.

In RoK level the treated cases in **day care facilities of out-patient clinics** take the first place – 54,5 %, then with the specific weight up to 37.1% come the treated cases on HRT in **day care facilities of day and night care hospitals**, the lowest specific weight falls to the share of home care – 8.4%.

Despite the reform taking place in RoK health care system, redistribution of the volume of medical care from the expensive and resource-intensive hospital care to hospital-replacing forms of care is carried out at a moderate pace.

The analysis of financing dynamics on hospital care structure

Hospital care financing analysis conducted in the period of 2010- 2014 shows that judging by the steady growth of charged amount to be paid, the increase in the number of patients treated using hospital-replacing technologies is one of the results of the active development and wide use of resource saving technologies. It should be noted, that the share of financial expenses to HRT in the general structure of expenses to hospital treatment is increasing (Figure 4).

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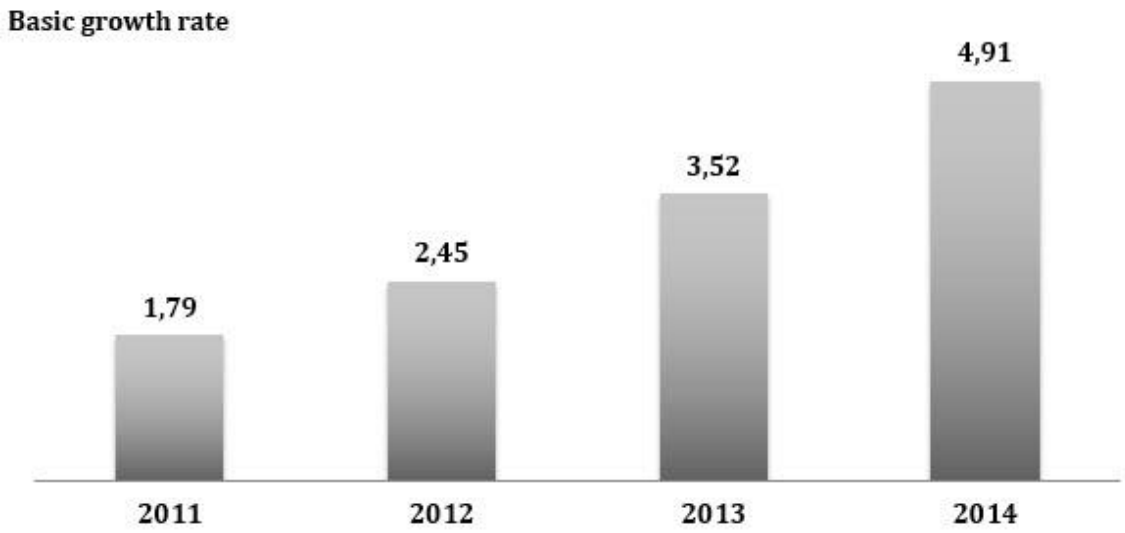

Figure 4 The growth rate of the amount to be paid in day care hospitals in comparison with 2010.

It should be noted that the financing of **DNCH in Almaty level** is improving: compared to 2010 it increased 1.7 times in 2011, in 2012 – 2.1 times, in 2013 –2.4 times, in 2014 – 2.5 times. It means that averagely in 1 year the medium growth rate was 26%.

As to the dynamics of financing **DNCH in RoK level**: in 2011 the sum charged to be paid increased 1.4 times, in 2012 – 1.9 times, in 2013 – 1.7 times, in 2014 – 1.8 times. Averagely in one year the medium growth rate was 15%.

According to statistical calculations, the financial expenditures for **HRT in Almaty level** increased 1.7 times in 2011 compared to 2010, in 2012 it increased 2.4 times, in 2013 – 3.5 times, and in 2014 – 4.9 times. It means that averagely in a year the medium growth rate constituted 49 %.

So the sum presented for the payment on **HRT in RoK level** in 2011 increased 2.1 times, in 2012 – 2.8 times, in 2013 – 2.4 times, to 2014 it increased 3.3 times. So averagely in a year the medium growth rate constituted 35%.

As shown by the results of studying **the average cost of 1 hospital treatment case**, compared to 2010, by 2014 there were significant growth trends. In particular, **the average cost of «1 treatment case» on HRT in Almaty level** increased 1.7 times in 2011, in 2012 it increaseed 2.4 times, in 2013 – 3.2 times, to 2014 – 3.8 times.

The average cost of 1 treatment case in DNCH in Almaty increased 1.8 times in 2011, in 2012 – 2.2 times, in 2013 – 2.5 times, in 2014 – 2.6 times.

Thus, over the past 5 years, HRC provided in hospital organizations charge the highest costs, meantime the expenditure results show that average cost of treatment increased on all types of HRT.

General financial costs for treatment in **DCF in hospitals** increased 4.6 times in 2014 in RoK level compared to 2010, whereas in 2011 the difference constituted an increase of 2.4 times.

This growth dynamics is observed in Almaty level; the absolute increase was 5.6 times in 2014 compared to 2010 and in 2011 the difference constituted only an increase of 1.7 times.

Among the number of hospital-replacing technologies, the cost of day care at home has a tendency to decrease; despite the low cost of home care, this type of hospital-replacing technology is rarely used. It is confirmed by a low growth rate of the number of treated patients for the last 5 years, so in 2011 the growth

difference constituted 9% in Almaty and 30% in RoK, and in 2014 the growth difference constituted -5% in Almaty, and -18% in RoK.

At the same time the monitoring of the dynamics of average cost of 1 case shows that the average treatment case in **day care facilities of out-patient organizations** increased 4.2 times, in RoK – 3.9 times, in **DCF of hospitals** in Almaty increased 2.8 times, in RoK - almost 4 times.

DISCUSSION

Kazakhstan health care system pays special attention to the availability of medical care to population. To increase the availability of PMC, it is necessary to consider the peculiarities of the contingent, the sex-age structure, work and living conditions, the level of education and culture.[20-22]

It should be noted that UNHS performed an important task to ensure availability of medical care to population and largely contributed to the development and active implementation of day care facilities[21] of all types. Currently, the population still prefers an expensive hospital care, but the tendency of development and efficient use of HRT has favourable results.[23] Thus, hospitalization level on hospital-replacing forms of medical care increased and constituted in 2010 – 49.0, in 2014 – 54.5 per 1000 of population.

HRT bed support of population for the last 5 years increased and constituted: in 2010 – 5.5, in 2014 – 9.1 per 10 000 of population, HRT coverage of population increased and comprised: in 2010 – 49.0, in 2014 – 57.3 per 1000 of population, the coverage of treatment at home comprised: in 2010 – 11.8, in 2014 – 9.6 per 1000 of population. The average stay of the patient in day care hospital was 7.2 bed days in 2010, and 7.6 bed days in 2014. In general, the number of day care patients in out-patient organizations exceeds the number of patients treated in day care facilities of the hispitals (54.5% against 37.1%).

In general, from 2010, from the implementation of UNHS, financial expenditures on HRT increased averagely to 35% a year, on DCH it increased to 15%, meanwhile, the analysis results of HRT economic effectiveness shows that the average cost of treatment increased significantly, similarly, the indicator of hospitalization level on all HRT types showed high dynamics of growth.

In connection with the increase of the proportion of elderly patients in the age structure of population, the issues of organizing medical care at home are of particular relevance both in Kazakhstan,[17] and other countries of the world. The number of patients who were provided hospital-replacing care among the elderly patients «above 60» averagely in the last 5 yars increased to 12%, among working-age population to 6%, the category of children aged 1-14 to 2%, as for the adolescents, the average growth rate was -14%, among the children aged under 1 year was -5%. Elderly people, in particular, need a home care.[24,25] It is connected with restructuring of health care system and reorientation of primary medical care to the population toward the out-patient link and the growth of the number of elderly people.

For the further development and wide implementation of HRT into healthcare practice it's necessary to improve and economically justify the activity of different DCH types. The performance and other characteristics of DCH require more in-depth analysis of the factors influencing HRT development. As the wide use of hospital-replacing technologies allows to increase the volume of medical care to patients while reducing its cost.

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All authors have seen and approved the final version.

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