We have analyzed human resources in healthcare of Kazakhstan over 1985-2011, and determined general trends and regularities. By the level of provision with physicians, Kazakhstan ranks as one of the leaders in the world, at the same time there have been a deficit of physicians in the Republic over the last 20 years, particularly in rural areas. As per its regions, there is an irregularity in the physicians provision rate: the most part of specialists is concentrated in cities – Almaty and Astana, there is a deficit of physicians in the Almaty, Kostanai, North-Kazakhstan and Jambyl Oblasts. The effective use of human resources will enable to optimize expenditure for the public health and to improve the medical service quality.

The problem of human resources in Kazakhstan is mentioned as one of the priorities of the public health system development in the country. The State Secretary of Kazakhstan Mukhtar Kul-Mohammed noted that there is a lack of over 5 ths. of health professionals in Kazakhstan (Meeting of the Ministry of Public Health, July, 2012). A deficit of physicians in rural areas is accentuated most of all.

To develop a personnel policy, to plan and to effectively use human resources in Kazakhstan, the public health organizers and managers should have appropriate information not only on the provision with human resources in the country in general, but also on the dynamics of changes in the number of health professionals per regions and different specialities over the last 20 years.

We have made an analysis of human resources in the country with a breakdown into the priority specialties, both in cities/towns and rural areas, of physicians and paramedical personnel, and as compared to the other countries of the world for more than the 25-year (1985 -2011), a content-analysis of regulatory acts relating to the activities of public health organizations and the personnel policy in Kazakhstan.

The following methods were used: information & analytical, content-analysis, mathematical treatment, and comparative analysis.

Over the last 25 years, the physicians provision rate for all specialities in Kazakhstan has been 37.4 per 10 000 population on the average. (Figure 1) [2-3]

![Figure 1: The density of physicians per 10000 population in Kazakhstan, 1985-2011](source: Statistic Database “Health of RK Polulation and activities of public health organizations” over 1985-2011)

During 1985-1990, provision with physicians of all specialities in Kazakhstan was increased from 33.2 to 41.2 per 10 000 population, however, by 1997, this rate was reduced to the level of 1985 again. During the following 10 years, provision with physicians was gradually increased and by 2011 it was 39.0 per 10 000 population.

According to the said rate, Kazakhstan holds the leading position worldwide (3.9 per 1000 population). Figure 2 shows the physicians provision rate in Kazakhstan and in the countries with different income levels [1]. (According to World Bank, since 2011 Kazakhstan is referred to the countries with Upper-Middle Income Level).

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As compared with the OECD countries, the rate is higher than in Kazakhstan just in the three countries (Figure 3), namely, in Norway (4.0 per 1000 population), Austria (4.7) and Greece (6.1). In the Russian Federation being no OECD country, the rate is also higher (4.3 per 1000 population), than in Kazakhstan (3.9 per 1000 population). [4]

However, in spite of the fact that there seems to be favourable conditions in general, the Kazakhstan Public Health system actually incurs a heavy deficit of its personnel. In many respects, the reason thereof is irregularity of medical personnel distribution in the regions of the country, with a disparity between the number of city physicians and that of rural ones, characterized by the tendency for the “aging” of human resources, the shortage of physicians of some particular specialities etc.

The following diagram shows the density of physicians of all specialities as per the regions of the country over 2001-2011[2-3].
As seen from Figure 4, the problem of a deficit of physicians is still pressing from year to year for the following regions: the Almaty, Kostanai, North-Kazakhstan and Jambyl Oblasts. The most of health professionals are concentrated in their cities of the country – Astana and Almaty (on the average, exceeding the total rate in the Republic 1.5 – 2 times more) where in relation to Astana, the rate has increased 1.7 times more over 10 years.

The density of health professionals in cities, towns and villages is given on Figure 5:

Figure 5: The density of physicians of all specialties for city and rural population in Kazakhstan (according to the RK Ministry of Health Statistic Database over 2011) per 10,000 population

As it is seen from the above diagram, provision with physicians in the rural areas is, on the average, 4 times less than in the city/town ones. The highest deficit of physicians can be observed in the villages of the North-Kazakhstan, Kostanai and Mangystau Oblasts. [2-3]

Since 2001, registration of physicians in the private sector of the public health system commenced. Thus, in the said year, the number of them was 6087, and in 2011 – 10,567. When analyzing the number of physicians in RK private organizations, it was ascertained that on the average, the said number was 5 times less than physicians in the state sector structure of the public health system. The most of physicians engaged in the private sector thereof are in Almaty, the Karaganda and East-Kazakhstan Oblasts, and the least one – in the Kzyl-Orda, North-Kazakhstan and West-Kazakhstan Oblasts [2-3].

Figure 6: Ratio of physicians in private and public organizations in RK over 2011 (according to RK Ministry of Health) as per the regions of the country

As regards the number of nursing staff, the nursing staff provision rate had the similar density like the rate of provision with physicians of all specialties for the period being analyzed (Figure 7). As shown on Fig. 7, during 1985-1990, provision with nurses and midwives in Kazakhstan was increased from 113.0 to 123.9 per 10,000 population; however, by 2001, that rate was reduced to the level of 73.8. During the following 10 years, provision with nurses and midwives was gradually increased and by 2011 it was 89.6 per 10,000 population [2-4].
It should be noted that according to the rate of provision with nursing staff, Kazakhstan leaves behind many OECD countries per 1000 population (Figure 8) [4].

As the following stage of our work, we analyzed the density of physicians of priority specialities in Kazakhstan over the period in question. We compared the said indices as per the regions and specialities both in cities/towns and in rural areas [2-3].

Like you see this on Figure 9, provision with general practitioners in Kazakhstan was reduced to 4.4-4.6 per 1000 population during 2001-2005.

Over the last 10 years, the density of general practitioners in rural areas is lower than the relevant rates in cities and towns. During 2001-2006, 2.4 times more, and from 2006 till 2011- 3.2 times more on the average.

The rate of the density of surgeons was 1.5 per 1000 population in 1985, then, it was relatively stable (about 1.3 per 1000 population) but during 2010-2011, that rate was increased up to 2.0 per 1000 population (Figure 9.). The rate of provision of rural population with operating surgeons during the last decade (2001-2011) was nearly 4 times less than the same in relation to the urban population.

Provision with pediatricians in Kazakhstan began to reduce since 1997 (4.6 per 1000 population), especially during 2005-2010 having reached 3.9 per 1000 population (Figure 9). Like in case of doctors of other specialities, the difference between the number of pediatricians in rural and urban areas is 2 or more times less.

Source: OECD Health Data, 2011

Source: OECD Health Data, 2011; Ministry of Health Statistic Database, 1985-2012

Source: Statistic Database “Health of RK Polulation and activities of public health organizations” over 1985-2011

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Provision of the Kazakhstan population with obstetrician-gynecologists, on the contrary, trended to a stable increase, with effect from 1990 (2.2 per 1000 population). During 2010-2011, provision of the country’s population with obstetrician-gynecologists attained a maximum of 2.9 and 2.8, respectively, per 1000 population. (Figure 9)

As regards provision of the rural population with obstetrician-gynecologists, that rate was 4 or more times less than the same for the urban population.

The Organization for Economic Cooperation and Development (OECD) (2011) points out that in many OECD countries the number of narrowly focused specialists largely prevails over the number of general practitioners.

In Kazakhstan, the official statistics take into account general practitioners together with primary care physicians and pediatricians. In 2011, the number of them (individuals) was 7821 (42.5%) of the total of doctors – 18377 employed by medical organizations administrating primary health care. The number of district nurses (individuals) in those organizations amounted to 13089 (30.5%) of the total of nursing staff - 42848.

7821 general practitioners, primary care physicians and pediatricians of the total of physicians of all specialties in Kazakhstan (65100 persons) amount to 12.0%, which can be compared with the relevant data of USA (12.3%) and Hungary (11.7%).

Still, the rate is largely lower than on the average within OECD (25.9%), not to mention those countries (Australia, Canada, France, Portugal), which have attained a universal coverage of the population rendering medical services (Figure 10).

Figure 10. The number of medical specialists and general practitioners in Kazakhstan and in selected OECD countries

Source: OECD Health Data, 2011; Statistics Digest of RK MPH, 1985-2012

Conclusion

Thus, in the analysis of human resources in Kazakhstan over 1985-2011 it was ascertained that Kazakhstan holds the leading position in the world by the physicians provision rate (3.9 per 1000 population). At the same time, the Kazakhstan Public Health system incurs a heavy deficit of its personnel. In many respects, the reason thereof is irregularity of medical personnel distribution in the regions of the country, with a disparity between the number of city physicians and that of rural ones, characterized by the tendency for the “ageing” of human resources, the shortage of physicians of some particular specialities etc.

During the last 10 years, the problem of a deficit of physicians is still pressing for the following regions: the Almaty, Kostanai, North-Kazakhstan and Jambyl Oblasts. The most of health professionals are concentrated in their cities of the country – Astana and Almaty. Within the Republic over the last 25 years, there were low rates of provision with general practitioners and pediatricians in 2001-2005, then there was a budding tendency for the increase in the number of the said specialists. Over the last 25 years, the number of surgeons and obstetrician-gynecologists has been inclined to increase on a constant basis.

When analyzing the physicians provision rate for rural areas, it was found out that the number of physicians of all specialties in rural areas is on the average 4 times less than in cities/towns. The highest deficit of physicians can be noted in the villages of the North-Kazakhstan, Kostanai and Mangystau Oblasts.

In Kazakhstan, the number of narrowly focused specialists is much lower than general practitioners, primary care physicians and pediatricians, which is largely lower than in OECD on the average (25.9%).

The effective use of human resources will enable to optimize expenditure for public health and to improve medical service quality.

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