https://doi.org/10.48047/AFJBS.6.8.2024.1848-1854

African Journal of Biological Sciences

Research Paper Open Access

EPIDEMIOLOGICAL CHARACTERISTICS OF FOOD SALMONELLOSIS

Matnazarova Gulbakhor Sultanovna - head of the department of Epidemiology of the Tashkent Medical Academy, doctor of medical sciences
Saidkasimova Nargiza Sayfullaevna - senior lecturer of the Department of Epidemiology of the Tashkent Medical Academy, Ph.D.
Tashkent Medical Academy department of Epidemiology.
Abdukaxarova Muattar Faxriddinovna- candidate of Medical Sciences, Associate Professor of the Department of Epidemiology of the Tashkent Medical Academy
Bryantseva Elena Vladimirovna - candidate of Medical Sciences, Associate Professor of the Department of Epidemiology of the Tashkent Medical Academy
Babajanov Khudaynazar Rajabovich-Urgench branch of Tashkent Medical academy, PhD, associate professor at the department "Internal disease and dermatovenerological disease"
Mirodilova Firuza Bakhtiyarovna- candidate of Medical Sciences, Associate Professor of the Department of Dermatovenereology and Cosmetology Tashkent Medical academy
Nuritdinova Dilnoza Yusupovna- clinics resident of the Department of Epidemiology of TMA
Eshkulova Sabogul Jalilovna- clinics resident of the Department of Epidemiology of TMA

Article History
Volume 6,Issue 8, 2024
Received:15 Mar 2024
Accepted : 29 Apr 2024
doi: 10.33472/AFJBS.6.8.2024.1848-1854

Annotation: In the last twenty years, in large numbers of countries in the world, the epidemiological features of the incidence of salmonellosis have increased, in particular, human morbidity rate, infection farm animals and birds with salmonella, and the environmental harmed has increased by *S. Enteritidis*. The increase in the epidemiological significance of farm animals, birds and industrial poultry products, the connection between epizootic and epidemic processes, the changes in the sanitary and epidemiological service in the Republic of Uzbekistan require the restructuring of the existing system of epidemiological surveillance for salmonellosis.

Key words: salmonellosis, epidemiology, prevention, epidemiological control.

Relevance. Among infectious diseases, salmonellosis, a representative of acute intestinal infections, occupies an important place after the group of acute respiratory infections [1; 2]. Salmonellosis is an urgent problem of public health and national economy. Salmonellosis is widespread throughout the world. "... salmonellosis, called "diseases of civilization", is so widespread that at present there is no question of eliminating them in any country, but only talking about a decrease in the incidence rate ..." [3; 5; 6]. Currently, the number of patients with salmonellosis in different countries is constantly increasing. [15;9;13]. According to WHO experts, salmonellosis is an urgent problem for the whole world. The socio-economic damage from salmonellosis is enormous [11; 14; 15; 10]. Even in countries where the epidemiological surveillance system for these diseases is well established, official data on the spread of salmonellosis are far from the true incidence and reflect only part of the real situation. Currently, the number of patients with salmonellosis in different countries is constantly increasing. The above data shows that food safety regulators around the world have recently emphasized the epidemic of foodborne salmonellosis and the need to strengthen disease monitoring and targeted control measures to prevent the spread of the disease. According to WHO, salmonellosis is one of the four main causes of gastrointestinal diseases.

The rate of salmonellosis infection and the uneven distribution of it across regions directly depend on social and environmental factors. These include changes in the production and consumption of food products (expansion, centralization of common food facilities, expansion of the production of semi-finished and finished food products, their distribution through retail chains, etc.), expansion of exports and imports of food and feed, rapid environmental pollution, as well as the quality of medical and veterinary services, the state of laboratory diagnostics, etc [2;3]. Salmonella enterica subsp. enterica causes food salmonellosis in *humans* [7; 8; 12; 16;17]. In 2010, Campylobacter and Salmonella enterica were the main causative agents of bacterial gastroenteritis in humans, accounting for 30% (174.3 million) of all cases of diarrhea *worldwide* [10]. In recent years, it has been established that *S. Enteritidis* is the leading etiological serological variant of the "zoonotic" epidemic process of salmonellosis [4].

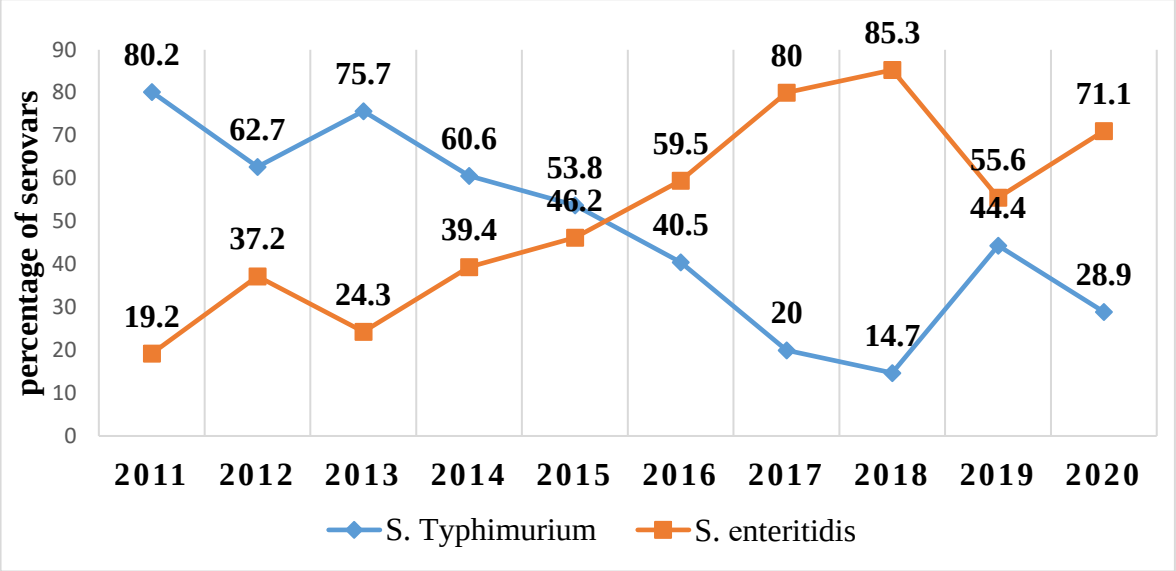
Purpose of the study: to assess the epidemiological features of gastroenteritis caused by food-associated salmonellosis

Materials and methods of research official data of the Service of Sanitary and Epidemiological Welfare and Public Health of the Republic of Uzbekistan on salmonellosis for 1971-2020, official data and reports of bacteriological laboratories of the Tashkent Department of Sanitary and Epidemiological Welfare and Public Health. Official data of the State Committee for Veterinary Medicine and Livestock Development of the Republic of Uzbekistan for 2012-2021 on salmonella isolated from animals have been received.

According to the results of the epidemiological analysis, the etiological structure of salmonellosis in Uzbekistan has changed over the past 10 years, in particular, the proportion of *S. Enteritidis* isolated from humans, animals and the environment has dynamically increased.

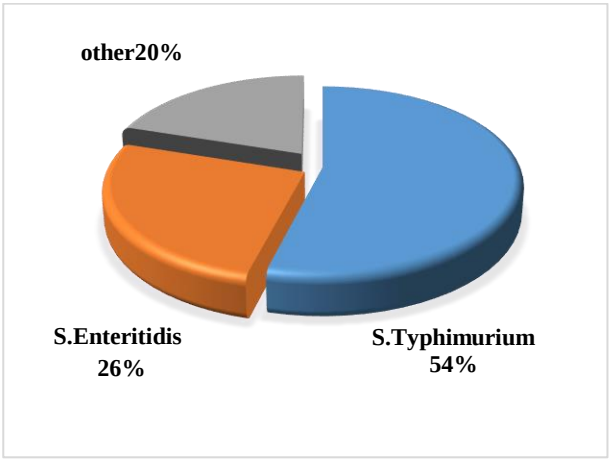
Of 2061 Salmonella strains isolated from humans in 2011-2020, 46.4% were *S. Typhimurium* and 53.6% were *S. Enteritidis*

(picture 1).

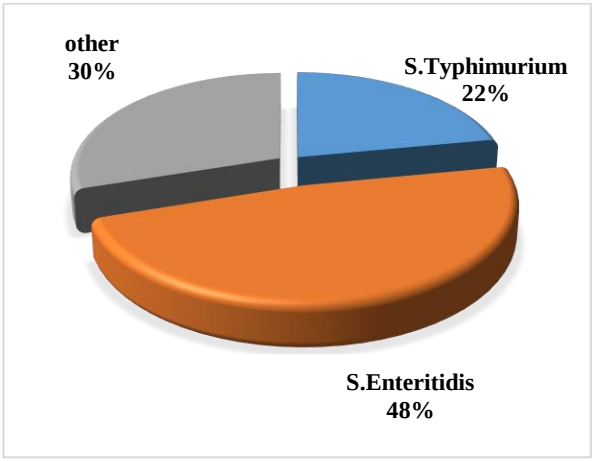


Pic. 1. Proportion of S. Typhimurium and S. Enteritidis isolated from humans in Tashkent in 2011-2020 (%)

Isolated serovars of salmonellosis isolated from a person in Tashkent in 2011-2020 were analyzed. In 2011-2015, *S. Typhimurium* was the leader in 54% of cases, *S. Enteritidis* was identified in 26% of cases, and other Salmonella species in 20% of cases (Picture 2). In 2016-2020 48% of cases were caused by *S. Enteritidis*, 22% by *S. Typhimurium* and 30% by other Salmonella (Picture 3).



Pic. 2. 2011-2015 y.y.

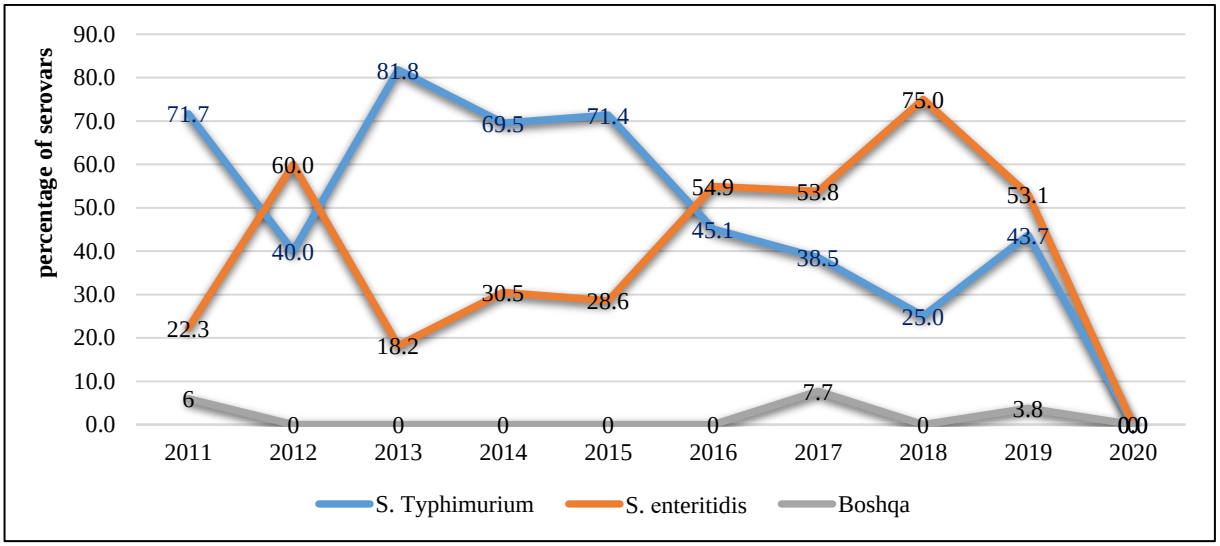


Pic. 3. 2016-2020y.y.

Quarantine restrictions imposed in connection with the outbreak of the global COVID-19 pandemic in 2020 also affected the epidemic process of salmonellosis. Due to the strict quarantine measures in place, most of the population was mostly at home. The population began to strictly observe the rules of sanitation and hygiene. The panic mood of the population led to the uncontrolled use of antibiotics, which affected the bacteriological diagnosis, in the direction of reducing the incidence. As a result, the overall incidence of salmonellosis in Tashkent in 2020 dropped sharply to 182 people, of which 14.8% were caused by *S. Enteritidis*, 6.04% by *S. Typhimurium* and 79.1% by other salmonella.

When analyzing the microbiological landscape of samples taken from environmental objects in Tashkent in 2011-2020, *S. Typhimurium* dominated in 2011. Since 2016, the *S. Enteritidis* serovar began to prevail, and by 2018 its detection had tripled (25.0% and 75.5%, respectively)

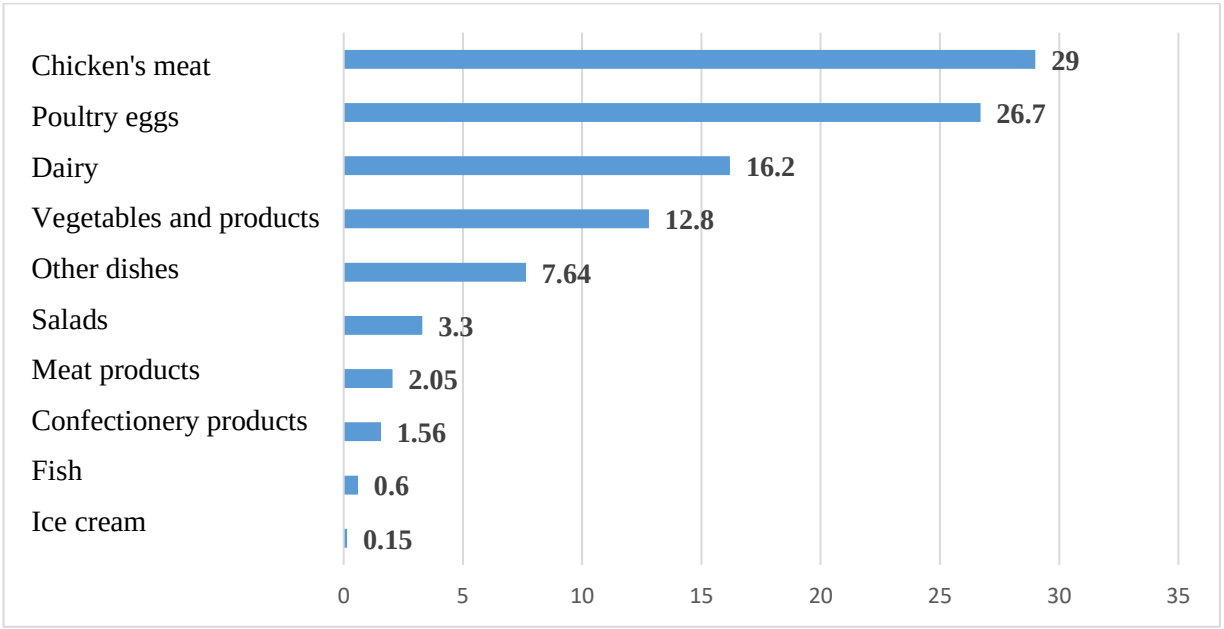
(Picture 4)



Pic. 4. Isolated serovars of Salmonella taken from the surfaces of external objects in Tashkent in 2011-2020 yy. (%)

When analyzing the materials of the report of the Service for Sanitary and Epidemiological Welfare and Public Health of Tashkent (2939 examination cards of the epidemic focus), it was found that most cases of the disease (95.8%) were transmitted through food products, (1.32%) through household contact , (0.4%) via water and (2.42%) by other routes.

29% of cases of foodborne salmonellosis are caused by the consumption of chicken meat, 26.7% - eggs of poultry, 17.3% - milk and dairy products, 2.6% - salads, 12.3% - fruits and vegetables, 2. 5% of meat products, 0.5% of fish products, 1.6% of confectionery, 0.1% of ice cream and 7% of other food products (Picture 5)



Pic. 5. Salmonella infection factors in Tashkent (%) (2011-2020)

According to the results of an epidemiological survey of foci of salmonellosis enteritidis, it

turned out that in 2015-2020. patients significantly more often consumed chicken eggs and egg-containing products (70.1 ± 2.6%), as well as chicken meat (48.6 ± 4.1%) (Table 1).

Table 1

Percentage of food intake of epidemiological significance in patients with Salmonella enteritidis

Products	2015-2020 years	
	Number of people who used the product	
	Sick (n=368)	
	ABS	%±m
Eggs (scrambled eggs, boiled eggs and egg products)	258	70,1±2,6
Poultry meat, poultry products	179	48,6±4,1
Meat products (beef, lamb)	150	40,7%±3,2
Salads, vegetables	65	17,6%±1,8
Fruit	28	7,6%±2,5

To determine the role of birds in the spread of Salmonella enteritidis, a special study was carried out in collaboration with specialists from the veterinary service. Samples were taken at 8 poultry farms from Samarkand, Kashkadarya and Jizzakh regions. Bacteriological examination of samples from 84 carcasses of dead birds, washings from eggshells of 70 eggs, 110 samples from farm inventory was carried out. *Salmonella enteritidis* infection was detected in 6 (7.14%) of 84 samples of dead birds, in 8 (11.4%) of 70 eggshell swabs, and in 14 (12.7%) of 110 samples of swabs from farm inventory. These data once again confirm that birds, eggs, poultry farm environments are contaminated with Salmonella enteritidis (Table 2).

Table 2

Results of the study of birds, poultry products and environmental samples

Products		2019 г.г.				
	Number of samples (Total)	Number of samples (Total)				χ^2
		Salmonella		of them ***Salmonella enteritidis***		
		M.r	% ±m	M.r	% ±m	
Dead birds	84	6	7,14%±1,8	6	7,14%±2,1	32,6
Eggshell Washes	70	8	11,4%±2,4	8	11.4%±3,9	5,21
Farm inventory swabs	110	16	14,5%±3,6	14	12,7%±3,1	0,45

CONCLUSIONS

1. Currently, the etiological structure of salmonellosis in Uzbekistan has changed. The proportion of the disease in Tashkent until 1990 was due to S. Typhimurium in 85.4% of cases, S. Enteritidis in 14.6% of cases. In 2011-2020 S. Enteritidis was isolated from humans in 53.6% of cases, S. Typhimurium - in 46.4% of cases.

2. Among chickens, their eggs were also relatively high infestation with S. Enteritidis (S. Enteritidis was isolated in 7.14% of cases, respectively).

3. The main factors of transmission of salmonellosis are food products, among which the main ones are chicken meat (29%) and poultry eggs (26.7%).

Literature

1. Миртазаев, О. М., Саидкасимова, Н. С., Матназарова, Г. С., & Хатамов, А. (2022). ХАРАКТЕРИСТИКА ПРОЯВЛЕНИЯ ЭПИДЕМИЧЕСКОГО ПРОЦЕССА САЛЬМОНЕЛЛЁЗА. *Results of National Scientific Research International Journal*, *1*(2), 18-31.

2. Миртазаев, О. М., & Саидкасимова, Н. С. (2016). Современние аспекты эпидемиологии сальмонеллёзов в республике Узбекистан. Инфекция, Иммунитет. *Фармакология*, *7*, 103-106.

3. Миртазаев, О. М., Саттарова, Н. А., Саидкасимова, Н. С., & Мустанов, А. Ю. (2011). Современные эпидемиологические особенности сальмонеллезов в Узбекистане. In *Актуальные проблемы эпидемиологии на современном этапе: матер. Всерос. науч.-практ. конф. с междунар. участием, посвящ. 80-летию каф. эпидемиологии и доказат. медицины (г. Москва, 13-14 окт.* (p. 275).

4. Эпидемиологические особенности сальмонеллезов в Узбекистане, С., Миртазаев, О. М., Саттарова, Н. А., Саидкасимова, Н. С., & Мус-танов, А. Ю. Актуальные проблемы эпидемиологии на современном этапе: Материалы Всероссийской научно-практической конференции с международным участием, посвященной 80-летию кафедры эпидемиологии и доказательной медицины (Москва, 13-14 октября 2011 г.). In *Всерос. науч.-практ. конф. с междунар. участием, посвящ* (pp. 275-276).

5. Саидкасимова, Н., & Миртазаев, О. (2021). ЎЗБЕКИСТОНДА САЛЬМОНЕЛЛЁЗЛАРНИНГ ЭПИЗООТОЛОГИК ВА ЭПИДЕМИОЛОГИК НАЗОРАТИНИ ТАКОМИЛЛАШТИРИШ.

6. Mirtazayev, O. M., Briko, N. I., Matnazarova, G. S., Saidkasimova, N. S., Toshboev,B. Y., & Khamzaeva, N. T. (2020). SCIENTIFIC, METHODOLOGICAL AND ORGANIZATIONAL BASES OF MANAGEMENT OF THE EPIDEMIC PROCESS IN CASE OF SALMONELLOUS INFECTION IN UZBEKISTAN. *Central Asian Journal of Pediatrics*, *2020*(3), 5-14.

7. Saidkasimova, N. S., & Mirtazaev, O. M. (2020). Epidemic Process of Salmonellosis in Tashkent. *Indian Journal of Forensic Medicine & Toxicology*, *14*(4), 7364-7367.

8. Saidkasimova, N. S., Mirtazaev, O. M., Matnazarova, G. S., Toshbaev, B. Y., & Khatamov, A. H. (2021). Epidemiological and Epizootological Characteristics of Salmonellosis and Improvement of Their Epidemiological Control. *JournalNX*, 610-618.

9. Sattarova, N. A., Mirtazaev, O. M., & Saidkasimova, N. S. (2009). Modern problems of epidemiological process of Salmonelloses in Uzbekistan. *Вестник Санкт-Петербургской государственной медицинской академии им. ИИ Мечникова*, (2), 193-194.

10. Саидкасимова, Н., & Миртазаев, О. (2021). ЎЗБЕКИСТОНДА САЛЬМОНЕЛЛЁЗЛАРНИНГ ЭПИЗООТОЛОГИК ВА ЭПИДЕМИОЛОГИК НАЗОРАТИНИ ТАКОМИЛЛАШТИРИШ.

11. Esan OB, Pearce M, van Hecke O, Roberts N, Collins DR, Violato M, McCarthy N, Perera R, Fanshawe TR. Factors Associated with Sequelae of Campylobacter and Non-typhoidal Salmonella Infections: A Systematic Review // EBioMedicine. 2017 Feb;15:100-111.

12. Kumar Y, Gupta N, Vaish VB, Gupta S. Distribution trends & antibiogram pattern of Salmonella enterica serovar Newport in India // Indian J Med Res. 2016 Jul;144(1):82-86.

13. Ranjbar R, Ahmadi M, Memariani M. Multiple-locus variable-number tandem repeat analysis (MLVA) for genotyping of Salmonella enterica subspecies enterica serotype Infantis isolated from human sources // Microb Pathog. 2016 Nov;100:299-304.

14. Saidkasimova, N. S., Matnazarova, G. S., & Mirtazayev, O. M. (2018). Some epidemiological patterns of salmonellosis in Uzbekistan. *Biology and Medical problems*, (4), 95-96.

15. Saidkasimova, N. S., Mirtazaev, O. M., & Matnazarova, G. S. (2023). Salmonellyozlarda epidemiologik va epizotologik nazorat.

16. Streit, J.M Prevalence and antimicrobial susceptibility patterns among gastroenteritis-causing pathogens recovered in Europe and Latin America and ***Salmonella*** isolates recovered from bloodstream infections in North America and Latin America: report from the SENTRY Antimicrobial Surveillance Program / J.M Streit, R.N. Jones, M.A. Toleman // Int. J. Antimicrob. Agents. - 2006. - № 27. - P. 378 - 386.

17. Zishiri OT, Mkhize N, Mukaratirwa S. Prevalence of virulence and antimicrobial resistance genes in Salmonella spp. isolated from commercial chickens and human clinical isolates from South Africa and Brazil //Onderstepoort J Vet Res. 2016 May 26;83(1):e1-e11.

Information about authors:

1. Matnazarova Gulbakhor Sultanovna, Tashkent city, Rakhmat Fayziy street No. 75A home, Tel: 97 343 23 09, E-mail: gmatnazarovaepid19@mail.ru , Passport series AA 8188376.
2. Saidkasimova Nargiza Sayfullaevna, Tashkent city, Olmazor district Chamanzor home No. 2 Tel: 90 9290559, E-mail: saidkosimova@inbox.ru , Passport series No. AA5541162
3. Abdukaxarova Muattar Faxraddinovna, Tashkent city., Chilanzar district Zuxra No.4 home. Tel: 97.726-4484, E-mail: muattarxon.abdukaxarova@tma.uz, Passport series No. AB 3671055.
4. Bryantseva Elena Vladimirovna, Tashkent city, Mirobod district, Chambil № 13 home. Tel: 93.588-17-44, E-mail: br-yelena@mail.ru, Passport series No. № AA5541162
5. Babajanov Khudaynazar Rajabovich. Kharezm region, Bagat district, Besharik village. Tel: 99 966 45 38, e-mail: babajanov.xudaynazar@bk.ru Passport series AA1555733
6. Mirodilova Firuza Bakhtiyarovna, Tashkent city, Katta-Darkhan street No.3-11, Tel: 933907777, E-mail: fira0672@mail.ru, Passport series AA 2980352
7. Nuritdinova Dilnoza Yusupovna.Fergana region. Fergana city Kashkar kishlak home N 457 Tel:972060275,E-mail: nuritdinovadilnoza80@gmail.com.Passport series N AB8381528
8. Eshkulova Sabogul Jalilovna.Jizzax region. G‘allaorol city Abdukarim kishlak home N 106 Tel:99 252 50 59,Passport series N AD0569478