and 15 cases in 2021. The number of botulism cases associated with vegetable preservation decreased from 7-8 in 2018-2019 to 1 case in 2020-2021. The percentage of botulism cases with an established type of toxin decreased from 50.8% in 1955-1985 and 43.41 in 2017-2019 to 18.37% in 2021, which does not allow for a reliable assessment of the distribution of pathogen types. Among the cases with an established type of toxin, type E associated with fish products prevails.

The infamous outbreak of botulism in 1933 in the city of Dnipropetrovsk, where 230 people fell ill, of which 94 people died (fatality rate - 41%) due to canned zucchini caviar produced at a food industry in the city of Odessa, led to increased control over the processing of factory canning by many ten years. During the years 1955-2016, almost 100% of botulism cases in Ukraine were due to canned food products made at home. But during the period of 2017-2018, the share of food products produced in factories that caused botulism increased sharply to 32.56% (84 cases), and the Case-Fatality Rate of botulism from food products purchased by consumers in retail chains in 2017- in 2018, was 8.06% or 5 deaths. In 2019, the percentage of botulism due to purchased factory products was 10.15%, in 2020, it was 13.85%, but it decreased to 9.18% in 2021.

Conclusions. In Ukraine, there is a trend towards a decrease in the total number of botulism cases, in particular, those caused by meat products, and an increase in the share of botulism caused by fish products. Cases of botulism due to factory-made products continue to be registered.

The state of war in 2022-2023 is likely to lead to an increase in the consumption of canned products by both the civilian population under evacuation and the personnel of the Armed Forces. Moreover, preservation can come both factory, collected by volunteers, and possibly homemade, which does not exclude the risk of complicating the epidemic situation regarding botulism.

THE STRUCTURE OF TOTAL AND EXCESS MORTALITY OF THE POPULATION OF UKRAINE

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According to WHO estimates, almost 3 million deaths worldwide were directly or indirectly related to COVID-19 in 2020, which is 1.2 million more than officially reported deaths from COVID-19. Both the direct and indirect effects of the COVID-19 pandemic on population mortality are of concern. Total excess mortality is one indicator that shows the indirect impact of the COVID-19 pandemic on mortality.

According to WHO, from January 1, 2020 to December 31, 2021, global excess deaths related to COVID-19 were 14.91 million, which is 9.49 million more deaths than worldwide directly attributable to COVID-19.

We compared the registered number of deaths in 2020-2021 in Ukraine and the expected mortality for this period. The research used data from the State Statistics Service of Ukraine, Institute of Demography and Social Research named after M.V. Birds of the National Academy of Sciences of Ukraine. Data analysis was carried out in Microsoft Office Excel.

In 2021, 714,263 deaths from all causes (codes A00-U85) were registered in Ukraine, the mortality rate per 100,000 population was 1,735.02, which is 16.5% higher than in 2020 and 17.69% - compared to the 5-year average (616,835 deaths in 2020, the death rate per 100,000 population is 1,489.27, which is 6.19% higher than the 5-year average). The excess mortality from all causes in 2020 is 28,161.4, compared to 99,463 in 2021.

In the structure of deaths from all causes in 2021, 60.1% are diseases of the circulatory system (Class IX, codes I00-I99), against 66.17% in 2020. There were 429,291 of them registered in 2021, or a death rate of 1042.80 per 100,000 population against 985.46 in 2020, which is higher than the average of the previous 5 years by 8.56% and 5.17%, respectively. Excess mortality from diseases of the circulatory system in 2020 was 48.48 per 100,000 population, in 2021 it was 82.24.

In 2021, 87,567 deaths from COVID-19 were registered, including 85,975 with the virus identified (Class XXII, codes U07.1) against 21,284 deaths in 2020. The specific weight of deaths from COVID-19 among the total number of deaths is 12.26% in 2021 and 3.45% in 2020. The share of deaths due to COVID-19 from the number of excess deaths in 2020 is 75.57%, and in 2021 - 88.04%.

Among all deaths (codes A00-U85) registered in Ukraine in 2020-2021, the specific weight of deaths from some infectious and parasitic diseases (Class I, codes A00-B99) is 1.13% and 0.88%, respectively, and the death rate per 100,000 population in 2021 was 15.28 against 16.85 in 2020 (a decrease compared to the 5-year average by 18.29% and 15.92%, respectively).

The share of respiratory diseases (Class X., codes J00-J98) among all deaths in 2020 and 2021 was 2.67% and 3.7%, respectively, which in absolute terms is 16,479 deaths in 2020 and 26,428 deaths in 2021 . It is also 22.76% and 65.78% higher, respectively, compared to the average for the previous 5 years. Excess mortality from respiratory diseases in 2020 is 7.37 per 100 thousand population, in 2021 – 25.47.

Having analyzed the indicators of excess mortality for the years 2020-2021, we can confidently say about the impact of the global pandemic of COVID-19 in Ukraine on the increase in the mortality rate of the population not only from COVID-19 itself, but also a significant increase in mortality that is not directly related to death from the new coronavirus.

ОЦІНКА РИЗИКУ СПОЖИВАННЯ ПИТНОЇ ВОДИ З ПІДВИЩЕНИМ ВМІСТОМ НІТРАТІВ ДЛЯ ЗДОРОВ'Я НАСЕЛЕННЯ

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За останні кілька десятиліть зростання населення збільшило попит на сільськогосподарські культури, призвело до збільшення виробництва, застосування нових технологій та використання речовин, які забруднюють грунт і водні джерела. Високий рівень нітратів або нітритів, що містяться в воді, знижують здатність крові переносити кисень до тканин, можуть викликати