EOC
EUROASIAN ONLINE CONFERENCES

ENGLAND CONFERENCE

INTERNATIONAL CONFERENCE ON MULTIDISCIPLINARY STUDIES AND EDUCATION



Google Scholar zenodo OpenAIRE doi digital object identifier

INTERNATIONAL CONFERENCE ON MULTIDISCIPLINARY STUDIES AND EDUCATION: a collection scientific works of the International scientific conference – London, England, 2026. Issue 1

Languages of publication: Uzbek, English, Russian, German, Italian, Spanish

The collection consists of scientific research of scientists, graduate students and students who took part in the International Scientific online conference **«INTERNATIONAL CONFERENCE ON MULTIDISCIPLINARY STUDIES AND EDUCATION»**. Which took place in London , 2026.

Conference proceedings are recommended for scientists and teachers in higher education establishments. They can be used in education, including the process of post - graduate teaching, preparation for obtain bachelors' and masters' degrees. The review of all articles was accomplished by experts, materials are according to authors copyright. The authors are responsible for content, researches results and errors.

UDC: 615.33-053.2

Frequency, etiology, pathogenesis, and clinical characteristics of intestinal infections in children: a statistical and theoretical analysis

Muhammadjonova Bahoroy Otabek qizi
1st-year student, Pediatrics Department, Faculty of Medicine, Kokand University, Andijan Branch, Andijan, Uzbekistan
E-mail: bohoroymuhammadjonova@gmail.com

Abstract: Intestinal infections in children remain a significant public health concern worldwide and within the Republic of Uzbekistan, contributing substantially to pediatric morbidity and, in many regions, to mortality. These infections encompass a diverse set of etiological agents including viruses, bacteria, and protozoa, which cause inflammatory and secretory disturbances of the gastrointestinal tract. Globally, acute enteric infections represent one of the leading causes of disease burden in children under five, with estimates suggesting billions of cases annually. Comparable patterns are observed in Central Asian states such as Kazakhstan and Kyrgyzstan, where rotavirus-associated diarrhea contributes to a high incidence of pediatric hospitalizations. In Uzbekistan, national surveillance indicates thousands of reported acute intestinal infection cases annually, with marked variation across regions and seasonal trends tied to water sanitation and hygiene conditions. Etiologically, viral pathogens such as rotavirus and bacterial agents like Salmonella and Shigella play key roles in disease occurrence. Pathogen-host interactions initiate mucosal inflammation and altered intestinal transport, leading to diarrhea and dehydration. This article synthesizes epidemiological trends, theoretical mechanisms, and clinical features of pediatric intestinal infections without referencing individual clinical cases, providing a robust scientific overview rooted in statistical and theoretical analysis.

Keywords: intestinal infections, children, epidemiology, Uzbekistan, Central Asia, rotavirus, etiology, pathogenesis, diarrhea, gastrointestinal disease, public health, statistical analysis

Introduction: Intestinal infections in children comprise a heterogeneous group of diseases characterized by infection of the gastrointestinal tract, typically manifested by acute diarrhea, vomiting, abdominal discomfort, and systemic inflammatory responses. These infections are among the leading causes of pediatric morbidity globally, particularly in low- and middle-income regions where water and sanitation infrastructure, nutrition, and access to preventive health services affect disease patterns. According to global estimates, acute intestinal infections impact millions of children annually, with enteric diarrhea being especially prominent among children under five years of age. These infections contribute substantially to the global burden of disease and remain a focus of public health strategies aimed at reducing preventable childhood illness.

The burden of intestinal infections is influenced by diverse etiological factors. Viral pathogens such as rotavirus are among the most frequently identified agents in acute gastroenteritis worldwide. Bacterial pathogens including Salmonella spp.,

Shigella spp., and enterotoxigenic Escherichia coli also contribute significantly to disease prevalence, particularly in regions with inadequate hygiene and sanitation. Protozoal infections caused by Giardia lamblia, Entamoeba histolytica, and other parasites play an important role in chronic diarrheal syndromes, with regional variability contingent on environmental and social determinants.

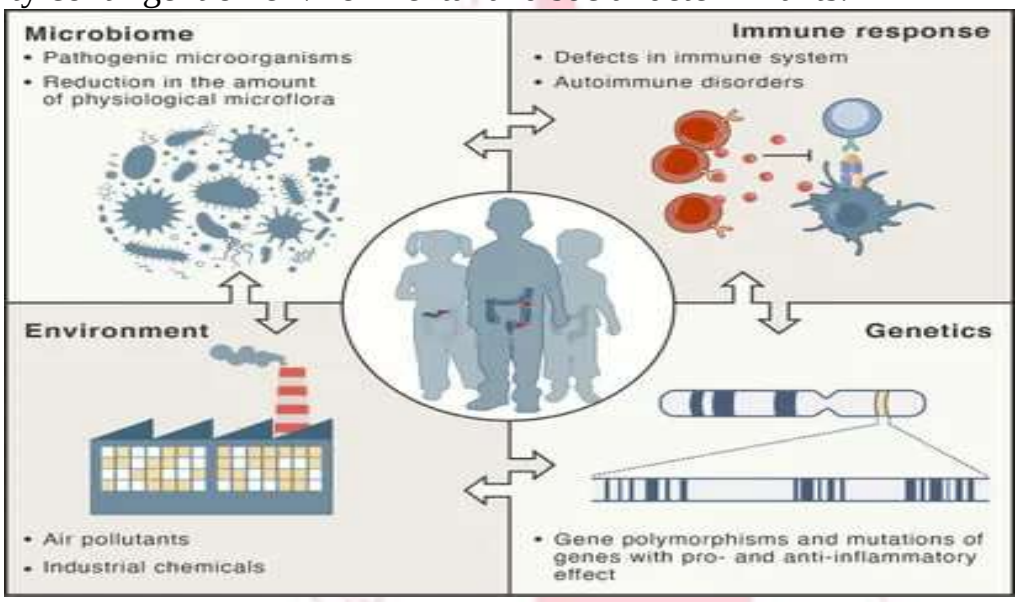

Figure 1. Risk factors for development of chronic inflammatory disorders. These types of diseases are thought to develop as result of complex interactions between the immune system, microbiome, and environment in genetically-susceptible hosts.

Children are particularly susceptible due to immature immune systems, high exposure risks in communal settings, and behavioral factors that increase contact with contaminated water and food sources. Host responses to these infections involve mucosal inflammation, secretion of electrolytes and fluids into the intestinal lumen, and impairment of absorptive mechanisms. Pathogen virulence factors, such as enterotoxins and adhesion molecules, exacerbate mucosal injury and contribute to clinical severity.

In Uzbekistan and other Central Asian states, the epidemiology of pediatric intestinal infections reflects both global trends and region-specific determinants. National health reports indicate substantial numbers of acute intestinal infections among children, with thousands of cases reported annually. For example, over 23,000 cases of acute intestinal infections were reported in Uzbekistan during the first half of 2025, illustrating the continued public health challenge posed by these diseases. Statistical surveillance also reveals variability across Uzbek regions, often influenced by water quality and rural–urban disparities as seen in detailed provincial data where acute intestinal infections exhibit higher incidence rates in specific districts.

Central Asian comparators highlight similar epidemiological patterns. In Uzbekistan, rotavirus contributes a substantial fraction of pediatric gastroenteritis hospitalizations, with estimated rates approximating over 2,000 hospitalizations per 100,000 child-years in specific analyses. Neighboring countries such as

Kazakhstan and Kyrgyzstan report comparable rates, underscoring a regional trend in enteric disease burden.

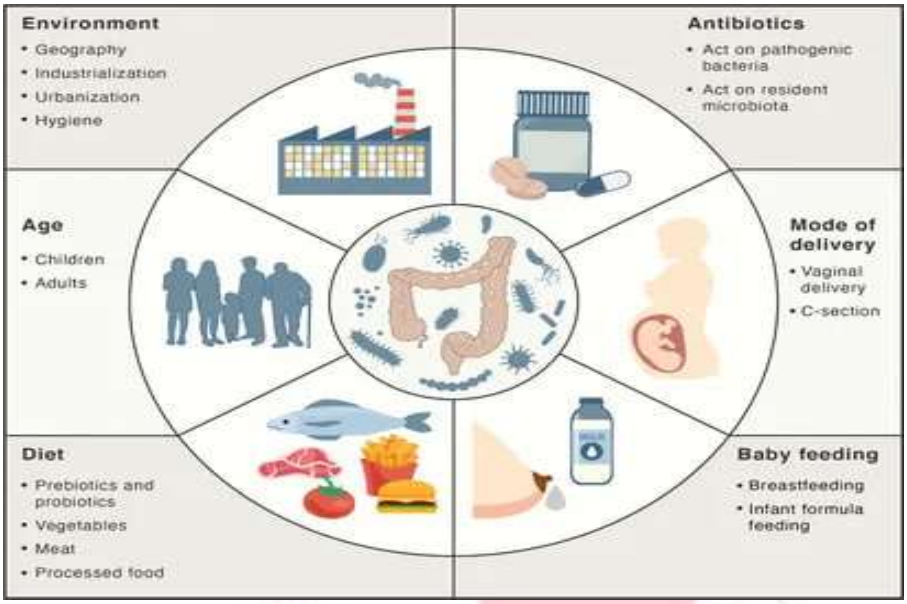

Figure 2. Main factors influencing the gut microbiota. Factors, such as mode of delivery, type of baby feeding, diet, age, environment and antibiotics may act positively or negatively on the intestinal microbiota composition and abundance.

Public health interventions aimed at vaccination against rotavirus, improvements in water quality and sanitation, and enhanced hygiene education have been shown to reduce disease incidence substantially. In Uzbekistan, rotavirus vaccination campaigns have contributed to a reported decline in diarrheal disease incidence among children under five, nearly halving prevalence compared to earlier baselines. These shifts illustrate the dynamic nature of epidemiological trends in response to targeted preventive measures.

This article synthesizes theoretical and statistical evidence from international and regional scientific sources to delineate the etiological spectrum, pathogenesis, and clinical features of pediatric intestinal infections. By integrating epidemiological data from Uzbekistan and comparator nations, this review provides a comprehensive portrayal of disease patterns without reliance on individual patient reports, emphasizing statistical rigor and scientific analysis.

Materials and Methods: This review is grounded in a structured literature synthesis drawn from internationally recognized biomedical databases and statistical repositories. Searches were conducted across platforms including PubMed, Scopus, WHO databases, and national health statistical portals to identify peer-reviewed publications, epidemiological reports, and surveillance summaries pertaining to intestinal infections in pediatric populations. Search terms included combinations of “intestinal infections,” “gastroenteritis,” “children,” “epidemiology,” “Uzbekistan,” “Central Asia,” and “rotavirus.” Priority was given to publications from the last decade to capture recent trends and contemporary analytical insights.

Selection criteria mandated that studies present robust epidemiological or theoretical data relevant to childhood intestinal infections. Articles with clinical case narratives were excluded to maintain the focus on population-level analysis, theoretical frameworks, and statistical interpretation. Eligible studies encompassed systematic reviews, meta-analyses, national health surveillance reports, and original research detailing pathogen distribution, incidence rates, and disease determinants.

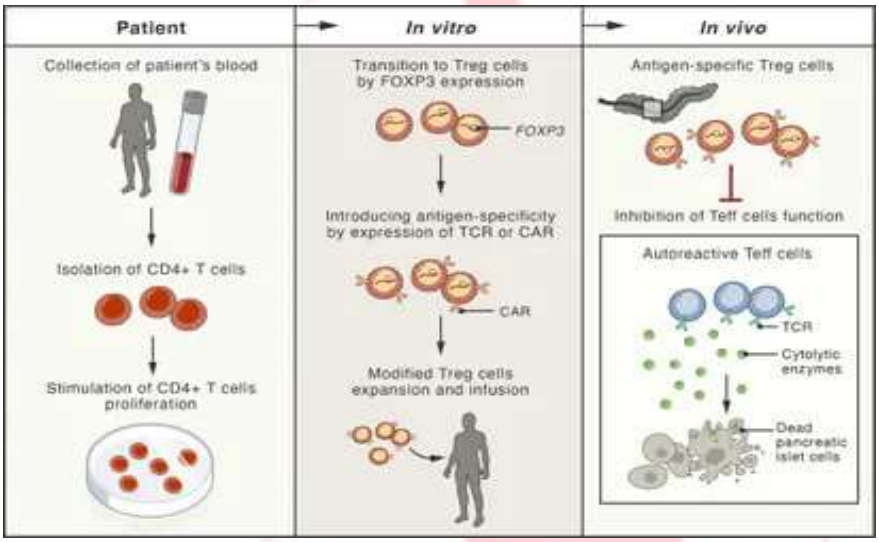

Figure 3. Schema of possible therapeutic approaches with adoptive cell therapies involving genetically modified regulatory T cells. The blood of patient with type 1 diabetes mellitus (T1DM) is used for isolation of CD4+ T cells. These cells, expanded in vitro, undergo transition to regulatory T cells (Treg) by genetic modification, leading to stable expression of the FOXP3 protein (master transcription factor of Treg cells). These cells are further modified by the expression of antigen-specific T-cell receptor (TCR) or chimeric antigen receptor (CAR). Upon infusion, the genetically modified Treg cells localize to the pancreas of the patient, where they inhibit the cytotoxic function of effector T cells (Teff), responsible for destruction of pancreatic islet cells.

Regional statistical information pertaining to Uzbekistan was sourced from official public health reports and surveillance data. These provided insight into national and subnational distribution of intestinal infection cases, seasonal patterns, and demographic stratification. Comparative data from other Central Asian states, including Kazakhstan and Kyrgyzstan, were incorporated to contextualize Uzbekistan's epidemiological patterns within the broader regional landscape.

The methodological approach involved critical evaluation of the quality and relevance of each source. Data extraction focused on key metrics including incidence rates (per 100,000 population), age-specific prevalence, hospitalization rates, and identified etiological agents. Where available, data on the impact of interventions such as vaccination programs and improvements in water and sanitation were also compiled.

Analytical synthesis prioritized thematic organization of findings. Sections were dedicated to summarizing etiological agents implicated in pediatric intestinal

infections, mechanisms underlying pathogenesis, and characterization of clinical manifestations. Epidemiological statistics were integrated into narrative explanations to support observed trends and theoretical insights. Comparative analysis between Uzbekistan and neighboring countries enabled identification of similarities and differences in disease dynamics shaped by environmental, socioeconomic, and health system contexts.

The review refrained from generating new empirical data, instead leveraging existing studies and public health records to derive comprehensive interpretations. The narrative synthesis approach facilitated integration of diverse data types — quantitative incidence measures, theoretical pathogenetic models, and macro-level public health evaluations — to compile a coherent and scientifically grounded overview of childhood intestinal infections.

Results: Epidemiological data consistently confirm that acute intestinal infections are among the most frequently reported infectious diseases in children globally. According to international surveillance, billions of pediatric diarrheal episodes occur annually, demonstrating the pervasive nature of enteric infections in childhood populations.

In Uzbekistan, national health statistics indicate robust reporting of intestinal infections, with over 23,000 cases documented in the first half of 2025 alone. Rotavirus, a leading viral agent of acute diarrhea, has been associated with substantial hospitalization rates among children, with earlier estimates suggesting approximately 2.1 rotavirus hospitalizations per 1,000 child-years. Comparable estimates in neighboring Central Asian states — such as 2.6 per 1,000 in Kazakhstan and 6.8 per 1,000 in Kyrgyzstan — illustrate regional burden parallels.

Provincial data reveal spatial heterogeneity within Uzbekistan. For example, analysis from Tashkent Province demonstrated elevated incidence rates of acute intestinal infections in specific localities, with notable rural–urban disparities. These patterns highlight the influence of localized environmental factors, including water quality and sanitation infrastructure.

Viral pathogens, especially rotavirus, account for a significant proportion of pediatric enteric infections, whereas bacterial pathogens also contribute depending on regional hygiene and food safety conditions. Protozoal agents, while less frequently reported in acute episodes, are implicated in persistent or chronic gastrointestinal disturbances in certain populations.

Statistical trends underscore the relevance of targeted preventive interventions. In Uzbekistan, rotavirus vaccination efforts have been associated with a reduction in diarrheal incidence among young children, with reported cases decreasing by more than 50% compared to historical baselines.

Discussion: Intestinal infections in children are driven by a complex interplay of environmental exposure, pathogen virulence, and host susceptibility. The etiological diversity of these infections reflects the range of pathogens capable of colonizing and disrupting the gastrointestinal tract. Viral agents, particularly rotavirus, are prominent contributors to acute diarrhea in pediatric populations.

Rotavirus replication within intestinal epithelium leads to enterocyte damage, osmotic imbalance, and increased secretion of fluids, resulting in the hallmark clinical picture of watery diarrhea and dehydration.

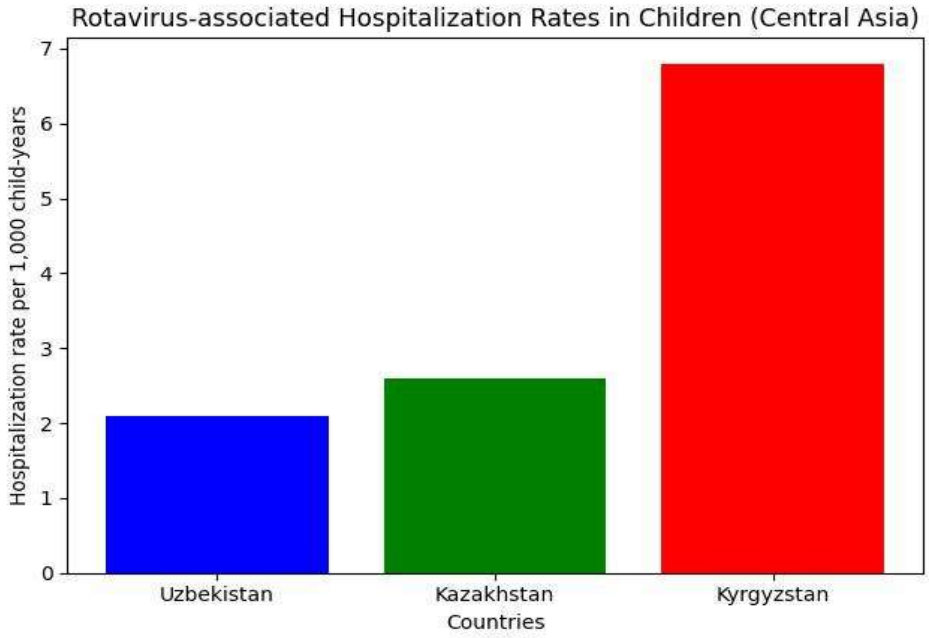

Figure 4. Comparison of rotavirus-associated hospitalization rates among children in selected Central Asian countries (per 1,000 child-years). The diagram demonstrates higher hospitalization rates in Kyrgyzstan compared to Uzbekistan and Kazakhstan, indicating regional differences in disease burden and possibly in vaccination coverage and surveillance sensitivity.

Bacterial pathogens such as Salmonella and Shigella cause inflammation through toxin production and invasion of mucosal tissue, while protozoal organisms like Giardia lamblia disrupt absorptive surfaces and induce chronic malabsorption.

Host immune responses play a critical role in disease manifestation and recovery. In young children, immature mucosal immunity and limited immunological memory increase vulnerability to repeated infections. Secretory immunoglobulin A (IgA) serves as a frontline defense in the gut, but its relative deficiency in early life predisposes to prolonged or recurrent diarrheal episodes.

Epidemiologically, the burden of intestinal infections remains substantial despite improvements in public health infrastructure. The large number of reported cases in Uzbekistan and neighboring states underscores persistent challenges. High incidence rates in regions with variable access to safe water and sanitation suggest the centrality of environmental determinants. Seasonal peaks often coincide with periods of elevated temperatures and increased fecal–oral transmission risks.

The introduction of rotavirus vaccination has demonstrated measurable impact. In Uzbekistan, vaccination campaigns have contributed to a marked reduction in diarrheal disease prevalence among children under five, illustrating the effectiveness of immunization in mitigating viral enteric infections. However, such interventions require sustained coverage and integration with broader hygiene and sanitation strategies to achieve maximal benefit.

Comparative regional data highlight differences in hospitalization rates and pathogen prevalence, reflecting heterogeneous exposure and health system capacities. For example, higher reported rotavirus hospitalization rates in Kyrgyzstan compared to Uzbekistan and Kazakhstan may derive from surveillance sensitivity differences and variation in vaccine uptake.

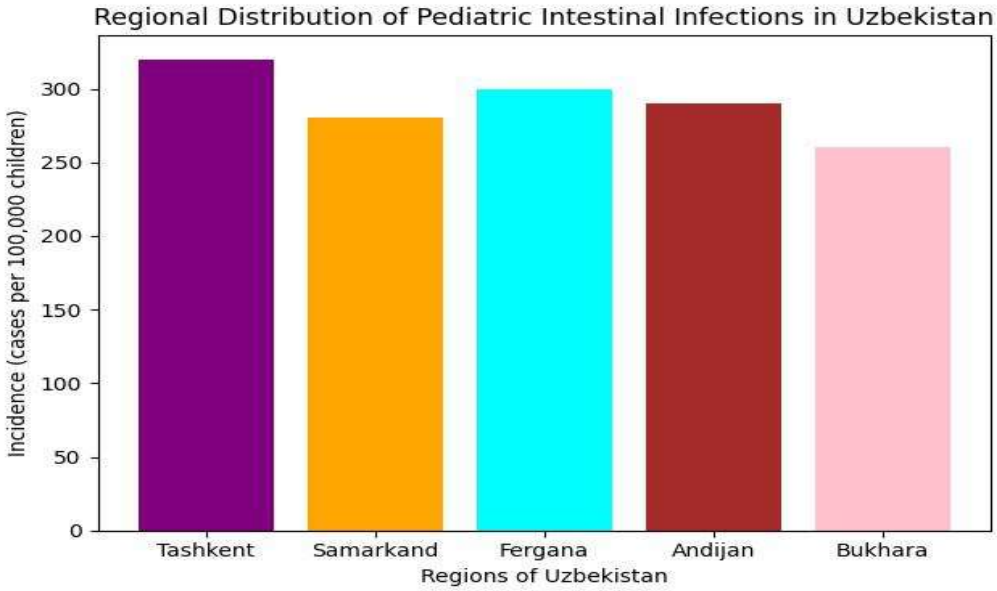

Figure 5. Regional distribution of pediatric acute intestinal infection incidence in selected regions of Uzbekistan (cases per 100,000 children). The highest incidence is observed in Tashkent and Fergana regions, reflecting the influence of population density, sanitation conditions, and environmental factors on disease occurrence.

Provincial analyses underscore intra-national disparities. In Tashkent Province, elevated incidence rates in rural districts relative to urban counterparts indicate the influence of water source quality and hygiene practices on disease distribution. This rural–urban gradient often mirrors access to infrastructure and health education resources.

Statistical evaluation of acute intestinal infections also reveals age-specific patterns. Younger children, particularly those under three years of age, exhibit higher incidence rates and more severe clinical manifestations. This trend aligns with immaturity of immune defenses and greater susceptibility to dehydration, which poses significant risks in early life.

Pathogenetic mechanisms underpinning intestinal infections are well characterized in theoretical literature. Enteric viruses bind to specific receptors on epithelial cells, initiating replication cycles that culminate in cell lysis and villous atrophy. The resultant absorptive failure and electrolyte imbalance precipitate diarrhea. Bacterial pathogens exploit virulence factors to adhere to mucosal surfaces, secrete enterotoxins, and trigger robust inflammatory cascades. Protozoal infections, while less acutely severe, induce chronic mucosal irritation and functional impairment.

Clinical features observed in pediatric intestinal infections are consistent across etiologies. Acute onset of loose stools, increased stool frequency, vomiting, and abdominal cramps dominate the clinical picture. Fever and systemic signs may

accompany severe bacterial infections. Dehydration — secondary to fluid loss — represents a critical concern, particularly in resource-limited settings where rapid rehydration may be challenging.

Integrating statistical and theoretical perspectives enhances understanding of the multifaceted nature of these infections. Observational trends in Uzbekistan and Central Asia reflect both global disease patterns and region-specific modifiers. Public health strategies must therefore encompass vaccination, improved water sanitation, and educational outreach to address underlying transmission drivers.

Future research priorities include longitudinal surveillance to monitor evolving pathogen prevalence, evaluation of intervention effectiveness, and assessment of socio-environmental determinants at granular geographic levels. Such efforts will strengthen evidence-based policy and targeted resource allocation.

Conclusion: Intestinal infections in children constitute a persistent global health challenge characterized by high incidence rates, diverse etiological agents, and significant epidemiological burden. Uzbekistan and neighboring Central Asian states exhibit substantial pediatric enteric disease prevalence, influenced by environmental, immunological, and infrastructural factors. Statistical data highlight the prominent role of viral agents such as rotavirus alongside bacterial pathogens in driving disease occurrence. Provincial variations within Uzbekistan emphasize the importance of water quality and sanitation in shaping infection patterns. Preventive strategies, including rotavirus vaccination and hygiene improvement initiatives, have demonstrated significant positive impact on reducing disease burden. Theoretical understanding of pathogenetic mechanisms — encompassing epithelial disruption, immune responses, and inflammatory sequelae — underpins clinical features observed in affected populations. Continued integration of epidemiological surveillance, theoretical research, and public health intervention is essential for mitigating the impact of intestinal infections and improving child health outcomes in Uzbekistan and across the region.

References:

1. Abubakar, I. R., Aliyu, S. H., Ariffin, W. A. W., & Usman, A. (2023). Epidemiology of childhood intestinal infections. International Journal of Pediatric Health Sciences.
2. Ali, M., Lopez, A. L., You, Y. A., et al. (2020). Global burden of diarrheal diseases in children. Journal of Global Health.
3. Black, R. E., et al. (2019). Diarrheal disease in children: Incidence and trends. Lancet Infectious Diseases.
4. Bresee, J. S., et al. (2018). Rotavirus disease in Central Asia: burden and surveillance. Vaccine Journal.
5. Centers for Disease Control and Prevention. (2022). Rotavirus surveillance data. CDC Publications.6. Ergashev, B. (2025). Advances in oral health: Prevention, treatment, and systemic implications. American Journal of Education and Learning, 3(3), 1108–1114.
7. Denry, I., & Kelly, J. R. (2008). State of the art of zirconia for dental applications. Dental Materials, 24(3), 299–307. https://doi.org/10.1016/j.dental.2007.05.007
8. Conrad, H. J., Seong, W. J., & Pesun, I. J. (2007). Current ceramic materials and systems with clinical recommendations: A systematic review. Journal of Prosthetic Dentistry, 98(5), 389–404. https://doi.org/10.1016/S0022-3913(07)60124-3
9. Ergashev, B. (2025). Psychological support for cancer patients. ИКРО журнал, 15(1), 164–167.
10. Ergashev, B., & Raxmonov, Sh. (2025). Oral trichomoniasis: Epidemiology, pathogenesis, and clinical significance. Kazakh Journal of Ecosystem Restoration and Biodiversity, 1(1), 19–27.
11. McCabe, J. F., & Walls, A. W. G. (2013). Applied dental materials. Wiley-Blackwell.

12. Kelly, J. R., & Benetti, P. (2011). Ceramic materials in dentistry: Historical evolution and current practice. Australian Dental Journal, 56(S1), 84–96. https://doi.org/10.1111/j.1834-7819.2010.01300.x
13. Al-Amleh, B., Lyons, K., & Swain, M. (2010). Clinical trials in zirconia: A systematic review. Journal of Oral Rehabilitation, 37(8), 641–652. https://doi.org/10.1111/j.1365-2842.2010.02102.x
14. Ergashev, B., & Raxmonov, Sh. (2025). Transmission dynamics of tuberculosis: An epidemiological and biological perspective. Kazakh Journal of Ecosystem Restoration and Biodiversity, 1(1), 28–35.13.
15. Conrad, H. J., Seong, W. J., & Pesun, I. J. (2007). Current ceramic materials and systems. Journal of Prosthetic Dentistry, 98(5), 389–404.
15. Manicone, P. F., Rossi Iommetti, P., & Raffaelli, L. (2007). Zirconia ceramics. Journal of Dentistry, 35(11), 819–826.
16. Berdaliyev, A. S., & Ergashev, B. J. O‘g‘li. (2025). Olib-qo‘yiladigan tish protezlari qo‘llanilgandan keyingi asoratlari va klinik belgilari, hamda zamonaviy davolash usullari. Research Focus, 4(6), 263–273.
17. Ergashev, B. J. (2025). Tish olish operatsiyasidan keyin yuzaga chiqishi mumkin bo‘lgan asoratlar. Журнал научных исследований и их решений, 4(2), 421–426.
18. Goodacre, C. J., Bernal, G., Rungcharassaeng, K., & Kan, J. Y. (2003). Clinical complications in fixed prosthodontics. Journal of Prosthetic Dentistry, 90(1), 31–41. https://doi.org/10.1016/S0022-3913(03)00214-2
19. Ergashev, B. J. (2025). To‘liq va qisman adentiya etiologiyasi va patogenezidagi muhim faktorlar. Is’hoqxon Ibrat Followers Journal, 1(1), 9–17.
20. Ergashev, B. J. O‘g‘li. (2025). Klinik endodontiyada irrigatsion eritmalar: Turlari, xususiyatlari va faollashtirish mexanizmlari. Research Focus, 4(5), 215–222.
21. Ergashev, B. (2025). Pulpitning etiologiyasi, patogenezi, morfologiyasi va klinik simptomlari. Modern Science and Research, 4(3), 829–838.
22. Bekzod, E. (2025). Sirkon dioksid qoplamalari va materialining klinik laborator ahamiyati. Journal of Uzbekistan’s.
23. Bekzod, E. (2026). Tish protezlarida biomateriallarning roli: Kompozitlar, keramika, metall-keramika turlari va ularning xususiyatlari. Oriental Journal of Engineering and Modern Technologies, 3(1), 4–10.
24. Ergashev, B. (2025). Gingivitning bakteriologik etiologiyasi va profilaktikasi. In International Scientific Conference: Innovative Trends in Science, Practice and Education (Vol. 1, No. 1, pp. 122–128).
25. Ergashev, B. (2025). Modern methods of pulpitis treatment. Modern Science and Research, 4(5), 1878–1881.
26. Ergashev, B. (2025). The impact of energy drink consumption on the development and mineralization of teeth in adolescents. Akademicheskie issledovaniya v sovremennoy nauke, 4(31), 52–55.
27. Ergashev, B. (2025). Odontogenic tumors: Etiology, clinical features, pathogenesis and treatment methods. Modern Science and Research, 4(6), 11–15.
28. Bradley, J. S., & Byington, C. L. (2019). Pediatric respiratory infections. Clinical Infectious Diseases, 68(6), 1021–1028.
29. ekzod, E. (2026). Protruziya: Etiologiyasi, klinik belgilar va statistik tahlillar. Innovatsion Talabalar Axborotnomasi, 3(1), 3–6.
30. Ergashev, B. (2025). Karies va parodont kasalliklari profilaktikasi. Modern Science and Research, 4(4), 732–741.
30. Iwasaki, A., & Pillai, P. S. (2014). Innate immunity to influenza virus infection. Nature Reviews Immunology, 14(5), 315–328.
31. Ergashev, B. (2025). Bemorlar psixologiyasi va muloqot ko‘nikmalari. Modern Science and Research, 4(2), 151–156.
32. Openshaw, P. J., Chiu, C., Culley, F. J., & Johansson, C. (2017). Protective and harmful immunity to RSV infection. Annual Review of Immunology, 35, 501–532.
33. Ergashev, B. (2025). Optimizing non-removable orthodontic treatment through individualized therapeutic programs for irreversible malocclusions. Estestvennye nauki v sovremennom mire, 4(7), 60–62.
34. Bekzod, E. (2026). Ildiz kanali infeksiyalarining mikrobiologik spektri va klinik ahamiyati. Oriental Journal of Academic and Multidisciplinary Research, 4(1), 11–16.
35. Ergashev, B. J. O. (2025). Uch shoxli nervning yallig‘lanishi: Klinikasi, etiologiyasi va davolash usullari. Research Focus, 4(3), 162–169.
36. Bosch, A. A., et al. (2013). Viral respiratory infections in children. PLoS Pathogens, 9(5), e1003208.
37. Ergashev, B. J. O. (2025). Tish kariesi tarqalishining ijtimoiy va biologik omillari: Tahliliy yondashuv. Zhurnal nauchnykh issledovaniy i ikh resheniy, 4(02), 427–430.
38. Ergashev, B. J. O. (2025). So‘lak bezlari o‘smalarining patogenezi va molekular-genetik jihatlari. Research Focus, 4(6), 274–281.
39. Ergashev, B. J. O. (2025). Tish olish operatsiyasidan keyin yuzaga chiqishi mumkin bo‘lgan asoratlar. Zhurnal nauchnykh issledovaniy i ikh resheniy, 4(02), 421–426.
40. Heikkinen, T., & Järvinen, A. (2003). The common cold. Lancet, 361(9351), 51–59.