UDC 94(477.82)“1914/1918”:614.4
DOI 10.24919/2519-058X.37.346045

Vasyl DENYSIUK
PhD (History), Associate Professor of the Department of History of Ukraine and Archeology, Lesya Ukrainka Volyn National University, 24 Shopen Street, Lutsk, Ukraine, postal code 43005 (denysuk.v@gmail.com)

ORCID: 0000-0003-1660-0070
ResearcherID: AAX-5368-2020

Anatolii SHVAB
PhD hab. (History), Professor of the Department of History of Ukraine and Archeology, Lesya Ukrainka Volyn National University, 24 Shopen Street, Lutsk, Ukraine, postal code 43005 (anatoliyshvab@gmail.com)

ORCID: 0000-0001-6864-1726
ResearcherID: H-1767-2019

Василь ДЕНИСЮК
кандидат історичних наук, доцент, доцент кафедри історії України та археології, Волинський національний університет ім. Лесі Українки, вул. Шопена, 24, м. Луцьк, Україна, індекс 43005 (denysuk.v@gmail.com)

Анатолій ШВАБ
доктор історичних наук, професор, професор кафедри історії України та археології, Волинський національний університет ім. Лесі Українки, вул. Шопена, 24, м. Луцьк, Україна, індекс 43005 (anatoliyshvab@gmail.com)

Bibliographic Description of the Article: Denysiuk, V., & Shvab, A. (2025). Sanitary and Epidemiological Condition of Frontline Cities of Volhyn Province in 1914 – 1918. *Skhidnoievropeiskyi Istorychnyi Visnyk [East European Historical Bulletin], 37*, 50–61. doi: 10.24919/2519-058X.37.346045

SANITARY AND EPIDEMIOLOGICAL CONDITION OF FRONTLINE CITIES OF VOLHYN PROVINCE IN 1914 – 1918

Abstract. ***The purpose*** *of the article is to research the problem of the sanitary and epidemiological state of frontline cities and towns under wartime conditions.* ***The research methodology*** *is based on the principles of objectivity, historicism, problematic and systematic approach and includes historical and comparative, statistical methods, as well as the method of critical analysis.* ***Scientific Novelty.*** *A systematic analysis of the sanitary and epidemiological situation of the county towns of Volhyn province on the eve and during World War I has been carried out; the influence of military factors on the general sanitary and epidemiological situation of the western districts of Volhyn province has been elucidated; the functioning of the sanitary and epidemiological control system at the level of state authorities, local self-government, and temporary military administrations has been highlighted; new archival materials have been introduced into scientific circulation.* ***Conclusions***. *The rapid development of socio-economic processes in the late 19th and early 20th centuries led to significant changes in the*

ensuring the vitality of towns. In the context of rapid population growth, modernization of the urban economy, and changes in urban lifestyles, there was an urgent need to establish an effective system of sanitary and epidemiological support and control. The effectiveness and dynamics of changes in this area were determined by both European trends and the peculiarities of traditions and technological and financial capabilities. The pace of adaptation of the system of sanitary and epidemiological control and provision of district towns in Volhyn significantly lagged behind not only the best European but also the all-Russian practice. The consequences of this lag were acutely evident during the war years, when Volhyn frontline towns began to receive a large number of refugees and military personnel, and the level of financing for the sphere of urban life support decreased.

The significant quality deterioration of social and everyday sphere of the frontline towns was also caused by the destruction of infrastructure facilities and residential buildings, excessive concentration of residents in surviving buildings, etc. The lack of water supply and sewage system, the use of river water by the townspeople for personal everyday use, the concentration of excessive amounts of household waste in the cities and towns became a catalyst for the spread of unsanitary conditions and epidemics. A significant deterioration of the sanitary and epidemiological situation had been observed since 1915 and reached its peak in the winter of 1917/1918, which led to the spread of epidemics, in particular, typhus in 1918.

***Key words**: sanitary and epidemiological situation, sanitation, epidemic diseases, medical infrastructure, frontline cities, World War I, Volhyn province.*

САНІТАРНО-ЕПІДЕМІОЛОГІЧНИЙ СТАН ПРИФРОНТОВИХ МІСТ ВОЛИНСЬКОЇ ГУБЕРНІЇ У 1914 – 1918 рр.

***Анотація**. **Метою статті** є дослідження санітарно-епідеміологічного стану волинських прифронтових міст в умовах війни. **Методологія дослідження** ґрунтується на принципах об'єктивності, історизму, проблемності та системності і включає історико-порівняльний та статистичний методи, а також метод критичного аналізу. **Наукова новизна**. Здійснено системний аналіз санітарно-епідеміологічного становища повітових міст Волинської губернії напередодні та в роки Першої світової війни; відстежено вплив воєнних факторів на загальну санітарно-епідеміологічну ситуацію західних повітів Волинської губернії; висвітлено функціонування системи санітарно-епідеміологічного контролю на рівні органів державної влади, місцевого самоврядування, тимчасових військових адміністрацій; введено до наукового обігу нові архівні матеріали.*

***Висновки**. Стрімкий розвиток соціально-економічних процесів кінця XIX – початку XX ст. зумовив значні зміни у забезпеченні життєдіяльності міст. В умовах стрімкого зростання чисельності населення, модернізації міської економіки, зміни міського укладу життя, постала нагальна потреба становлення ефективної системи санітарного-епідеміологічного забезпечення та контролю. Ефективність та динаміка зрушень у цій сфері визначалася як загальноєвропейськими тенденціями, так і особливостями традицій та технологічними і фінансовими можливостями. Темпи адаптації системи санітарно-епідеміологічного контролю та забезпечення повітових міст Волині суттєво відставали не лише від кращих європейських, але і від загальноросійського практик. Наслідки такого відставання гостро проявилися в роки війни, коли волинські прифронтові міста почали приймати велику кількість біженців та військових, а рівень фінансування сфери їхнього життєзабезпечення скоротився.*

Значне погіршення якості соціально-побутової сфери прифронтових міст зумовили також руйнування інфраструктурних об'єктів і житлових будинків, надмірна концентрація мешканців в уцілілих будівлях тощо. Відсутність системи водопостачання та каналізації, використання містянами річкової води для особистого повсякденного вжитку, концентрація надмірної кількості побутових відходів у містах стали каталізатором поширення антисанітарії та епідемій. Значне погіршення санітарно-епідеміологічного становища прослідковується з 1915 р. і сягає піку взимку 1917/1918 рр., що призвело до поширення епідемій, зокрема, тифу у 1918 р.

***Ключові слова**: санітарно-епідеміологічне становище, санітарія, епідемічні захворювання, медична інфраструктура, прифронтові міста, Перша світова війна, Волинська губернія.*

Problem Statement. The end of the 19th – the beginning of the 20th century in the history of European countries is marked by the introduction of a number of technical and technological inventions into everyday life, which significantly influenced the formation of the sanitary and epidemiological culture of the modern world. First of all, this was due to the need to overcome mass epidemic diseases that spread in the rapidly growing towns engulfed by the Industrial Revolution of the second half of the 19th century (Abellán, 2017, pp. 5–6). This was also facilitated by significant scientific achievements in the fields of medicine and biology, which led to the "Bacteriological Revolution" in the establishment and development of sanitary services (Melosi, 2008, p. 5). It was at the time that the idea of a "sanitary town" appeared, for the implementation of which it was necessary to form new services capable of implementing it in practice. To a large extent, this depended on the level of economic development of countries and regions, their scientific and technological potential, the availability of qualified personnel and general culture of society. At the same time, it was discovered how much quarantine, vaccination and other sanitary measures could contribute to the fight against epidemics, and the military movement – to their spread (Wulff, 2020, pp. 138–140).

The study of the sanitary and epidemiological situation of front-line towns of Volhyn province in 1914 – 1918 allows us to determine, using the example of Volhyn province, the place of the Russian Empire in the process of formation and development of sanitary services; to trace the standard of living and social and everyday culture of the inhabitants of Volhyn front-line counties; to determine the impact of the war on the sanitary and epidemiological situation of front-line towns.

Review of Recent research and Publications. The topic of sanitary and medical care for the population as a separate subject of study came to the scholars' focus several decades ago. Among the topics that are actively studied are the provision of drinking water, waste disposal and the impact of these factors on the quality of life (Abellán (Abellán, 2017), Zh. Floris, K. Staub (Floris, & Staub, 2019), D. Pieshkov (Pieshkov, 2023), V. Denysiuk (Denysiuk, 2024)). Conceptually important for the study of the idea of the "sanitary town" of the 19th–20th centuries is the study by V. Melosi (Melosi, 2008) and E. Wulff (Wulff, 2020).

Among Ukrainian historians, T. Herasymov comprehensively studied the functioning of the cities of Right-Bank Ukraine during World War I, including their sanitary situation (Herasymov, 2017; Gerasymov, & Romaniuk, 2024). L. Hryzhenko did research on certain aspects of medical care (Hryzhenko, 2012).

The purpose of the article is to study the sanitary and epidemiological situation of front-line towns of Volhyn province during the war of 1914 – 1918. The main focus is on the analysis of sanitary and epidemiological development on the eve and during the war; the formation and evolution of the system of sanitary supervision and prevention of epidemics and unsanitary conditions; the impact of war on the sanitary and epidemiological situation; tracing the features of military, civilian sanitary and medical infrastructure operating; highlighting the contemporary challenges of ensuring the vital activity of cities in the field of sanitary, epidemiological and medical support.

Research Results. On the eve of World War I, the sanitary and medical condition of Volhyn towns depended on the speed of implementation of such municipal projects as improving the water supply system, garbage removal, development of sewage systems, systematic disinfection, and constant sanitary supervision significantly. Despite the fact that technological and technical capabilities for the implementation of such projects existed

(Abellán, 2017, pp. 5–10), towns were often unable to financially provide for them. This task was also complicated by a rapid demographic growth of the urban population. At the beginning of the 20th century the population of the cities of the Right Bank increased by 70% (Herasymov, 2017, p. 46).

Despite a significant lag of the sanitary and epidemiological system of the Russian Empire from European countries, and Volhyn province from other Russian provinces, the situation worsened during World War I significantly. With its beginning, revenues to town budgets decreased sharply, and because of this, expenditures on medical, veterinary, and sanitary spheres. In the budget of Rivne, one of the largest county cities of the province, in 1914, out of 360.6 thousand rubles of income, only 3.9 thousand rubles were allocated for the needs of medical, veterinary and sanitary services, and separately 4.1 thousand rubles for the maintenance of the city hospital (SARR, f. 165, d. 1, c. 29, pp. 5, 39–39b, 41). In the following year, 1915, the level of income of the city budget of Rivne decreased by 24.6% to 265.6 thousand rubles, and expenditures on the medical, veterinary and sanitary parts of the budget – to 7.2 thousand, of which 6.3 thousand rubles were allocated for the maintenance of the local hospital, and 156 rubles for the maintenance of city sewage dumps (SARR, f. 616, d. 1, c. 2, pp. 5–7).

Similar trends can be observed in other front-line cities and towns. In Dubno, out of the 1914 budget, which amounted to 63.4 thousand rubles in income and expenses, only 60 rubles were allocated for medical, veterinary and sanitary needs (SARR, f. 359, d. 1, c. 12, pp. 129, 162–163, 169–170). In 1915, the budget of income and expenses of this city decreased by 21.1% to 50.4 thousand rubles, of which 60 rubles were allocated for medical, veterinary and sanitary services (SARR, f. 359, d. 1, c. 13, pp. 105, 127).

The health, sanitary and epidemiological situation of city residents was influenced by a number of factors: humidity of the area, access to clean water, waste disposal, nature of habits, etc. According to official information, at the beginning of the 20th century cities and towns of Volhyn province, with the exception of Zhytomyr, were provided with drinking water from rivers (Goroda, 1906, III, p. 100). The general sanitary culture of city dwellers was generally low. River water was mostly used for everyday use without prior boiling. The fact that garbage and waste in cities and towns were systematically thrown out into the street also had a significant impact on water quality (Herasymov, 2017, p. 324). The unsanitary conditions were further exacerbated by the fact that public toilets in cities were only just beginning to appear at the time. Even in the few cases where such places were equipped, their use was carried out without observing sanitary standards (SARR, f. 165, d. 1, c. 28. pp. 96–97).

Despite a slow pace of the formation of a "sanitary city" conditions in the provincial cities of the Russian Empire, the dynamics of these changes slowed down with the beginning of the Great War. The state reduced spending on structural urban sanitary and epidemiological projects significantly, instead focusing on the prevention of epidemic diseases and medical support for the military. In addition to the Ministry of War and local governments, in the Russian Empire, the All-Russian Zemstvo Union for Aid to the Wounded and Sick, the Committee for Provision of Temporary Assistance to Victims of War Disasters (the so-called "Tetianin Committee"), and other organizations were responsible for resolving issues of medical and sanitary epidemiological services for the military and civilian population. The directions, and accordingly the structure, of their work were changing dynamically. For example, only the committee of the South-Western Front of the All-Russian Zemstvo Union, as of April 1, 1916, had under its care 1486 structural units, including 209 medical and

sanitary departments (including 44 epidemic detachments, 3 medical stations, 28 paramedic stations, 6 hospitals, 15 bacteriological laboratories, 24 vaccination detachments, 11 disinfection detachments, 6 sanitary trains, etc.) (Spisok uchrezhdeniy, 1916, pp. 1–2). These organizations tried to coordinate their actions, but military operations and a chronic shortage of human and material resources negatively affected the achievement of the set goals (Ocherk deyatelnosti, 1916, p. 6).

The problems of supplying drinking water, maintaining cleanliness, removing and disinfecting waste and garbage, which the authorities had been actively working on since the beginning of the 20th century, became more acute with the outbreak of war (Freyberg, 1913, pp. 411–452). The Russian military command tried to increase requirements for compliance with sanitary rules, in particular regarding the timely cleaning of cesspools and maintaining cleanliness in public spaces. The main burden of cleaning was placed on the residents of the nearest houses. Over time, the city authorities' resources became less and less. There was a shortage of disinfectants, in particular bleach (SARR, f. 359, d. 1, c. 12, pp. 318, 321, 346–348).

Maintaining sanitary standards in frontline cities and towns remained a priority task for both the Austrian and German military administrations (Austro-Hungarian and German troops occupied Western Volhyn in 1915 and controlled Lutsk and Dubno until 1916, and Kovel and Volodymyr until 1918). The German and Austrian military administrations resorted to unpopular, but quite effective measures: timely cleaning of cesspools, punishment for non-compliance with sanitary standards and dumping of garbage in unauthorized places, etc. (Herasymov, 2015, pp. 104–106).

Volhyn cities suffered most from unsanitary conditions during the period of the approach of the front, when the previous government no longer had the opportunity to ensure compliance with the necessary sanitary conditions, and the new one needed time to assess the situation and find ways to improve it. This could last from several weeks to several months. It should be noted that cities and towns such as Lutsk and Dubno changed their subordination twice in 1915–1916, Kovel and Volodymyr – once.

The approach of the front was accompanied by mass exodus. A particularly large number of refugees appeared in the second half of 1915 (Kovalenko, 2021, p. 102). Volhyn cities were temporary shelters for refugees on their way to the East. Places of concentration of internally displaced people (houses and wagons) were transformed into centres of unsanitary conditions (Smolii, 2015, pp. 421–422, 440–442). Supervision of compliance with sanitary standards in places of concentration of refugees was entrusted to the heads of committees and doctors of sanitary and epidemiological detachments. Their duties included control over refugees' visits to baths and disinfection of their clothes (CSHAUK, f. 930, d. 1, c. 2, p. 93).

In the autumn of 1917, financial support for refugees, which included food, clothing, and medical care, ceased due to the Bolshevik coup (CSHAUK, f. 930, d. 1, c. 15, pp. 98, 107b). However, the number of forcibly displaced people continued to grow. In December 1917, more than five thousand refugees lived in Lutsk, compared to 20 thousand permanent residents (SAVR, f. 3, d. 1, c. 1629, pp. 109–109b). In October 1918, the population of Lutsk increased to 32 thousand people (SAVR, f. 3, d. 1, c. 1648, pp. 73–74). This trend was common to all Volhyn cities.

Military operations had a significant impact on the sanitary and epidemiological situation in cities. Almost all infrastructure important for the functioning of cities was destroyed or taken away during the army's retreat (Smolii, 2015, pp. 88, 94, 97). A number of villages and

towns, especially those that had been in the frontline zone for a long time, were destroyed. However, according to the testimony of one of the Russian soldiers who passed through Volhyn in July 1916, Lutsk did not suffer such a fate. The city was not much affected by the military operations (Pakhalyuk, 2014, p. 149). Minor destruction of front-line towns was an exception, which was explained by the rapid advance of the Russian army in May-June 1916. Many settlements that returned to Russian rule, in particular Dubno, were largely destroyed. As a result, there was a reduction in the number of suitable housing and an excessive concentration of residents in the surviving buildings (SARR, f. 359, d. 1, c. 14, p. 9; Smolii, 2015, p. 449).

In a number of front-line cities and towns, social and living conditions deteriorated due to the presence of a large number of soldiers there. For example, the headquarters of the Special Army was transferred to Lutsk in the summer of 1916. The relocation was accompanied by the arrival of a large number of soldiers, which required the allocation of additional funds for cleaning wells, river banks, and cesspools (SAVR, f. 3, d. 1, c. 1584, pp. 12–12b).

A significant deterioration in social and living conditions in front-line cities was observed after the overthrow of the Provisional Government and the short-term spread of Bolshevik power to the territory of Ukraine. In the autumn of 1917, many soldiers of the Russian army, encouraged by the Bolsheviks, voluntarily left the front line and moved to the cities for the winter. The concentration of a large number of soldiers and their horses in cities that were not adapted for this led to uncontrolled consequences. In December 1917, in Lutsk, about 4,000 horses died due to a lack of fodder. In January 1918 the head of the district police wrote that the corpses of horses were lying in the middle of the streets, and there was no money to remove them. Under the conditions of the thaw, this created exceptional threats of unsanitary conditions and the spread of infectious diseases. Throughout the rest of 1918, the sanitary and epidemiological situation was extremely difficult in Lutsk (SAVR, f. 3, d. 1, c. 1648, pp. 3, 49–49b).

Since the pre-war years, in larger cities, responsibility for compliance with sanitary and epidemiological standards had been vested in sanitary commissions and doctors of county and provincial cities. Their authority extended to grocery stores, markets, bakeries, working premises, restaurants and canteens (Robak & Demochko, 2024, p. 55). In small towns that did not have the opportunity to maintain special commissions, sanitary standards were controlled by a mayor. With the outbreak of the war, the sanitary and epidemiological situation in the towns only worsened. Within a few months, veterinarians in Rivne and Lutsk noted that livestock suppliers did not conduct livestock inspections in order to avoid paying fees. This increased the risk of slaughtering unhealthy livestock (SARR, f. 165, d. 1, c. 28, p. 7; SAVR, f. 3, d. 1, c. 1584, p. 9).

The deterioration of the sanitary and epidemiological situation was contributed by the low activities efficiency of sanitary commissions and doctors. A mandatory condition for opening any catering, trade, production, etc. establishment was the permission of a sanitary doctor and the commission after inspecting the compliance of the proposed facility with the standards. Such inspections were often formal in nature, sometimes local authorities, despite the warnings of sanitary commissions, granted permits for activity anyway. For example, in 1915 in Rivne, no refusals to institutions due to non-compliance with sanitary standards were recorded (17 permits were granted), even in cases where the doctor reported that the premises were in an unsuitable condition (SARR, f. 165, d. 1, c. 28, pp. 10–14b, 16–16b, 36–38b, 53–54b, 76–76b, 130–130b, 137–141b, 160–160b). The formality of the procedure for granting permits for activity is also evidenced by the case of "Angliya" Hotel opening in

Rivne in April 1915. Despite the remarks of the sanitary commission that the previous owner had kept a "drinking den" in this building, the city council granted permission to open the hotel without additional sanitary obligations (SARR, f. 165, d. 1, c. 28, pp. 77–77b).

The water supply system of the urban population played an exceptional role in maintaining sanitary standards, as it was the main source of the spread of epidemic diseases such as dysentery, typhoid fever, and cholera.

At the beginning of the 20th century, the practice of using river water for everyday use by the population was commonplace, which often led to outbreaks of infections. Drinking water was taken from rivers in specially designated places, for household needs – in others. Barrels for transporting drinking and household water also differed, but the rules did not provide for their disinfection and cleaning. Certain changes in water supply in the western county towns of Volyn province can be traced back to the beginning of the 20th century. The practice of providing townspeople with artesian water was introduced. In the 1910s, artesian wells operated in Rivne, Dubno, and other cities. Due to the concentration of a large number of soldiers, three such wells appeared in Lutsk in September 1914. The appearance of new artesian wells in the city, apparently due to their insufficient number and habits of the townspeople, did not solve the problem of providing the city population with high-quality water. A certain part of the city residents continued to use river water, despite the fact that the test results recognized it as unfit for drinking (Denysiuk, 2024, p. 28). The situation often worsened in the summer, when the water level in the wells fell and consumption increased due to river water (Herasymov, 2017, pp. 293–294).

Public and private baths served to improve the general culture of everyday life and the rules of personal hygiene of residents of front-line cities. Three such institutions operated in Lutsk (SAVR, f. 3, d. 1, c. 1648, pp. 3, 11, 14, 49–49b, 62, 73–74). However, if sanitary standards were not observed, they also served as a hotbed for the spread of infections. One way of spreading this was by draining water from the baths into open water bodies (Freyberg, 1913, p. 404).

At the beginning of the 20th century a serious challenge to overcome unsanitary conditions was the removal of waste and garbage in Volhyn cities. Many large cities in Europe began to use sewage systems at the time (Floris & Staub, 2019, pp. 257–262). In smaller cities, sewage carts were used for this purpose – horse-drawn carts on which large barrels were placed for transporting garbage and waste. At the turn of the 19th and 20th centuries, many cities in the Russian Empire dealt with waste in this way. Maintaining sewage wagons required significant funds for disinfection, maintenance of horses and equipment (Robak & Demochko, 2024, p. 54). Disinfection of wastewater with lime was quite expensive – 2–4 kopecks per 0.1 square fathom (0.455 sq m). In order to save money, waste disposal service providers usually simply dumped the sewage outside the city (Freyberg, 1913, p. 405). At the beginning of the 20th century, the county towns of Volhyn province did not yet have an established system of sewage carts. Waste, at best, was taken out by carts without any disinfection, or remained on site in the so-called absorption pits, which were an extremely ineffective means of purification. It should be noted that at this time in the neighbouring Kyiv and Podilsk provinces, disinfection carts were already actively introduced in cities (Goroda, 1906, III, p. 100; Freyberg, 1913, p. 413).

During the war, garbage and waste disposal in most Volyn cities was carried out extremely unsatisfactory. The need to solve this problem during his stay in Rivne at the end of 1914 was also emphasized by one of the members of the imperial family. The deputies of the

city council explained the reasons for such unsanitary conditions and dirt by the cramped conditions of the houses and the proximity of military operations. The most neglected were some of the central parts of the cities, where the poor population lived. In Rivne, this prompted the city council to seek a loan of 19.8 thousand rubles for the arrangement of a sewage truck (Denysiuk, 2024, p. 29).

The practice of setting up sewage wagons in Volyn front-line cities became widespread in the first years of the war. Loans were often used for this. In particular, in Dubno and Lutsk, the necessary equipment (a pneumatic pump and several iron barrels) and horses were purchased in 1915 – 1916. However, due to the heavy load, the sewage wagons could not cope with the removal of waste (Denysiuk, 2024, p. 30).

An important component of ensuring the proper sanitary and epidemiological situation in front-line cities was the medical service system. On the eve of the war in the Russian Empire, medical institutions were subordinate to the Ministry of Internal Affairs, but a number of powers in the field of health preservation and improvement of the sanitary situation were held by city authorities (Hryzhenko, 2012, p. 37). The central government implemented the principle of co-financing, partially covering the costs of maintaining doctors, paramedics and pharmacists, establishing and maintaining medical institutions, etc. The rest was financed from local budgets. The distribution of central funding had clear disparities. One resident of Moscow or St. Petersburg received 6.76 and 6.45 rubles per year, and a resident of Volyn province received 0.39 rubles, which is 16.5–17.3 times less and even lower than the average for the empire (Otchet o sostoyanii, 1915, p. 69).

At the beginning of the 20th century, from one to three hospitals operated in the county towns of Volyn province. The towns that became front-line during the war had hospital beds of 30 to 65, and in Kremenets – 232 (Goroda, 1906, III, pp. 106–107). This was not enough for the daily needs of city dwellers long before the war (SAVR, f. 3, d. 1, c. 441, pp. 2–2b; SAVR, f. 3, d. 1, c. 528, pp. 5–5b). As of 1904, in Volodymyr-Volynsky, there were 349 residents per hospital bed, in Lutsk – 506, Dubno – 523, Rivne – 528, Kovel – 589. The corresponding average figure for the province was 483.3 people.

The efficiency and quality of medical care depended on the availability of qualified doctors. According to the average Russian indicators of the ratio of the population to one doctor, Volyn province also lagged behind noticeably. According to data from 1904, there were 2,844 residents of Volhyn district cities per doctor. In 1913, this ratio decreased to 2,200 residents per doctor (the average indicator for the provinces of the European part of the empire was 1 to 1,300).

The number of doctors in the front-line Volhyn county towns, except for Rivne, was significantly lower than the general provincial indicator (9.2 doctors per town). In 1904, there were four doctors working in Dubno, five in Volodymyr-Volynsky, six – in Kovel and Lutsk, and 18 – in Rivne. Each county town also had at least one veterinarian (Goroda, 1906, III, pp. 106–107; Otchet o sostoyanii, 1915, p. 57).

With the beginning of the war, despite the fact that field military hospitals were deployed in front-line counties, the load on civilian hospitals increased significantly.

The structure of the Russian Army 3, which operated in the Volhyn and Podilsk provinces, included 18 field mobile and 23 reserve hospitals (Smolii, 2015, pp. 67–70). New medical institutions were also opened in front-line cities, often under the auspices of the All-Russian Zemstvo Union. As of mid-1915, 51 medical institutions with the ability to accommodate bedridden patients (a total of 3,567 beds) operated in Volhyn province. The bulk of the

military medical facilities, with 2,280 beds, were located away from the front line in Zhytomyr County. In the front-line Volodymyr-Volhyn County, military hospitals could accommodate 340 people, and in Kovel county, only 230. For comparison, in the neighbouring, also front-line, Podilsk province, there were 82 such institutions with twice the number of beds for patients – 4,685 (Spisok gospitaley, 1915, pp. 194–195, 1–9).

Since the beginning of the war, the city authorities had intensified their activities in establishing new medical institutions. In October 1914, Dubno town council urgently organized a new hospital (100 beds) in the town (SARR, f. 359, d. 1, c. 12, pp. 434–436, 525), and in November 1914, an active search was underway for a building for a hospital in Lutsk (SAVR, f. 3, d. 1, c. 1291a, pp. 86–86b). Over time, the protracted positional war prompted thrift. In September 1917, Volyn Provincial Committee of the All-Russian Zemstvo Union decided to reduce the number of beds in medical institutions, where no more than 50% of the beds were occupied (CSHAUK, f. 930, d. 1, c. 15, pp. 79–80).

The consequences of the significant increase in the load on the existing system of sanitary and medical support of the front-line cities of Volhyn became apparent in the spring of 1915 with a significant seasonal increase in the number of patients with respiratory and infectious diseases. In Rivne, the issue of building an isolation facility for «contagious patients» became acute. In order to contain the spread of infections into groundwater for the new institution, the sanitary commission recommended cementing cesspools, burning and covering patients' excrement with limestone, etc. (SARR, f. 165, d. 1, c. 28, pp. 58–58b, 62–63, 83–84). A significant role in the deterioration of the situation was played by the significant complication of the problem of providing the population with food in the region, which was associated with the priority of providing the army (Shvab, & Denysiuk, 2020, pp. 79–80).

An additional burden on the sanitary and epidemiological situation in front-line areas was the fact that from 1915, first on the Western and then on the Eastern Fronts, the practice of treating wounded soldiers near the front line began to be implemented. In this regard, a large number of hospitals were deployed (Ward, 2013, p. 18–19, 57). The civilian system of medical and sanitary institutions also took on a significant burden.

Over the years of the war, the system of medical and sanitary institutions in front-line cities expanded and, as far as possible, adapted to the challenges of wartime. In particular, in Lutsk, as of November 1918, there were a general zemstvo and venereal hospitals (each 30 beds), an epidemiological department (30 beds), a city disinfection chamber, two outpatient clinics, including one for food testing, and a private hospital. A sanitary doctor, 5 paramedics and 12 private doctors provided their services separately. Probably, the chemical and bacteriological office of the All-Russian Zemstvo Union also operated. The majority of these institutions lacked funding, so there was a threat of their closure (SAVR, f. 3, d. 1, c. 1648, pp. 73–74).

A difficult challenge for the sanitary and medical services of Volhyn province during the war years were infectious diseases and epidemics. On the eve of the war, the most common infectious diseases in the Russian Empire, which often developed into epidemics, were measles, scarlet fever, typhus, whooping cough, diphtheria, and smallpox. Respiratory diseases and typhus were the most common in winter and early spring, and dysentery in summer. The incidence of smallpox in Volyn in 1913 was one of the lowest in the empire, and of typhus and relapsing typhus – average. However, the rates of typhus fever – 18.4 cases per 10 thousand people and syphilis – 14.2 per 10 thousand people, respectively, were among the highest (Otchet o sostoyanii, 1915, pp. 5–6, 15–17, 26–29, 32–35, 45, 49, 54).

In 1915, with the intensification of hostilities in the region, the situation with infectious diseases deteriorated significantly, which forced the authorities to step up. If until the summer of 1915, only a few epidemic detachments operated on the South-western Front, then in August 1915 there were 15, in January 1916 – 35 (Ocherk deyatelnosti, 1916, p. 17).

Due to poor sanitation and numerous problems with the sanitary and medical system, the population of Volhyn province increasingly suffered from typhus. The situation was especially aggravated during the thaw, especially from the beginning of 1917 (Herasymov, 2017, p. 326). In the second half of July 1918, 7 new cases of typhus and 10 of typhus, 6 of dysentery, 1 of diphtheria, and 3 of measles were recorded in Lutsk. Higher disease rates were only in the provincial centre. To prevent the spread of the epidemic, additional funds were urgently allocated to maintain an additional doctor and five paramedics, and doctors were on duty around the clock. The Ministry of Public Health allocated about 100 thousand rubles to combat typhus in February 1919 (SAVR, f. 3, d. 1, c. 1648, pp. 36–36b, 49–49b, 88; SAVR, f. 3, d. 1, c. 1718, pp. 13–24). A separate problem in the last few months of the war and immediately after its end was the so-called "Spanish" flu, whose victims were estimated at tens of millions of people around the world. Due to the difficult military and political and socio-economic circumstances and the lack of sufficient knowledge about viruses, accurate statistics on this disease were not kept, and ways to overcome it were not developed (Rosu, 2021, pp. 90–92).

Conclusions and Prospects. A rapid development of socio-economic processes of the late 19th – early 20th centuries led to significant changes in the provision of life in cities and towns. Under the conditions of a rapid population growth, modernization of the urban economy, changes in the urban lifestyle, there was an urgent need to establish an effective system of sanitary and epidemiological support and control. The effectiveness and dynamics of changes in this area were determined by both European trends and the peculiarities of traditions, as well as technological and financial capabilities. The pace of adaptation of the system of sanitary and epidemiological control and provision of county cities and towns of Volhyn significantly lagged not only from the best European, but also from all-Russian practices. The consequences of this lag were acutely evident during the war years, when Volhyn frontline cities began to receive a large number of refugees and soldiers, and the level of funding for the life support sector in cities decreased.

A significant deterioration in the quality of the social and everyday life of frontline cities led to the destruction of infrastructure facilities and residential buildings, excessive concentration of residents in surviving buildings, etc.

The lack of a water supply and sewage system, the use of river water by citizens for everyday use, and the concentration of excessive amounts of household waste in cities became catalysts for the spread of unsanitary conditions and epidemics. The military and civilian authorities tried to tighten control over compliance with sanitary rules, develop sanitary and medical institutions, use sewage trucks in cities, etc. However, the measures taken and the resources provided were insufficient.

The causes of unsanitary conditions remained and were exacerbated by the conditions of martial law. Frontline cities were important centres of army logistics, which did not allow for the widespread use of quarantine as an important means of combating epidemics. The general sanitary and epidemiological situation was exacerbated by the large concentration of military personnel. Despite the development of military medical infrastructure in frontline cities, the burden on civilian hospitals also increased. The level of unsanitary conditions

began to increase significantly from 1915, especially in the winter of 1917/1918, which led to the spread of epidemics. The typhus epidemic was the most widespread in 1918.

The topic of this study is extensive and poorly studied. Further study is required: everyday household practices of citizens in providing their houses and farms with water; utilization and removal of everyday waste from urban life; development of the water supply and sewage system; care and cleaning of urban space; development of a network of public toilets, baths, city wells, etc.; formation and functioning of the sanitary and epidemiological system; the then practices of epidemic prevention, etc.

Acknowledgement. We express sincere gratitude to all editorial board members for the consultations provided during the preparation of the article for printing.

Funding. The authors did not receive any financial assistance for the research and publication of this scientific work.

BIBLIOGRAPHY

Abellán J. (2017). Water Supply and Sanitation Services in Modern Europe: Developments in 19th–20th Centuries. *XII International Congress of the Spanish Association of Economic History, 12*, 1–17. URL: https://www.academia.edu/34533153/Water_supply_and_sanitation_services_in_modern_Europe_developments_in_19th_20th_centuries. [in English].

Denysiuk, V. (2024). Voda ta vyviz vidkhodiv yak chastyna sanitarno-epidemiolohichnykh problem u mistakh Zakhidnoi Volyni u 1914 – 1918 rr. [Water and Waste Disposal as Part of Sanitary and Epidemiological Problems in the Towns of Western Volyn in 1914 – 1918]. *Mynule i suchasne Volyni ta Polissia*, *76,* 27–32. [in Ukrainian].

*Derzhavniy arkhiv Volynskoi oblasti [State Archive of Volyn Region – **SAVR**]*.

*Derzhavnyi arkhiv Rivnenskoi oblasti [State Archive of Rivne Region – **SARR**]*.

Floris, J. & Staub, K. (2019). Water, Sanitation and Mortality in Swiss Towns in the Context of Urban Renewal at the End of the 19th Century. *The History of the Family, 24 (2)*, 249–276. DOI: 10.1080/1081602X.2019.1598460. [in English].

Freyberg, N. (1913). Vrachebno-sanitarnoe zakonodatelstvo v Rossii: uzakoneniya i rasporyazheniya pravitelstva po grazhdanskoy meditsinskoy, sanitarnoy i farmatsevticheskoy chastyam, opublikovannye po 1 yanvarya 1913 g. [Medical and sanitary legislation in Russia: the establishment and expansion of the clergy in the civil medical, sanitary and pharmaceutical units, trained until January 1, 1913]. Sankt-Peterburg: Prakticheskaya meditsina. [in Russian].

Gerasymov, T., & Romaniuk, I. (2024). Entry to World War I: Historical Time and Everyday Aspects (based on the Material of Zhytomyr). *Skhidnoievropeiskyi Istorychnyi Visnyk [East European Historical Bulletin], 30*, 71–78. DOI: 10.24919/2519-058X.30.299898. [in English].

Goroda Rossii. (1906). [Cities of Russia]. *Tsentralnyy statisticheskiy komitet MVD*. (T. 1), Sankt-Peterburg: Tipo-litografiya Nyrkina. [in Russian].

Herasymov, T. (2015). Sanitarni problemy mist Volynskoi hubernii v 1914 – 1917 rr. [Sanitary problems of Volyn Province Towns in 1914 – 1917]. *Hurzhiivski istorychni chytannia, 10,* 172–174. URL: http://nbuv.gov.ua/UJRN/gurit_2015_10_63. [in Ukrainian].

Herasymov, T. (2017). *Mista Pravoberezhnoi Ukrainy i Persha svitova viina: povsiakdenna istoriia* [Cities of Right-Bank Ukraine and World War I]. Vinnytsia: Merkiuri-Podillia. [in Ukrainian].

Hryzhenko, L. (2012). Stan medychnoho obsluhovuvannia miskoho naselennia Katerynoslavshchyny (kinets XIX – pochatok XX st.). [The State of Medical Care for the Urban Population of Katerynoslav Region (the late 19th – early 20th centuries)]. *Visnyk Dnipropetrovskoho universytetu, 20*, 36–44. [in Ukrainian].

Kovalenko, T. (2021). War beyond the Frontline: Refugees in Internal Governorates of the Russian Empire during World War I. *Skhidnoievropeiskyi Istorychnyi Visnyk [East European Historical Bulletin], 18*, 98–106. DOI: 10.24919/2519-058X.18.226510. [in English].

Melosi, V. (2008). *The Sanitary City: Environmental Services in Urban America from Colonial Times to the Present*. Pittsburgh: University of Pittsburgh Pre. [in English].

Ocherk deyatelnosti. (1916). *Ocherk deyatelnosti Komiteta Yugo-Zapadnogo fronta za 1915 god* [Outline of the Activities of the Committee of the South-Western Front in 1915]. Kiev: Tip. A. I. Grosman. [in Russian].

Otchet o deyatelnosti. (1916). *Otchet o deyatelnosti meditsinskoy organizatsii Komiteta Zapadnogo fronta Vserossiyskogo zemskogo soyuza za oktyabr, noyabr i dekabr 1915 g.* [Report on the Activities of the Medical Organization of the Western Front Committee of the All-Russian Zemstvo Union for October, November and December 1915]. Moskva: Vserossiyskiy zemskiy soyuz. Komitet Zapadnogo fronta. [in Russian].

Otchet o sostoyanii. (1915). *Otchet o sostoyanii narodnogo zdraviya i organizatsii vrachebnoy pomoshchi v Rossii za 1913 god* [Report on the State of Public Health and the Organization of Medical Care in Russia for 1913]. SPb.: Tip. Ministerstva Vnutrennikh Del. [in Russian].

Pakhalyuk, K. (Red.). (2014). *Pervaya mirovaya: vzglyad iz okopa. [World War I: A View from the Trench*]. SPb.: Nestor-Istoriya. [in Russian].

Pieshkov, D. (2023). Yakist pytnoi vody ta dostup do nei v Poltavi XIX – pochatku XX st. [The Quality of Drinking Water and Access to it in Poltava in the XIX and early XX centuries]. *City: History, Culture, Society, 16 (2)*, 52–66. DOI: 10.15407/mics2023.02.052. [in Ukrainian].

Robak, A., & Demochko, H. (2024). Stvorennia kharkivskoi miskoi likuvalno-sanitarnoi orhanizatsii yak vplyvovyi chynnyk polipshennia yakosti zhyttia mistian naprykintsi XIX – na pochatku XX stolit. [Establishment of the Kharkiv city Medical and Sanitary Organization as an Influential Factor in Improving the Quality of Life of Citizens in the late XIX and early XX centuries]. *Doslidzhennia z istorii i filosofii nauky i tekhniky, 33 (1)*, 49–59. DOI: 10.15421/272406. [in Ukrainian].

Rosu, V. (2021). How did the Spanish Influenza Impact the 1918 Union of Transilvania with Romania? *Skhidnoievropeiskyi Istorychnyi Visnyk [East European Historical Bulletin], 21*, 87–96. DOI: 10.24919/2519-058X.21.246904. [in English].

Shvab, A., & Denysiuk, V. (2020). Food Supply of the Frontline Cities of the Volhyn Governorate in 1914 – 1917. *Skhidnoievropeiskyi Istorychnyi Visnyk [East European Historical Bulletin], 14,* 76–85. DOI: 10.24919/2519-058x.14.197791. [in English].

Smolii, V. (Ed.) (2015). *Velyka viina 1914 – 1918 pp. i Ukraina* [The Great War 1914 – 1918 and Ukraine]. (Book 2). Kyiv: Klio. [in Ukrainian].

Spisok gospitaley. (1915). *Spisok gospitaley, sostoyashchikh na uchete Vserossiyskogo zemskogo soyuza: (na 1-oe iyunya 1915 goda)* [The List of Hospitals Registered with the All-Russian Zemstvo Union: (on June 1, 1915)]. Moskva: Vserossiyskiy zemskiy soyuz pomoshchi bolnym i ranenym voinam. Otdel evakuatsii. [in Russian].

Spisok uchrezhdeniy. (1916). *Spisok uchrezhdeniy Komiteta na 1-oe aprelya 1916 goda* [The List of the Committee's Institutions on April 1, 1916]. Kyiv: Vserossiyskiy zemskiy soyuz. Komitet Yugo-Zapadnogo fronta. [in Russian].

Tsentralnyi derzhavnyi istorychnyi arkhiv Ukrainy u Kyievi [Central State Historical Archives of Ukraine in Kyiv ***– CSHAUK]***.

Ward, C. (2013). *Living on the Western Front: Annals and Stories, 1914 – 1919*. London: Bloomsbury Publishing Plc. [in English].

Wulff, E. (2020). Army Forces and Epidemic Diseases: A Travel through the 19th Century International Sanitary Conferences. *History of Science and Technology, 10, 1(16)*, 138–150. DOI: 10.32703/2415-7422-2020-10-1(16)-138-150. [in English].

The article was received February 06, 2025.
Article recommended for publishing 28/11/2025.