ANALYSIS OF INFECTIOUS DISEASE RATE IN CHILDREN OF DIFFERENT AGES AIMED AT DEVELOPING HYGIENE

Krylov VP ✉

Pirogov Russian National Research Medical University, Moscow, Russia

The persistently high rate of infectious diseases requires constant monitoring, in-depth analysis of age-related characteristics of the disease spread and dynamics, and also necessitates improving the sanitary and epidemiological well-being of the population, specifically, children, adolescents, and their parents. The study aimed to to study epidemiological trends and identify the most vulnerable age groups among the pediatric population in the context of the incidence of key infections, such as acute intestinal infections (AIIs), enterovirus infection, viral hepatitis A, measles, whooping cough and enterobiasis. A retrospective epidemiological analysis of official statistical data over a seven-year period (2018–2024) was carried out covering the pediatric population of the Western Administrative Okrug (ZAO) of Moscow. Age differences in the structure of infectious morbidity have been determined. In children under one year, viral AIIs (rotavirus, norovirus) and airborne infections prevailed. A similar trend for viral AIIs is reported in children aged 1–2 years. High prevalence of enterobiasis is reported for children aged 3–6 years (attending preschool educational institutions), and a significant increase in the incidence of enterovirus infection and airborne infections is reported in all age groups, especially in school students and adolescents. As for the viral hepatitis A incidence, the situation remains stable throughout the assessed period in all age groups. High incidence of key infections among children persisting in all age groups demonstrates an urgent need for the development and implementation of the targeted and adapted hygiene education programs for pediatric population and parents.

Keywords: children and adolescents, age groups, infectious diseases, morbidity, hygiene education

✉ **Correspondence should be addressed:** Vasily P. Krylov
Gostinichnaya, 12, bld. 6, Moscow, 127106, Russia; vasily.rune.77@gmail.com

Received: 07.09.2025 **Accepted:** 11.12.2025 **Published online:** 30.12.2025

DOI: 10.24075/rbh.2025.148

АНАЛИЗ ИНФЕКЦИОННОЙ ЗАБОЛЕВАЕМОСТИ ДЕТЕЙ РАЗНОГО ВОЗРАСТА С ЦЕЛЬЮ РАЗРАБОТКИ ПРОГРАММ ГИГИЕНИЧЕСКОГО ВОСПИТАНИЯ

В. П. Крылов ✉

Российский национальный исследовательский медицинский университет имени Н. И. Пирогова, Москва, Россия

Сохраняющийся высокий уровень инфекционных заболеваний требует постоянного мониторинга, глубокого анализа возрастных особенностей распространения и динамики заболеваемости, а также обусловливает необходимость повышения санитарно-эпидемиологического благополучия населения — в частности, детей, подростков и их родителей. Целью работы было изучить эпидемиологические тенденции и выявить наиболее уязвимые возрастные группы среди детского населения в контексте заболеваемости ключевыми инфекциями, такими как острые кишечные инфекции (ОКИ), энтеровирусная инфекция, вирусный гепатит А, корь, коклюш и энтеробиоз. Выполнен ретроспективный эпидемиологический анализ официальных статистических данных за семилетний период (2018–2024 гг.), охватывающий детское население Западного административного округа (ЗАО) г. Москвы. Установлены возрастные различия в структуре инфекционной заболеваемости. У детей до года преобладали вирусные ОКИ (ротавирусная, норовирусная) и инфекции, передающиеся воздушно-капельным путем. Схожая тенденция для вирусных ОКИ отмечена у детей 1–2 лет. Установлена высокая распространенность энтеробиоза среди детей 3–6 лет (посещающих дошкольные образовательные учреждения), помимо этого выявлено значительное увеличение заболеваемости энтеровирусной инфекцией и инфекциями, передающимися воздушно-капельным путем, во всех возрастных группах, особенно среди школьников и подростков. По заболеваемости вирусным гепатитом А ситуация стабильная на протяжении всего анализируемого периода во всех возрастных группах. Сохраняющаяся во всех возрастных группах высокая заболеваемость детей ключевыми инфекциями демонстрирует острую потребность в разработке и внедрении целенаправленных и адаптированных программ гигиенического воспитания детского населения и родителей.

Ключевые слова: дети и подростки, возрастные группы, инфекционные болезни, заболеваемость, гигиеническое воспитание

✉ **Для корреспонденции:** Василий Павлович Крылов
ул. Гостиничная, д. 12, корп. 6, г. Москва, 127106, Россия; vasily.rune.77@gmail.com

Статья получена: 07.09.2025 **Статья принята к печати:** 11.12.2025 **Опубликована онлайн:** 30.12.2025

DOI: 10.24075/rbh.2025.148

Since the children's immune system is still developing, they are often susceptible to infectious diseases. The lack of specific immunity to various pathogens, along with other factors, leads to high morbidity among children. The child's immune system begins to form even before birth, from the first weeks of intrauterine development. The immune system structure and functions are formed during the body's growth, starting from birth and ending with the onset of puberty. Identification and subsequent removal of foreign antigenic agents of both external (e.g., pathogenic microorganisms) and internal (e.g., virus-infected or malignant cells) origin are the immune response central elements. The body's defense system against foreign substances is based on synergy of the innate and adaptive (acquired) immunity, which complement each other and are being continuously communicating [1–3].

Airborne infectious diseases and diseases transmitted by household contacts are especially common among children and adolescents, that is why the key role in prevention of such infectious diseases is played by hygiene education and training of children and adolescents, since in children's

groups, poor hygiene is one of the main causes of the spread of infections. Children should acquire basic sanitary and hygienic skills, knowledge and abilities already in preschool years or in elementary school. At this age it is necessary to develop sustainable habits: be sure to wash your hands before eating, take precautions if you may come into contact with sick people — keep your distance, regularly ventilate the premises, wear protective masks, and use personal utensils. At an older age, the child should understand his/her responsibility for the possible spread of infections — for example, understand that it is unacceptable to attend school with symptoms of ARVI. In addition, the prevention of vaccine-preventable infections is an important link in the hygiene education for children and adolescents. Vaccination is the most effective means of protection against infectious diseases, and refusal of vaccination leads to irreversible consequences, including death. For example, in the 1990s, a major outbreak of diphtheria occurred in the Russian Federation (RF) and the countries of the former USSR. From 1990 to 1996, 111,144 people got infected in the RF alone, including 35,928 children, of whom 3,047 people (729 children) died. Almost all of those, who died of diphtheria (95%), were not vaccinated. Systemic shortcomings in the vaccination campaign organization were the key factors of the unfavorable epidemiological situation: decreased vaccination rate in both children and adults due to refusal of vaccination, which is general suggested low hygiene education levels [4].

Acute intestinal infections (AIIs) are among the most prevalent infectious diseases reported in Russian children. In 2019, the pediatric population accounted for more than 70% of the overall number of registered cases (more than 960,000) [5, 6]. Furthermore, the share of AIIs with the identified causative agents in children was 79% (196,424 cases), which was several times higher than the general population rate. The vast majority of pediatric AII cases occur in younger age groups. Viral infections predominate (up to 70%), in particular rotavirus and norovirus ones, mixed viral-bacterial forms are also encountered [7, 8].

Enterovirus infection is showing a general upward trend in Russia. After a decline in 2018, the incidence rate increased by 25% in 2019, with 91.8% of cases (17,003 people) registered in children.

The incidence of acute viral hepatitis A in children also increased by 12.1% in 2019, reaching 4.98 per 100,000 population. Children under the age of 17 accounted for 34% of the total number of cases (1,441 cases) in 2019, despite minimal incidence rates in the previous year [9, 10].

Along with intestinal infections, airborne infections are common among children and adolescents. For many years, isolated cases of measles have been registered in the RF, and cases of importation from foreign countries have been noted. However, at the end of 2019 – beginning of 2020, there was a significant increase in the incidence of measles in children and adults, first in Europe and then in the RF. For example, in the Republic of Sakha (Yakutia), children under the age of 17 accounted for 29.4% of those infected, and the largest number of infected children was registered in the age group 1–2 year: 10 cases (5.9%) [11].

An increase in the incidence of whooping cough has also been noted in all population groups, especially in children. In 2023 in the Orenburg Region, children under the age of 14 made up the overwhelming majority (81.3%) of all whooping cough cases. Of particular concern is the sharp increase in the incidence among the youngest children: for children under the age of one year, the rate exceeded the 2019 level by 6.4 times (from 52.63 to 338 per 100,000 children). The incidence rate among adolescents aged 15–17 also increased significantly, rising from 7.58 to 207.53 per 100,000 compared to the pre-pandemic 2019 level [10, 12].

Parasitic diseases, in particular enterobiasis, also remain common in children and adolescents [13]. In the Astrakhan Region, 11,502 cases of helminthic and protozoal infestations were registered in 2016–2020, with 93.7% of those (10,777 cases) occurring in children under the age of 17. During this period enterobiasis accounted for 84% of all pediatric parasitic infestations (9,052 cases). The largest proportion of cases (58.5% or 5,295 cases) was registered in school-age children (7–17 years). In children aged 1–7 years, enterobiasis was diagnosed in 38.2% of cases (3,702 cases), which was 1.5 times less often than in school students. The lowest incidence rate was reported for infants aged 5–12 months (0.6%, 54 cases) and children under the age of one year (0.3%, 14 cases) [14].

The study aimed to analyze the incidence of infectious diseases in the pediatric population in order to improve hygiene education of children of different age groups and their parents.

METHODS

The study included a comprehensive analysis of infectious morbidity in children of different age groups. The main objective of the analysis was to identify age groups most susceptible to infectious diseases in order to develop hygiene education programs considering age characteristics.

In a retrospective study, statistical data on the incidence of infectious diseases in adolescents were used: data from statistical accounting and reporting annual forms No. 2 "Information on infectious and parasitic diseases" of the Center for Hygiene and Epidemiology in Moscow in the Western Administrative Okrug (ZAO) of Moscow for the years 2018–2024, as well as information on the population size for each age group based on the data from the tables of estimated populations of the Moscow administrative districts for the years 2018–2024. The incidence rates of the infections analyzed were calculated per 1000 people in each age group using the MS Office 2016 software package (Microsoft; USA).

RESULTS

Differences in morbidity in different age groups of children and adolescents have been determined. Fig. 1 shows changes in the infectious morbidity over 7 years (2018–2024) among children of various age groups in the ZAO of Moscow. Airborne infectious diseases and those transmitted by household contacts (aerogenic and fecal-oral routes of infection transmission) that are especially widespread among children were included in the analysis. Among the infectious diseases identified in this population, the highest incidence rates are typical for AIIs and enterobiasis. In the structure of morbidity, the leading places are occupied by AIIs caused by the identified bacterial and viral pathogens, as well as foodborne toxic infections of known etiology, enterovirus infection, viral hepatitis A, enterobiasis, whooping cough, measles.

In 2018–2024, in the age group of children under the age of one year the maximum levels of viral AIIs (including rotavirus and norovirus ones), as well as airborne infections, such as whooping cough and measles, were reported (Fig. 2).

In the age group of 1–2 years, there is a consistently high level of incidence of AIIs of viral etiology (in particular, rotavirus and norovirus ones) in 2018–2024 (Fig. 3).

In the age group of 3–6 years, there is an alarming increase in the incidence of airborne vaccine-preventable infections

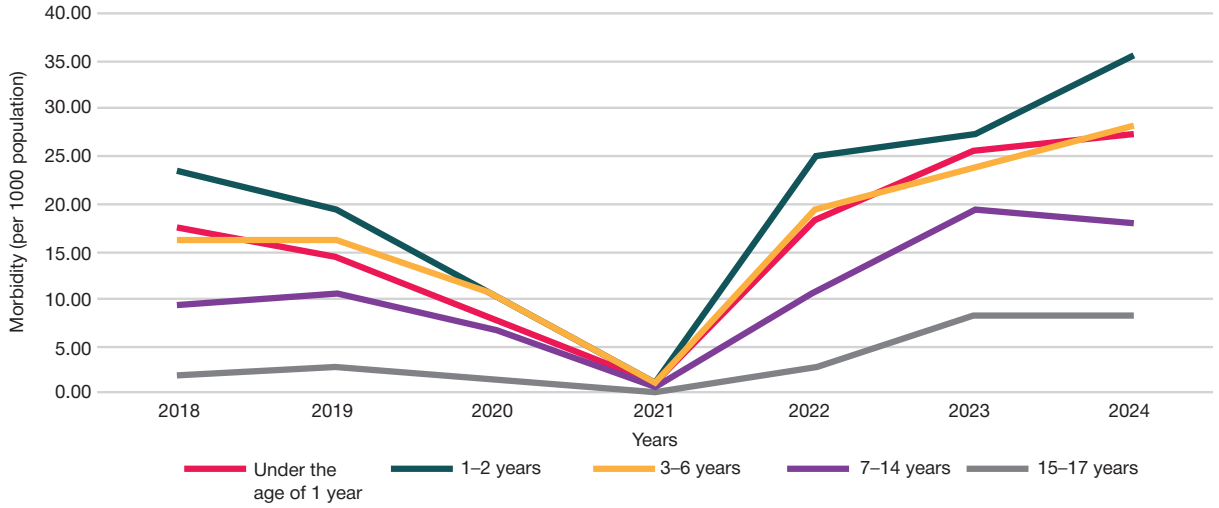

Fig. 1. Infectious morbidity rates in pediatric population of the ZAO of Moscow for the years 2018–2024 (7-year average)

(measles, whooping cough). Furthermore, the number of cases of enterobiasis has increased (Fig. 4).

In children aged 7–14 years, a multiple increase in the incidence of airborne infections (whooping cough, measles) has been also noted, and the incidence of acute intestinal and enterovirus infections increased several times. Furthermore, the enterobiasis incidence rate has increased (Fig. 5).

In children aged 15–17, as well as in those aged 7–14, an increase in the incidence of almost all analyzed infections was noted: the incidence of airborne infections (whooping cough, measles) increased, the incidence of acute intestinal and enterovirus infections increased several times; the incidence of enterobiasis increased as well (Fig. 6).

DISCUSSION

Based on the results of the analysis of infectious morbidity in children of different age groups living in the ZAO of Moscow, it can be noted that there is a high incidence of AIIS (caused by the identified bacterial and viral pathogens, as well as foodborne toxic infections of known etiology) not only among young children, but also among school students and adolescents (3–6 years — an increase of 48%, 7–14 years — 188.5%, 15–17 years — 291.3%). This is consistent with the data of studies of the RF [5, 6].

There is a significant increase in the incidence of enterovirus infection in children of all age groups (under the age of one year — an increase of 273.8%, 1–2 years — 490.8%, 3–6 years — 645.4%, 7–14 years — 502%, 15–17 years — 292.6%), which is also in line with the previously published research data for the RF [9, 10].

The situation with viral hepatitis A in children and adolescents in the ZAO of Moscow in the selected period is stable, the largest age group based on the incidence of this infection are children aged 7–14 years (17% of the total number of cases — 118 cases), in contrast to the situation in the RF, where, according to previously published data, the increase in the incidence of the disease was reported for the entire child population [9, 10].

Among those with enterobiasis, children and adolescents attending preschool and general education institutions are the predominant groups. They accounted for 96.5% of the total number of people infected with enterobiasis, which is consistent with previously published data on the enterobiasis incidence in the Astrakhan region [14].

In the ZAO of Moscow, an upward trend of the incidence of measles has been reported. Children under the age of 17 accounted for 56.9% of all cases, and the largest number of cases were detected in the age group of 7–14 years: 1,216 cases (24.1%). A similar trend was identified in the Republic of Sakha (Yakutia) [11].

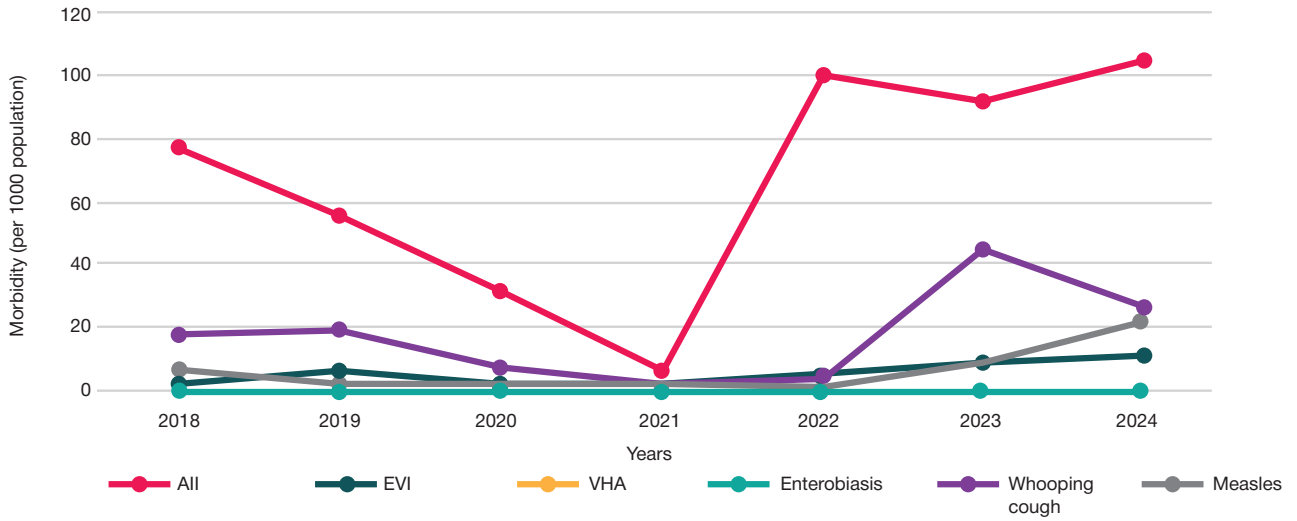

Fig. 2. Infectious morbidity rates in children under the age of one year in the ZAO of Moscow for the years 2018–2024. Note: AII — acute intestinal infections; EVI — enterovirus infection; VHA — viral hepatitis A

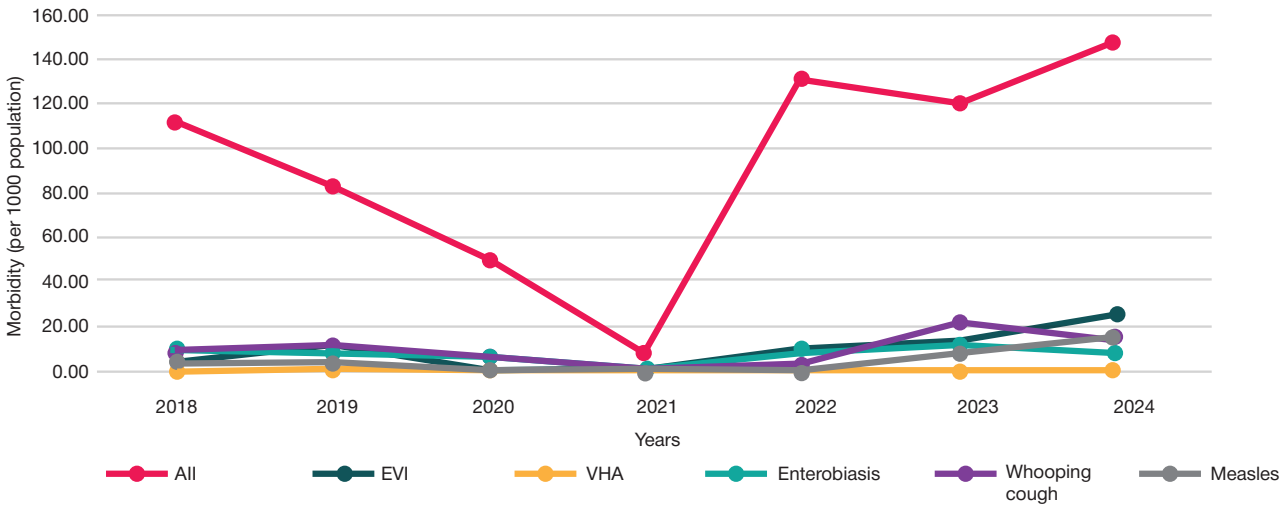

Fig. 3. Infectious morbidity rates in children aged 1–2 in the ZAO of Moscow for the years 2018–2024. Note: AII — acute intestinal infections; EVI — enterovirus infection; VHA — viral hepatitis A

The incidence of whooping cough in the ZAO of Moscow has increased significantly in all age groups. The majority of cases also occurred among children aged 7–14 years attending general education institutions (38.2% of all whooping cough cases), which is consistent with the data of the whooping cough incidence studies conducted in the Orenburg Region [10, 12].

Hygiene education and the healthy lifestyle promotion provide the basis for the infectious disease prevention. These areas are implemented consistently and continuously: from the moment the child enters school and throughout the entire educational path. Preventive work with children should be carried out continuously in a variety of settings: at home, during school classes, extracurricular activities, as well as in places of children's recreation and health improvement. Futhermore, it is important to take into account two interrelated aspects of impact. The first is individual, namely direct training of the child, his/her acquisition of the necessary knowledge and practical skills in the field of hygiene. The second is the influence of the immediate social environment, where parents play a key role. It is the family that helps the child consolidate what he/she has learned in the educational institution. The coordinated efforts of teachers and parents yield tangible results. Firstly, all participants in the process develop a common understanding of the importance of hygiene standards and rules of conduct. Secondly, the continuity of learning is ensured: the knowledge acquired at school is successfully transferred into everyday life. Thirdly, theoretical information is firmly absorbed through the regular practical application. And finally, repeating actions over and over again helps to form sustainable habits. For students, more effective methods of improving hygiene education could be various competitions, quizzes, immunization lessons, game activities, thematic dictations, essays, and gameplay videos. It is necessary to conduct seminars and meetings (on the importance of vaccination, on how to protect a child from infection, etc.) for teachers and parents with a survey to determine their knowledge. The combined efforts of children, parents, and teachers contribute to the deeper understanding of hygiene knowledge, which, in turn, results in reduction of the infectious disease rate.

CONCLUSIONS

During the study we examined epidemiological trends and identified the most vulnerable age groups among the pediatric population for key infectious diseases (acute intestinal infections (AIIs), enterovirus infection, viral hepatitis A, measles, whooping cough, enterobiasis). Younger age groups are the most vulnerable: children under the age of one year show maximum incidence rates of viral AIIs (rotavirus, norovirus ones), as well as airborne

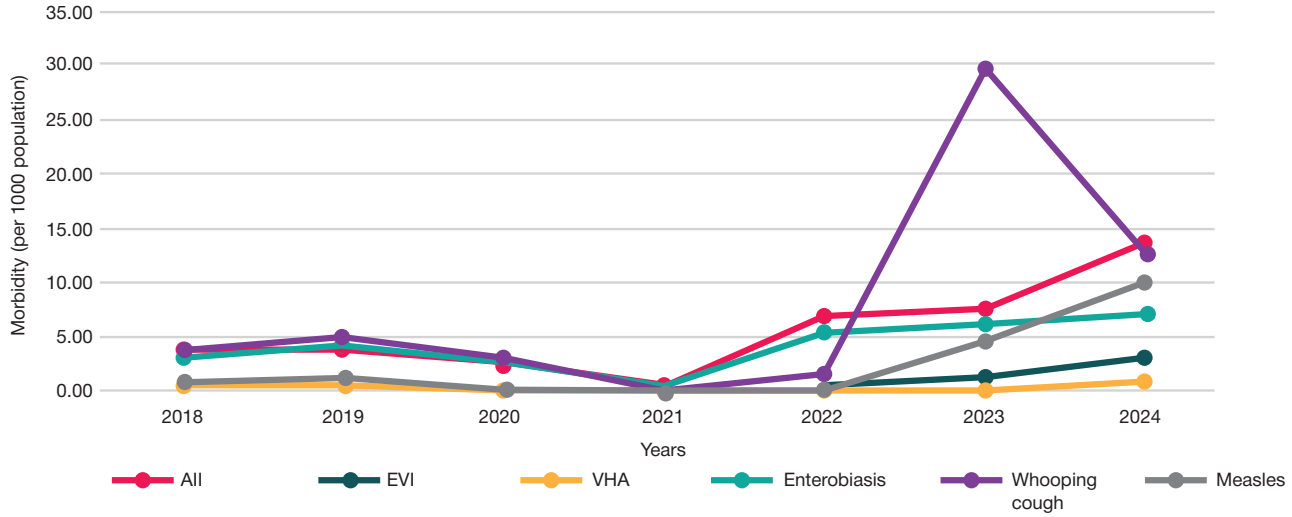

Fig. 4. Infectious morbidity rates in children aged 3–6 in the ZAO of Moscow for the years 2018–2024. Note: AII — acute intestinal infections; EVI — enterovirus infection; VHA — viral hepatitis A

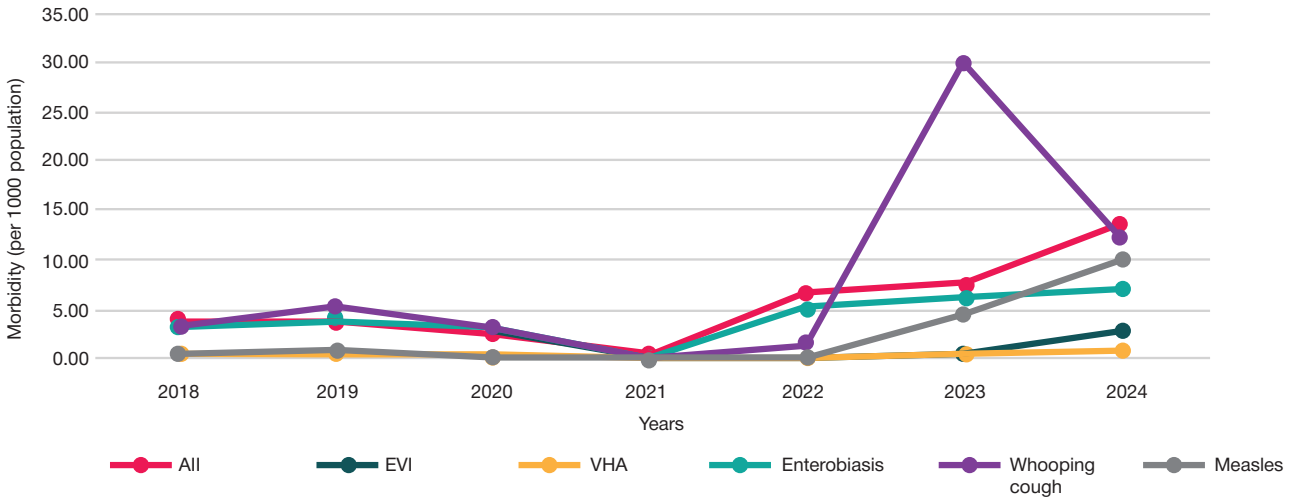

Fig. 5. Infectious morbidity rates in children aged 7–14 in the ZAO of Moscow for the years 2018–2024. Note: All — acute intestinal infections; EVI — enterovirus infection; VHA — viral hepatitis A

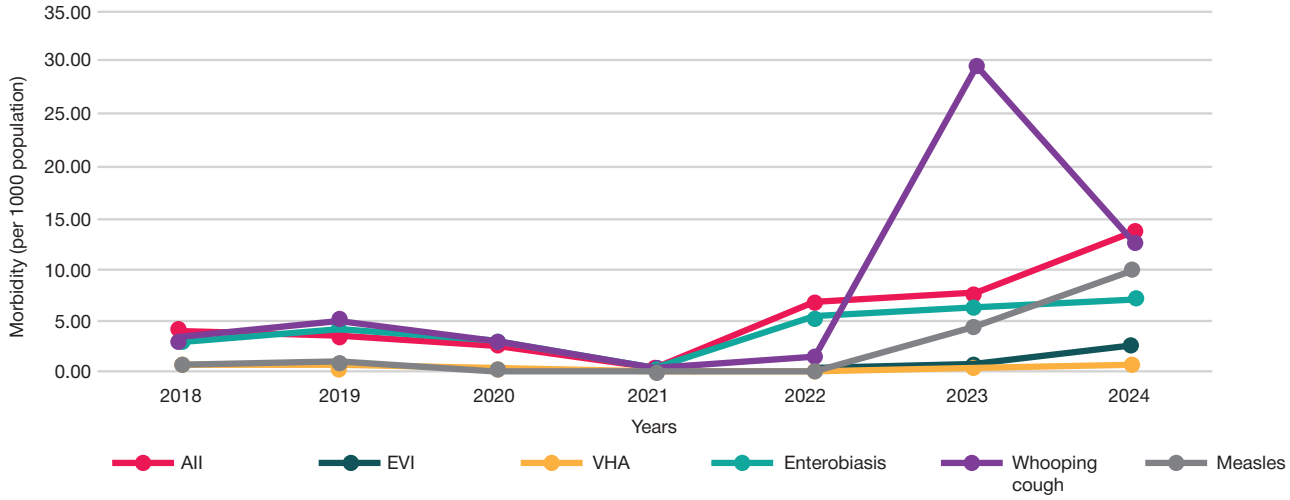

Fig. 6. Infectious morbidity rates in children aged 15–17 in the ZAO of Moscow for the years 2018–2024. Note: All — acute intestinal infections; EVI — enterovirus infection; VHA — viral hepatitis A

infections (whooping cough, measles). In the 1–2 year group, the incidence of viral acute intestinal infections (mainly of rotavirus and norovirus etiology) remains consistently high. An alarming increase in vaccine-preventable airborne infections (measles, whooping cough) and enterobiasis has been reported for preschool children (3–6 years old). In school students (7–14 years old), a multiple increase in the incidence of airborne infections (measles, whooping cough), AIIs and enterovirus infections, and enterobiasis has been reported. Adolescents (15–17 years old) demonstrate the dynamics similar to those of younger school students, with an increase in the incidence of almost all analyzed disease entities, including airborne, intestinal, and parasitic infections. The study confirmed the age-related heterogeneity of infection risk. The greatest risk is observed in infants (under the age of one year) and school students (7–14 years). The data obtained can provide the basis for the development of differentiated preventive programs targeting specific age groups and priority disease entities, designed to improve the hygiene education of children and their parents and reduce the incidence of infectious diseases.

References

1. Zajceva OV. Infekcija i immunitet: aktual'nye voprosy v praktike pediatra. Detskie infekcii. 2015; 14 (1): 36–43 (in Rus.).
2. Bellanti JA. Immunology IV: Clinical Application in Health and Disease. Washington: I Care Press, 2012; 1063 p.
3. Janeway ChA, et al. Immunobiology (6th edition). Garland Science Publishing, New York — London, 2005; 823 p.
4. Maksimova NM, Jakimova TN, Markina SS, Jackovskij KA, Adugjuzelov SJe. Difterija v Rossii v 21 veke. Jepidemiologija i vakcinoprofilaktika. 2017; 5 (96): 4–15 (in Rus.).
5. Gosudarstvennyj doklad "O sostojanii sanitarno-jepidemiologicheskogo blagopoluchija naselenija v Rossijskoj Federacii v 2017 godu". Federal'naja sluzhba po nadzoru v sfere zashhity prav potrebitelej i blagopoluchija cheloveka, 2018 (in Rus.). Available from: https://www.rospotrebnadzor.ru/documents/details.php?ELEMENT_ID=10145.
6. Gosudarstvennyj doklad "O sostojanii sanitarno-jepidemiologicheskogo blagopoluchija naselenija v Rossijskoj Federacii v 2018 godu". Federal'naja sluzhba po nadzoru v sfere zashhity prav potrebitelej i blagopoluchija cheloveka,

2019 (in Rus.). Available from: https://www.rospotrebnadzor.ru/documents/details.php?ELEMENT_ID=12053.
7. Behtereva MK, Lukjanova AM, Horosheva TS, Volohova OA, Kvetnaja AS. Sovremennye podhody k racional'noj terapii bakterial'nyh diarej. Lechashhij vrach. 2014; (12): 54 (in Rus.). Available from: https://www.lvrach.ru/2014/12/15436120/.
8. Lukjanova AM, Behtereva MK, Ptichnikova NN. Kliniko-jepidemiologicheskaja harakteristika virusnyh diarej u detej. Zhurnal infektologii. 2014; 6 (1): 60–6 (in Rus.).
9. Lobzin JuV, Rychkova SV, Uskov AN, Skripchenko NV, Fedorov VV. Sovremennye tendencii infekcionnoj zabolevaemosti u detej v Rossijskoj Federacii. Kubanskij nauchnyj medicinskij vestnik. 2020; 27 (4): 119–33 (in Rus.).
10. Svedenija ob infekcionnyh i parazitarnyh zabolevanijah za janvar'–dekabr' 2018 g. Federal'naja sluzhba po nadzoru v sfere zashhity prav potrebitelej i blagopoluchija cheloveka; 2019 (in Rus.). Available from: https://www.rospotrebnadzor.ru/activities/statisticalmaterials/statictic_details.php?ELEMENT_ID=11277.
11. Dmitrieva TG, Nestereva ME. Analiz infekcionnoj zabolevaemosti u detej v Respublike Saha (Jakutija) s 2012 po 2021 gg. Vestnik Severo-Vostochnogo federal'nogo universiteta imeni M.K. Ammosova. Serija "Medicinskie nauki". 2023; (1): 37–46 (in Rus.).
12. Denisjuk NB, Popova LJu, Alemanova GD, Kuznecova LJu. Jepidemiologicheskaja situacija po kokljushu v Orenburgskom regione: analiz zabolevaemosti, problemy profilaktiki. Detskie infekcii. 2025; 24 (2): 5–9 (in Rus.). DOI: 10.22627/2072-8107-2025-24-2-5-9.
13. Pentina EA, Soshnikov VI. Askaridoz i jenterobioz v postsovetskij period. Internauka. 2022; 1-1(224): 22–4 (in Rus.).
14. Konopleva VV, Shipilova NA, Zajceva AE, Mazurina EO, Arakeljan RS, Kasatkin DN, et al. Jenterobioz u detej na territorii Astrahanskoj oblasti. Mezhdunarodnyj nauchno-issledovatel'skij zhurnal. 2024; 1 (139): 1–5 (in Rus.). DOI: 10.23670/IRJ.2024.139.39.

Литература

1. Зайцева О. В. Инфекция и иммунитет: актуальные вопросы практике педиатра. Детские инфекции. 2015; 14 (1): 36–43.
2. Bellanti JA. Immunology IV: Clinical Application in Health and Disease. Washington: I Care Press, 2012; 1063 p.
3. Janeway ChA, et al. Immunobiology (6th edition). Garland Science Publishing, New York — London, 2005; 823 p.
4. Максимова Н. М., Якимова Т. Н., Маркина С. С., Яцковский К. А., Адугюзелов С. Э. Дифтерия в России в 21 веке. Эпидемиология и вакцинопрофилактика. 2017; 5 (96): 4–15.
5. Государственный доклад «О состоянии санитарно-эпидемиологического благополучия населения в Российской Федерации в 2017 году». Федеральная служба по надзору в сфере защиты прав потребителей и благополучия человека, 2018. URL: https://www.rospotrebnadzor.ru/documents/details.php?ELEMENT_ID=10145.
6. Государственный доклад «О состоянии санитарно-эпидемиологического благополучия населения в Российской Федерации в 2018 году». Федеральная служба по надзору в сфере защиты прав потребителей и благополучия человека, 2019. URL: https://www.rospotrebnadzor.ru/documents/details.php?ELEMENT_ID=12053.
7. Бехтерева М. К., Лукьянова А. М., Хорошева Т. С., Волохова О. А., Кветная А. С. Современные подходы к рациональной терапии бактериальных диарей. Лечащий врач. 2014; (12): 54. URL: https://www.lvrach.ru/2014/12/15436120/.
8. Лукьянова А. М., Бехтерева М. К., Птичникова Н. Н. Клинико-эпидемиологическая характеристика вирусных диарей у детей. Журнал инфектологии. 2014; 6 (1): 60–6.
9. Лобзин Ю. В., Рычкова С. В., Усков А. Н., Скрипченко Н. В., Федоров В. В. Современные тенденции инфекционной заболеваемости у детей в Российской Федерации. Кубанский научный медицинский вестник. 2020; 27 (4): 119–33.
10. Сведения об инфекционных и паразитарных заболеваниях за январь–декабрь 2018 г. Федеральная служба по надзору в сфере защиты прав потребителей и благополучия человека; 2019. URL: https://www.rospotrebnadzor.ru/activities/statisticalmaterials/statictic_details.php?ELEMENT_ID=11277.
11. Дмитриева Т. Г., Нестерева М. Е. Анализ инфекционной заболеваемости у детей в Республике Саха (Якутия) с 2012 по 2021 гг. Вестник Северо-Восточного федерального университета имени М. К. Аммосова. Серия «Медицинские науки». 2023; (1): 37–46.
12. Денисюк Н. Б., Попова Л. Ю., Алеманова Г. Д., Кузнецова Л. Ю. Эпидемиологическая ситуация по коклюшу в Оренбургском регионе: анализ заболеваемости, проблемы профилактики. Детские инфекции. 2025; 24 (2): 5–9. DOI: 10.22627/2072-8107-2025-24-2-5-9.
13. Пентина Е. А., Сошников В. И. Аскаридоз и энтеробиоз в постсоветский период. Интернаука. 2022; 1-1(224): 22–4.
14. Коноплева В. В., Шипилова Н. А., Зайцева А. Е., Мазурина Е. О., Аракельян Р. С., Касаткин Д. Н. и др. Энтеробиоз у детей на территории Астраханской области. Международный научно-исследовательский журнал. 2024; 1 (139): 1–5. DOI: 10.23670/IRJ.2024.139.39.