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Tuberculosis and hard-to-reach group – migrant population

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Abstract

Background: The Republic of Moldova reports the biggest incidence of tuberculosis and the biggest rate of migrants among European Region countries. For the most of migrants the risk for TB development is correlated with social risk factors (low life conditions, overcrowding, disruption from the health care services), epidemiological risk factors (infectious contact) and biological features (young age, male sex, some physiological conditions, associated diseases). Risk factors association is more evident than the severity of one risk factor. The review study was conducted using relevant scientific resourses. **Conclusions:** TB is a big challenge worldwide. Despite high trends of migration noted in the 20th century the phemonen of migration as a risk factor for TB development is studied insufficienly. Immigrants are the majority of TB patients in high-income countries. The irregular emigrants are the most of TB patients from high-burden countries. Radiological and immunological screening in pre-departure phase is the most important procedure for decreasing of TB rates by providing latent TB infection treatment. Raising awareness among migrants about TB, emphasizing that diagnosis and treatment are free of charge and independent regarding migration status are important TB control actions performed in this hard-to-reach population.

Key words: tuberculosis, migration, risk factors.

Introduction

Labor market – vector of the mobility and migration. There is an estimated one billion migrants in the world today, which includes 232 million international migrants and 740 million internal migrants. *Mycobacterium tuberculosis* (TB) caused 9 million people ill with TB worldwide in 2013, with 1.5 million deaths [32]. TB particularly affects poor and vulnerable populations, migrants being assessed as key affected population [34]. In the framework of the 61st World Health Assembly of the WHO, was approved a resolution (61.17 from 2008) regarding the health of migrants, asking Member States to promote health care policies and practices aiming at migrant population [20]. Consecutively in June 2012, the working group headed by UN General Secretary Ban Ki-moon, approved the Millennium Development Goals (MDGs) where migration was recognized officially as an important factor of development, with a total impact of about one trillion dollars. On May 19, 2014, in the framework of the 67th World Health Assembly were adopted the new post-2015 global TB targets and strategy [32]. The strategy aimed to end the global TB epidemic with specific bench-marks and targets till 2035. It is built on a

"know-your epidemic" approach and focuses particularly on serving those not reached/hard-to-reach as well as most vulnerable and marginalized populations [33]. That strategy highlighted the needs of migrants and the necessity of the cross-border collaboration regarding the health of migrants. It was established that migrants' vulnerability to TB is caused by discriminatory policies in non-health sectors such as immigration service, labor and social protection departments. Absence of collaboration with these institutions and the absence of targeted TB prevention and control strategies regarding migrants create significant barriers in reaching TB elimination targets [1, 28].

For on average 1 billion migrants, migration is an effective and immediate tool to reduce poverty, conflict and escape for improving the life condition for their families [32]. Migrants are the backbone of health systems in all OECD countries and the safety valve in the global economy [30]. An important vector for migration from low to high-income contruies is the price of a labor hour. Explaining the economic role of labor migration we note the differences between wages: for India and China it is 0.25 USD/hour, Moldova 0.51 USD/hour, Russia 0.6 USD/hour, and Poland 2.09 USD/hour, USA 17.2 USD/hour, Japan 23.66 USD/hour, France 17.66 USD/hour, and Germany 33.88 USD/hour [19]. A big difference between monthly salaries is registreted in the CIS region. The medium salary in the economy in Russia constitutes 119 USD, in the Ukraine 66 USD, in Moldova 69 USD, in Kirgistan 31 USD, in Tadjikistan 13 USD. Adjusted to the financial role the differences in work time between EU countries and other states are noted. In EU countries the work time per year is less than 650 hours comparing with Japan and less than 340 comparing with the US [17]. In Europe it is established a specific work segregation according to the national criteria. So, migrant workers are employed in hard work conditions with low wages [25]. Gender inequality is also well expressed and appreciated by the employment of majority of men in construction, transportation, agriculture, and women in home care, service and entertainment [25].

One of the objectives of EU policy is to remove barriers for job mobility. Work mobility is essential for a proper function of the internal economy and for origin country as well as for destination country. Currently, only 2% of EU citizens are exercising their right to work in another country. Despite this, over one million European people cross the border every day for work searching and every year 250 000 people get their pension in other Member States of the European Union but not in their own country [25].

The migration is a necessity for a Moldovan migrant worker and other individuals from low-income countries. The negative repercussion of the migration is the severe damage of the origin country economy by "drain and export of the human skills" [8]. This type of migration lasts long periods of time or is a permanent emigration (such as the emigration for the US or Canada) [27]. This emigration has not a compensation recovery for balancing the national budget of the origin country [12]. According to the concept of knowledge and experience exchange, people migrate for searching new place of work, taking with them their profession and qualifications. Based on the concept of brain wasting, intellectual emigration is seen as a "cleaning" phenomen of the exporting countries. "Brain-drain" manifests economically negative tendency leading to the diminishing of the life standard of the citizens from origin country [8]. It was established that the emigration of 3-5% of skilled migrants is equal to the loss of 10% of the gross domestic product of the exporter country [7]. Factors that determine the "drain and export of human skills" are: a) personal – the need of high wages, restructuring and loss of jobs in the origin country, information from immigrated relatives and friends, curiosity and spirit of adventure, fear of war persecution; b) general – global demographic changes, that diminish the working population in high-income countries, economic globalization, visa liberalization, progress in transportation and communication, deep economic disparities between countries, possibility to create jobs through investment and development of multinational companies [26]. Analyzing the labor market situation in Moldova during 2000-2010, it was noted the decreasing number of active population from 1 654 662 to 1 422 300 people due to the intensive process of emigration [38].

For the developed countries the mobility/migration of the employees is integrated in the "mondialisation of the competences" [7]. As the workers have a similar economic high level, they do not migrate to gain more money but to change the professional experience. Their absence is recompensated rapidly by arrived foreign migrants. There is no evident economic repercussion on the export country, but is established a professional gain for the accepting country. Studying the real causes of migration in the European Union, the European Commission made the following general recommendations: a) to develop a national strategy for migration control in EU Member States; b) to promote information services in third countries to boost the cooperation between diplomatic organizations and local authorities; c) to develop policies for prevention of illegal migration (sanction of the illegall transportation of persons); d) to promote appropriate policies of labor attraction; e) to develop and to apply simple and transparent policies for obtaining of work permition, by this way combating undeclared work; f) to improve the status of migrant women g) to pay particular attention to unaccompanied minors who migrate from third countries into the European Union; h) apply the rules for marriage convenience of a person from a Member State with a person from a third country [25].

Finding work in a foreign country for a labor migrant is complicated by a multitude of problems: firstly – the residence visa issues, secondly – problems with the police, thirdly – problems with the crime organizations, fourthly – low salary from the employer, fifthly – the problem with healthcare services. A serious problem for a migrant in this regard is the lack of health insurance (56%), its high price (32%) and the absence of a residence address (4%) [20]. Research

data showed that Moldovan migrants have long absences at the medical addressing. Migrants visit health care services 2 times less frequently than the population not involved in migration. The number of visits to the general practitioner of migrants is on average 1.5 visits/year *versus* 3.2 visits/year of the individuals not involved in migration. That is reflected on the life expectancy indicator. For Moldova it is about 10.8 years lower in comparison with the average for EU, but is about 1.5 years higher than on average for CIS countries [35]. Other problems for migrant population are: low quality feeding, low psychosocial climate, stigma, etc. [19].

Migration is a big challenge, especially for the epidemiological security. Massive immigration automatically involves reducing of the public health actions for providing the epidemiological security goals. If the epidemiological security of the population immigrated from the country of origin is lower than the epidemiological security of the host country, migrants will bring with them infections and will be defined as public threat for the hosting population. Regardless of this, if new arrivals during the time will follow standards of personal hygiene their epidemiological security will increase and the epidemiological load on the hosting population will decrease. This phenomenon is well established for EU countries, where massive migration of groups originally from high burden for TB, especially MDR-TB countries, such as CIS countries, decreased the epidemiological security [1, 11].

If the epidemiological security in the hosting country is low, migrants after crossing the borders are not in secure epidemiological conditions and put themselves in a doubtful safety being the first to contact the infectious diseases. This phenomenon is described in Russia, regarding HIV infection. East-Asian migrants just arrived in Russia frequently contact HIV infection due to their free sex behaviour. Even within the state there are epidemiological security oscillations between different regions according to their economical, climatic, epidemiological particularities that are reflected on the epidemiological indicators.

Migration policies describe several types of migrants: individuals with specific legal and social status – labor migrants and undocumented migrants, trafficked and detained migrants. In the Republic of Moldova the highest level achieves illegal labor emigration. Labor migration involves not only skilled people but more evident healthy people. It is estimated that till 2050 every second citizen of the Republic of Moldova will have the status of migrant obtained due to internal and external migration [38]. A specific type of migration for our country is so called "commuting" or internal migration, defined as a commutation from the village to the city. Villages in the Republic of Moldova were always providing labour population to cities. On average for the entire country, every fifth person has performed an internal migration and every second citizen changed domicile [38].

A detrimental aspect of internal economy is that Moldova is considered a country with the lowest degree of urbanization in Europe (41.4%). The fact has major implications for employment policies, which must provide the creation of new jobs places in rural areas and jobs in the frame of alternative sectors of agriculture [29]. Due to a low economical growth, the Moldovan rural population rests without jobs being pushed to leave the family and to perform internal or external migration with the aim for finding a well paid place of work. Actually Moldova experiences a mass migration phenomenon due to its weak economy [29]. Migrants are the major source of income for the national economy, with total remittances from those living abroad estimated at 1 billion dollars per year. During 2000-2010, the number of legal Moldovan migrants working abroad increased from 138 300 to 311 000 thousand persons, which represents about 27% of the working age Moldovan population [30]. This process is increased due to expanding of European Union border in 2006 and due to changing of visa status for some category of population, for example for Moldovans with Romanian passports (fig. 1).

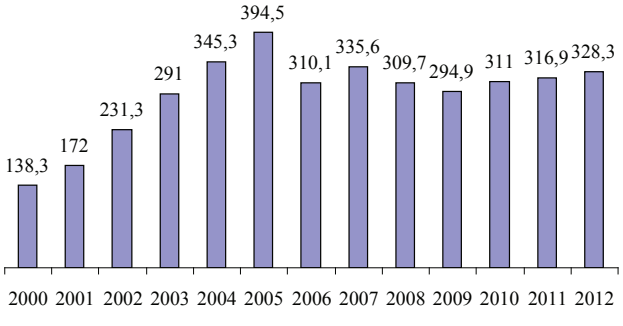

Fig. 1. The dynamics of the number of Moldovan citizens working abroad, (thousands of persons, absolute number). National Bureau of Statistics [38].

A high risk consequence for the next generation is the increasing number of minors whose parents are gone to work abroad, so-called phenomen of "home alone children". In Moldova this phenomenon achieved the highest level in Europe and is caused by low social services, vague knowledge, erroneous attitudes and practices regarding child rights [35].

At this moment can be identified three types of international migration specific for Moldovan citizens [34]: 1) short international migration – Moldovan labour migrants go to work in the Community of Independent States (CIS); 2) long international migration – Moldovan labour migrants go to work in the states of the European Union 3) long legal international migration – Moldovan migrants go to live in the US and Canada. More recently were observed the following trends and changes in the general pattern of international migration: changing the preference from CIS region to the countries of the EU; changing the short migration to long-term migration; increased migration to the US and Canada [8]. Moldova has considerable experience with emigration to the US and Canada where depart 3000 Moldovan citizens annually.

According to the research conducted by the National Bureau of Statistics, 60% of Moldovan migrants leave for CIS countries, mainly to the Russian Federation and 40% of

them to the EU countries, mainly to Italy. Characteristics of migrants working in CIS are the predominance of male and people from rural area, while to the EU countries go to work more frequently women and skilled young people [39]. As following of labor migration it was observed the reduction of unemployment rate in the Republic of Moldova due to reducing of economically active age population. Also, due to labor migration in the Moldovan population is actively manifesting the phenomenon of «demographic aging». The process of demographic aging is reflected by growing of the rate of population aged over 60 years, due to the migration of young people (70% of migrants are aged form 16 to 29 years, and 60-70% of them are women) [38].

Only less than 3% of immigrants will rest in the destiny country for all their life. Illegal status pushes migrants to return home. It was noted, that skilled migrants more frequently returned home than unskilled, being equipped with additional education, training and work experience that they have gained abroad [8]. Upon returning to the origin country, migrants who lived in poor housing, received low wages and had limited access to health services are returning home less healthy than when they left. When migrants return to their place of origin with detected, untreated TB, erroneously treated TB, or complications, they become an important load on their health care system and manifest profound health implications for their families and communities. In this way migrants determine high financial burden on their households if they do not have adequate health and social protection upon returning to their places of origin [1]. Another negative economical effect of migration is increasing of consumption, non-productiveness and the remittance depending by the non-migrant population.

Why are migrants vulnerable to tuberculosis?

There are several risk factors for TB development in migrants. First of all, migrants face a higher exposure to TB infection due to overcrowded living and working conditions. Due to poverty they have increased vulnerability to HIV infection contact, malnutrition and substance use. Delays in TB diagnosis among migrants are commonly associated with difficulty in healthcare access, lack of education, poor health-seeking behaviors, cultural beliefs, stigma and marginalization. Due to social risk factors, migrants often do not have access to correct TB-related information as the consequence of language barriers and cultural beliefs. Social-related factors: stigma, lack of awareness of health services, low health-related spending capacity, as well as migrant-unfriendly health services, all lead to delaying in seeking for health care [20].

Nkulu F. in the study regarding social features of migrants living in Sweden demonstrates their low degree of knowledge, low degree of healthcare seeking behavior, several misconceptions and negative attitudes regarding TB [26]. The author established that 23% of Swedish TB cases are foreign-born residents established in Sweden for more than 10 years. It was established that implicated risk factors for TB are the language barrier and unfamiliarity with the Swedish Health Care System. The study demonstrated that including TB education measures for accepting the screening will help to improve TB control in the country through early detection.

In high-burden countries TB-related morbidity and mortality among migrants have negative economic effects at household level for them and for their families. At societal level sick migrants will cause the loss of productivity and loss of revenue in the industries and at national government level. The negative economic effect is manifested in both - source and destination countries (loss of productiveness for destination country and loss of remittances for origin country).

Among migrant workers with a legal status, their access to TB diagnosis tools and health care is determined by the health insurance coverage, provided by the State or by the employer [2]. Irregular migrants face the fear of deportation that reduces their access to diagnostic and treatment services. If TB is diagnosed, the migrant is pushed to leave the destination country. Deportation during the anti-TB treatment causes the incompliance or interruption of anti-TB treatment which leads to development of drug resistant TB and increases danger of such patients for the health systems of origin, transit and destination countries. In Western Europe, more frequently multidrug-resistant TB (MDR-TB) is diagnosed in immigrants from Eastern European countries. MDR-TB is very difficult and expensive to treat. Resistant TB determines a substantial economic impact on the hosting country (ex. EU countries are low TB-incidence countries). As the transmission of TB infection from foreign-born to native European populations is well documented, in this way is established the epidemiologic danger of immigrants.

There are data showing that in low TB-burden countries, from 20% to 70% of notified TB cases are foreign-born individuals. Posey D. L. in the study of the implementation of new TB screening requirements for the US immigrants and refugees established that during 2013 in the US 64.6% of TB cases were diagnosed among foreign-born individuals [27]. Farah M. G. studying tuberculosis in migrants from Norway determined that the incidence of TB in originals from Africa is 190/100 000 and from Asia 80/100 000 population [13].

The risk for development is the highest among foreign-born groups and is up to 50 times higher than in native populations. The increased risk among foreign-born individuals may continue for 20 years after migration due to reactivation of latent TB infection contacted in their country of origin. Kruijshar M. E. in a study regarding TB in migrants from the UK established that 28% of migrants had positive results at interferon gamma release assays, that means that one third of migrant population of the UK have latent TB infection and a high risk for TB development [21].

Even during the transit to destiny country the TB risk of migrants is high especially when the travel occurs under precarious conditions. Irregular migrants may face violence and be held in detention centers with poor nutrition and ventilation, often in close proximity with others with preexisting TB. At destination migrants' integration into the host

country's health system, social services, accessing of housing, jobs is difficult. The continuous risk to be expulsed from the arrival country diminishes the health care seeking due to mistrust. As well as migrants' own health-seeking behavior and cultural practices may affect their use of TB services. Discriminatory practices such as deportation after positive TB diagnosis are an important barrier for migrants for seeking TB services in the country of destination [23].

Priimac A. A. established that among multiple causes that influence the epidemiological situation of tuberculosis in Russia should be noted the main influence of migration, constituted by the influx of persons released from prison from ex-USSR countries, migrant workers, refugees from the former Soviet Republics and from the regions of the ethnic conflicts of Russia [36]. Since 90-es the law in the Russian Federation does not require the annual chest radiography of persons with the risk for TB including migrants. Consecutively migration contributes to the deterioration of the epidemiological situation of tuberculosis in Russia. It was noted that the TB morbidity rate in migrant population is 6.7 times higher than in the resident population. More severe is the situation that annually about 30% of Russian patients with active TB migrate within the country. Moving to a new place of residence, such patients often remain unaware of new TB facilities and, therefore, do not receive an appropriate treatment, also in their environment are not carried out the necessary preventive measures. To resolve this situation the author recommends to reorganize the migration service in Russia, to adopt a proper legislation for a strict control of the state on the migration, obliging migrants to be screened timely for tuberculosis, and detected sick migrants to be treated.

It was noted that migrants dramatically worsened the epidemiological situation in Petersburg. As an example was shown St. Petersburg where in 2012 came 228 000 migrant workers. During this period of time TB was detected in 352 migrants and only 150 of them were deported or left the country on their own wish to perform the treatment. Also in 2012 the diagnosis of HIV infection in native St. Petersburg population was recorded at 60.0/100 000 and among migrants 83.2/100.000; TB in native St. Petersburg population was recorded at 32.4/100 000 and among migrants – 154.2/100 000 [35]. According to the epidemiological situation the most dangerous for the epidemiological situation are migrant workers from Central Asia. They have origin in high TB-burden region and being infected with *M. tuberculosis*, put themselves to risk for developing of active disease. Sick migrants expose a high epidemiological danger on the Russian native population.

Rospotrebnadzor noted that in Russia the epidemiological situation is aggravated by the fact that about 80% of migrants work on social significant objects such as: construction, selling, markets and are in constant contact with a lot of people [36]. Coordinator of the regional program in the field of labor migration J. Zelensky noted that Tajikistan is one of the largest suppliers of cheap labor in Russia. In this country the incidence of TB is much higher than in Russia, representing 204/100 000, but in Russia – about 85/100 000 people. According to this fact the individuals arrived from Tajikistan represent danger for epidemiological security of Russia being more frequently ill.

More severe is the epidemiological situation in Moscow. Among newly diagnosed patients with TB in Moscow during 2008, 16.7% of them were migrant-foreigners, 9% – were internal migrants (citizens of other regions of Russia), and about 10% – homeless people. Among foreign-born TB patients identified in Moscow, the proportion of citizens of Tajikistan was 21.3%, of Uzbekistan –20.3%, Kyrgyzstan – 14.4%, Ukraine – 14.1%. From the total number of TB patients detected in Russia, only 11.7% were deported to their origin country and 20.8% of them were admitted to the Russian hospitals for the treatment of TB [36]. The rest of migrants with TB remain on the territory of Russia continuing to spread the infection.

Local studies noted a high prevalence of Moldovan migrants with tuberculosis that returned from Russia (64%), Ukraine (12.1%), and other countries such as Italy, Turkey. It was established the prevalence of severe forms: caseous pneumonia and fibrocavitary tuberculosis in 19.6% of migrants. Low success rate, high default rate (10.6%) and deaths (5%) were more evident than in local resident population [10].

Regarding HIV infection, J. Zelensky noted that migrants from Central Asia have a greater risk to contact HIV in Russia, because sex is much freer than in the East and 30% of migrants have a high risk behavior [36]. Condom use among the population from the East is very low, as well as general knowledge about the HIV infection is precarious. The author established that adjusted to life threatening infections such as TB and HIV in migrant population demonstrate the epidemiological load on the Russian health security.

No studies were found about the TB among migrants from detention. Migrants in detention centers or trafficked persons often live in unsanitary and unhealthy conditions for extended periods of time, that increase their vulnerability to TB infection and active disease.

It was established that forced displacement of persons after an army conflict or a natural disaster is often associated with an increased TB risk due to malnutrition, overcrowding in camps and disruption from the health care services.

International experience of screening for tuberculosis in migrant population

Migration is a social determinant of the increased TB-related morbidity and mortality. There are specific differences in migrant screening procedures in the pre-departure phase and post-arrival phase for each country. Those differences influence TB-related morbidity and potential public health impact on the health system [28].

Rizo M. established that screening in pre-immigration settings may reduce the risk of TB development compared with post-immigration screening. Also the author noted that the new entrants more frequently complete the screening procedures than the old-established migrants [28].

The majority of European countries continue to use chest radiography for screening and detection of TB among applicants for permanent residence [24]. However, chest radiography has a low sensitivity and specificity for detection of TB. Chest radiography is even less sensitive and less specific for TB in HIV-positive individuals. Irregular migrants cannot benefit of such screening care in origin and destination countries, due to the lack of health insurance. The fear to perform the screening for TB is amplified by discriminatory practices such as deportation or interdiction to work if an active disease is established. Moldova experiences the pre-arrival screening in 3000 citizens annually of emigrants with intention to leave the country for the US and Canada. They perform the digital chest radiography, serological testing for hepatitis B and HIV infection.

Posey D. L. in the study of the implementation of new TB screening requirements for the US noted that beginning from 1991 the algorithm for TB diagnosis among adult migrants includes chest radiography and microscopic sputum examination of those with findings suggestive for TB [27]. In 2007 the national algorithm was enhanced by including additionally sputum cultures as a diagnostic tool for TB screening of those with suggestive findings for TB. In pediatric population TB screening was performed through tuberculin skin testing. From 2009 tuberculin skin test was replaced by interferon gamma release assays (IGRAs). This serological technique of TB screening demonstrated a high sensibility for identifying persons with latent TB infection. The author demonstrated the importance of serological screening of foreign-born migrants through IGRAs for identifying the latent TB infection [27].

Kruijshar M. E. in a study regarding serological screening of new entrants in the UK established that 20-28% of migrants had positive results at IGRAs [21], in this way demonstrating that one third of migrants have latent TB infection. The author noted high trends of migration to England from countries of Sub-Saharian Africa and continuously increased trends of migration from the Indian Subcontinent Countries, regions with high TB-burden epidemiological situation.

Farah M. G. studying the long-term risk of tuberculosis in immigrants in Norway determined that the incidence of TB in Norwegian migrants from Africa is 190/100 000 and among migrants from Asia 80/100 000 population [13]. These rates were 90 times higher than the crude TB incidence in Norway, and the rate of TB development was 2 times higher in the first two years after arrival of migrant in Norway [13]. The author recommended the vigilance regarding migrants due to the high risk for TB disease that lasts many years after arriving in the hosting country.

It is well established the negative influence of migration on the anti-TB treatment compliance. Chen Jing evaluated TB among migrants in Shanghai China [41]. In China there are registered one million TB cases, the second largest number in the world with a global incidence of 75/100 000 population. In China, the most frequent type of migration is commuting from rural to urban areas. In total there were registered 145 million internal migrants in China during the period of 2009. From the total number of TB patients 52% were internal migrants. Among outcomes of antituberculosis treatment predominated default (52% of treated cases) and death (30%). There were established risk factors for default of anti-TB treatment in Chinese migrants: self-administrated treatment, retreatment, and age of the patient over 60 years. The national study assesses that almost one third of patients with TB who interrupted or defaulted the antiTB treatment were migrants.

Conclusions

TB is a big challenge worldwide. Immigrants are the majority of TB patients in high-income countries. The irregular emigrants are the most of patients of high-burden countries. Radiological and immunological screening in pre-departure is the most important procedure for decreasing the rates of TB. Raising awareness among migrants about TB, emphasizing that diagnosis and treatment are free of charge and independent regarding migration status are important TB control actions. Considering high relevance of migration on the risk of TB development a national survey in the actual geopolitical context must be performed in the Republic of Moldova.

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