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## ENGLISH VERSION: ANALYSIS OF SCHOOLCHILDREN'S HEALTH IN THE MODERN ENVIRONMENT AS EXEMPLIFIED BY POLTAVA REGION\*

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*The article provides the analysis of data on incidence and prevalence of diseases among children in Poltava region as compared to those of Ukraine for the period 2011-2015. The analysis found that destabilization of children's health has been held for the last 5 years - morbidity and prevalence of diseases remain high, despite the positive trend. It is noted that the incidence decreases with age, and the prevalence increases, due to the increase in chronic diseases over the years. The incidence among rural child population is 1000.8 per 1000 children that is below the average indicator (1200.4) and significantly lower than the incidence among urban child population (1304.7).*

**Keywords:** child population, disease, prevalence of diseases.

It is commonly known that health of the nation depends on the level of children's health. The level of development of younger generation, their physical and mental potential, is a prerequisite for the state to come out of social and economic recession. Indicators of health of women and children as well as mortality rates, are considered as the most important indicators of social well-being of the population. Due to the social and economic problems of recent years, the dynamics of children's health in our country has become a negative trend. Numbers of children with chronic disorders are growing constantly and so is children's disability.

The cause of this situation is associated by researchers not only with economic instability, but also with worsening environmental conditions of life, the spread of harmful habits among children, neglecting the basic rules of healthy lifestyle and so on. Scientists warn that these factors affect not only the health, but also life expectancy and mortality rate of future generations. [1, 2].

The aim of the study is to analyze the health of children as exemplified by Poltava region in 2011 – 2015.

### Materials and Methods

The study was carried out within the research project "Scientific substantiation for prevention of negative influence of certain environmental factors on quality of life and health of children in geochemical province" (state registration number of 0111U8522). The work uses data from the state statistics on the incidence and prevalence of diseases among children in Ukraine. The work contains analysis of the incidence and prevalence of disease among children in Ukraine and in Poltava region, the main classes of diseases and age for 2011-2015.

### Results and Discussion

Children's health is the future of the nation and the most important resource of any society. [8] Children's health acquires particular importance during the unfavorable demographic situation. And in Ukraine there has been registered a permanent decrease of reproduction over the past decades, when the amount of each new born generation is less than generation of their parents

and incapable to make up for the loss of population due to death [9].

According to the State Statistics Service, by the end of 2015 the population of Ukraine totaled 42.760.5 thousand people (without Crimea annexed by Russia - 2.3 mln. people), including 29.556.4 thousand people lived in urban areas, and 13204, 1 thousand people - in rural areas. For the past 22 years, the population of Ukraine has reduced. Reduction in the population of Ukraine has been due mostly to steady natural decrease, i.e. excess of deaths over the number of births. For the first time it was registered in 1991, and by early 2016 it exceeded the total value of 6 million people, or about 12.4% of the total population of Ukraine as of early 1991. Over the past years of the 21 century, our population has continued to decline, albeit with a noticeable slowdown, causing the decrease by 673.7 thousands people in the period from 2011 to 2016, and by 168.8 thousands for the past year [11]. The largest rate of natural population decline during 2011-2015 was held by Chernihiv, Sumy, Poltava, Kirovohrad region and ranged from 10 to 5% [11].

In Poltava region, the steady natural decrease in population (especially rural population) has been registered. Natural movement of population is negative and is getting steadily worse. In 2011, it has resulted in 6.9, and in 2015 - in 7.6 per 1000 people. The lowest population growth has been in Globinskiy, Chornuhynskomu, Khorol, Semenov and Kozelshchina areas. The highest population growth has been in Komsomolsk, Poltava, Kremenchug [3,4,5,6,7].

From 2007 to 2014, there was a slight growth in the birth rate in Poltava region (8.7 in 2007, 9.5 in 2011, 10.0 in 2014), but in 2015 this figure decreased and amounted to 9.3 per 1.000 people. The mortality rate was 16.4 per 1.000 people in 2011 and 16.9 per 1.000 people in 2015.

The lowest birth rates have been in Khorol, Lokhvytsky and Hadiach areas, the highest mortality rates have been in Chornuhynskomu, Globinskiy and Kozelshchina areas.

Since 1992, the number of children has decreased by almost one third over the past 5 years to 5614 children (2.4%) (Figure 1). The share of the child population has

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been within 16.1-16.3% of the total population over the past 5 years.

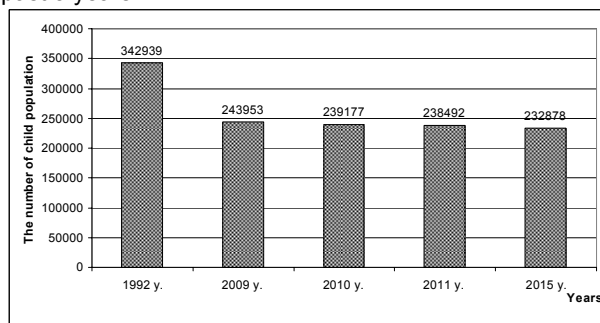


Fig. 1. The number of child population dynamics in the Poltava region for 1992 – 2015

Analysis of the health of children in the country and in the regions shows that destabilization of children's health has been held for the last 5 years - morbidity and prevalence of diseases, despite the positive trend, remain high. In 2015, the incidence among child population was 1.200.4 per 1.000 children (1274.76 per 1000 children for Ukraine), prevalence of diseases 1780.8 per 1000 children (1742.3 per 1000 children for Ukraine). In 2010, the incidence was 1361.0 (1393.99 per 1000 children for Ukraine), prevalence of diseases 1944.6 per 1000 children. With age, incidence decreases and prevalence increases, due to the increase in chronic diseases over the years. The decline in incidence was almost in all nosology.

The structure of morbidity of children in the Poltava region in 2015: first place is occupied by respiratory diseases - 67% (1st place in Ukraine - 67.11%), second - diseases of the skin and subcutaneous tissue - 5.7% (2nd place in Ukraine - 5.14%) III - infectious and parasitic diseases - 4.3% (4<sup>th</sup> place in Ukraine - 3.58%) IV - diseases of the eye and adnexa - 3.5% (7th place in Ukraine - 3.39%) V - diseases of the digestive system - 3.4% (6th place in Ukraine - 3.6%), VI - injury and poisoning - 3.2% (5th place in Ukraine - 3.87%).

This incidence rate among children of rural areas is 1000.8 per 1000 children, that is below average indicator (1200.4) and significantly lower than the incidence among the children of urban residents (1304.7). Respiratory diseases occupy the first place in the structure of morbidity for rural residents, I - diseases of the skin and subcutaneous tissue, II - injuries and poisonings, IV - diseases of the digestive system, V - infectious and parasitic diseases. The incidence among children of urban areas is 1304.7 per 1000 children. The structure of morbidity for urban residents: 1<sup>st</sup> place - respiratory diseases, II - diseases of the skin and subcutaneous tissue, III - infectious and parasitic diseases, V - diseases of the eye and adnexa, V - diseases of the digestive system. There has been a growing incidence of tumors among children - 4.6 per 1.000 children, especially amount of children from urban areas - 6.0 per 1000 as compared to 2.1 per 1.000 children in rural areas.

It takes considerable time in the life of a child to stay at educational institutions, which are virtually indispensable and the only (after the family) factor that affects the health of children. In recent years, the innovations and reforms in the educational sector were carried out without regard to their impact on the health of children, that was the cause of significant increase in the incidence and growth of so-called "school pathology." Information overload, stressful situations, upgrade in the educational

process requires great exertion of a child's body, and along with other factors (limitation of physical activity, the use of computer technology, the lack of natural lighting and artificial lighting, forced working posture along with the wrong selection of school furniture and absence of rational nutrition) leads first to a functional impairment, and subsequently to the formation of organ pathology. Educational activities are not adapted to the development peculiarities and state of health of modern students, teachers have insufficient expertise in the preservation and strengthening of health, and parents and children themselves are passive on their health. According to research, children of school age have poor functional adaptation to physical activity being in low fitness level and having low functional reserve of the heart [11]. Accordingly, it is observed that in this age group, the highest prevalence of diseases and chronic pathology begins to accumulate, as evidenced by the results of preventive medical checkups.

In 2015, mandatory preventive medical examinations covered 99.9% of children aged 0-18 in Poltava region (97.6% in Ukraine) [7, 11]. Against the decrease in overall morbidity among children population in the region, there is a significant concern about the rapid increase in the frequency of detection of scoliosis, posture disorders and decreased visual acuity during preventive medical examinations, especially among primary school children. With the beginning of children's education at school, a sharp increase in the incidence is observed, as compared with children of preschool age - by 3.8 times increased number of children with reduced visual acuity - 51.2, by 6.4 times increased number of children with impaired posture - 60.9 and by 7.8 times increased detection of scoliosis - 13.4. Not suitable learning environment for children from 2 to 8 leads to further deterioration in the health of children: reduced visual acuity (figure rises to 6 times), posture disorder (an increase of 8 times) and the rapidly growing number of children who have scoliosis were found.

In general, over the past 25 years the frequency of disorders of posture among the children increased by 2.5 times (45.7 in 2015 to 18.2 in 1992) in Poltava region, and the incidence of scoliosis - by 3.3 times (22.8 in 2015. vs. 6.9 in 1992).

The highest numbers of disorders of posture and reduced visual acuity of the child population are observed in Poltava, Kremenchug, Komsomolsk that may be due to low motor activity of urban children, significant workload in schools, especially in secondary schools, lyceums, huge number of lessons, focus of teachers on children to obtain high level of knowledge neglecting breaks with physical activities, especially among children of primary school, abnormal time spending by children with modern means of communication and information (computers, tablets, smart phones, etc.) without proper lighting and working postures. Significant detection of this pathology may indicate the effectiveness of preventive health examinations. At the same time the detection of scoliosis (compared with the detection of posture disorders) is lower below in the cities, indicating the timeliness and effectiveness of the preventive measures at detection premorbid condition phase.

At the same time, the rate of detection of decreased visual acuity, disorders of posture and scoliosis among rural child population is almost at the same level, and in some areas the level of detection of scoliosis is higher than the revealed disorders of posture, indicating poor

implementation of preventive medical examinations due to lack of specialized professionals, lack of early detection of disorders of posture and formation of severe scoliosis disease (Kotelevsky, Dicanskiy, Kozelshchina, Globinskiy, V.Bahachansky areas). The level of detecting scoliosis is significantly above the average in Khorol, N.Sanzhary, Mashivka, Hadiach, Kobeliatsky, Hrebinka areas.

### Conclusions

1. In Poltava region, there is a steady natural decrease in population (especially rural) due to reduced fertility and increased mortality.

2. Analysis of the health of children in the Poltava region and in Ukraine shows that for the last 5 years there has been destabilization of children's health - morbidity and prevalence of diseases remain at high level, despite the positive trend.

3. With age, the incidence decreases and the prevalence increases, due to the increase in chronic diseases over the years.

4. The incidence among rural child population is 1000.8 per 1000 children that is below the average indicator (1200.4) and significantly lower than the incidence among urban child population (1304.7).

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