

# INDICATORS OF MICROBIOLOGICAL PURITY OF DRINKING WATER

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**Introduction.** To date, one of the most pressing problems in Ukraine is drinking water. High-quality drinking water in an amount to meet basic human needs, is one of the conditions for strengthening human health and the sustainable development of the state as a whole. Failure to comply with the standard of drinking water quality will lead to adverse both short and long-term consequences for the health and welfare of the population.

**Aim:** to analyze the situation with drinking water in Ukraine. Two thirds of Ukrainians consume water from rivers, lakes and reservoirs, and one-third - get water from underground sources. The main source of drinking water in Ukraine - the Dnieper. 69% of the drinking water that comes into the house of Ukrainians, does not comply with sanitary standards. Consider the main reasons for this state. In Ukraine, there is an uneven distribution of drinking water for the region.

**Materials and methods.** We have studied and analyzed the materials Sanitary and Epidemiological Service of Ukraine. In large cities (Odessa, Donetsk, Kharkiv) per person on average 400 liters per day, with an average for Ukraine - 250 liters. In the countryside - 35-40 liters. Not all regions of Ukraine have the same quality of drinking water. Quality of water for most areas of chemical and bacterial composition is classified as polluted and dirty (IV-V grade quality). The most polluted in terms of drinking water, are the following regions: the Dnieper river basin, the Seversky Donets, Azov Sea River, some tributaries of the Dniester, Western Bug. The zone includes the most critical regions of Odessa, Donetsk, Kharkiv, Dnipropetrovsk, Zaporizhia, Kherson and Mykolaiv region. In these areas, the water quality is classified as very dirty (VI class). In these regions, due to anthropogenic pollution (industry, domestic waste water), as well as due to the aging treatment facilities technical people often drink water, deviations from the norm which is sometimes up to 80 percent. Most clean regions, in terms of drinking water, is the western region of Ukraine (except Lviv): Rivne, Ternopil, Ivano-Frankivsk, Volyn and others. Pretty good situation in Sumy, Poltava and Chernihiv regions. For most regions of Ukraine are characterized by common problems related to the quality of drinking water: - anthropogenic pollution of water sources; - excessive chlorination; - secondary pollution.

**Results and discussion.** Secondary pollution causes diseases such as hepatitis, dysentery and even typhoid. Only in the past few years, outbreaks of infectious diseases recorded in Ukraine related to unsafe drinking water. It is because of unsafe

drinking water, adults and children infected with hepatitis, dysentery and even typhoid fever!

In 2005-2015 Ukraine noted the deterioration of the epidemiological situation of acute intestinal diseases, are associated with the supply of drinking water to the population of poor quality. The number of outbreaks of acute intestinal infections has increased in 3.0 times. In Dnepropetrovsk, Kirovograd, Khmelnytsky, Donetsk, Odessa and Vinnytsya regions recorded resulting from the use of poor-quality drinking water outbreaks population dysentery Flexner and Sonne, typhoid fever, rotavirus and enterovirus infections and hepatitis A, for which the water transfer factor is a major. Anthropogenic pollution of water sources due to the huge releases of untreated water by industrial enterprises of Ukraine, as well as the cities of sewage networks. According to experts, it is not cleared more than 30 percent of all the water.

To evaluate the safety of drinking water for epidemiological indicators estimated availability thermotolerant coliform bacteria (no – in 100 mL), general coliforms (no - in 100 mL), total bacterial count (the number of colony forming bacteria in 1 ml - no more than 50), coliphages (number plaque forming units per 100 ml - no), the spores of sulphite reducing clostridia (the number of spores in 20 ml - no), Giardia cysts (the number of cysts in 50 ml - no).

The number of drinking water samples with deviations for microbiological parameters, including mismatched Coli-index with the Coli-index of 20 or more were almost at the same level for the past two years (7.4 – 8.7%). The situation concerning the bottled water was no better: all 3 brands of bottled drinking water from the 8-and-tested meet the sanitary requirements in excess of the others observed total count.

**Conclusions.** Today Ukraine is on the quality of drinking water sources 95 takes place (out of 122). In the first five, Finland, New Zealand, Canada, United Kingdom and Japan. Our water is a little bit better than in Haiti and Ethiopia. 80% of Ukrainians consume water from surface sources (rivers of the Dnieper and Dniester drinking 35 mln. People), and 20% from groundwater. For comparison, on the contrary, almost all in Europe. As one of the leading Ukrainian scientists in this field, "Dnepr – a wastewater 3-4 category." In these rivers, as in most others, dumped a huge amount of untreated sewage, domestic and industrial waste, pesticides are washed away by rain, nitrates, nitrites, heavy metals, etc.

High-quality drinking water in an amount to meet basic human needs, is one of the conditions for strengthening human health and the sustainable development of the state as a whole. Failure to comply with the standard of drinking water quality will lead to adverse both short and long-term consequences for the health and welfare of the population. The problem of Ukraine's population to safe drinking water in sufficient quantity at the moment still remains unsolved.