MORE THAN TEN YEARS OF DOTS IN BOSNIA AND HERZEGOVINA

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Abstract

Directly Observed Therapy Short-course (DOTS) is composed of five distinct elements: political commitment, case detection through quality-assured bacteriology; drug supplies; surveillance and monitoring systems and use of highly efficacious regimens; and direct observation of treatment.
DOTS produces cure rates of up to 95 percent even in the poorest countries and prevents the development of Multi-Drug Resistant Tuberculosis.
National TB Programme (NTP) has been started to introduce in 1994 according to DOTS principles in B&H with central and regional levels. At central levels there are national TB coordinators, and in all Cantons/Regions there are regional TB Coordinators. During intensive phase of therapy, patients are hospitalized. In the second phase of therapy, patients are treated in anti-tuberculosis dispensaries and some of them by a responsible member of the family (family supervision).
There are several weaknesses in implementation of DOTS in B&H: TB case detection was not fully implemented in all medical services. Registration of TB cases in some facilities, there is no official central recommended registry, individual reporting for treatment outcomes and establishing a reliable monitoring and evaluation system.
Application for 6 round of The Global Fund to Fight AIDS, TB and Malaria (GFATM) had been finally approved and signed for B&H in October 2007. These grants would repair some implementation gaps and improve DOTS strategy in B&H.

KEY WORDS: DOTS strategy, Bosnia and Herzegovina.

DOTS - Directly Observed Therapy Short-course, usual standard abbreviation for TB strategy all over the world.

Introduction

Directly Observed Therapy Short-course (DOTS) is composed of five distinct elements: political commitment, case detection through quality-assured bacteriology; drug supplies; surveillance and monitoring systems and use of highly efficacious regimens; and direct observation of treatment. WHO generally uses the term to mean the five components of DOTS. But the word "DOTS" is an acronym for Directly Observed Therapy Short-course. Many workers therefore interpret DOTS purely as direct supervision of therapy. In fact it has two purposes, to ensure that the patient with tuberculosis (TB) completes therapy to cure and to prevent drug resistance from developing in the community (1). *Political commitment* is needed to foster national and international partnerships, which should be linked to long-term strategic action plans prepared by National TB Programmes (NTPs). Strategic action plans should address technical and financial requirements and promote accountability for results at all levels of the health system (2). *Case detection through quality-assured bacteriology* for diagnosis remains the recommended method of TB case detection, first using sputum smear microscopy and then culture and drug susceptibility testing (DST). A wide network of properly equipped laboratories with trained personnel is necessary to ensure access to quality-assured sputum smear microscopy. In addition, every country should have a well-resourced and fully functioning national reference laboratory. The laboratory network should be based on the following principles: adoption of national standards in accordance with international guidelines; decentralization of diagnostic services, with high proficiency levels maintained; communication among members at various levels of the network; and functioning internal and external quality management, including supervision. Culture and DST services should be introduced, in a phased manner, at appropriate referral levels of the health system. Their functions should include diagnosis of sputum smear-negative TB, diagnosis of TB among HIV-positive adults and children, diagnosis and monitoring of response to treatment of MDR-TB, and testing related to periodic surveys of the prevalence of drug resistance. Maintaining the quality of the laboratory network depends on regular training, supervision and support, and motivation of laboratory staff. *Drug supply* with standardized TB drugs, with supervision and patient support is the mainstay of TB control organizing and administering across the country for all adult and pediatric TB cases – sputum smear-positive, smear-negative, and extra pulmonary. In all cases, WHO guidelines on patient categorization and management should be followed (3). These guidelines emphasize use of the most effective standardized, short-course regimens, and of fixed-dose drug combinations (FDCs) to facilitate adherence to treatment and to reduce the risk of the development of drug resistance. Separate WHO guidelines are also available for management of patients with drug-resistant TB (4). The TB recording and reporting system is designed to provide the information needed to plan, procure, distribute and maintain adequate stocks of drugs. Anti-TB drugs should be available free of charge to all TB patients. The Global Drug Facility (GDF) and the Green Light Committee offer countries with limited capacity the benefit of access to quality-assured TB drugs at reduced prices and also facilitate access to training on drug management (5). *Establishing a reliable monitoring and evaluation system* with regular communication between the central and peripheral levels of the health system is vital. This requires standardized recording of individual patient data, including information on treatment outcomes, which are then used to compile quarterly treatment outcomes in cohorts of patients. These data, when compiled and analyzed, can be used at the facility level to monitor treatment outcomes, at the district level to identify local problems as they arise, at regional or national level to ensure consistently high-quality TB control, and nationally and internationally to evaluate the performance of each country. Regular programme supervision should be carried out to verify the quality of information and to address performance problems. DOTS produces cure rates of up to 95 % even in the poorest countries and prevents the development of MDR-TB by ensuring the full course of treatment is followed. By the end of 1998, all 22 of the high burden countries which bear 80% of the estimated incident cases had adopted DOTS. The need to carry out specific interventions in addition to training in DOTS in universities and medical schools in order to improve TB control is discussed. A specific project in this area developed by the IUATLD in Latin America (6).

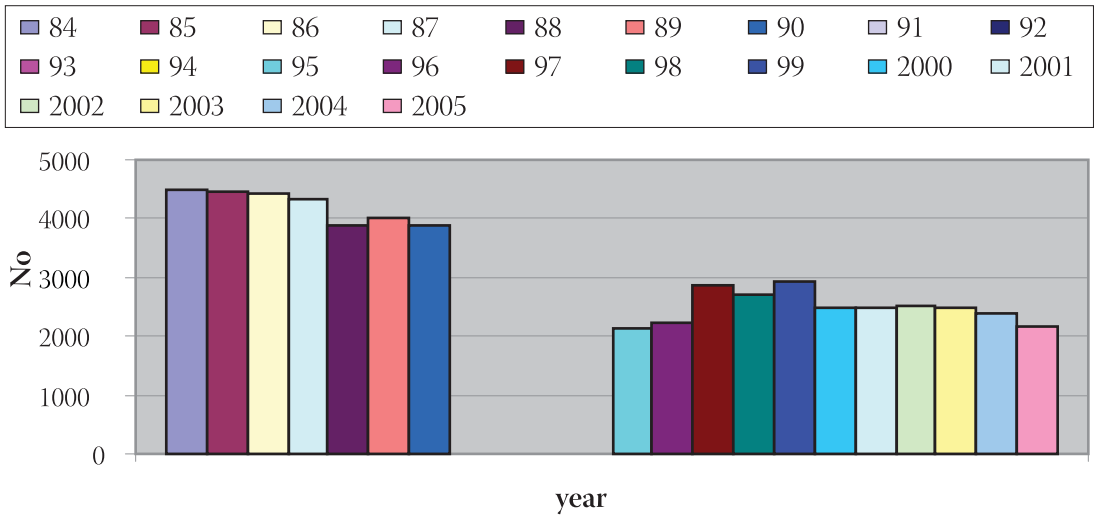
DOTS implementation in Bosnia and Herzegovina

In former Yugoslavia, Bosnia & Herzegovina had very high TB incidence rate over 100/100 000 population till 1988, and it's slightly decreased between 90 and 100. During the War in B&H DOTS strategy and National TB Programme (NTP) has been started to introduce in 1994 according to DOTS principles. In both Entities of B&H, Federation of Bosnia and Herzegovina (FB&H)

year	84	85	86	87	88	89	90	91	92	93	94
No	4490	4466	4430	4330	3901	4004	3872	*	*	*	*
incid*	110,4	113,0	110,0	106,0	94,0	96,0	95,0	*	*	*	*
year	95	96	97	98	99	00	01	02	03	04	05
No	2132	2220	2869	2711	2923	2476	2469	2506	2496	2382	2160
incid*	62,0	65,0	77,5	74,0	76,0	62,0	61,0	62,4	61,0	59,4	55,3

* incidence/100.000 population

TABLE 1. Number of registered TB cases and TB incidence rate in Bosnia and Herzegovina in period 1984-2005



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and Republika Srpska (RS) was established central level, and regional levels too, 10 in each canton of FB&H, and 7 in each region of RS, and one in District Brčko (DB). At central levels there are national TB coordinators, and in all Cantons/Regions there are TB Coordinators, and one in DB. All of them work on implementation of DOTS strategy in the whole country. NTP organization on each level (regional and local) have responsibility for close collaboration with Central Unit (Central level) based on activities planned for Cantons-Regions: planning, supervision and control activities (drugs supply, TB lab equipment supplies, documentation, correct reporting, training, case finding, reporting on treatment results). During intensive phase of therapy, patients are hospitalized. In the second phase of therapy, patients are treated in antituberculosis dispensaries (PFD) and some of them by a responsible member of the family (family supervision). After several years of implementation all B&H was covered with DOTS. B&H was categorized in category 4 by degree of DOTS implementation (coverage with DOTS is 100% -WHO Report 2003, p 11). National TB program (NTP) in Bosnia and Herzegovina was approved

year	84	85	86	87	88	89	90	91	92	93	94
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TABLE 2. TB Incidence rate in Bosnia and Herzegovina in period 1984-2005

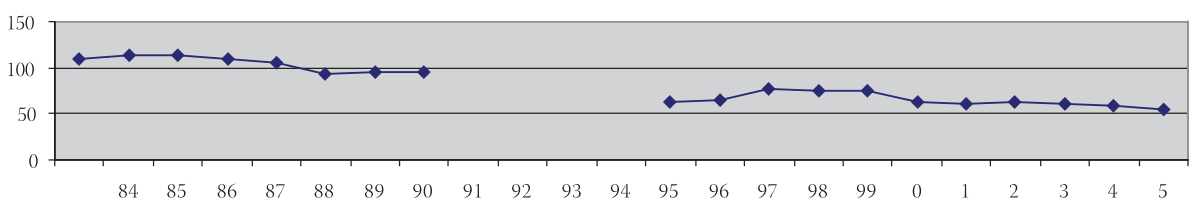

FIGURE 2. TB Incidence rate in Bosnia and Herzegovina in period 1984-2005

age groups/ gender	0-4	5-14	15-24	25-34	35-44	45-54	55-64	> 64	Unk*	Total
M	1	1	42	54	59	43	25	52	0	277
F	0	2	26	41	22	22	25	70	0	208
Total	1	3	68	95	81	65	50	122	0	485

*unk - unknown

TABLE 3. Number of New pulmonary smear positive TB cases in Bosnia and Herzegovina in 2004

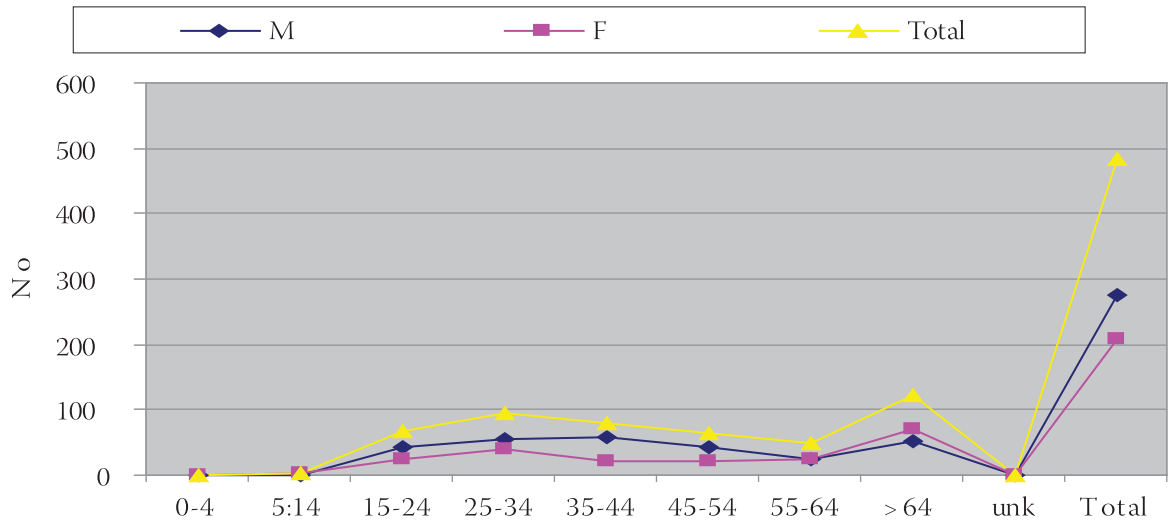

FIGURE 3. Number of New pulmonary smear positive TB cases in Bosnia and Herzegovina in 2004

on 24, May 1994. (This is a first NTB program in war) and after it were several edition of NTP, the last 2005. TB laboratory network follows similar structure of NTP, with reference TB labs in capitals of each entity, and network of TB labs in the whole country, a lot of small with smear microscopy, and several with cultures and DST. Internal quality control (QQ) was established after several years of implementation, and last year external QQ was established.

Results

Recording and reporting system reached WHO international standards with yearly reports through "Data collection form" and some of these data were presented in the next tables and figures:.

- No data during war in B&H

Table 1. and 2., and also Figure 1. and 2. show that the number of TB registered cases and incidence rate were gradually decreased. During the war in B&H there were no recording and reporting system, so there were no data on TB cases. After 1995 the number of TB cases was significantly smaller than before The War. The reason for it was smaller population, but decreasing TB incidence rate shows better TB control in the whole country. Incidence rate in B&H approaches gradually to the middle range incidence (20-49 TB cases/100 000 population). New pulmonary smear-positive TB cases belongs 55-64 and elder age groups, like in western European countries. (Table and Figure 3.) Table 4. and Figure 4. show that extra-pulmonary tuberculosis in B&H was under 10% of all TB cases, except in 2005. Usually

year	pulm	ep	total	Incidence /100 000
1984	4 490	201	4691	110,4
1985	4466	200	5 666	113,0
1986	4430	175	4 605	110,0
1987	4330	192	4 522	106,0
1988	3901	192	4 093	94,0
1989	4004	172	4 176	96,0
1990	3872	204	4 073	95,0
1991	*		*	*
1992	*	*	*	*
1993	*	*	*	*
1994	*	*	*	*
1995	1 983	149	2132	62,0
1996	2 088	132	2220	65,0
1997	2 694	175	2869	77,5
1998	2 476	235	2711	74,0
1999	2 653	270	2923	76,0
2000	2 283	193	2476	62,0
2001	2 232	237	2469	61,0
2002	2 279	227	2506	62,4
2003	2 281	215	2496	61,0
2004	2 187	195	2382	59,4
2005	2 003	157	2 160	55,3

TABLE 4. Number of registered all TB cases, pulmonary and extrapulmonary and TB incidence rate in Bosnia and Herzegovina in period 1984-2005

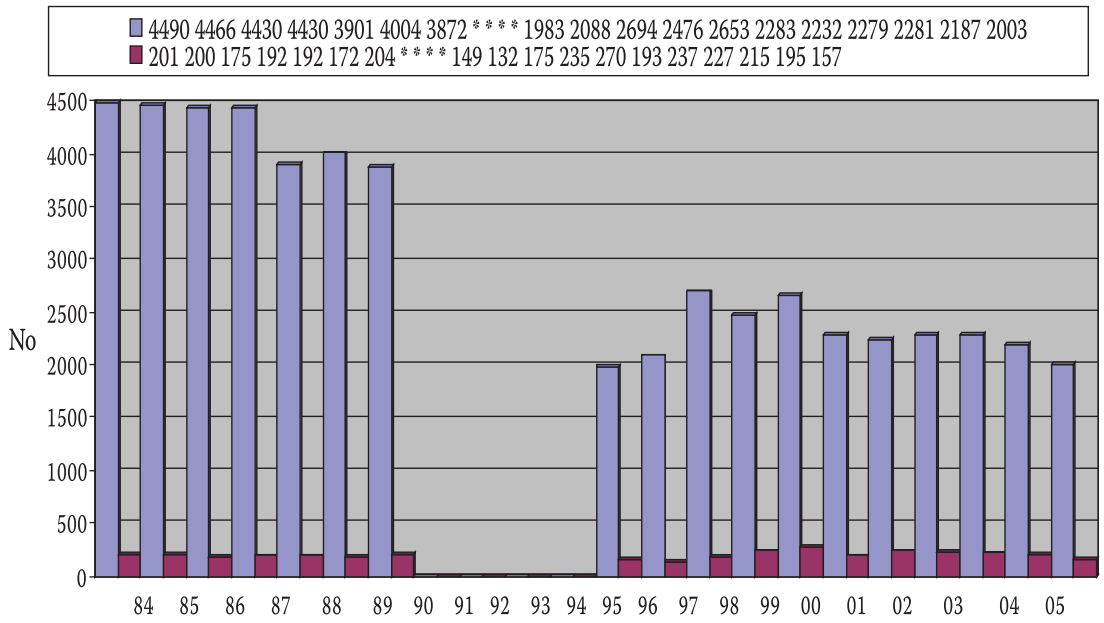

FIGURE 4. Number of registered all TB cases, pulmonary and extrapulmonary and TB incidence rate in Bosnia and Herzegovina in period 1984-2005

	NEW - DOTS	RETREATM. DOTS
P-C+	914	91
No of excluded	0	0
Cochort available. for evaluation	951	91
Cured	914	87
Completed	17	0
Died	5	2
Filed	4	0
Defaulted	4	1
Transferred	7	1
Steal on tr.	-	-
Unkn.	-	-
Total	951	91

TABLE 5. Treatment results for new and re-treatment TB cases in B&H in 2003

it can be till 15% of all TB cases. In the next table and figure were presented the results of treatment: TB outcome results presented on Table 5. and Figure 5 are very high – cure rate >96% for new TB cases, and 95,6 % for re-treatment TB cases.

Discussion

Nowadays, diabetes mellitus is one the main risk factors for cardiovascular disease. Successful diabetes control is very important for the patients in the need of CABG. Hyperglycaemia is in correlation with many side effects which in turn affect the heart. Effects of acute hyperglycaemia on vascular endothelium may cause poor surgi-

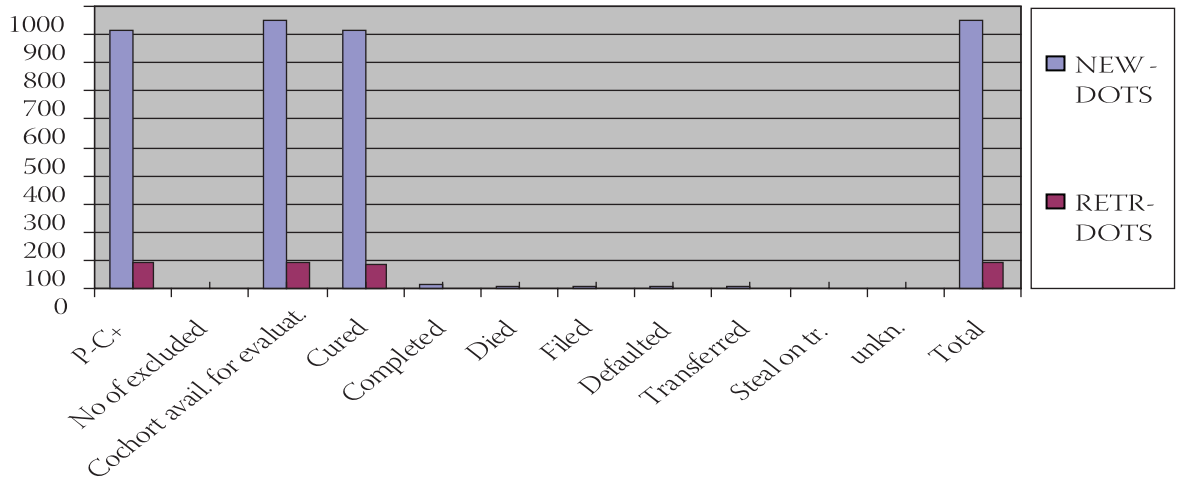

FIGURE 5. Treatment results for new and re-treatment TB cases in B&H in 2003.

cal result (9). This retrospective study shows postoperative blood sugar levels in patients who had CABG. Three groups of patients were considered. The first group included patients who had diabetes before surgical intervention and were treated with peroral antidiabetic. The second group included patients already taking insulin, while the third group consisted of patients without diabetes and served as the control. The results show that all three groups had increased values of blood sugar on the first postoperative day. The importance of glycaemia control on the first postoperative day was also analyzed in previous studies. Mc Alister et al. (5) proved that it is very important to decrease the levels of glycaemia on the first postoperative day. This is due to the fact that during this day, the values of glycaemia increase by 1 mmol/l which in turn relates to17% greater risk of unwanted side effects. Hyperglycaemia can lead to dehydration, electrolyte disbalance and arrhythmia. It is considered that these complications occur when glycaemia values exceed 11 mmol/l (6). Certain studies indicate that continuous insulin infusion following CABG exerts better control of glycaemia than insulin injections (7, 8). Patients with better glycaemia control stay shorter period of time in intensive care unit, they do not develop sternal wound infections and thus, the cost of treatment is lower. Study shows that the patients from the first group, who receive peroral therapy, need insulin after surgical intervention to treat diabetes. Stress during operation and administration of several medications after operation may also cause increased insulin resistance and distort glycaemia control.

Conclusion

During resent years NTPs of B&H had activities on DOTS implementation improvement. So far Application for 6 round of The Global Fund to Fight AIDS, TB and Malaria (GFATM) had been finally approved and signed in October 2007. These grants would repair some implementation gaps and improve implementation of DOTS strategy in B&H.
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List of Abbreviations

DOTS	-	Directly Observed Therapy Short-course
MDR-TB	-	Multi-drug Resistant Tuberculosis
NTP	-	National Tuberculosis Programme
DST	-	Drug Sensitivity Tests

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