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ANALYSIS OF THE GENERAL MORBIDITY OF THE POPULATION OF THE DNIPRPO REGION

Actuality. *Today, there is no doubt about the postulate regarding the foundations of human health formation, starting from the moment of conception, birth and childhood. The lost quality of health and life, of course, affects the intelligence, creativity, physical development and working capacity of each individual, which in aggregate is of great importance for the harmonious development of the entire society. In the analysis of indicators of general morbidity of the population, medical statistics play an important role, which opens up the possibility of comparative analysis of the norm of the physical condition of the population and social pathologies in different countries.*

The purpose of the study *was a retrospective study of the levels of general morbidity among the rural child and adult population living in the industrial zone of the Dnipro region.*

Materials and methods of the study. *In this study, correlation and cluster analyses of the information obtained were used with the subsequent mathematical processing of statistical data. The main part of the mathematical processing was performed on a PC using the standard statistical package STATISTICA 6.1 portab.*

Research results. *In the structure of the general morbidity of the population of the Dnipro region, infectious and parasitic diseases occupy the first place. The incidence of these diseases among all age groups of the population of this region for the period 2018–2021 was characterized by a tendency to increase (from 564 90.12 to 622262.63) cases per 100.000 population. However, the average annual incidence of infectious and parasitic diseases was at the level of 58232.04 cases per 100.000 population in the region. The growth rates were 7.0 – in cluster areas and 0.9 – in the Dnipro region as a whole, respectively. The second place in the structure of the general morbidity of the population is occupied by non-communicable diseases, which are characterized by a tendency to increase for the period from 2018 to 2021 (from 54135.58 to 59901.11) cases per 100 thousand population, which exceeds the average annual level. The growth rate of this indicator for the period from 2018 to 2021 was at the level of 7.0% for the region as a whole. Analysis of the morbidity rate of the entire population revealed an increase in the rates of oncological diseases, diseases of the nervous system, sensory organs, etc.*

Conclusions. *The main factors influencing the level of general morbidity of the population of the Dnipro region during 2018–2021 are demographic indicators of different age groups, as well as indicators of dispensary surveillance in the territory of the experimental observation zone. The first place in terms of morbidity among the adult and child population for the period from 2018 to 2021 is occupied by infectious and parasitic diseases with a tendency to increase. Among the categories of children from 0 to 14 years old, an unfavorable trend in growth dynamics with an increased prevalence of non-communicable diseases, including malignant neoplasms and diabetes mellitus, was determined. A trend towards a decrease in the incidence of gastric and duodenal ulcers, gastritis and duodenitis was registered. The stabilization of the indicators of the general morbidity of adolescents with arterial hypertension in the region was also shown.*

Key words: *Dnipro region, demographic indicators of age categories, medical and social factors, dispensary surveillance, population morbidity.*

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АНАЛІЗ ЗАГАЛЬНОЇ ЗАХВОРЮВАНОСТІ НАСЕЛЕННЯ ДНІПРОВСЬКОГО РЕГІОНУ

Актуальність. *На сьогодні не викликає сумніву постулат щодо основ формування здоров'я людини починаючи з моменту її зачаття, народження та дитинства. Втрачена якість здоров'я та життя впливає на інтелект, креативність, фізичний розвиток та працездатність кожного індивідуума, що у сукупності має неабияке значення для гармонічного розвитку всього соціуму. В аналізі показників загальної захворюваності населення важливу роль відіграє медична статистика, яка відкриває можливість порівняльного аналізу норми фізичного стану населення та соціальних патологій у різних країнах.*

Метою дослідження було *ретроспективне вивчення рівнів загальної захворюваності серед сільського дитячого і дорослого населення, яке проживає у промисловій зоні Дніпровського регіону.*

Матеріали та методи дослідження. *У цьому дослідженні був використаний кореляційний та кластерний аналізи отриманої інформації з наступною математичною обробкою статистичних даних. Основна частина математичної обробки виконувалась на ПК з використанням стандартного статистичного пакета STATISTICA 6.1 portab.*

Результати дослідження. *У структурі загальної захворюваності населення Дніпровського регіону перше місце посідають інфекційні та паразитарні хвороби. Захворюваність на ці хвороби серед усіх вікових груп населення цього регіону за період 2018–2021 років характеризувалася тенденцією до зростання (від 564 90,12 до 622262,63 випадків на 100 000 населення). Проте середньорічний показник захворюваності на інфекційні та паразитарні хвороби був на рівні 58232,04 випадка на 100 000 населення по регіону. Темпи приросту становили відповідно 7,0 – по кластерних районах та 0,9 – по Дніпровському регіону загалом. Друге місце у структурі загальної захворюваності населення посідали неінфекційні хвороби, які характеризувалися тенденцією до зростання за період з 2018 по 2021 – з 54135,58 до 59901,11 випадка на 100 тисяч населення, що перевищує середньорічний рівень. Темп приросту цього показника за період 2018–2021 років був на рівні 7,0% по регіону загалом. Аналіз рівня захворюваності всього населення виявив зростання показників онкологічних захворювань, захворювань нервової системи, органів чуття тощо.*

Висновки. *Головними чинниками, які впливали на рівень загальної захворюваності населення Дніпровського регіону протягом 2018–2021 рр., були демографічні показники різних вікових груп, а також показники диспансерного нагляду на території*

дослідної зони спостереження. Перше місце із захворюваності серед дорослого та дитячого населення за період з 2018 по 2021 рр. посідали інфекційні та паразитарні хвороби з тенденцією до зростання. Серед категорій дітей (від 0 до 14) років визначено несприятливу тенденцію динаміки росту з підвищеною поширеністю на неінфекційні хвороби, у тому числі злоякісні новоутворення та цукровий діабет. Зареєстровано тенденцію до зниження захворюваності на виразкову хворобу шлунка і дванадцятипалої кишки, гастрити та дуоденіти. Також виявлено стабілізацію показників загальної захворюваності підлітків на артеріальну гіпертензію в регіоні.

Ключові слова: *Дніпровський регіон, демографічні показники вікових категорій, медико-соціальні фактори, диспансерний нагляд, захворюваність населення.*

Introduction. Actuality. During last ten years in Ukraine was worsened demographic situation on a background of negative trends in population genetic processes (Mallol et al. 2021; Wu et al. 2023; Jenssen 2023; Edstorp et al., 2022). Number of patients in the Ukrainian population increased on 25%, total population number was declined on 4 million persons. Noninfectious pathology, including oncological diseases was increased annually in the population on (2.6–3)% (Bar-Zeev et al., 2022). In this regard, the national hygienic problem today is to assess economic losses due to the deterioration of population health indicators among adults and children. It is caused by influence of biomedical factors and influence of negative environmental factors (Morales-Suбrez-Varela et al., 2022; Chi et al., 2022; Sia et al., 2022).

Dnipro region district is located in the western part of the Dnipro region in the north and west of Kherson region. In the south part of Ukraine it was bordered with Velyka Bilozerka rural district, in the east part of Ukraine it was bordered with Vasilevskyi district of Zaporozhskyi region. The given region covers total area 1.23 000 km^2, which included 6.2% from the total area of Dnipro region. Area in the region is characterized by warm dry summer, mild winter with frequent thaws. The largest quantity of precipitation (267 mm) falls in April and October. Population of the district is 41.800 people, including urban population 13800 people, rural population 28000 people. At the age structure of population is dominated age groups over 50 years old, which account 50.7% total amount of the adult population. It was observed trend to the population aging.

Dnipro region district covered 17 administrative districts, including 16 villages. In this rural district are dominated numerous small villages with population less than 2000 people in 10 villages. In the administrative-territorially planning the district includes Dnipro region Rural Council and 8 village councils, which control 16 villages.

In Dnipro region district was shown tendency to development of agricultural production orientation. Area of landfill soils was covered 63200 hectares. Animal breeding complexes is well-developed, including 1 dairy farm. About 38.2% of working population (1831 people) employed in agriculture field. Organization of drinking water supply is centralized and carried out from individual mine or tubular wells. Centralized water supply of the district is covered on 60%. Centralized water sources is underground aquifer, carried out in the depth 26 m or more.

The purpose of the study of the retrospective epidemiological study performed by the cohort method is to study the levels of population health among children and adults living in the rural industrial area of the Dnipro region.

Materials and research methods. Analysis of morbidity by main classes of diseases, in accordance with International Classification of Diseases – X, was carried out at the adult and children population in Dnipro region district for the period from 2018 to 2021 years. There were used data of statistical reports of the regional information center of Department of Public Health in Dnipro region for 2018–2021 years. Generally, were investigated 450 cases of morbidity among adult population; 550 indicators of morbidity among children population in Dnipro region district (statistical report Form No. 20).

The experienced district includes 17 administrative centers, including 16 rural settlements. In the Dnipro region district, small villages with a population less than 2000 people predominate. There are about 10 settlements in total. To assess the health status of the child population in the experimental (Dnipro region) district, an analysis was made on the prevalence rates of diseases and morbidity, which were classified by the individual nosological groups, according to ICD-X. In the rural area it was stratified by age composition, choice of which was based on the uniformity of social and hygienic parameters, types of water supply systems (mainly decentralized and imported drinking water), level of health care system in rural dispensaries. The rural population is provided with drinking water through centralized water supply and with the help of individual mine or tubular wells (Lototska et al.,2023). Provision of rural population with drinking water is carried out through centralized water supply and with the help of individual mine or tubular wells. Average annual indicators of drinking water quality were monitored in accordance with DSanPiN 2.2.4-171-10 “Hygienic requirements for drinking water intended for human consumption” (Mykyta et al.,2023; Regional report on the state of the natural envi-

ronment in the Dnipropetrovsk region for 2023, 2023). On a basis of the study was carried out epidemiological method (Regional report on the state of the natural environment in the Dnipropetrovsk region for 2022. 2022; Zamora-Ledezma et al., 2021). Based on the data from official statistical reports (Machate, 2023; Fawkes, 2022; WHO; 2023; Hama Aziz et al., 2023) the database focused on the health status of children and adults was created. Statistical grouping and development of materials on the prevalence of diseases and incidence of rural population were conducted in accordance with the "International Statistical Classification of Diseases and Related Health Problems" (ICD-X) (Onul et al., 2020). Statistical analysis and analysis results of the study were carried out using medical-statistical methods (Parks et al. 2023; Unsal et al. 2023). The formation and editing of the original database was carried out on the personal computer "Pentium 5 Intel PC" in Windows XP Professional environment (product number 42310-789-55779002-675209). All statistical processing is performed with using STATISTICA 6.1 software (StatSoftInc., Serial number AGAR 909E415822FA).

Research results and their discussion. In a structure of morbidity in Dnipro region district infectious and parasitic diseases taking the first rank place. Incidence of this disease among all age groups of population in this region for the period 2018–2021 years was characterized by the tendency to increase from (56490.12 to 622262.63) cases per 100 000 population. However, average annual indicator of infectious and parasitic diseases was on the level 58232.04 cases per 100 000 population in the district and 57957.58 cases per 100 000 population in Dnipro region. Growth rates were respectively 7.0 – in the district and 0.9 – in the region. The highest level of this class of diseases was observed in 2021 year on 1.07 times higher, compared with level of average annual indicator for the district and region (Fig. 1).

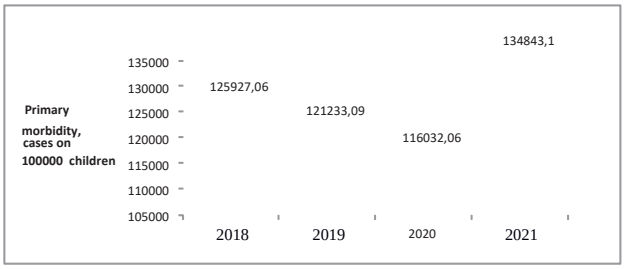

Fig. 1. Dynamics of incidence for the infectious and non-infectious diseases among children (at the age from 0 to 14 years) in Dnipro region rural district for 2018–2021 years

Second rank place in a structure of morbidity belongs to the non-infectious diseases, which characterized by the tendency to increase during 3-year period of observation, respectively (from 54135.58 to 59901.11) cases per 100 000 population, which exceeds levels of average annual indicator on (1.03–1.07) times both in the district and region. Growth rate of this index for the period 2018–2021 years was on the level 7.0% in the district and 0.8% – in the region (Fig. 2).

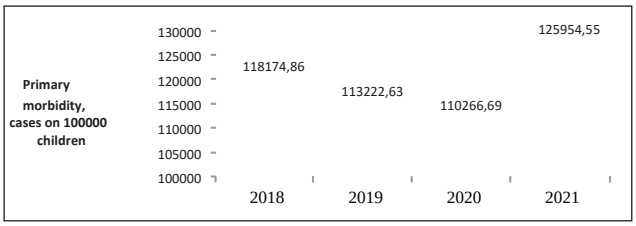

Fig. 2. Dynamics of incidence for the non-infectious diseases among children (at the age from 0 to 14 years) in Dnipro region district for 2018–2021 years

Third rank position occupied by respiratory diseases, influenza and SARS. Incidence of this disease by average annual indicator was on the level 24560.88 cases per 100 000 population in the district and 26787.54 cases per 100 000 population in the region. The highest growth rate of morbidity in all population of Dnipro region district was 12.2%.

Analysis level of incidence among all population was shown growth indicators of diseases for oncological, diseases of the nervous system and sensory organs, with growth rates in the district 32.3%, while in the region (8.7–2.1)% respectively.

Great reduction incidence of diseases among all population with negative growth rates was observed in the district by the following classes of diseases: blood and blood-forming organs (growth rate – 6.4%), diseases of the endocrine system (-22.1%), diabetes (-19.1%), psychiatric disorders (-11.9%), myopia (-11.5%), cardiovascular diseases (growth rate – 7.0%), hypertension (-17.4%), coronary artery disease (-27.1%), gastritis and duodenitis (growth rate -34.6%), diseases of the skin and subcutaneous tissue (-34.2%), diseases of bone and muscular system (-7.4%). There was a modest decline of the incidence of asthma (2.2%), diseases of digestive system (-4.4%) in the rural district during 2018–2021 years.

Among the categories of children and adults living in the territory of Dnipro region for 2018–2021 years, found the highest rates of positive growth in the incidence of infectious and parasitic diseases (growth rate of 7.0%), non-communicable diseases (7%) neoplasms (3.3%), malignant neoplasms (6.8%), diseases of the nervous system and sensory organs (32.3%), respiratory diseases, influenza and acute respiratory disease (12.2%), injury and poisoning (7.7%) and a moderate

increase in the incidence of gastric ulcers and duodenum (1.1%). The positive trend towards pronounced dynamic growth of morbidity among children age (0 to 14) years for average perennial indicator of how the district and the region of infectious and non-communicable diseases (growth rates respectively 8.3 and 3.0%), non-communicable diseases (7.7 and 2.7%), infectious and parasitic diseases (16.9 and 6.8%), cancer (66.1 and 11.5%), malignant neoplasms (221.7 and 11.4%), diseases of the nervous system and sensory organs (51.9 and 10.6%), diseases respiratory, flu and ARVI (12.5 and 3.1%). Stabilization was registered by the incidence of asthma among children (0–14) years, with growth rates (0.5%) and the district (14.5%) in the region. The highest incidence among children in this class of disease was observed in 2021 and amounted to 107.91 cases per 100 000 population was 1.7 times higher than the figure for average annual level in the area and on 1.4 times respectively in the region (Fig. 3).

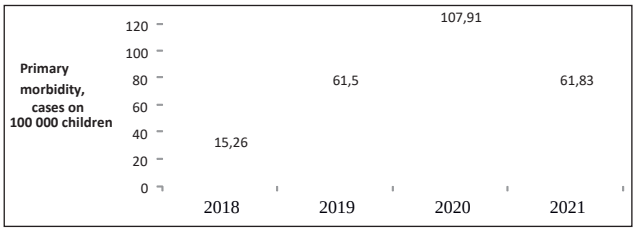

Fig. 3. The trend in the incidence of asthma among children (aged 0 to 14 years) in Dnipro region district for 2018–2021

Dynamic trend with a marked decrease in the incidence rate was registered among children (0–14) years on the following classes of diseases as diseases of blood and blood-forming organs (negative growth rate of -8.0%), diseases of the endocrine system (-12.5%), myopia (-21.8%), cardiovascular diseases (-20.9%), diseases of the digestive system (-5.6%), gastritis and duodenitis and diseases of the skin and subcutaneous tissue (-32.1%), diseases of the musculoskeletal system (-19.6%).

Analysis of morbidity among adults and adolescents (from 15 to 17) years shows that the first place is occupied rank infectious and noninfectious diseases. Trends in the incidence of this class demonstrates the pronounced growth performance intensive level of 44.210.82 in 2018 to 49.021.05 cases per 100000 population in 2021, with a positive growth rate of 6% in the district and a negative growth rate at -0.5% by area. Noncommunicable diseases occupy the second rank in the structure of morbidity among adults and adolescents and are characterized by dynamic growth in 6.4% of the area of 42.821.97 to 47.828.79 cases per 100000 population for the period of study.

Third place in the rank structure of morbidity among adults and adolescents account for respiratory diseases, influenza and ARVI. Morbidity and young adults for this class of diseases characterized by the growth dynamics of 11.2%. Average annual incidence rate of respiratory diseases, influenza and ARI was 13.724.38 cases per 100000 population in the area and 15.650.94 cases per 100 000 population in the region.

Analysis of data on morbidity among adults and adolescents showed marked growth of 2018–2021, in the class of diseases of the nervous system and sensory organs (26.9%), neoplasms (30.5%), injuries and poisonings (9.1%), as well as infectious and non-infectious diseases (6.0%), non-communicable diseases (6.4%), respiratory diseases, influenza and acute respiratory disease (11.2%).

Dynamic trend with a marked decrease in morbidity among adults and adolescents were registered for the following classes of diseases such as infectious and parasitic diseases (growth rate -8.0%), diseases endocrine system (-24.0%), diabetes (-18.9%), psychiatric disorders (-14.5%), myopia (-9.1%), cardiovascular diseases (-6.6%), including hypertension (-17.4%), coronary disease (-27.1%), gastritis and duodenitis (-36.7%), skin and subcutaneous tissues (-35.7%), diseases of the musculoskeletal system (-6.6%) (Fig. 4–7).

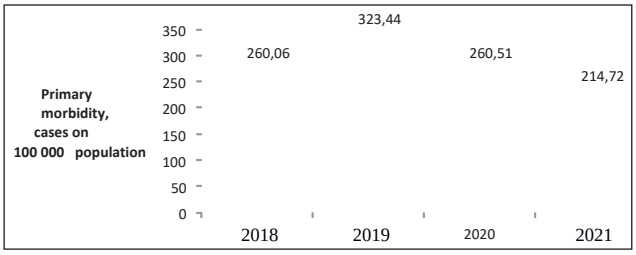

Fig. 4. The trend in the incidence of diabetes in the adult and child population (aged 15–17 years) in Dnipro region district for 2018–2021

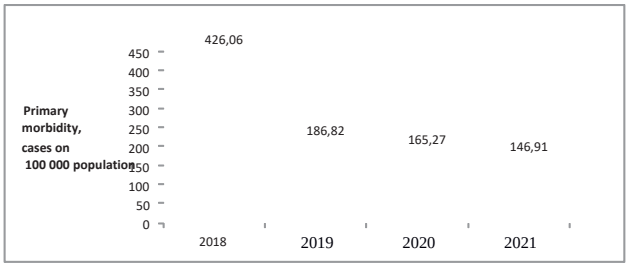

Fig. 5. The trend in the incidence of gastritis and duodenitis adult and child population (aged 15–17 years) in Dnipro region district for 2018–2021

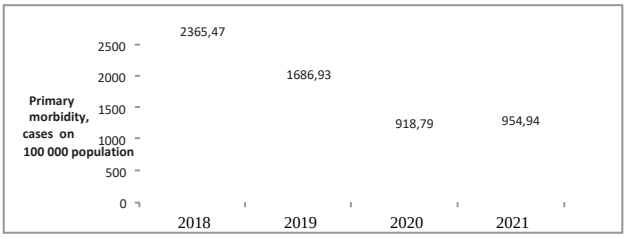

Fig. 6. The trend in the incidence of diseases of the skin and subcutaneous tissue in the adult and child population (aged 15–17 years) in Dnipro region district for 2018–2021

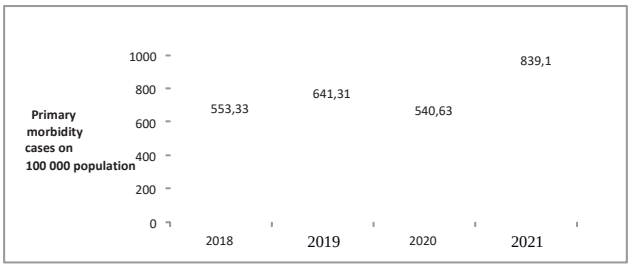

Fig. 7. The trend in the incidence of tumors in the adult and child population (aged 15–17 years) in Dnipro region district for 2018–2021

Analysis of prevalence of diseases among categories of adult and children population in Dnipro region showed that the first place is occupied rank infectious and noninfectious diseases, the second – non-communicable diseases, in third place – diseases of the circulatory system. The tendency of increasing levels of indicator in dynamics for 2018–2021 is characterized for these types of diseases. The prevalence of diseases infectious and non-communicable diseases in the general population tends to increase from 145.885.40 to 151.652.97 cases per 100 000 population, with a growth rate in the district on 3.6%. However, prevalence of diseases of this class was 146,390.14 cases per 100 000 population in the area and 146.412.63 cases per 100 000 population in the region.

Adverse dynamic trend with a strong growth rate was registered also in the following classes of diseases such as infectious and parasitic diseases (growth rate 5.8%), diseases of the endocrine system (7.5%), diabetes (8.9%), diseases of the nervous system and sensory organs (15.4%), cardiovascular diseases (5.8%), including coronary heart disease (13.0%), injury and poisoning (8.2%). Prevalence of diseases with hypertension was stable both in area (annual growth rate of 1.0%) and the region (1.5%).

The tendency to a significant decrease in prevalence of diseases malignancies average in the area (growth rate of -10.0), diseases of the blood and blood-forming organs (-11.4%), myopia (-29.0%), asthma (-13.4%), gastritis and duodenitis

(-13.2%), diseases of the skin and subcutaneous tissue (-30.9%), congenital anomalies (-6.4%).

The structure of the prevalence of disease among children aged (0–14) years communicable and non-communicable diseases occupy the first rank place. The incidence of this class of diseases among children in the district hastends to increase from 168.823.44 to 173.071.57 cases per 100.000 children. Prevalence of this class of diseases was 164.360.13 cases per 100 000 children in the area and 170.357.35 cases per 100 000 children in the region. The highest prevalence of this class of diseases observed in 2021, but was 1.05 times lower than for average annual district level, and in 1.01 times lower than in the region (Fig. 8).

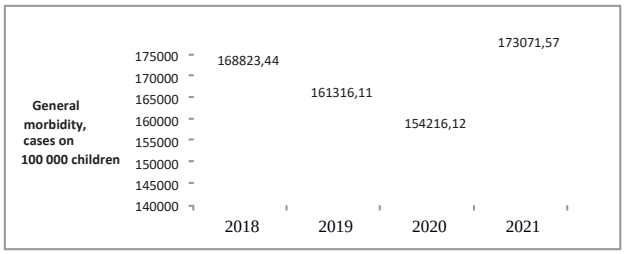

Fig. 8. The trend of prevalence of infectious and non-infectious diseases among children (aged 0 to 14 years) in Dnipro region district for 2018–2021

The second rank in the structure of disease prevalence population aged children (0–14) years occupied by non-communicable diseases, which is also characterized by a tendency to increase during 2018–2021 period from 154.845.11 to 156.299.27 cases per 100 000 children on average annual rate in 2011 to 1.04 times (Fig. 9).

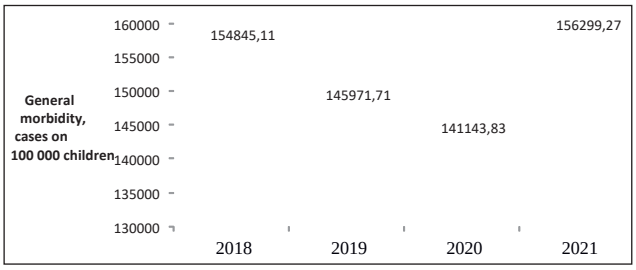

Fig. 9. The trend of prevalence of non-communicable diseases among children (aged 0 to 14 years) in Dnipro region district for 2018–2021

Third rank position occupied by respiratory diseases, influenza and ARVI. Prevalence of diseases for this class of diseases in children (0 to 14) years for average perennial level is 87.260.22 cases per 100 000 children in the district and 104.638.46 cases per 100 000 children in the region.

Adverse dynamic trend with a strong growth rate in the district was recorded the following classes of diseases, both infectious and non-communicable diseases (growth rate of 5.3%), infectious and parasitic diseases (13.4%), cancer (6.9%), malignant neoplasms (116.5%), diabetes (14.9%), diseases of the nervous system and sensory organs (9.7%), myopia (10.9%), respiratory diseases, influenza and acute respiratory disease (12.2%).

Common tendency to decline in the prevalence of diseases in blood diseases and blood-forming organs (negative rate of growth of the district -18.2%), diseases of the endocrine system (-22.6%), cardiovascular diseases (-12.0%), disease the digestive system (-17.9%), including gastric and duodenal ulcer (growth rate -76.3%), gastritis and duodenitis (-37.2%), diseases of the skin and subcutaneous tissue (-30.6%).

Prevalence of diseases major classes of diseases that occur among children of age group (0 to 14) in research rural area represented in (Fig. 10–13).

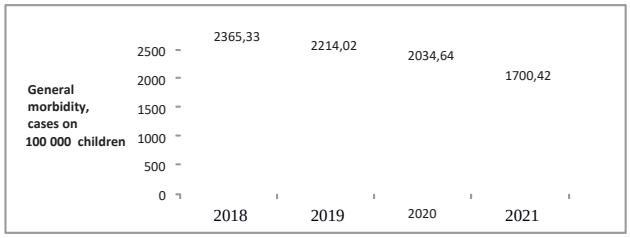

Fig. 10. The trend of prevalence of diseases of blood and blood-forming organs among children (aged 0 to 14 years) in Dnipro region district for 2018–2021

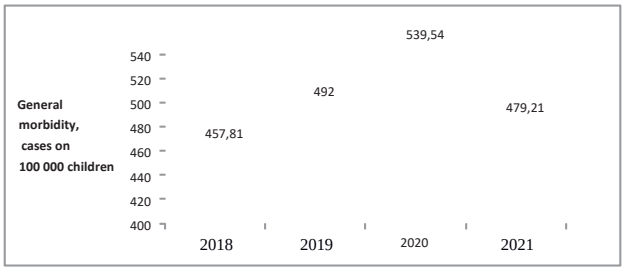

Fig. 11. The trend of prevalence of diseases asthma among children (aged 0 to 14 years) in Dnipro region district for 2018–2021

Analysis of prevalence of diseases among adults and adolescents demonstrates the pronounced negative trend towards growth in the prevalence of diseases. Prevalence of diseases by average annual indicator exceeded its level in the district in 2018–2021 years from (1.0 to 1.03) times for infectious and non-communicable diseases and non-communicable diseases, from (1.01 to 1.08) times for diseases of the endocrine system from (1.02 to 1.09) times for diabetes, from (1.1 to 1.2) times for diseases of the nervous system and sensory organs in 1.05 times in 2021 to cardiovascular diseases, 1.13 times in 2011 for coronary heart disease, from (1.04 to 1.06) times for respiratory diseases, flu and respiratory diseases, from (1.05 to 1.09) times for injuries and poisonings.

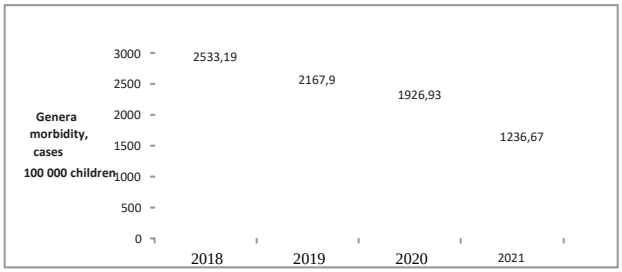

Fig. 12. The trend in prevalence of diseases gastritis and duodenitis among children (aged 0 to 14 years) in Dnipro region district for 2018–2021

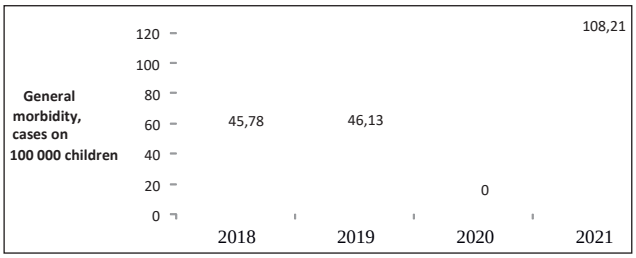

Fig. 13. The trend in prevalence of diseases malignancies among children (aged 0 to 14 years) in Dnipro region district for 2018–2021

Trends in prevalence of diseases among adults and adolescents (15–17) years demonstrated a marked reduction of these indicators with negative growth rates by class of blood diseases and blood-forming organs (-6.3%), malignant neoplasms (-10.6%), myopia (-41.3%), asthma (-15.0%), gastritis and duodenitis (-10.5%), skin and subcutaneous tissue (-31.4%), congenital abnormalities of development (-14.6%).

Analysis of the dynamic trends of prevalence main types of diseases among children and adult categories of the population aged (15 to 17) years presented in (Fig. 14–20).

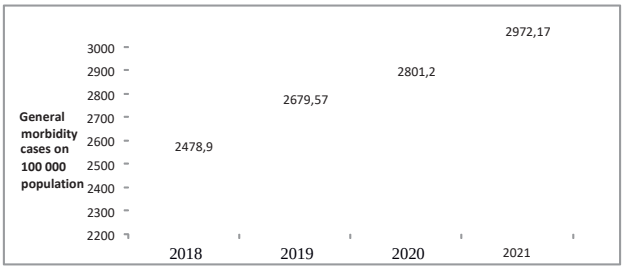

Fig. 14. The trend of prevalence of diseases from diabetes in the adult and child population (aged 15–17 years) Dnipro region district for 2018–2021

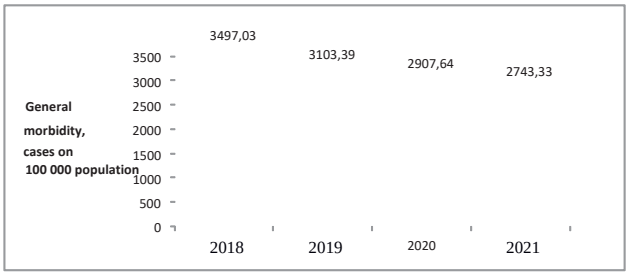

Fig. 15. The trend in prevalence of diseases gastritis and duodenitis adult and child population (aged 15–17 years) in Dnipro region district for 2018–2021

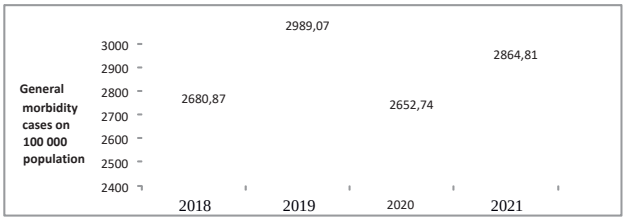

Fig. 16. The trend spread diseases to tumors in the adult and child population (aged 15–17 years) in Dnipro region district for 2018–2021

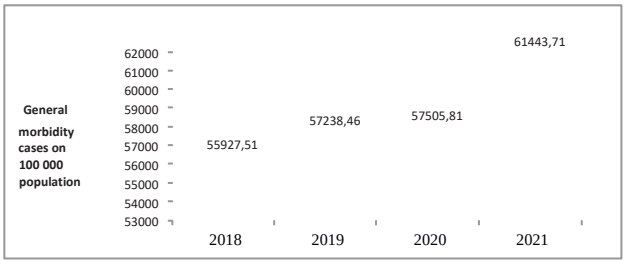

Fig. 17. The trend of prevalence of cardiovascular diseases in the adult and child population (aged 15–17 years) in Dnipro region district for 2018–2021

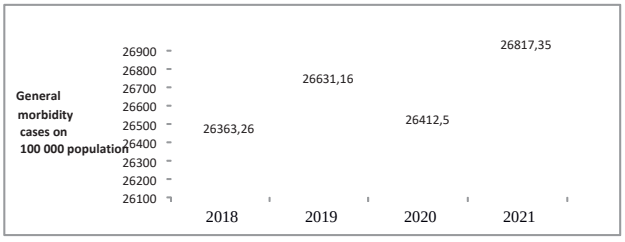

Fig. 18. The trend of prevalence of respiratory diseases, influenza and acute respiratory disease in the adult and child population (aged 15–17 years) in Dnipro region district for 2018–2021

The main factors, which influence on the formation of public health are demographic indicators of different age groups, as well as indicators of dispensary supervision (the composition of health groups, the proportion of children who are often sick) in the territory of experimental observation area. In our study, we tried to study these two groups of medical and social factors in order to understand the conditions under which health of the rural population in this industrially developed Dnipro region of Ukraine takes place.

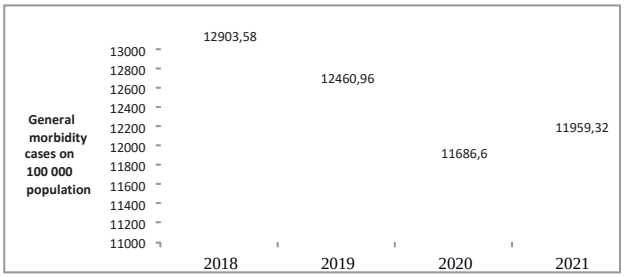

Fig. 19. The trend of prevalence of digestive diseases in the adult and child population (aged 15–17 years) in Dnipro region district for 2018–2021

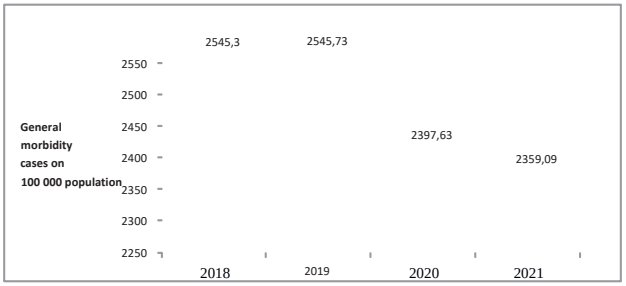

Fig. 20. The trend in prevalence of diseases stomach ulcers and 12 – duodenum adult and child population (aged 15–17 years) in Dnipro region district for 2018–2021

According to the results of our researches, in 2018–2021 years total population rate in the Dnipro region district decreased from (52279 cases per 1000 population) in 2008 to (50178 cases per 1000 population) in 2021. The rate of decline in the given district was 5% (Tables 1, 2).

Demographic situation in the Dnipro region rural district is critical as in recent years the overall mortality rate has increased (from 16.9 to 18.5 cases per 1000 population) and the infant mortality rate has increased (from 1.3 to 1.6 cases per 1000 population). At the same time, the fertility rate in recent years also increased (from 6.6 to 11.3 cases per 1000 population) (Table 3).

According to our data number of children assigned to the I group of health during 2018–2021 decreased (from 50.8 to 42.1) %, while number of children from organized groups in II (33.6–39.6)% and III group of health (15.6–18.3)% increased, which indicates about negative tendency towards decreasing the proportion of healthy children and increase in the proportion of children with functional disorders of organs and systems (II group of

Table 1

Number of children and adolescents' population by age category

Contingent	2018	Percent	2019	Percent	2020	Percent	2021
Total population	52279	4%	50722	0.9%	50272	0.2%	50178
Total children	9703	1,5%	9554	2.6%	9310	1.2%	9192
0–6 years	3478	2.4%	3394	2.7%	3304	1.6%	3249
Organized children	1105	8%	1023	0.5%	1018	0.4%	1014
7–14 years	4608	5.3%	4376	2.4%	4273	0.2%	4281
Schoolchildren	5897	4.5%	5644	3%	5477	4.6%	5234
0–14 years	8086	4%	7770	2.5%	7576	0.6%	7530
15–17 years	1817	1,8%	1784	2.7%	1734	6.9%	1622

Table 2

Demographic indicators of children's population

Children's contingent	2018	Percent	2019	Percent	2020	Percent	2021
Total population	52279	4%	50722	0.9%	50272	0.2%	50178
Total children	9703	1.5%	9554	2.6%	9310	1.2%	9192

Table 3

Characteristics of demographic indicators among children of Dnipro region district or the period 2018–2021 years

Indicator	2018	2019	2020	2021
Birth rate (per 1000 population)	6.6	6.7	8.9	11.3
Total mortality rate (per 1000 population)	16.9	17.8	18.2	18.5
Natural increase	-9.4	-9.8	-10.1	-11.2
Infant mortality rate (per 1000 population)	1.3	1,.5	0.8	1.6
Number of children population (per 1000 population)	15.0	15.2	15.1	15.1

health) and chronic diseases in the compensation stage (III group of health).

The percent of children of organized groups that often ill in the Dnipro region rural district during observation period (2018–2021 years) was increased: from 53.3% in 2008 to 58.8% in 2011, which also testifies negative tendency to increase the rate of children who were ill more than 4 times during 1 year, and the low resistance of the body to acute viral infections. Thus, a detailed analysis health indicator of the rural population of the Dnipro region district has allowed us to identify a whole range of medical and social factors that contribute to the deterioration of health, primary in the most sensitive category, such as a child population, living in the ecologically burdensome region of Ukraine – Dnipro region.

Conclusions

1. It is established that in the structure of primary and general morbidity among adults and children of (0 to 14) and (15 to 17) years in Dnipro region the first-rank positions is taken by the diseases (I, IV, VI, IX, X, XI, XII, XIII) classes by ICD.

2. It is proved that the first place in terms of morbidity among adults and children categories population in Dnipro region for the period from 2018 to 2021 carried out infectious and parasitic diseases with a tendency to increase from 56.490.12 to 622.262.63 cases 100 000 people. Average annual incidence rate for this class (I class) was on the level 58.232.04 cases per 100 000 population in the district and 57.957.58 cases per 100 000 population in the region. The rate of positive growth for the I class of disease is 7.0 in Dnipro region.

3. It should be taken into account reduction in morbidity among adults and children categories population of the region with negative growth rates in the district during 2018–2021 years by classes of diseases according to ICD-X: III (index growth rate – 6.4%), IV (growth rate of -22.1%), V (-11,9%), VII (-11.5%), IX (-7.0%), XII (-34.2%), XIII (-7.4%), including hypertension (-17.4%), coronary artery disease (-27.1%), gastritis and duodenitis (-34.6%). There was a decline in the incidence of asthma (-2.2%) and III class of disease (-4.4%) in the district.

4. Among the categories of children aged (0 to 14) years i Dnipro region area was defined adverse dynamic growth trend with a maked prevalence of diseases by the following classes, and levels of growth rate I (13.4%), II (6.9%), VI (9.7%), VII (10.9%), X (12.2%), including infectious and non-communica-

ble diseases (5.3%), malignant neoplasms (116.5%), diabetes (14.9%). During 2018–2021 years was registered pronounced tendency to decline incidence of III class of disease (negative rate of growth in the district (-18.2%), IV class (-22.6%), IX class (-12.0%), XI (-17.9%), XII class (-30.6%), including gastric ulcer and duodenal ulcer (growth rate is -76.3%), gastritis and duodenitis (growth rate is -37.2 %).

5. Noncommunicable diseases occupy the second rank in the structure of morbidity among adolescents (15–17 years) of rural areas and characterized by growth in dynamic on 6.4% in the area from 42.821.97 to 47.828.79 cases per 100 000 population in 2018–2021 years of study. There is a general stabilization of disease among adolescents with hypertension in the area (annual growth rate is 1.0%) and in the region (1.5%). Pronounced growth levels of primary and general morbidity among category of the child population (aged from 15–17 years) occurs the following classes of diseases according to ICD-X (IV, VI, IX, X, XIX).

6. An unfavorable dynamic tendency to increase the proportion of children who are often ill (from 53.3 to 58.8)%, as well as a decrease number of children from the I group of health (50.8–42.1)% on the background of increasing children from the II (33.6–39.6)% and the III group of health (15.6 - 18.3)% in 2018–2021 years, which is probably indicate a low resistance of the child to acute respiratory viral infections, and increased percent of children with chronic diseases in the compensation stage.

Prospect of further research: systematic study of the health of children in each children's team, organization of depth medical examinations, control of institutions with the maximum use of methods of instrumental and laboratory research. Scientific research of environmental factors, which have a negative impact on the population health.

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