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ЭПИДЕМИОЛОГИЧЕСКАЯ СИТУАЦИЯ ПО ТУБЕРКУЛЕЗУ В УЧРЕЖДЕНИЯХ ПЕНИТЕНЦИАРНОЙ СИСТЕМЫ УКРАИНЫ

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Получены результаты распространенности туберкулеза в пенитенциарных учреждениях Украины и дана оценка закономерностям, определяющим эпидемиологический процесс. Отмечены некоторые положительные тенденции показателей заболеваемости и смертности от ТБ.

Ключевые слова: эпидемиологическая ситуация; заболеваемость; смертность; туберкулез; ВИЧ-инфекция/СПИД; пенитенциарная система.

Introduction. Tuberculosis (TB) remains an important social and economic problem in the country. In its latest analysis of the global TB situation [1], WHO estimated that 89 incident TB cases (new and relapses) per 100000 population occurred in Ukraine in 2011, which is the 10th highest level among 53 countries of the WHO European Region (and 9th among 15 former Soviet Union republics). At the same time, the estimated TB mortality rate is the highest in the Region (18 per 100000). Ukraine is commonly considered as the country with the highest burden of HIV/AIDS in Eastern Europe and the former USSR. Annual number of new HIV infections has been increasing since 1999. In 2011, it was officially reported 21177 new HIV cases (46,2 per 100000 population) [2]. According to WHO estimates 18 incident TB/HIV cases per 100000 populations were registered in 2011 in Ukraine, which is also the highest rate in the European Region, substantially exceeding the levels in other countries. HIV prevalence among TB patients is very high and has increased from 11,3 % in 2009 to 16,6 % in 2010 and 18,5 % – in 2011 [1].

In the countries of Western Europe only single cases of TB disease are registered that mainly concentrate among immigrants, homeless, drug addicts and prisoners. In the Eastern Europe, including Ukraine, the TB epidemic covers wider populations and is complicated by the growing burden of HIV epidemic infection and a significant number of persons in penitentiary institutions. Pre-trial isolators (PTI) and penal institutions play the role of a “filter” by piling patients with active TB forms, 70,0 % of whom are unaware of their disease before their arrest, while more than 50 % of them have drug resistant forms of TB [3]. The penitentiary system is the epicenter

of the TB epidemic in society. According to WHO experts, the TB prevalence in the penitentiary systems of different countries is 10–100 times higher than in the civil sector [4]. The TB prevalence in the country or in the territory is estimated by epidemiological indicators. However, the scientific journals lack data on TB infection, incidence, morbidity and mortality in the penitentiary system of Ukraine. As of year 2005 data, the prison facilities of Ukraine included about 10 thousand TB patients, and the TB incidence in prisons was 60 times higher than similar numbers in the population [5].

Study objective constituted compilation and analysis of data on TB incidence and mortality in SPS institutions of Ukraine.

Study object and methods. Published data on TB incidence and mortality in the penitentiary system of Ukraine, 2001–2011, as well as data received from the Department of Health and Sanitary Provision at the State Penitentiary Service of Ukraine (SPS).

Study results and their discussion. An average population of the penitentiary system of Ukraine in 2011 was 153929 persons (337 per 100000 of the total population), including 38,799 – in PTI and 115,130 – in penal institutions. Annual average prison population has decreased by 18,0 % during years 2002–2011.

Figure 1 reflects the dynamics of the absolute number and TB incidence in the country (including penitentiary sector) for the last decade. According to the Ministry of Health of Ukraine [6] the number of new TB cases has increased from 68,6 per 100000 population in 2001 to 84,1 in 2005; however, its steady decrease was registered for the next six years. In 2011 30659 new TB cases were reported across the country, equivalent to 67,2 per 100000 population rate, that is

slightly lower than in 2001 and 20,1 % lower than the highest rate recorded in 2005.

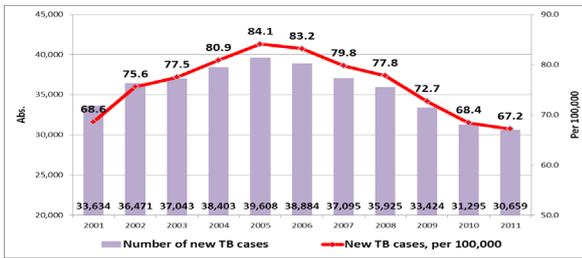


Figure 1 – TB incidence in Ukraine, 2001–2011 [6].

A similar trend was observed regarding TB mortality (Figure 2). Mortality increased by 23,4 % (from 20,5 to 25,3 cases per 100000 population) in the period 2002–2005, and decreased in the following years. If in 2005 11896 people died from TB, in 2011 this number was 6951 (with the rate 15,2 per 100000 which is 39,9 % lower than in 2005).

While remarking the above positive overall trends, it should be noted that in 2011, unlike the several years that proceeded, the annual change in the number of notified new TB cases was minimal: the 2011 notification rate was just 1,8 % lower than that in 2010.

Over the last 10-year period, a total of 46768 incident (new and relapse) TB cases were registered among detainees. The annual number of incident cases decreased from 9195 in 2002 to 6421 in 2005 (by 30,2 %) and further, more significantly, to 1930 cases in 2011 (by 69,9 % from 2005). Generally, the annual number of incident TB cases decreased 4,8 times during the last 10 years.

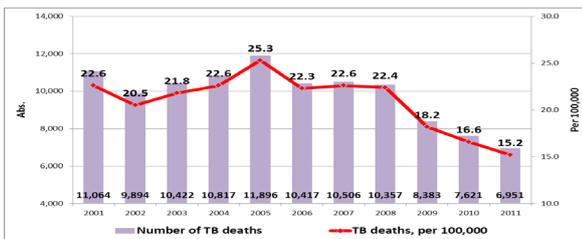


Figure 2 – TB mortality rate in Ukraine, 2001–2011 [6]

Accordingly, the rate of reported incident TB cases (new and relapse) was 1254 cases per 100000 prisoners, which decreased 3,9 times from 2002 (from 4901/100000 in 2002 to 3,122/100000 in 2005 or to 24,2 % and further to 66,3 % from 2005 to 2011). Trends in absolute and relative numbers on TB incidence in prisons is shown in Figure 3.

In 2002, the number of new TB cases, registered in the penitentiary sector, accounted for as much as

15,6 % share of the total number of new cases notified in the country. Afterwards, this percentage had been decreasing steadily until 2008, when it became 4,2 % of the total, and remained more or less at the same level during the years that followed (Figure 4).

Table 1 presents data on the total number of TB patients in the penitentiary system at the end of 2009–2011, with breakdown by the type of facility (TB hospital or PTI).

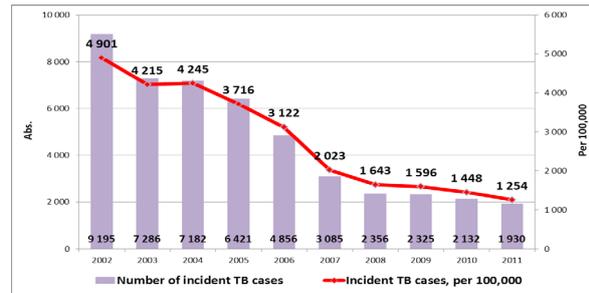


Figure 3 – TB incidence (new cases and relapses) in the penitentiary system

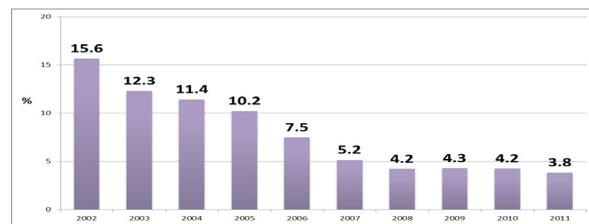


Figure 4 – New TB cases in penitentiary system as a share of the total number of new TB cases in Ukraine, 2002–2011 (%)

Table 1 – Number of TB patients at the end of the year in penitentiary system

Institution	2009		2010		2011	
	abs.	%	abs.	%	abs.	%
TB hospitals	4,684	81,8	4,558	82,8	4,052	83,7
Pre-trial isolators	1,043	18,2	949	17,2	789	16,3
Total	5,727	100	5,507	100	4,841	100

The total number of recurrent TB cases at least twice as large as the number of new cases, and the annual number of all active TB cases diagnosed and treated in prisons is 3500–4000 (about 1200 new cases and 2300–2800 relapses).

HIV cases among prisoners account for as many as about 12,0 % of the officially registered annual new HIV infections in Ukraine. HIV prevalence among all inmates was at 15,0 % (32,0 % in females and 12,0 % men) rate [7].

According to the SPS data from 1987 to 2012, a total of 35134 individuals were diagnosed with HIV in Ukrainian prisons, out of which 3544 developed clinical AIDS. During 2011, there were 2,819 new HIV cases in the system, and 881 AIDS patients. As of January 1, 2012, a total of 6910 HIV-positive persons (including 817 females) were under evidence in the penitentiary system, out of which there were 822 AIDS-patients (including 85 females), and 986 persons were receiving ARV-therapy. The absolute number of HIV-positive prisoners doubled from the beginning of 2005.

The registered HIV incidence in prisons increased from 1188/100000 in 2006 to 1831/100000 in 2011 and, today, is 40 times higher than the incidence among general country population. Clinical AIDS incidence in 2011 was 572 per 100000 prison population, compared to 20,1/100000 level country-wide. 388 HIV-infected individuals died in prisons in 2011, out of which more than half (216 or 55,7 %) – from HIV-associated TB.

The burden of TB/HIV co-infection is very high, as measured by its contribution to TB mortality. Table 2 and Figure 5 below show the absolute annual figures and mortality rates among TB patients from different causes. The total TB mortality rate in prison system increased over the past three years. In 2011, it reached 234,5 per 100000 prison population, which is 29,8 % more than in 2010.

Table 2 – Annual TB mortality rate in TB hospitals of SPS, 2009–2011

Cause of Death	2009		2010		2011	
	abs.	%	abs.	%	abs.	%
TB	95	37,7	88	33,1	105	29,1
TB and HIV/AIDS	133	52,8	156	58,7	213	59,0
Other causes	24	9,5	22	8,2	43	11,9
Total	252	100	266	100	361	100
Mortality rate per 100,000	173.0		180.6		234.5	

HIV/AIDS is the leading cause of death among TB patients. The percentage of deaths associated with HIV/AIDS increased from 52,8 % in 2009 to 59,0 %

in 2011. Mortality rate of HIV-associated TB has increased dramatically over the past three years: it increased by 16,0 % from 2009 to 2010 and by 30,7 % from 2010 to 2011.

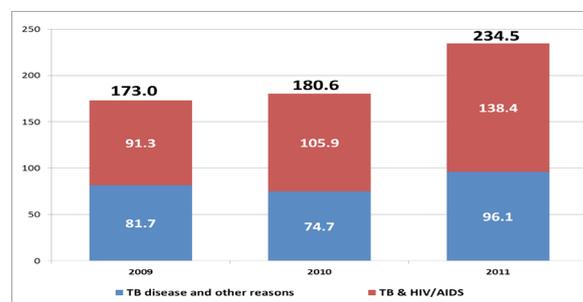


Figure 5 – TB mortality rate per 100000 prison population in penitentiary system, 2009–2011

Table 3 shows the absolute number of deaths from various causes in TB hospitals of prison system. In 2011, 243 TB patients died in such institutions that is 46,4 % more than the level of year 2010 and is the highest level in the last five years. Similarly to the overall trend, the share of HIV/AIDS associated deaths in the hospitals increased from 44,2 % in 2007 to 54,7 % in 2011. The in-hospital lethality accounted for 4,7 % of all discharges in 2011, compared to 3,3 % in 2009 and 2010 and 3,8 % in 2008.

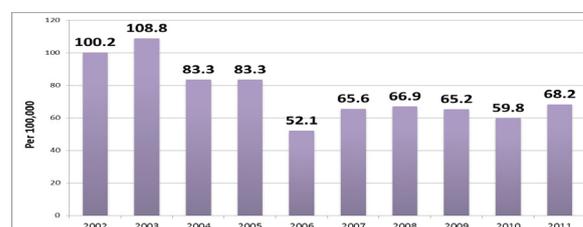


Figure 6 – TB mortality in SPS institutions, 2002–2011

Due to TB progression (i. e. excluding HIV/AIDS and other causes) the mortality rate dropped by half from 2002 to 2006 (from over 100 per 100000 to 52,1 per 100000, respectively). In subsequent years, however, no further improvement was achieved, and in 2011 TB mortality increased by 14,0 % compared

Table 3 – Absolute number of TB deaths from all causes in specialized TB hospitals in the penitentiary system, 2007–2011

	2007		2008		2009		2010		2011		Total	
	abs.	%	abs.	%								
TB	83	42.1	74	37.2	65	36.3	58	34.9	67	27.6	347	35.3
TB and HIV/AIDS	87	44.2	93	46.7	90	50.3	86	51.8	133	54.7	489	49.7
Other causes	27	13.7	32	16.1	24	13.4	22	13.3	43	17.7	148	15.0
Total	197	100	199	100	179	100	166	100	243	100	984	100

with 2010, which is higher than any other annual level since 2005 (Figure 6).

Conclusions. Generally, TB incidence and mortality in Ukraine increased from 2001 to 2005, but over the following six years there was a steady decrease.

In 2002, the number of new TB cases reported in the penitentiary sector amounted to 15,6 % of the total number of new cases in the country. Then this share gradually declined until 2008, and remained stable during the following years. Thus, in SPS institutions the annual number of TB cases has decreased 4,8 times over the past 10 years. From 2002 to 2005 this figure dropped to 30,2 %, and then to 69,9 % between 2005 and 2011.

The TB mortality rate in the prison system has increased over the past three years. In 2011, it reached 234,5 per 100000 prison population, which is 29,8 % more than 2010 rate. Due to TB progression mortality rate dropped by half from 2002 to 2006. No further improvement was achieved in the following years, and in 2011 the TB mortality rate was higher than any other annual level since 2005.

The intensity of the TB epidemic process is largely due to the fact that it develops in the light of HIV-infection/AIDS prevalence. Today, HIV incidence rate is 40 times higher in SPS institutions compared to general population. The AIDS incidence in 2011 was 572 per 100000 inmates. The burden of TB/HIV co-infection is very high. Mortality from HIV-associated TB has increased over the past three years: it increased by 16,0 % from 2009 to 2010 and by 30,7 % from 2010 to 2011.

The highlighted epidemiological situation is characterized by high rates of TB incidence and mortality rates. A decline in TB incidence reflects stabilization of the situation and the effectiveness of the TB preventive interventions in both SPS institutions and the whole country. But the TB mortality increase, especially caused by HIV infection, is the evidence of insufficiently harmonized organization of medical care provision for TB/AIDS patients and the effectiveness of ARV and TB treatment.

Prospects for further studies. The conducted analysis of TB incidence and mortality may provide an insight into the TB prevalence, as well as evaluate laws influencing epidemic process in SPS institutions of Ukraine. These data are promising for evaluation of early detection and diagnosis of TB, as well as treatment quality in penitentiary institutions and the level of awareness of health care institutions in the country on the TB prevalence among general population.

References

1. Global Tuberculosis Report 2012, WHO. URL: http://www.who.int/tb/publications/global_report/en/index.html/
2. Ukraine UNGASS Country Progress Report 2012. URL: [http://www.unaids.org/en/dataanalysis/knowyourresponse/countryprogressreports/2012countries/ce-UA_Narrative_Report %5B1 %5D.pdf](http://www.unaids.org/en/dataanalysis/knowyourresponse/countryprogressreports/2012countries/ce-UA_Narrative_Report%5B1%5D.pdf).
3. Кононец А.С. Лекарственно-устойчивый туберкулез легких в исправительных учреждениях уголовно-исполнительной системы / А.С. Кононец // Проблемы туберкулеза и болезней легких. 2008. № 12. С. 60–62.
4. Veen J. Microepidemics of tuberculosis: the stone-in-the-pond principle / J. Veen // Tuberculosis and Lung Diseases. 1992. Vol. 73 (2). P. 73–76.
5. Мельник В.М. Туберкульоз, як медико-соціальна і політична проблема / В.М. Мельник. URL: <http://www.ifp.kiev.ua/doc/people/msprob.htm>.
6. Туберкульоз в Україні: аналітично-статистичний довідник за 2000–2011 роки. МОЗ України. Київ, 2012. 87 с.
7. Analytical report on results of the linked research. Monitoring of awareness, behavior and HIV prevalence among prisoners as part of second generation HIV surveillance. Міжнародний Альянс з ВІЛ/СНІД в Україні, 2010. URL: http://www.aidsalliance.org.ua/ru/library/our/monitoring/pdf/zvit_zakl.indd_eng.pdf.