MEDICAL AND SOCIAL ANALYSIS OF CHILD MORBIDITY IN SEPARATE RURAL DISTRICTS OF THE TERRITORY OF DNIEPROPETROVSK REGION BY THE LONG-TERM ANNUAL AVERAGE INDICATORS

L.V. Hryhorenko, Ph.D., Senior Lecturer
Dnepropetrovsk Medical Academy of Ministry of Health of Ukraine, Ukraine

The author has carried out medical and social analysis of child morbidity at the age of 14 by the long-term annual average indicators in the separate taxons of the territory of Dnepropetrovsk region during 2007-2012. Level of child morbidity was analyzed in accordance with ICD-X classes by the following indicators: average annual, intensive, extensive; the growth rates of the disease were calculated.

Keywords: medical and social analysis, morbidity, taxons, child population, ICD-X disease classes, growth rate.

Conference participant,
National championship in scientific analytics,
Open European and Asian research analytics championship

Introduction. In the recent decade the demographic situation in Ukraine has worsened against the background of negative trends in the flow of genetic processes in the population [1]. The number of patients within the Ukrainian population has increased by 25 %, while the general population has decreased by 4 million people. Non-contagious, including the oncological disease incidence among the population shows the growing trend – by 2.6-3% annually [2, 3]. National hygienic issue today is to assess the economic losses based on the deterioration of the population health indicators [4]. One of the national problems in the modern medicine is a complex demographic situation, observed against the background of negative trends in the flow of genetic processes in the population and the increasing number of cases of genetic hereditary diseases [5-7]. Mostly, the mortality is related to cardiovascular diseases (60 %), followed by cancer (12 %), and external causes including accidents and poisonings (9.7 %); these three causes account for 81.8 % of all deaths in Ukraine. Health-Adjusted Life Expectancy (HALE) is not usually calculated; international research conducted in 2003 has revealed that in 2002 HALE was 54.9 years for men and 63.6 years for women in Ukraine [8]. According to the data offered by the National Institute for Strategic Studies, the infant mortality had been rising between 1991 and 1995, but then fell by the third between 1995 and 2006 [9]. Research conducted by the Ministry of Health and the National Institute for Strategic Studies has also revealed that the number of neonates weighing between 500g and 999 g has decreased by half in the period of 2006-2007. The in-depth analysis has also shown a significant increase in the survival rate of these infants (from 36.4 to 50.3 per 1000 live births), despite the continuing problems with access to equipment in the neonatal intensive care departments. The early neonatal death rate and maternal mortality have both doubled since the country had gained independence [10].

Materials and methods. According to the territorial distribution, 22 administrative districts of the Dnepropetrovsk region have been categorized into 6 types of rural districts in accordance with the Scheme of territorial planning in the Dnepropetrovsk region. The first ranking place by the density of the water supply sources covering is occupied by the first taxon (Kryvorozskyi and Novomoskovskyi districts); the second place is taken by the sixth taxon (Apostolivskyi, Mahdalynivskyi, Petropaulivskyi, Tomakivskyi, Tsarychanskyi and Yuriivskyi rural districts); third taxon (Dnipropetrovskyi district) and Synelnikovskyi districts); third taxon (Dnipropetrovskyi district) and the second taxon (Nikopolskyi and Padvlograd districts). Retrospective examination of distribution of sicknesses and the assessment of indicators of child morbidity (in relation to those younger than 14) in rural districts of the Dnipropetrovsk region during 2008-2013 has been carried out on the basis of using the data copied from the official statistic documentation related to the morbidity of the population, acquired in the facilities included in the system of the Ministry of Health of Ukraine.

Results and discussion. In the structure of child morbidity of those under 14, diseases in general occupy the first place (100 %). Child morbidity in relation to those living in the first taxon of the Dnipropetrovsk region is accurately determined on the level of 11024.76±305.57 cases per 10 000 children by an average annual indicator during 2008-2013 (p < 0.001). Growth rates of all diseases in the first taxon have been registered at the level +2.9 % on average in all administrative districts and -16.8 % around the Dnipropetrovsk region. The highest level of all diseases was accurately observed in the second taxon: 11910.33±393.92 cases per 10 000 children (p < 0.05), with the typical positive growth rate in average around all the rural districts - +11.1. The lowest level of all diseases was accurately registered in the sixth rural district: 9482.96±399.20 cases per 10 000 children of the population (p < 0.05), with the negative growth
rates in the districts (-11.5%) and in the whole Dnepropetrovsk region (-28.4%).

Second ranking position in the structure of morbidity among the children population living in the first district is clearly occupied by the respiratory system diseases (7205.40±204.73) %00 (p < 0.001), with the typical +6.2% positive growth rate in average by the districts and the negative growth rate in relation to the whole region (-16.3%). The highest morbidity among the children population in relation to the XII class diseases was observed in the third taxon and was accurately registered on the level of 7735.50±188.12 %00, (p < 0.05), with the highest growth rate in districts (+14.1), and the negative growth rate in the region (-10.2). The share of the X class diseases in first taxon was 65.36%, whereas in the third taxon was 66.29 %.

The third ranking place in first taxon was occupied by the diseases of the skin and subcutaneous tissue, i.e. their level was 4.85%. Morbidity in relation to the XII class diseases in the first taxon by the long-term annual average indicator was accurately registered at 534.29±44.07 %00, (p < 0.05), with the negative growth rates in relation to the districts (-3.1%) and the whole Dnepropetrovsk region: -26.2% (Fig. 1).

Moreover, our study has revealed the fact that the highest growth rate of the morbidity indicator in relation to the XII class diseases was registered in the second taxon (+31.6%), at the morbidity level of 726.02±89.13 %00, (p > 0.05). The positive growth rate for this class of diseases among children was observed in the whole region as well: +0.3.

Analysis levels of children morbidity in the second taxon shows the clearly expressed growth of indicators of morbidity related to diseases of the endocrine (+130.9%), nervous (+56.5%), musculoskeletal (+75.9%) and genitourinary system (+22.9%), as well as congenital anomalies (malformations) (+25.2%) and congenital anomalies of the circulatory system (+55.2%) with the highest growth rates on average by districts.

Clearly expressed reduction of the children morbidity in the second taxon with the negative growth rate around the district was observed for the following diseases: blood and hematopoiesis system diseases (growth rate of the indicator: -13.5 %), anemia (-12.6%), digestive system diseases (-25.1%). The moderate decline of the morbidity indicator related to the neoplasms was registered on the level of -6.8% on average in the second taxon during 2008-2013.

Among the children living in the territories of the third taxon during 2008-2013 we were able to register the rate of the positive growth of the morbidity indicators in relation to the diseases of the respiratory system (+14.1%), digestive system (+2.3%), skin and subcutaneous tissue (+7.2%). The third taxon is mostly characterized by the negative trend - growth of the morbidity indicators related to the infectious and parasitic diseases (-39.3%), neoplasms (-31.1%), blood and hematopoiesis system diseases (-20.0%), anemia (-19.5%), endocrine system diseases (-29.6%), nervous system diseases (-28.7%), circulatory system diseases (-35.4%), musculoskeletal system diseases (-48.0%), genitourinary system diseases (-5.9%), as well as congenital anomalies (malformations) (-32.0%) and congenital anomalies of the circulatory system (-33.7%).

The in-depth analysis of the morbidity indicators related to the certain classes of diseases among children under 14 years in all rural districts of the Dnepropetrovsk region has shown that the lowest level of infectious and parasitic diseases
was observed in the period of 2008-2013 in the third taxon and was accurately registered at the level of (246.72±15.55) %00 (p < 0.05), while the highest level of the I class diseases was observed in the second taxon (549.27±52.90) %00. As shown in the figure 2, long-term average annual level of this class of diseases has exceeded the average regional level of morbidity (533.10±38.75) %00 by 1.03 times and the average district level (410.68±31.68) %00 – by 1.34 times.

Incidence of neoplasms among children under 14 years was clearly the highest by the levels of the long-term annual average indicators in the first taxon: 19.92±1.81 %00 (p < 0.05) and the fifth taxon: 19.59±3.04 %00 (p < 0.001). In addition, the II class diseases have exceeded the average district indicator of morbidity related to neoplasms 16.92±0.48 %00 by 1.78 times (the first taxon) and by 1.02 times (the fifth taxon), with positive growth rates by districts: from +17.7 to +15.8%. In general, the II class disease morbidity indicator in relation to the children population hasn’t exceeded the average level of morbidity of the whole region (25.20±0.39) %00, in all districts of the Dnepropetrovsk region (p < 0.001).

During 2008-2013 a negative growth rate trend in relation to the neoplasms was registered in the region in the first taxon (-20.9%), second taxon (-37.5%), third taxon (-31.1%), fourth taxon (-33.8%), fifth taxon (-22.3 %) and the sixth taxon (-29.2 %). The density of neoplasms among the children under 14 in separate districts of the Dnepropetrovsk region was the following: from 0.09% in the third taxon to 0.21% in the fourth taxon. (Fig. 3)

As for the dynamics, the districts of the Dnepropetrovsk region show the clear growth of the morbidity level related to diseases of blood and the hematopoiesis system among children: from 156.90±11.76 cases in the first district (p < 0.05) to 289.71±32.72 cases per 10 000 children in the sixth taxon. The density of intensity of this pathology in separate districts of the region is increasing from 1.42% in the first taxon to 3.05% in the sixth district. In addition, we have registered a positive growth rate on average in the districts related to the III class of diseases. It is the mostly manifested in the fifth taxon (+3.3 %) and sixth district (+24.9%). The level of morbidity exceeds the average regional level in these districts by 1.03-1.25 times. The positive growth rate in relation to the III class of diseases around the region is registered at +24.5% in the fifth district and +50.6% in the sixth taxon. The average regional indicators are exceeded by 1.25-1.51 times.

The trend in significant growth of the number of cases of anemia among the children under 14 was revealed: from 155.12±11.42 %00 (p < 0.05) cases in the fifth taxon to 286.68±32.59 % 00 cases in the sixth taxon (Fig. 4). The clearly expressed trend of negative growth of indicators of morbidity related to anemia by districts is registered in the following taxa: -32.2% in the first district; -12.6% in the second district; -19.5% in the third district; -20.9% in the fourth district. The positive growth rate in relation to diseases of the III class (D50-D53) was typical for the fifth and the sixth districts: respectively +2.5 and +25.2% (by the districts) and +25.2 and +52.9 % (in the region) (Fig. 4). In both Dnepropetrovsk region taxa the morbidity related to this class of diseases has exceeded the average district level of morbidity: by 1.02-1.25 times, and in average...
indicators of the whole region - by 1.25-1.53 times.

Share of the genitourinary system diseases in the structure of all diseases among children under 14 was the following in separate taxa of the region: 1.73% (first district); 2.29% (second district); 1.80% (third district); 2.86% (fourth district); 2.35% (fifth district); 2.47% (sixth district). The lowest level of the XIV class of diseases was registered in the first taxon: 190.84±20.75 %, with the negative growth rates both in districts (-14.4%) and in the region: -32.1%. The highest level of this class of diseases among children was observed in the second taxon: 273.89±23.72 %, with the positive growth by the districts (+22.9%), and the negative growth rate in the region (-2.6%). In general, the diseases of the genitourinary system have exceeded the average district index of morbidity in the second district (by 1.23 times); fourth district (by 1.0 time); fifth district (by 1.18 times); sixth district (by 1.05 times).

Morbidity of children under 14 related to the congenital circulatory system anomalies was the highest in the second, fourth and the sixth taxa; both the average district level and the average regional level indices were exceeded by: the second taxon (1.55 – 1.73 times), the fourth taxon (1.26 – 1.41 times); the sixth taxon (1.26 - 1.41 times). The highest growth rate in relation to diseases of the XVII class (Q20-Q28) was observed: by districts in the second taxon (+55.2%); in the fourth taxon - by districts (+26.0%), in the region (+40.6%); in the sixth taxon - by districts (+26.4%), in the region (+41.0%). AS for all the other taxa the negative growth rates was registered for the period of 2008-2013: in the first taxon - by districts (-16.2%), in the region (-6.5%); in the third taxon - by districts (-33.7%), in the region (-26.1%); in the fifth taxon - by districts (-22.2%), in the region (-13.2%).

Conclusions. We have found out that the structure of morbidity among children in different rural districts varies in relation to some classes of diseases. In the first taxon the largest share was registered for the following classes of diseases: X (65.36%), XII (4.85%), XI (4.42%), I (3.23%) and the IV class (2.01%); in the second taxon the situation was the following: X (58.89%), XII (6.09%), XIII (5.01%), I (4.61%) and the IV class (5.21%); in the third taxon the situation was the following: X (66.29%), XII (5.07%), XI (3.94%), I (2.11%) and the IV class (1.62%); in the fourth taxon the situation was the following: X (58.89%), XII (6.09%), XIII (5.01%), I (4.61%) and the IV class (5.21%); in the fifth taxon the situation was the following: X (66.29%), XII (5.07%), XI (3.94%), I (2.11%) and the IV class (1.62%); in the fourth taxon the situation was the following: X (66.29%), XII (5.07%), XI (3.94%), I (2.11%) and the IV class (1.62%); in the fifth taxon the situation was the following: X (66.29%), XII (5.07%), XI (3.94%), I (2.11%) and the IV class (1.62%); in the sixth taxon the situation was the following: X (66.29%), XII (5.07%), XI (3.94%), I (2.11%) and the IV class (1.62%).

Information about author:

1. Liubov Hryhorenko - Ph.D. in Medicine, Associate Professor, Dnipropetrovsk Medical Academy Ministry of Public Health; address: Ukraine, Dnipropetrovsk city; e-mail: ask_liubov@mail.ru