

**THE DYNAMICS OF ACUTE INTESTINAL INFECTIONS INCIDENCE
IN SEVASTOPOL (2022-2024 YEARS)**

**Динамика заболеваемости острыми кишечными инфекциями
в городе Севастополь (2022–2024 годы)**

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Summary

The steady increase in the number of reported cases of acute intestinal infections from 2022 to 2024 indicates both improved diagnosis and the need to strengthen preventive measures. Monthly peaks of the incidence in late summer and early autumn underscore the importance of seasonal surveillance and regular public awareness campaigns during the high-risk months.

Keywords: Sevastopol, epidemiological investigation, bacterial and viral intestinal infections, population growth, seasonal variation in morbidity, public health surveillance.

Аннотация

Неуклонный рост числа зарегистрированных случаев острых кишечных инфекций с 2022 по 2024 годы свидетельствует как об улучшении диагностики, так и о необходимости усиления профилактических мероприятий. Резкие подъемы заболеваемости в конце лета и начале осени подчеркивают важность сезонного эпиднадзора и регулярное проведение кампаний по информированию общественности в месяцы повышенного риска.

Ключевые слова: Севастополь, эпидемиологическое расследование, бактериальные и вирусные кишечные инфекции, прирост населения, сезонные колебания заболеваемости, Санитарный надзор за населением.

Acute intestinal infections (often referred to as acute gastroenteritis or acute diarrhoeal diseases) are infections of the gastrointestinal tract caused by a variety of pathogenic microorganisms — bacteria, viruses and, less frequently, parasites [2]. They typically present with sudden onset of liquid or unformed stools (often three or more per day), sometimes accompanied by vomiting, abdominal cramping, fever and dehydration [3]. Transmission is chiefly via the faecal-oral route: contaminated food or water [1], poor personal or food hygiene, infected hands and sometimes direct person-to-person spread or inefficiencies in sanitation (especially in crowded or low-resource settings) [5]. Etiologically, common viral agents include rotavirus, norovirus, adenovirus and astrovirus; common bacterial agents include *Shigella*, *Campylobacter*, and enterotoxigenic *E. coli* [1].

These infections are extremely common worldwide and represent a major public health burden. For example, according to the World Health Organization (WHO), diarrhoeal diseases — many of which are acute intestinal infections — remain a leading cause of mortality in children under five years old: “Diarrhoeal disease is the second leading cause of death in children under five years old, and was responsible for the deaths of 370,000 children in 2019”. In a large global burden study, it

was estimated that in 2019 there were about 6.59 billion incident cases of enteric (intestinal) infections and 1,748,251 deaths worldwide. Another review states: “Infectious gastroenteritis is one of the most common diseases throughout the world. It poses a global health problem, especially severe in children and older adults” [7].

In developed countries, acute diarrhoeal illness also accounts for large outpatient and hospital visit volumes; for instance, in the United States it was estimated that acute diarrheal disease accounts for 179 million outpatient visits annually [6].

The main danger of acute intestinal infections lies in dehydration and electrolyte imbalance: frequent watery stools and vomiting cause loss of fluid, sodium, potassium and bicarbonate. If replacement is insufficient, this can lead to life-threatening complications (especially in young children, the elderly, or those with weakened immunity). Other complications include invasive bacterial infections, systemic spread of enteric pathogens, malnutrition (especially in children in low-resource settings), delayed growth and cognitive development, and further burden on healthcare systems. In addition, from a public health perspective, high incidence causes resource strain (hospital beds, rehydration therapy), risk of outbreaks (especially in institutions, schools, communities) and can signal food- or water-safety failures in a community [4].

Therefore, the **purpose** of my work was to study the dynamics of the incidence of acute intestinal infections in the city of Sevastopol, Republic of Crimea.

Materials and methods. The incidence data was provided by the Federal Budget Healthcare Institution "Center for Hygiene and Epidemiology in the Republic of Crimea and the Federal city of Sevastopol". I calculated the relative indicators (incidence per 100,000 population) and analyzed the data obtained.

Results and discussion. The analysis of epidemiological investigations in Sevastopol over the past three years (2022–2024) provides valuable insight into the evolving public health scenario of the region. By examining year-wise and month-wise data, it becomes evident that the total number of recorded investigations has increased steadily each year.

Table 1

Incidence of acute intestinal infections in Sevastopol, absolute numbers

Year	Total	Bacteria	Viral	Unidentified
2022	2159	252	814	1093
2023	2315	429	1079	807
2024	2612	488	1108	1016

A consistent year-on-year increase is visible: from 2,159 in 2022 to 2,315 in 2023, and 2,612 in 2024 — representing a 21% total increase over the three-year period. The most notable rise is seen in bacterial infections, which nearly doubled, indicating improved diagnostic reporting and possibly heightened bacterial transmission due to climatic or environmental changes.

This rise prompts critical questions regarding whether it reflects an actual increase in disease spread or a gradual population growth leading to a proportional rise in recorded cases. That's why I used data from the Federal State Statistics Service and calculated a relative indicator - the incidence per 100000 population.

Table 2

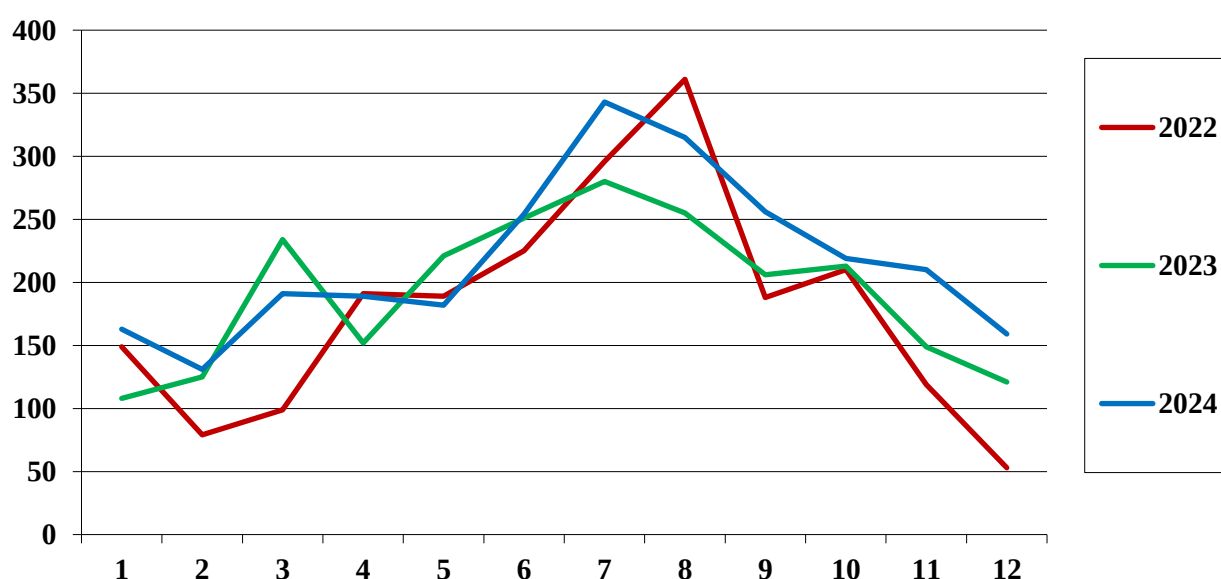
Incidence of acute intestinal infections incidence per 100000 population, Sevastopol

Year	Estimated Population	Incidence per 100,000 people
2022	~434,000	497
2023	~439,000	532
2024	~443,000	590

Even after adjusting for population changes, the rate per 100,000 inhabitants rises sharply, confirming that the growth in investigations cannot be attributed solely to demographic expansion. Rather, it reflects a true increase in disease activity or improved detection capacity within Sevastopol's health monitoring system.

The progressive increase in epidemiological investigations may stem from enhanced surveillance systems, environmental influences, post-pandemic vigilance, and sociodemographic shifts such as migration and urban crowding. From a regional viewpoint, Sevastopol mirrors the broader epidemiological trend observed across many urban centers post-2021 — showing a gradual rise in communicable disease detection due to both increased sensitivity of public health monitoring and potential ecological or behavioral drivers.

Monthly Patterns. A detailed month-wise review shows that cases tend to peak between August and October, while January to March consistently report the lowest numbers. This seasonal trend can be explained by several factors: climatic conditions, increased human activity during summer, and better surveillance during outbreaks.



Pic. 1. Monthly Patterns of acute intestinal infections incidence in Sevastopol

The distribution of etiological agents in 2024 shows that bacterial and viral infections remain the two predominant categories, while a smaller share belongs to unidentified or unconfirmed causes: bacterial infections (488 cases or 18.7 %), viral infections (1108 cases or 42.4 %) and unidentified (1016 cases (or 38.9 %). This ratio demonstrates that viral agents dominate the total structure, which is typical for most modern urban environments. Viral infections (mainly norovirus and rotavirus) are highly contagious, have short incubation periods, and can spread rapidly through communal settings, particularly in winter and early spring. The high proportion of bacterial infections,

however, indicates significant foodborne and waterborne transmission — often linked to summer seasonality, inadequate storage of food, and increased outdoor consumption.

Thus, the etiological pattern of 2024 reflects diverse infection pathways: viral infections → mainly person-to-person or through contaminated surfaces (more in cold months); bacterial infections → foodborne and environmental (more in warm months).

Conclusion. The steady rise in investigation numbers across 2022–2024 highlights both the improved responsiveness of Sevastopol’s public health infrastructure and the need for continuous preventive strategies. While modest population growth partly explains the numerical increase, the per-capita escalation underscores a genuine rise in infection prevalence or detection efficiency. Monthly peaks in late summer and early autumn emphasize the importance of seasonal surveillance and public awareness campaigns during high-risk months.

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