

Sh.M. Balayeva, M.J. Sultanova, N.J. Jafarzade
Azerbaijan Medical University, Baku, Azerbaijan

MORBIDITY OF THE CHILD AND ADOLESCENT POPULATION OF AZERBAIJAN

e-mail: s.balayeva@amu.edu.az

The article presents data on the incidence of children in Azerbaijan aged 0 to 13 years and adolescents 14–17 years for the period 2007–2016. The analysis of the prevalence of diseases belonging to different classes of ICD-10, the assessment of changes in the structure of morbidity for the ten-year period. The materials of the State Statistics Committee of the Republic of Azerbaijan are used in the work. It was found that although the overall incidence of children 0–13 years had a tendency to decrease, there is a clear increase in the prevalence of diseases of the digestive, nervous, musculoskeletal systems, blood-forming organs and diseases of the eye and adnexa. Over the period of 2007–2016, the overall incidence of adolescents 14–17 years increased 2.5 times. The increase in morbidity was observed in almost all classes of diseases. The prevalence of diseases of the nervous, digestive, musculoskeletal, and urogenital systems, diseases of the eye at a particularly high rate.

Key words: children, adolescents, health status, structure of diseases.

Ш.М. Балаєва, М.Дж. Султанова, Н.Дж. Джафарзаде

ЗАХВОРЮВАНІСТЬ ДИТЯЧОГО І ПІДЛІТКОВОГО НАСЕЛЕННЯ АЗЕРБАЙДЖАНУ

У статті представлені дані про захворюваність дітей віком від 0 до 13 років та підлітків 14–17 років за період 2007–2016 років. у Азербайджані. Проведено аналіз поширеності захворювань, що належать до різних класів МКХ-10 та оцінку зміни структури захворюваності за десятирічний період. У роботі використано матеріали Державного комітету зі статистики Азербайджанської Республіки. Встановлено, що хоча загальна захворюваність дітей 0–13 років мала тенденцію до зниження, спостерігається явне зростання поширеності захворювань травної, нервової, опорно-рухової систем, органів кровотворення, хвороб очей та придатків. За період 2007–2016 років загальна захворюваність підлітків 14–17 років збільшилась у 2,5 рази. Зростання захворюваності спостерігалось практично за всіма класами хвороб. Особливо високі темпи поширення захворювань нервової, травної, опорно-рухової та сечостатевої систем, хвороб очей.

Ключові слова: діти, підлітки, стан здоров'я, структура захворювань.

The state of children and adolescents' health, evaluated by the analysis of morbidity, is a socially significant problem for the development of society. Morbidity, along with demographic indicators, is a sensitive barometer of the country's socio-economic development, the effectiveness of the activities of health authorities and institutions, and the social sphere as a whole. The global health priority is the optimal development of knowledge, skills and attributes in early childhood that could reduce health risks across the life course [1, 2]. As experts from the World Health Organization show, social determinants play a leading role in shaping population health. During critical periods of a child's growth and development, a decrease in the body's adaptive-compensatory abilities against the backdrop of high aggressiveness of environmental factors and social factors contributes to an increase in morbidity and disability among children. The Sustainable Development Goals (SDGs), set in 2015 by the UN General Assembly, call for all countries to reach an under-5 mortality rate at least as low as 25 deaths per 1,000 livebirths and a neonatal mortality rate of at least as low as 12 deaths per 1,000 livebirths by 2030 [3, 8].

Over the past few decades, there has been a negative trend in the decline of children and adolescents' health. The prevalence of anemia, diseases of the digestive system, functional deviations and chronic diseases is increasing [10, 11]. Currently, pediatricians, hygienists, and anthropologists express great concern over the sharp deterioration of physical development and other health criteria, physical performance, and physical fitness. Diseases of the musculoskeletal system, digestive and circulatory systems pathology prevail among the nosologies [3, 9].

Monitoring the health status of children indicates that even at the preschool stage, the number of practically healthy children does not exceed 10%, and a significant part of the examined children (70 %) have several functional disorders. The deterioration of the health of children and adolescents jeopardizes the achievement of the Health–2020 policy targets [9].

The purpose of the study was to analyze the incidence of diseases among children and adolescents in Azerbaijan over the past 10 years.

Materials and methods. The study used the State Statistics Committee of the Republic of Azerbaijan materials for 2007–2016 [4, 5].

According to the purpose of this study, data was collected and analyzed from official sources, primarily relying on the “Children in Azerbaijan. State Statistical Committee of the Republic of

Azerbaijan. Official publication/ Statistical yearbook” for the years 2006 and 2017. Additionally, statistical data related to annual morbidity and the number of cases were obtained from the official website www.stat.gov.az, covering the period from 2007 to 2016. The study included children aged 0 to 17 years, with separate assessments made for two distinct age groups: children aged 0 to 13 years and adolescents aged 14 to 17 years.

The study's primary objectives included the analysis of the overall morbidity rate among children in Azerbaijan, the examination of structural features and trends in morbidity during the specified years, and the determination of the number of cases of diseases per 10,000 children. The study also involved grouping nosologies (specific diseases or medical conditions) based on their respective systems within the body (e.g., respiratory, circulatory, diseases of the blood and blood-forming organs, etc.) and evaluating the tendency for incidence rates to either increase or decrease across different classes of diseases. The analysis included a comparative assessment of the percentage representation of these diseases within the overall structure of morbidity.

The data processing for this study was carried out using Microsoft Excel 2010. This data analysis process included various statistical calculations and the generation of graphical representations to aid in the interpretation of the findings. The significance of differences between groups was assessed by Student's t-test. Statistical significance was recognized at $p < 0.05$.

Results of the study and discussion. According to the data obtained, the overall morbidity rate of children aged 0–13 in 2021 was 3133.3 cases per 10,000 children. Despite a slight decrease in overall morbidity over the period of 2007–2016 (from 3347.6 in 2007 to 3133.3 in 2016), there has been an increase in the number of cases of diseases belonging to various classes of the 10th revision of the International Classification of Diseases (ICD-10) (Table 1).

Table 1

Incidence of children aged 0–13 years in 2007 and 2016 per 10,000 people

ICD 10 – disease classes	2007	2016
All diseases	3347.6	3133.3
Including:		
Certain infectious and parasitic diseases	417.5	291.1
Neoplasms	1.5	1.0
Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	110.4	147.5
Endocrine nutritional and metabolic diseases	78.0	69.9
Mental and behavioural disorders	11.0	7.3
Diseases of the nervous system	108.6	162.8
Diseases of the eye and adnexa	80.3	125.8
Diseases of the ear and mastoid process	70.1	92.4
Diseases of the circulatory system	44.7	53.1
Diseases of the respiratory system	1795.3	1526.6
Diseases of the digestive system	193.5	240.4
Diseases of the skin and subcutaneous tissue	94.6	68.6
Diseases of the musculoskeletal system and connective tissue	23.0	41.5
Diseases of the genitourinary system	55.0	81.7
Certain conditions originating in perinatal period	495.6	650.8
Congenital malformations, deformations and chromosomal abnormalities	9.4	10.9
Injury, poisoning and certain other consequences of external causes	175.6	150.4

Throughout the entire analyzed period, the leading rank in the incidence structure of children was taken by respiratory diseases, with a share of 50.0 % and a prevalence of 1526.6 cases per 10,000 people. The proportion of respiratory diseases in the incidence structure had a tendency to decrease in 2016.

The second rank in the incidence structure was taken by some infectious and parasitic diseases, with a share of 10 % and a prevalence of 291.1 cases per 10,000 people in 2016. This indicator decreased by 30.3 % during the period from 2006 to 2016.

The third rank was taken by diseases of the digestive system organs, with a share of 8 %. The frequency of diseases of this class increased by 24.2 % during the period from 2007 to 2016 (from 193.5 in 2007 to 240.4 cases in 2016).

The fourth rank was taken by diseases of the nervous system, with a share of 5 %. The incidence of these diseases increased by 49.9 % (1.5 times).

Traumas, poisonings, and some other consequences of external causes occupied the fifth rank, with a prevalence that decreased from 175.6 in 2006 to 150.4 cases per 10,000 children in 2016.

Injuries, poisonings, and some other consequences of external causes taken the fifth rank, the prevalence of which decreased in 2016 compared to 2006, from 175.6 to 150.4 cases per 10,000 children. An increase in the incidence over the study period was noted for the following ICD-10 classes: diseases of the blood, blood-forming organs, and immune system (6th rank) by 33.6 % (by 1.3 times); diseases of the eye and adnexa (7th rank) by 56.7 % (by 1.6 times). At the same time, an increase in indicators was also observed for other classes of diseases: diseases of the musculoskeletal system and connective tissue by 1.8 times (by 80.4 %), diseases of the genitourinary system by 1.5 times (by 48.5 %), diseases of the ear and mastoid process by 1.3 times (by 31.8 %), diseases of the circulatory system by 1.2 times (by 18.8 %).

It is worth noting a decrease in the incidence of children aged 0–13 years in the following classes of diseases: mental disorders and behavioral disorders (by 33.6 %), diseases of the endocrine system, eating disorders, and metabolic disorders (by 0.4 %), neoplasms (by 33.3 %), diseases of the skin and subcutaneous tissue (by 27.5 %), and injuries, poisonings, and some other consequences of external causes (by 14.4 %).

The incidence rates of teenagers aged 14–17 in 2007 and 2016 are presented in Table 2.

Table 2

The incidence of the adolescents aged 14–17 years in 2007 and 2016 per 10,000 people

ICD-10 Disease classes	2007	2016
General morbidity	993.1	2530.4
Including:		
Certain infectious and parasitic diseases	111.4	206.6
Neoplasms	0.5	2.5
Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	36.3	132.1
Endocrine nutritional and metabolic diseases	26.2	57.5
Mental and behavioral disorders	7.4	12.7
Diseases of the nervous system	27.8	71.1
Diseases of the eye and adnexa	32.4	144.8
Diseases of the ear and mastoid process	25.1	64.2
Diseases of the circulatory system	26.3	68.2
Diseases of the respiratory system	457.6	1053.0
Diseases of the digestive system	73.6	277.2
Diseases of the skin and subcutaneous tissue	41.9	56.3
Diseases of the musculoskeletal system and connective tissue	11.3	59.3
Diseases of the genitourinary system	31.6	106.3
Pregnancy, childbirth and postpartum period	2.0	1.3
Injuries, poisoning and some other consequences of external causes	73.9	189.4

In 2016, the overall incidence rate of teenagers aged 14–17 was 2530.4 cases per 10,000 people. Over the 10-year period under study, there was a 2.5-fold increase in the overall incidence rate, which was 993.1 cases per 10,000 teenagers in 2007.

Respiratory diseases, like in the structure of morbidity of children aged 0-13, take the first rank place in the structure of teenage morbidity, with a share of 42 % and prevalence of 1053 cases per 10,000 people.

The prevalence of digestive system diseases among teenagers in 2016 was 277.2 cases per 10,000 people, and this disease class took the second rank place with a share of 11 %. Some infectious and parasitic diseases ranked third with a frequency of 206.6 cases per 10,000 people and a share of 8 % in the structure of morbidity. Next in the structure, ranked sequentially: injuries and poisoning (4th rank; prevalence–189.4 cases); diseases of the eye and its adnexa (5th rank; prevalence–144.8 cases); diseases of the blood and blood-forming organs (6th rank; prevalence–132.1 cases). The proportion of these diseases in the structure of morbidity is 8 %, 6 %, and 5 %, respectively.

Analyzing the structure of morbidity among adolescents in 2016, it can be seen that the rank distribution of diseases differs from the indicators of 2007. In 2007, the class of infectious and parasitic diseases was in second place with a frequency of 111.4 cases per 10,000 people. Next, in third place, was the class of injuries and poisonings with a rate of 73.9 cases per 10,000 adolescents. Digestive system diseases ranked fourth with a prevalence of 73.6 cases. The frequency of digestive system diseases in 2016 increased by 3.8 times compared to 2007. Therefore, unfortunately, this class of diseases rose from fourth

to second place. The prevalence of eye diseases and their adnexa also increased, and this class rose from seventh place in 2007 to fifth place in 2016.

As can be seen from Table 2, an increase in the incidence rate is observed for all classes of diseases, except for the "Pregnancy, childbirth and the puerperium" class. At the same time, the most significant increase in the indicator (by 5.2 times) was discovered in the "Diseases of the musculoskeletal system" class: from 11.3 to 59.3 cases per 10,000 adolescents; $p < 0.001$. The prevalence of neoplasms among adolescents also increased by five times: the indicator increased from 0.5 to 2.5 cases per 10,000 children. Next in terms of growth rate are eye and its adnexal diseases: the incidence of these diseases increased by 346.9 % (from 32.4 to 144.8 cases per 10,000 adolescents; $p < 0.001$); the prevalence of digestive system diseases increased by 276.6 % (from 73.6 to 277.2; $p < 0.001$); blood, blood-forming organs diseases increased by 263.9 % (from 36.3 to 132.1; $p < 0.001$); and genitourinary system diseases increased by 236.4 % (from 31.6 to 106.3; $p < 0.005$).

Fig. 1 shows the dynamics of the incidence of adolescents aged 14–17 over 10 years (2007–2016).

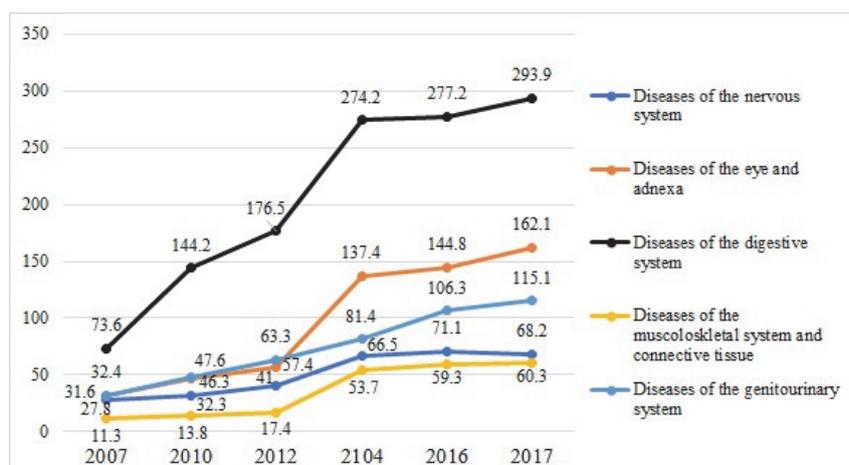


Fig. 1. Dynamics of morbidity among adolescents aged 14–17 over 10 years (2007–2016).

There has been a consistent increase in the prevalence of diseases of the musculoskeletal system, eyes and its adnexal structures, digestive organs, nervous system, and genitourinary system from 2007 to 2016.

According to our analysis the structure of morbidity changed, with the disease classes of musculoskeletal system, eyes and its adnexal structures, and genitourinary system moving to higher ranking positions.

But it should be taken into account that in various age groups structure of morbidity depends on different factors. So, Pluzhnikova TV, et al in their study of newborn revealed that in the city of Poltava, there is a clear decrease in the incidence of hemolytic disease, anemia, cardiac disorders, intrauterine hypoxia and asphyxiation in contrast with our data of older children [7].

In our study the prevalence of diseases of the nervous system increased at particularly high rates. The similar data related to mental problems was obtained by Ma L, et al (2021). Based on the twenty-three studies (21 cross-sectional studies and 2 longitudinal studies) from two countries (i.e., China and Turkey) with 57,927 children and adolescents the authors noted that adolescents exhibited higher prevalence of depression and anxiety compared to children [6].

Different (from our data) results were revealed by Xie M, et al, who analyzed respiratory diseases (RD) in the period of 1990–2017 and indicated that the total number of chronic RD cases increased by 39.5% from 1990 to 2017, nevertheless, the age-standardized prevalence rate (ASPR) and age-standardized incidence rate (ASIR) showed decreasing trends. The ASIRs of chronic obstructive pulmonary disease, pneumoconiosis, and asthma decreased, whereas the ASIR of interstitial lung disease and pulmonary sarcoidosis increased during the past 27 years [12].

Volosovets OP, et al with the purpose of a retrospective 25-year analysis (1993 to 2017) of the incidence and prevalence of the digestive system diseases of allergic and non-allergic genesis in children of Ukraine have revealed that among children of Ukraine (aged 0–17 years included) there was a tendency of increasing the prevalence of diseases of the digestive system by 13.6 %, as well as their incidence – by 12.1 %. These are similar with our study in part of increasing of prevalence of digestive system pathologies [11].

An increase in indicators may indicate changes in the lifestyle of children and adolescents towards an increase in physical inactivity, irrational nutrition, an increase in school workload among students, as well as irrational use of digital technologies. It is important to study lifestyle risk factors and to predict the health status of the younger generation. In order to prevent diseases among children and adolescents, public health authorities need to carry out a complex of health-improving measures and, in particular, strengthen control over timely medical examinations.

Conclusions

1. Despite a slight decrease in overall morbidity in children aged 0–13 years over the period of 2007–2016 (from 3347.6 in 2007 to 3133.3 in 2016), there has been an increase in the number of cases of diseases belonging to various classes of ICD-10.

2. Over the 10-year period under study, there was a 2.5-fold increase in the overall incidence rate in adolescents aged 14–17 years, which was 993.1 cases per 10,000 teenagers in 2007 and 2530.4 cases in 2016.

The structure of morbidity has also changed, with the disease classes of musculoskeletal system, eyes and its adnexal structures, and genitourinary system moving to higher ranking positions. The prevalence of diseases of the nervous, digestive, musculoskeletal, genitourinary, and visual systems increased at particularly high rates.

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