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*E. Lesnic¹, L. Todoriko², A. Niguleanu¹, I. Ieremenchuk²,
I. Semianiv², O. Pidverbetska²*

THE SOCIO-ECONOMIC RISK FACTORS OF TUBERCULOSIS IN CONDITIONS OF A HIGH MIGRATION IN TRANS-BORDER REGION

State Medicine and Pharmacy University Nicolae Testemicanu, Chisinau, Republic of Moldova¹
HSEI of Ukraine «Bukovinian State Medical University», Chernivtsi, Ukraine²

Abstract. Tuberculosis is a classic example of an infectious disease linked with social determinants of the health. The survey includes information about the risk factors, socio-economical status pulmonary tuberculosis patients from a high tuberculosis burden trans-border region:

Chisinau and Balti city and Western Ukraine Chernivtsi region.

Key words: tuberculosis, risk factors, socio-economic status.

Background. Tuberculosis (TB) represents a major global health problem, that is well recognized in the Republic of Moldova as well as in Ukraine [2, 4, 5]. It was established that the decline of TB epidemiological indices is attributed to the improving of social and economic conditions, rather than to the clinical advances [1, 3]. In 90 % of cases at least three different factors are associated, the most prevalent being social factors. The major social factors are overcrowding, poor indoor ventilation, close contact with an infectious source, medical conditions that diminish the immune host defenses against micobacterial infection, such as malnutrition, tobacco smoke, indoor air pollution, alcoholism, and comorbid conditions (HIV infection, diabetes, gastro-intestinal diseases, chronic respiratory diseases, silicosis, malignancies and immunosuppressive treatment).

Objective: comparative assessment of demographic and TB epidemiological indices in two Moldovan overburden regions (Chisinau and Balti cities in comparison with national data) and Western Ukraine Region (Chernivtsi region).

Material and methods. We have conducted a retrospective, randomized, selective, descriptive study targeting TB risk factors and socio-economical peculiarities of 228 new pulmonary TB cases from two Moldovan cities Chisinau and Balti and 271 new pulmonary TB cases from Chernivtsi region of Ukraine. First Moldovan sample included 185 patients selected as being diagnosed and therapeutically managed in the frame of medical specialized organizations of Chisinau city (Chisinau group – CG), the second Moldovan sample included 43 patients from Balti city (Balti group – BG) and the third group, Ukrainian sample included 271 patients of Chernivtsi region (Chernivtsi group – ChG) registered in the period of 01.01.2015-31.12.2015.

Results and discussion. The study was designed to incorporate health-related issues of TB morbidity into demographic measures. According to the National Statistical Bureau the stable population of the RM is continuously decreasing. Between 2013 to 2015 the total number of the Moldovan population decreased by 4278 people from 3 559 497 in 2013 to 3 555 159 citizens in 2015. In 65 Moldovan towns,

considered as the major infectious cluster were residing 1 492 165 Moldovan citizens (40,67 % of the total population) in 2013, 1 502 996 (42,24 % of the total population) in 2014 and 1 507 265 citizens (42,39 % of the total population) in 2015. Therefore, the population in the urban area increased between 2013 to 2015 by 10 831 people, by on the other hand the rural population of the RM decreased by 19 428 people in the same period. To compare, between 2013 and 2015, the population of Chisinau city increased by 9600 people and the population of Balti by 491 citizens.

In the global epidemiological context the major epidemiological indices describing the spread of TB disease in the general population are: global incidence (number of new cases and relapses reported in 100 000 people), incidence of new case, prevalence and mortality. According to the published data by the Moldovan National Centre for the Management in Health during the period 2013-2015 it was registered an important decline of all TB indices. According to the table 1 the global incidence in RM decreased between 2013 and 2015 by – 22 %, in Chisinau city by – 22,4 % and in Balti by – 24,2 %. A similar vector was established regarding the prevalence (the total number of TB patients) which decreased between 2013-2015 in RM by – 23,3 %, in Chisinau by – 25,5 %, in Balti by 28,3 %. Multiple causes are involved in this rapid decline of registered values: low rate of high risks groups investigated in the frame of active way of screening (annual chest radiological examination), high rate of migration population inaccessible for screening procedures (according to mass-media data 1 million Moldovan citizen are migrants), low health care seeking behavior of the population, high rate of citizens with lack of insurance policy and low accessibility to health care services. Mortality due to the progression of tuberculosis is very high, despite of decreasing trend of indices. During the period 2013-2015 mortality decreased twice from 16,1 to 8,8 at 100 000 population in RM, as well as from 10,8 to 6,9 at 100 000 population in Chisinau. On the other hand the mortality increased in Balti during the same period of time from 9,3 to 16 of 100 000 population.

Table 1

Demographic indices of three high TB burden trans-border regions

| Index | 2013 | | 2014 | | 2015 | |
|--|------------|-------|------------|-------|------------|-------|
| | abs. | % | abs. | % | abs. | % |
| Population of RM ¹ | 3 559 437 | - | 3 557 634 | - | 3 555 200 | - |
| Urban population ¹ (rate/RM) | 1 492 165 | 40,67 | 1 502 996 | 42,24 | 1 507 265 | 42,39 |
| Population of Chisinau ¹ (rate/RM) | 800 601 | 22,49 | 804 476 | 22,61 | 809 600 | 22,77 |
| Population of Balti ¹ (rate/RM) | 149 709 | 4,2 | 149 784 | 4,2 | 150 200 | 4,2 |
| Population of Ua ² | 44 629 813 | - | 42 903 211 | - | 42 929 298 | - |
| Population of Kiev ² (rate/UA) | 1 722 100 | 3,85 | 2 827 395 | 6,6 | 2 829 000 | 6,3 |
| Population of Chernivtsi ² (rate/UA) | 907 139 | 2,03 | 905 443 | 2,06 | 906 828 | 1,87 |

Note. 1. Statistic of Moldova. Demographic situation of Moldova; 2. Medstat.gov.ua/ukr

Table 2

Distribution of patients according to the risk

| Risk groups | | Chisinau group | Balti group | Chernivtsi group |
|----------------------------|--------------------|------------------|------------------|------------------|
| | | N=185 (M±m %) | N=43 (M±m %) | N=271 (M±m %) |
| Social groups | Uninsured | 139 (75,13±3,17) | 23(53,49±7,61*) | n/a |
| | Unemployed | 124 (67,03±3,46) | 23 (53,49±7,61*) | 191 (70,48±2,71) |
| | Young persons | 112 (60,5±3,59%) | 26 (60,46±7,46) | 154 (56,83±3,01) |
| | Poor persons | 106 (57,29±3,64) | 33 (76,74±6,44*) | 182 (67,16±4,42) |
| | Extreme poverty | 29 (15,68±2,67) | 3 (6,96±3,89) | 11 (4,06±1,19) |
| Co-morbid groups | Comorbid cases | 50 (27,03±3,26) | 23 (53,49±7,61*) | 63 (23,24±2,56*) |
| | HIV positive | 11 (5,94±1,74) | 6 (13,95±5,28) | 34 (12,54±2,21) |
| | Chronic alcoholism | 13 (7,03±1,88) | 12 (27,91±6,84*) | 31 (11,44±1,93) |
| | IDU | 3 (1,62±0,93) | 1 (2,32±2,29) | 6 (2,21±0,89) |
| | Psychic diseases | 4 (2,16±1,07) | 3 (6,98±3,88) | 9 (3,32±1,09) |
| Epidemiological risk group | TB contacts | 15 (8,11±2,01) | 8 (18,61±5,93) | 16 (5,91±1,42) |
| High risk group | Migrants | 24 (12,97±2,47) | 7 (16,28±5,63*) | 3 (1,11±0,63) |
| | Former detained | 9 (4,86±1,58) | 2 (4,65±3,21) | 11 (4,06±1,19) |

Note. * - statistical difference, n/a – no available situation, IDU - injection drug using, former detained– patient with history of detention

Distributing patients according to the sex we established the predominance of men 138 (74,6±3,20 %) in comparison with women 47 (25,4±3,20 %), with a male/female ratio=2,93/1 in Chisinau group (CG), 31 (72,09±6,84 %) men vs 12 (27,90±6,84 %) women in Balti group (BG), with male/female ratio=2,58/1 and 204 (75,27±2,62 %) men and 67 (24,72±2,62 %) women, with male/female ratio=3,04/1 in Chernivtsi region group (ChG). Repartition of patients in age groups according to the WHO recommendations, identified a same distribution of patients in all three groups, so the biggest one was 35-44 years age group: 52 (28,1±3,30 %) patients in CG, 14 (32,56±7,15 %) patients in BG and 76 (28,04±2,73 %) patients in ChG. Redistributing patients in two age groups (15-44 years old and >45 years) we established the predominance of young patients in CG 112 (60,5±3,59 %) compared to those aged more than 45 years old 73 (39,5±3,59 %). In

BG and ChG was established a similar proportion 26 (60,46±7,46 %) compared to 17 (39,53±7,46 %) cases in BG, and 154 (56,83±3,01 %) compared to 117 (43,17±3,01 %) cases in ChG. So, distributing patients according to the biological characteristics we demonstrated that men and young individuals must be targeted by the screening methods and risk reduction measures.

Hierarchy of risk groups identified that the biggest impact on the risk of developing active pulmonary tuberculosis in Chisinau city determines: inaccessible healthcare due to the lack of health insurance associated with unemployment (two third of patients), living in poor conditions and young age of patients (one half of patients). Comparing with Ukrainian group were only few migrants (3 (1,11±0,63) cases) were diagnosed with tuberculosis.

Comorbid patients were one third of CG and ChG cases and one half of BG, among them HIV-

infected being the fifth part of BG and ChG. In this context Balti and Chernivtsi are two regions endemic for HIV and TB co-infection. Diagnosed with chronic alcoholism were the tenth part of CG and ChG, and the third part of BG. Drug users and patients with psychic diseases are the minor part of all samples. Former detained patients were in a similar proportion in all three groups.

Conclusions

Republic of Moldova shows a continuously decrease of its entire population and an increase of urban population that contributes to the polarization of health care services, which became much more accessible in urban area. Ukraine is experiencing an increase in its population due to territorial redistribution, despite this, the population of Chernivtsi region is decreasing as being reported to the entire Ukraine population. Moldovan health care system is based on the health insurance mechanisms, but one third of Moldovan population is uninsured, as consequence, active screening of all high risk groups is unaffordable. Although we established a decreasing vector of

main tuberculosis epidemiological indices in urban areas of the Republic of Moldova and in Chisinau city, their increase in rural regions demonstrated that epidemiological situation remains tense.

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СОЦИАЛЬНО-ЭКОНОМИЧЕСКИЕ ФАКТОРЫ РИСКА РАЗВИТИЯ ТУБЕРКУЛЕЗА В УСЛОВИЯХ ВЫСОКОЙ МИГРАЦИИ В ПРИГРАНИЧНОМ РЕГИОНЕ

Е. Лесник¹, Л. Тодорико², А. Нигулену¹, И. Еременчук², И. Семьянив², Е. Подвербецкая²

Резюме. Туберкулез является классическим примером инфекционного заболевания, связанный с социальными детерминантами здоровья. Исследование включает в себя информацию о факторах риска, социально-экономический статус больных туберкулезом легких с высоким бременем туберкулеза трансграничного региона: Кишинев и город Бельцы и Западная Украина, Черновицкая область.

Ключевые слова: туберкулез, факторы риска, социально-экономический статус.

СОЦІАЛЬНО-ЕКОНОМІЧНІ ФАКТОРИ РИЗИКУ РОЗВИТКУ ТУБЕРКУЛЬОЗУ В УМОВАХ ВИСОКОЇ МІГРАЦІЇ В ТРАНСКОРДОННОМУ РЕГІОНІ

Е. Лесник¹, Л. Тодоріко², А. Нігулену¹, І. Єременчук², І. Сем'янів², О. Підвербецька²

Резюме. Туберкульоз є класичним прикладом інфекційного захворювання, пов'язаний із соціальними детермінантами здоров'я. Дослідження включає в себе інформацію про фактори ризику, соціально-економічний статус хворих на туберкульоз легень із високим тягарем туберкульозу транскордонного регіону: Кишинів і місто Бельци і Західна Україна, Чернівецька область.

Ключові слова: туберкульоз, фактори ризику, соціально-економічний статус.

Державний медичний університет медицини і фармації Ніколае Тестеміцану (Кишинів, Республіка Молдова)¹
Вищий державний навчальний заклад України «Буковинський державний медичний університет» (Чернівці)²

Рецензент – проф. Л.П. Сидорчук

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