



The Significance Of Population Migration As A Risk Factor For Cross-Border Importation Of Dangerous Infectious Diseases Into The Territory Of The Republic Of Uzbekistan

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Abstract: This article examines certain types of external population migration as risk factors for the emergence of outbreaks of especially dangerous infectious diseases in the Republic of Uzbekistan and the Central Asian region. The role of tourism and labor-related cross-border migration in shaping the epidemic manifestations of infectious diseases is highlighted. The importation of influenza caused by new virus subtypes, cholera, poliomyelitis, hemorrhagic fevers, anthrax, brucellosis, and others is becoming increasingly relevant for these regions.

Keywords: migration, tourism, especially dangerous infectious diseases, Uzbekistan, Central Asia.

The public health system and its readiness to implement urgent measures for the prevention and elimination of the consequences of especially dangerous and quarantine infectious diseases are decisive in the multidisciplinary process of maintaining a favorable sanitary-epidemiological situation and, at the same time, an important element in the security structure of our republic [2,9,10].

At the present stage, the intensive integration of independent Uzbekistan into the global economy has led to a significant expansion of its foreign economic, trade, and cultural ties, the development of tourism, and the growth of private entrepreneurial activities with many countries both near and far abroad. The ongoing process of economic globalization in Uzbekistan stimulates the development and improvement of transport communications, facilitating the movement of large flows of passengers and goods over long distances at minimal costs. This inevitably leads to a relative simplification of the system for processing accompanying documentation and border crossing procedures, and consequently, to a reduction in the time required for sanitary control inspections at checkpoints along the State border of Uzbekistan. In recent years, the share of international road transport in the republic has significantly increased, driven by the growth in the number of joint-stock and private national transport companies, as well as the active expansion of international road transport companies into the Central Asian region. The developed network of international highways, connecting the extensive national economic complex of Uzbekistan, provides access to neighboring countries, including those unfavorable in terms of quarantine and especially dangerous infections. The flow of goods delivered to the republic by river transport along the Amu Darya River through the river port in Termez is continuously increasing [2,9]. International air traffic is rapidly developing, through which Uzbekistan is today connected with virtually all countries of the world. Regular flights are operated to many countries endemic for especially dangerous infections. This is



particularly true for Southeast Asian countries, where, in addition to the well-known existing foci of plague and cholera, new especially dangerous diseases such as hemorrhagic fevers, anthrax, brucellosis, and others have spread in recent years [2,9]. Consequently, the multifaceted development of Uzbekistan's transport infrastructure under modern conditions creates the prerequisites for the possible importation of quarantine and especially dangerous infections into the territory of the republic by virtually any type of transport, both from neighboring countries and from the most remote parts of the world. Like all developed countries of the international community, Uzbekistan has a system of nationwide measures designed to prevent the importation and spread of especially dangerous infectious diseases within its territory. The existing system also provides for the prevention of the importation into the territory of our republic of any goods, radioactive, chemical, and biological substances, waste, and other cargoes that pose a danger to the population, and includes a set of adequate measures for sanitary protection of the state's territory [9]. The issue of importing dangerous infectious diseases into the Republic of Uzbekistan, and particularly into the territory of Central Asia, is becoming increasingly relevant due to the expansion of non-stop air routes with various regions of the world, including those endemic for especially dangerous infectious diseases, the growth of passenger traffic between them, the increased intensity of interstate movement of people for labor activities and professional duties, as well as the intensification of population migration within our republic. Population migration is the process of people moving across state and administrative territorial borders relative to their places of residence and work. Depending on the nature of the borders crossed, migration is classified as external (international) migration, which involves crossing state borders, and internal migration, which occurs within a single country. An important component of migration is tourism, which in turn is divided into domestic tourism-travel within one's own country, inbound tourism-the arrival of residents from foreign countries to a specific country, and outbound tourism-departure of citizens abroad [1,8].

Population migration can lead to the importation of infections, their widespread distribution, and the activation of epidemic processes in a given territory [1, 8, 10]. In particular, the great migration of peoples from east to west and from north to south related to the fall of the Roman Empire led to the spread of plague in Europe: Byzantium, Italy, Gaul, and Germany in the 7th–10th centuries. Later, in the 14th century, during the development of the second plague pandemic ("Black Death"), an important role was played by the increased intensity of trade and economic contacts between countries of Europe, Asia, and North Africa, and the related movement of people [3].

In modern conditions, political conflicts, natural and ecological disasters, and other events occurring in many countries around the world often lead to a significant decline in the standard of living, crises in public health, deterioration of sanitary-epidemiological conditions, and consequently provoke mass population migration. The movement of people contributes to the importation of dangerous infectious diseases into epidemiologically stable administrative territories. International population migration has repeatedly contributed to the emergence of epidemics of especially dangerous infectious diseases. In 2003, intensive air traffic between China and other countries served as a factor in the spread of severe acute respiratory syndrome (SARS) to 32 countries worldwide [4]. In 2009, a disease caused by a new variant of influenza A subtype H1N1 initially spread among migrating populations in Mexico and the United States, and was



subsequently introduced to other countries on different continents via air travel by tourists. Epidemic manifestations of influenza A (H1N1) were registered in 136 countries worldwide [4,5]. Furthermore, it was precisely external migration that served as the trigger for the large cholera epidemic on the island of Haiti in 2010. Following a natural disaster-a devastating earthquake that nearly destroyed the water supply and sewage systems-the infection was introduced by a military contingent from Nepal [6]. Cross-border migration was the main factor in the epidemic spread of the Ebola virus disease in 2014, when the practical indistinctness of state borders between Guinea, Liberia, and Sierra Leone led to the rapid spread of the infection among these three West African countries [6].

The aim of the study is to analyze the characteristics of certain types of population migration and to determine their role in the formation of risks for the emergence of epidemic outbreaks of dangerous infectious diseases in the Republic of Uzbekistan.

Materials and Methods. The study employed comprehensive epidemiological and historical-descriptive methods. An analysis was conducted of literary and archival data on the spread of plague during the 7th-10th and 14th centuries across various continents and the connection between the epidemic process and population migration. Materials on cases of importation of dangerous infectious diseases into the territory of the Republic of Uzbekistan from 1999 to 2020 were analyzed. Official information on the epidemic manifestations of these diseases, published in periodicals, as well as statistical data from the Republican Sanitary-Epidemiological Welfare and Public Health Departments (CSEB and PH) by region, were used.

Results and Discussion: According to the results of sanitary-quarantine control carried out by specialists of the Sanitary-Epidemiological Welfare and Public Health Departments in the administrative territories of the Republic of Uzbekistan, in 2014 alone, more than 4.5 million residents of the country traveled to 9 countries worldwide. The most visited destinations were the Russian Federation, China, Thailand, Turkey, the Republic of Korea, Kazakhstan, Egypt, and the UAE, which accounted for $87.3 \pm 0.02\%$ of travelers. Currently, mass interstate tourism is primarily an organized form of recreation, with travelers accommodated in hotels meeting sanitary standards and provided with a package of standard sightseeing routes. However, despite this, the risk of tourists becoming infected through contact with sick individuals (carriers) among the local population, as well as travelers from other countries endemic for dangerous infectious diseases, cannot be excluded. A typical example is the introduction of the SARS-CoV-2 coronavirus pathogen into our republic by a citizen who had traveled to France for tourism purposes. As a result, the spread of COVID-19 began in Tashkent on March 15, 2020, and then throughout the entire republic. According to research results, in the first months of the epidemic, 140 (0.2%) local residents infected with the new coronavirus returned to Tashkent on charter flights from foreign countries.

They were infected while engaged in labor migration, business trips, studying, tourism, or visiting on guest visas in foreign countries. Among 104 identified COVID-19 patients, they returned from: 43 (30.7%) from Kazakhstan; 12 (8.5%) from Tajikistan; 6 (4.2%) from Turkey; 5 (3.5%) from Italy; 4 (2.8%) from India; 4 (2.8%) from the United Kingdom; 2 (1.4%) from France; 2 (1.4%) from the United Arab Emirates; 1 (0.7%) from Switzerland; 1 (0.7%) from the Czech Republic; 1 (0.7%) from the USA; and 1 (0.7%) from the People's Republic of China (10). These circumstances demonstrate that trips abroad are an important epidemiological factor that triggered the spread of



the disease in the city of Tashkent. The foundation of this epidemiological factor model is considered to be significant transport communications, mainly international aviation. It is evident that this factor allows for anticipating the epidemic spread of COVID-19 infection in the capital.

Special attention is required for the increasingly popular extreme types of tourism and the growing number of travelers who travel independently, bypassing organizations that provide tourist services. Enthusiasts of car safaris, mountaineers, divers, hunters, fishermen, lovers of rafting on mountain rivers, and other types of active summer recreation plan their travel purpose, route, and temporary stops according to their interests. When gathering information about their route, they often do not pay adequate attention to assessing the epidemiological situation and the risks of infection with dangerous infectious diseases in the areas they visit. During their travels, these individuals have close contact with the local population and tourists from other countries, including those endemic for dangerous infectious diseases. Moreover, they actively visit natural biotopes-reservoirs of pathogens harmful to humans-which increases their risk of infection [3]. Considering the examples provided, it can be confidently stated that tourist external migration plays a significant role as a risk factor for the emergence of epidemic complications of dangerous infectious diseases, primarily transmitted via airborne, waterborne, and contact-household routes, as well as sporadic cases of importation of dangerous natural-focal infectious diseases, including those transmitted by vectors and not exhibiting epidemic spread. This situation demands constant readiness on the part of healthcare institutions to promptly diagnose and provide effective medical assistance. One of the epidemiological risks of importing diseases dangerous to the population of the Republic of Uzbekistan, associated with external migration, is cross-border tourism. Since the beginning of the 21st century, this type of tourism has undergone significant changes: from trips exclusively of a commercial nature (shopping tours, "shuttle" business) to beach vacations by the sea, as well as educational tourism, active recreation, and cultural exchange.

The importation of cholera into the Republic of Uzbekistan from Pakistan in 1999 (2 cases) and the development of acute outbreaks primarily transmitted through waterborne routes are directly linked to the intensification of private trade in the last decade of the 20th century. Given that the total length of Uzbekistan's state border with neighboring countries is 6,698 km (with Afghanistan – 137 km; Turkmenistan – 2,098 km; Kazakhstan – 2,203 km; Kyrgyzstan – 1,099 km; Tajikistan – 1,161 km), cross-border tourism holds particular importance for Uzbekistan. It should be noted that in recent years, the epizootic and epidemic situation regarding quarantine and especially dangerous infections in neighboring countries remains tense. In the context of developed road and air transportation connections with these countries, this situation creates epidemiological risks related to the potential infection of tourists by diseases endemic to the border regions of neighboring states. Practically every year, epizootics of plague of varying intensity and cases of especially dangerous infections in humans are registered in these countries; therefore, there is a threat of the infection being introduced into the territory of Uzbekistan. For example, a difficult epidemiological situation persists regarding brucellosis, rabies, hemorrhagic fevers, and anthrax in neighboring Tajikistan. In this republic, in 2005 compared to 2004, the incidence of brucellosis increased by 1.7 times. Although in 2005 there was a decrease in the incidence of hemorrhagic fevers and anthrax compared to 2004, the overall epidemiological situation for these especially dangerous infections cannot be considered favorable. In the Republic of Kazakhstan, in 2004 - 2005, sporadic cases of tularemia



and anthrax were also registered. At the same time, the incidence rates of newly diagnosed brucellosis remained high in this republic. For example, in 2004, 2,933 new cases of brucellosis were identified, and in 2005 - 505 cases (incidence rates of 19.24 and 22.71 per 100,000 population, respectively). There was a 4.6-fold increase in the incidence of hemorrhagic fevers. Cases of rickettsioses among the population are consistently registered [7,9]. In the border regions of Uzbekistan, there is free migration of people without sanitary-quarantine or other types of control for the purposes of labor, recreation, education, and others. In the territories of the aforementioned neighboring countries, active natural foci of plague, tularemia, rabies, and other natural-focal diseases exist, and the epidemiological situation remains tense with regard to cholera, tuberculosis, measles, poliomyelitis, brucellosis, Crimean hemorrhagic fever, and anthrax [7].

In 1997, during a cholera outbreak in the Republic of Kazakhstan, two cases of the disease were registered as imported into the territory of Uzbekistan. From the stool of one patient, an epidemiologically dangerous strain of *Vibrio cholerae* El Tor, serovar Ogawa, was isolated, which contained the *ctxAB* operon of the toxin-producing gene in its genome. In the second case, the diagnosis was confirmed by bacteriological methods: *V. cholerae* El Tor, serovar Ogawa, was isolated from the patient's vomit and stool. Considering the endemic nature of neighboring countries for a number of diseases that pose a threat to the population (plague, cholera, etc.), the epidemiological risks of their importation due to cross-border migration and subsequent spread within the region increase significantly. The most vivid example of the leading role of cross-border tourism in the formation of epidemic complications was the multiple transboundary introductions of influenza A (H1N1) into the territories of Central Asian regions throughout 2009 [9].

It should be noted that several factors contributed to the development of the influenza epidemic in Uzbekistan: the virus was imported during the influenza epidemic season (October), and organized groups were involved in the epidemic process (children in preschool institutions, school students, and students of secondary special and higher educational institutions).

Another component of the epidemiological risks of importing dangerous infectious diseases is associated with labor migration. Labor migrants, as a socially vulnerable group, are mainly employed in low-paid jobs and often live in poor sanitary and hygienic conditions with high population density. Their daily long working hours deprive them of the opportunity to seek timely medical care.

At the same time, it is precisely labor migrants who play a significant role in the economies of CIS countries that are primarily responsible for importing diseases such as poliomyelitis, malaria, tuberculosis, HIV infection, and sexually transmitted infections. In the Republic of Uzbekistan, the majority of officially registered labor migrants (89.1%) working abroad are in the Russian Federation. An analysis of their employment distribution shows that most of them (77%-or 66.2% of all labor migrants) are employed in mining, construction, public transportation, and industrial production. Among the official labor migrants traveling to and working in the Russian Federation, the majority are from the central Central Asian countries-Uzbekistan, Tajikistan, and Kyrgyzstan.

Conclusions

1. In the Republic of Uzbekistan, cases of imported dangerous infectious diseases of various etiologies are registered almost annually. These cases often lead to epidemic spread among susceptible populations and, consequently, the formation of emergency situations.



2. Risk factors for the importation of these infectious diseases include mass interstate tourism, including cross-border tourism, as well as transboundary labor migration.
3. In Uzbekistan, the intensity of migration flows and the presence of endemic foci determine high-risk areas, which include: the Russian Federation, Turkey, Kazakhstan, the Republic of Korea, Tajikistan, and Egypt.

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