Authors have shown the influence of some components of the chemical composition of potable water in the six rural taxons of the Dnepropetrovsk region (Zn, Cu, Mn, pH, F, Al, ammonium nitrogen, nitrites, nitrates, oxidation) on the incidence of the following diseases in the 14 y.o. children: blood circulation system diseases, tumours, blood and blood organs diseases, anaemia, nervous system diseases, congenital anomalies, i.e. blood circulation system diseases (r = 0.58 – 0.79); between anaemia and content of chlorides and sulphates in the centralized water sources (r = 0.87) (p < 0.05). Significant correlation was determined between general rigidity and iron in the potable water and blood organs diseases, and anaemia in children in the majority of rural taxons (r=0.58 – 0.79); between anaemia and content of chlorides and sulphates in the centralized water sources (r = 0.87) (p < 0.05).

**Keywords:** rural taxons, children population, correlation, potable water

**Fig. 1.** Anaemia cases in 14 y.o. children, by average annual indicators, in the separate taxons of the Dnepropetrovsk region during 2008-2013 (cases per 10 000 children).
In the 2nd taxon one should pay attention to the strong correlation link between neoplasms in the 14 y.o. children – and iron (r = 0.87), blood and hematopoietic organs diseases – and total hardness (r = 0.78) and iron (r = 0.74), anaemia – and iron (r = 0.79), endocrine system diseases – and total hardness (r = 0.88), dry residue, chlorides, sulphates, calcium and magnesium (r = 0.83), respiratory system diseases – and total hardness, dry residue, chlorides, sulphates, calcium and magnesium (r = 0.73), congenital anomalies – and iron (r = 0.74), congenital anomalies of blood circulation organs – and iron (r = 0.77) (p < 0.05).

Analysis of correlation matrices, conducted among children in the 3rd taxon has shown a significantly high relationship between: neoplasms – and iron content (r = 0.87), blood and hematopoietic organs diseases – and total hardness (r = 0.78), dry residue, chlorides, sulphates, calcium and magnesium (r = 0.32), iron (r = 0.95), anaemia – and total hardness (r = 0.58) and iron (r = 0.79), endocrine system diseases – and total hardness (r = 0.88), dry residue, chlorides, sulphates, calcium, magnesium (r = 0.74) and iron (r = 0.93), nervous system diseases – and iron (r = 0.87), circulatory system diseases – and iron (r = 0.74) (p < 0.05). Significantly strong correlation in this taxon was observed between diseases of the respiratory system and total hardness (r = 0.87), dry residue, chlorides, sulphates, calcium, magnesium (r = 0.95), congenital anomalies of the circulatory system – and iron content (r = 0.87) (p < 0.05).

In relation to the 14 y.o. children in the 4th taxon the probable impact was defined: iron – on the tumors and hematopoietic organs diseases (r = 0.87), anaemia and nervous system diseases (r = 0.95), cardiovascular diseases (r = 0.93), congenital anomalies (r = 0.87), i.e. anomalies of the circulatory system (r = 0.71); total hardness – on the respiratory system diseases (r = 0.87), as well as dry residue, chlorides, sulphates, calcium and magnesium (r = 0.84) (p < 0.05).

In the water of 5th taxon authors determined a strong correlation between incidence of children diseases as well as hematopoietic organs diseases – and total hardness (r = 0.78), anaemia – and over-normal content of chlorides and sulphates (r = 0.87), endocrine system diseases – and dry residue (r = 0.87), respiratory system diseases – and dry residue, chlorides, sulphates, calcium and magnesium (r = 0.83) (p < 0.05).

The majority of drinking water quality indicators in the 6th taxon significantly influenced the morbidity level (average and strong correlation): total hardness – on the hematopoietic organs diseases (r = 0.78), anaemia (r = 0.58), diseases of the endocrine system (r = 0.49), circulatory system (r = 0.39), respiratory (r = 0.82), digestion system (r = 0.65), skin and subcutaneous tissue (r = 0.58), musculoskeletal system (r = 0.42) (p < 0.05). Similar trend was observed in relation to the iron content and the following diseases in children: tumours (r = 0.87), hematopoietic organs diseases (r = 0.74), anaemia (r = 0.79), diseases of the endocrine and nervous systems (r = 0.80), circulatory system diseases (r = 0.78) (p < 0.05) (Fig. 1).

In all rural taxons of the Dnepropetrovsk region authors have revealed common trend – strong correlation between some chemical indicators of drinking water quality (Zn, Cu, Mn, pH, F, Al, nitrogen ammonia, nitrates, nitrates and oxidability) and morbidity of 14 y.o. children with the following diseases: in the 1st taxon – circulatory system (r = 0.87); in the 2nd taxon – tumours (r = 0.87), hematopoietic organs diseases (r = 0.74 – 0.95), anaemia (r = 0.79 – 0.87), diseases of the nervous (r = 0.87) and circulatory (r = 0.74 – 0.95) systems, congenital anomalies of the circulatory system (r = 0.87); in the 4th taxon – with tumours (r = 0.87), hematopoietic organs (r = 0.87), anaemia (r = 0.74 – 0.95), congenital anomalies (r = 0.87); in the 5th taxon – with tumours (r = 0.87), blood and organs of haematopoiesis (r = 0.74 – 0.95); in the 6th taxon – with tumours (r = 0.87), hematopoietic organs diseases (r = 0.74 – 0.95), anaemia (r = 0.79 – 0.87), circulatory system (r = 0.75 – 0.78) (p < 0.05).

Medium correlation between infectious diseases in children, consuming drinking water from the centralized water supply sources in the 2nd taxon and the following chemical substances was revealed: Zn, Cu, Mn, F, Al, nitrogen ammonia, nitrates and nitrates (r = 0.30, p < 0.05) (Fig. 2).

In relation to the drinking water of 1st taxon levels of the following diseases among 14 y.o. children strongly correlated: congenital anomalies – with all chemical indicators characterising the drinking water quality (Zn, Cu, Mn, F, Al, nitrogen ammonia, nitrates, nitrates), except pH and oxidability (r = 0.74), i.e. congenital anomalies of circulatory system (r = 0.77) (p < 0.05). In the 2nd taxon all chemical parameters, except pH, strongly correlated with tumours (r = 0.87), hematopoietic organs diseases...
(r = 0.74 – 0.89), anaemia (r = 0.79 – 0.87); in the 4th taxon – all chemical parameters, except pH and nitrate, correlated with diseases of nervous (r = 0.87 – 0.95) and circulatory system (r = 0.83 – 0.93); in the 5th taxon all chemical parameters, except pH, F and nitrate correlated with diseases of the nervous (r = 0.80 – 0.83) and the circulatory system (r = 0.80); in the 6th taxon – all chemical parameters, except pH, correlated with endocrine (r = 0.80 – 0.83) and nervous system diseases (r = 0.80) among children (p < 0.05).

A strong correlation between diseases of the endocrine (r = 0.83) and respiratory systems with pH was revealed (r = 0.73) in the 2nd taxon; diseases of the endocrine system correlated with pH, F, nitrites and oxidizability – in the 3rd taxon (r = 0.83 – 0.93) (p < 0.05).

**Conclusions.**

1. Structure of morbidity among children in different taxons of the Dnepropetrovsk region varies by individual classes of diseases. In the 1st taxon the largest percentage rate was identified for such classes of diseases as X (65.36 %), XII (6.59 %), XI (5.01 %), I (4.61 %) and IV classes (5.21 %); in the 2nd taxon: X (58.89 %), XII (6.09 %), XIII (5.01 %), I (4.61 %) and IV classes (5.21 %); in the 3rd taxon: X (66.29 %), XII (5.07 %), XI (3.94 %), I (2.11 %), IV classes (1.62 %); in the 4th taxon: X (56.27 %), XII (5.91 %), XI (5.02 %), I (5.93 %), IV classes (2.80 %); in the 5th taxon: X (64.63 %), XII (5.02 %), XI (4.02 %), I (4.02 %), III (2.14 %) and IV classes (2.29 %), in the 6th taxon: X (59.81 %), XII (5.31 %), XI (5.11 %), I (3.86 %), III (3.05 %), i.e. anaemia (3.02 %).

2. Taking into account the distribution of children by separate taxons, in the structure of all diseases authors have established higher incidence of diseases of the respiratory system, skin and subcutaneous tissue, digestive system, musculoskeletal system, infectious and parasitic ones, endocrine system diseases, hematopoietic organs diseases and anaemia among children in the majority of taxons of the Dnepropetrovsk region.

3. Correlation between salt composition of drinking water from the centralized water supply sources and morbidity among 14 y.o. children by the separate classes of diseases: neoplasm – correlation with high iron content in the 3rd and 4th taxons (r = 0.87); hematopoietic organs diseases – with total hardness in the 2nd, 3rd, 5th, and 6th taxons (r = 0.78); anaemia – with total hardness (r = 0.58) and iron content (r = 0.79) in the 3rd, 6th taxons; anaemia – with iron (r = 0.95) in the 4th taxon; anaemia – with high content of chlorides and sulphates (r = 0.87) in the 5th taxon (p < 0.05).

4. Correlation between some heavy metals in the drinking water taken from the centralized water sources (Zn, Cu, Mn, F, Al, nitrogen ammonia, nitrite, nitrate (r = 0.74)) and incidence of congenital anomalies among children was determined in the 1st taxon (p < 0.05).

**References:**


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