

Healthy Israel 2020: Objectives, targets, and evidence-based strategies to prevent tuberculosis and HIV infection in Israel

**Daniel Chemtob, MD, MPH, DEA^{*1} and
Elliot Rosenberg, MD, MPH²**

¹Department of Tuberculosis and AIDS, Public Health
Services, Ministry of Health, Jerusalem, Israel and

²Healthy Israel 2020 Initiative, Ministry of Health,
Jerusalem, Israel

Abstract

Healthy Israel 2020 is Israel's long range health targeting initiative. The TB, HIV, and STI prevention subcommittee was charged with describing the local burden of disease, developing objectives and measurable targets for 2020 and proposing science-based interventions.

This article focus on TB and HIV prevention. Methods: Morbidity data were derived from two national registries, epidemiological and behavioral surveys. A 5-year TB incidence rate, calculated for each annual cohort of immigration, was adopted for Israeli immigrants. Five year (2015) targets were generated when existing trends could not reliably project 2020 rates. Expert opinion and international experience directed target setting. Interventions were modeled after international best practice and adapted to local conditions.

Results: Overall TB incidence decreased from 10.8/100,000 (1998) to 5.5/100,000 (2007). In 2020 TB incidence rate is expected to be reduced among the veteran Israeli population by 50% (to ~1/100,000). Overall HIV incidence is among the lowest in Western European countries (49.6 per million inhabitants, end 2007), but subpopulation groups show wide variability. *Conclusions:* TB control is currently at an advanced level as compared with many European countries. However, in an era of emerging resistance to TB treatment worldwide, major challenges exist for an immigrant-absorbing country such as Israel. A very specific mix of HIV epidemics exists due to the health history and current behaviors of its varied immigrant groups. To effectively control this complex situation, a multifaceted approach has been developed. However, to meet the ambitious targets set for both TB and HIV control, additional resources are vital.

Keywords: Tuberculosis, HIV, AIDS, policy, public health, Israel.

Introduction

Healthy Israel 2020 is Israel's long range health targeting initiative. Its overarching goal is to increase

* **Correspondence:** Daniel Chemtob, MD, MPH, DEA,
Department of Tuberculosis and AIDS, 91010 Jerusalem,
Israel. E-mail: dmchemtob@yahoo.com

the life expectancy and the quality of life of Israel's citizens, while reducing equity gaps within the population. It follows in the steps of such international efforts as the WHO's Europe Health21 (1) and the United States' Healthy People 2010 programs (2).

Since 2006, its twenty-one committees have worked in a systematic fashion. Topics were first selected on the basis of their respective burden of disease. Next, year 2020 outcome objectives with quantitative target values were fashioned. If insufficient baseline data existed, committees chose to create developmental data objectives, with the hope that this would facilitate the creation of appropriate databases so regular objectives could later be crafted.

To help reach these targets, committees were asked to search for science-based interventions in the literature. Naturally, local interventions were preferred, but in lieu of these, international strategies and interventions were accepted, with the caveat that they be practicable in Israel (3).

The infectious disease committee selected the following topics for subcommittee focus: vaccine-preventable diseases, prevention of nosocomial infections, prevention of zoonotic infections, increasing hand washing compliance in community venues, and prevention of TB, HIV and Sexually Transmitted Infections (STI). In this article, we will focus on TB and HIV prevention.

Prevention and treatment of tuberculosis (TB)

Current overview

Over the past decade, the incidence of TB has ranged from 5.5-11 cases per 100,000, with the rate highly influenced by the waves of immigration. In 2007, the national rate was 5.5/100,000. Treatment success reached roughly 80% in the year 2005. Multi-drug resistant TB has ranged from 4-12% during this decade, again fluctuating as per the influx of new immigrants (4-7).

In 1997, Israel's preventive, diagnostic, and therapeutic system was upgraded and a National Program was instituted (4,5). The new infrastructure included the following: nine TB diagnosis and

treatment clinics, two TB-oriented hospitals, two designated laboratories, 15 district and regional health offices (DHOs) and a national Department at the Ministry of Health (MOH) (4,5). The latter is responsible for establishing, implementing, and updating national policy, and oversees a monitoring system, through direct supervision of the nine clinics that began offering DOTS (Directly Observed Therapy, Short Term) by the DHOs (4,5).

Following diagnosis of a TB case, an epidemiologic investigation ensues. It focuses on locating all contacts. Supervised treatment for TB is administered as per the diagnosis. LTBI (Latent TB Infection) treatment is recommended when a diagnosis of active TB can be excluded. In addition to screening close contacts, high risk subpopulations are also screened for LTBI (4,5). The two TB-oriented hospitals and several others have respiratory isolation facilities (4,5). If active TB is suspected in a hospitalized patient, the medical authority is requested to transfer the patient to one of these two TB wards (4,5,14). Medical personnel undergo a tuberculin test to establish their individual baseline health status.

Specific concerns

The veteran population (i.e., those born in Israel) has an TB incidence rate of approximately 2/100,000 (6). Within this group, health targets characteristic of developed countries may be set. But for many new immigrants the scenario is more problematic and, in fact, resembles that occurring in countries with a moderate or high level of TB endemicity. This is the case among new immigrants from Former Soviet Union (FSU) and from Ethiopia. Their five-year cumulative incidence (as per cohort analysis) is on the order of 100/100,000 and 1,500/100,000, respectively (6). Mostly among FSU group, two main concerns figure prominently: 1) decreased adherence due to a high level of psycho-social risk factors, (8) and 2) an increasing rate of multi-drug resistant (MDR) and, recently, extensively drug-resistant (XDR) strains of TB (7).

The WHO defines resistance to the two most important first-line drugs, isoniazid and rifampicin, as multi-drug-resistant TB (MDR-TB). Resistance to these, as well as to a fluoroquinolone and at least one

second-line injectable agent (amikacin, kanamycin and/or capreomycin), is termed extensively drug-resistant (XDR) TB (10).

The burden of extensively drug-resistant TB (XDR-TB) in the larger of the two Israeli TB wards has been described by Lubart et al (11): 14 cases were diagnosed over the period 2000-2004. However, controversy exists regarding the methodology used to generate this report (12). Considerable attention has been devoted to the XDR-TB issue, since the 2006 publication of a very high case-fatality rate among HIV-infected XDR-TB patients in South Africa (13). Correct estimation of XDR-TB rate at a national level is thus critical. The challenge is to control the epidemic within this high risk group so as to prevent transmission of MDR-TB and XDR-TB both within and outside these groups.

Different scenarios exist for FSU and for Ethiopian immigrants. Increasing rates of MDR-TB among the FSU immigrants may soon exceed our ability to provide adequate levels of psycho-social support within the existing TB preventive and therapeutic care infrastructure (both hospital and ambulatory).

With respect to FSU and Ethiopian immigrants, substantial reduction of disease incidence will depend on three main factors: TB incidence among future immigrants in their home country, the level of adherence to TB treatment and to prophylactic therapy for LTBI, and the level of effective control of MDR-TB transmission within this group (8,9).

Lastly, some concern has been expressed regarding how to further increase the prevention of TB transmission within general hospitals prior to diagnosis of the TB index case.

Economic analysis

Since January 2010, the total cost of an ambulatory treatment of an active TB case was approximately USD 9,200, while the cost of a treatment for LTBI was approximately USD 390. In 1996, a cost-effectiveness analysis was conducted prior to the launching of the National TB program, and it was concluded that for each 500 cases correctly treated under the new DOTS policy, approximately 4-5 million US dollars would be saved (15).

Objectives

These naturally differ between low and high risk populations. Target rates were set via expert opinion. They are predicated upon continued implementation of existing strategies that have facilitated recent reductions of TB incidence in the respective populations. For all but the veteran Israeli population, reaching the targets will require implementation of the interventions delineated below. This is contingent upon provision of adequate funding to support these activities:

a) Veteran Israeli population: reduce the TB incidence rate by 50% to $\sim 1/100,000$ by the year 2020.

Baseline: $\sim 2/100,000$

Source: Department of Tuberculosis and AIDS

Rationale: In this group, a target incidence of 1 case per 100,000 was set, similar to that targeted by some Scandinavian countries and akin to the current target set by the US CDC (2). To reach this target by the year 2020 continued implementation of strategies currently applied in Israel should be sufficient, as per decreasing incidence trends observed during the last decade.

b) Immigrants from the Former Soviet Union (FSU): reduce the 5 year TB cumulative incidence rate by 40% to $\sim 60/100,000$ by the year 2015.

Baseline: $\sim 100/100,000$.

Source: Reference 6.

Rationale: Expert opinion. The fact that more immigrants are entering the country with MDR-TB currently precludes accurate prediction of future rates beyond 2015. At that time, though, it is hoped that generation of a realistic target for 2020 will be feasible.

c) Immigrants from Ethiopia: reduce the 5 year TB incidence rate by 50% to $\sim 750/100,000$ by 2015.

Baseline: $\sim 1,500/100,000$

Source: Reference 6.

Rationale: Expert opinion. All future target values are very sensitive to the level of adherence to the prophylactic therapy offered for LTBI.

d) Undocumented migrants: This group can have a significant impact on the overall national incidence as it comprises a relatively high proportion of the total cases. Establishing a specific target rate is

problematic due to the constant fluctuation in immigration patterns, the increased burden of TB in this subpopulation in recent years, and the need for additional funding for continuing performance of adequate TB control measures (e.g., provision of free comprehensive treatment for the active cases (4, 5)).

Developmental objective

Calculate the TB incidence rate in the undocumented immigrant population.

Interventions

It is important to improve outreach/coverage among LTBI and to improve adherence to DOTS among active TB cases. DOTS is eventually implemented in 100% of districts and individuals (10). However, delays in implementation occur almost exclusively among socially-challenged TB patients and among those with MDR. These are due to barriers such as comorbidities (drug or alcoholic misuses, psychiatric conditions), or to differing sets of priorities among recent immigrants (6,8).

Improving social support has been shown to improve the rate of implementation of Directly Observed Therapy, Short Course (DOTS). To facilitate this additional support, additional human resources will be necessary for outreach and support.

It is also necessary to provide additional respiratory isolation facilities in hospitals to allow isolation of suspected TB cases. There is reason to believe that provision of such facilities in all hospitals may prevent intra-hospital transmission of TB, particularly the outbreak of TB among immunodeficient patients (16). However, we currently lack sufficient data to fully understand the importance of transmission of TB in general hospitals in Israel, and the cost-effectiveness of such TB environmental measures in a low TB endemic context such as in Israel. Therefore, an in depth situation analysis of TB infection control (IC) situation in Israel has been recommended. In addition, other (non-TB) airborne transmitted diseases should also be addressed in order to maximise infection control measures and decrease the overall costs of environmental measures by

increasing the preventive "return on investment". Therefore, mapping of the existing infrastructure and the precise specification of required improvements are necessary. These should be elaborated in concert with the Healthy Israel 2020 subcommittee on the prevention of nosocomial infections.

HIV and aids

Epidemiology

Overall HIV incidence rate in Israel is among the lowest of those in Western European countries (49.6 per million inhabitants at the end of 2007) (17). However, major differences exist among subpopulation groups in the country (18).

During the years 1981-2007, 5358 new cases of HIV/AIDS were reported to the Ministry of Health. When fatalities and those who left Israel are subtracted from that total, one is left with 4239 individuals diagnosed with HIV/AIDS in Israel during that period. Based on epidemiological trends among each subpopulation group, we estimate that at the end of 2007, approximately 5940 individuals with HIV/AIDS resided in Israel (17).

For more than half of HIV/AIDS cases identified in Israel, the presumed origin of infection was abroad, and therefore, small changes in the absolute numbers have largely been influenced by waves of immigration. However, over the past five years, the absolute numbers have remained stable (with an average of 333 new cases reported annually). Of the 4239 individuals living with HIV in Israel at the end of 2007, 45.6% were migrants from countries with generalized epidemics, 17.0% were men having sex with men (MSM), and 13.4% were injecting drug users (IDU).

Objectives

These have been generated for each of the relevant subpopulation groups.

a) General population aged 15-54 years (includes heterosexuals not belonging to any of the subgroups described in sections b to d below): Maintain the existing low incidence of HIV.

Baseline: Women: 0.11-0.37 cases per 1,000 (2004-2006), or 2-7 new cases/year. Men: 0.36-0.54 cases per 1,000 (2004-2006), or 7-10 new cases/year.

Source: Department of Tuberculosis and AIDS.

Rationale: Expert opinion. As stated in the previous section, Israel has been successful in maintaining a relatively low incidence of HIV infection in the general population. Continued close surveillance and effective intervention are expected to perpetuate this trend.

b) Individuals originated from countries with a Generalized HIV Epidemic

1) Israeli migrants: Halt the rising trend of new HIV cases among Ethiopian immigrants by 2012 and then reduce that incidence rate by 25% by the year 2020.

Baseline: (absolute number of new cases) in 2007: 106.

Source: Department of Tuberculosis and AIDS.

Rationale: Expert opinion. With the end of the mass immigration from Ethiopia, the absolute number of HIV infections has decreased, although it should be noted that in Ethiopia, general HIV has decreased as well. However, the major concern lies with the continuing local transmission occurring among Ethiopian migrants in Israel, among whom the current preventive intervention has had only a minor impact on HIV transmission. Therefore, it is estimated that the proportion of cases due to local transmission will likely increase in the near future. This group will be the focus of renewed interventional efforts that are still in the planning stage.

2) Non-Israeli migrants: This group mainly consists of undocumented migrants. Therefore, at this point, it is impossible to define a measurable target for the year 2020.

Baseline (absolute number of new cases) in 2007: 50.

Source: Department of Tuberculosis and AIDS.

c) Men having sex with men (MSM): Halt the rising incidence among the adult homosexual population by 2013, and then reduce that incidence rate by 25% by the year 2020.

Baseline (absolute number of new cases) in 2007: 110.

Source: Department of Tuberculosis and AIDS.

Rationale: Expert opinion. Local surveys (Dept. of TB and AIDS unpublished data and reference 19)

show that this population possesses an adequate level of knowledge regarding the means to prevent HIV transmission. The major challenge is how to bring about a behavioral change within this community, so that condom use and drug-free sex will be the social norm. A variety of health preventive tools are currently being developed together with the major gay NGO in Israel in order to positively impact these social norms.

d) Injecting drug users (IDU): Reduce the incidence of HIV cases among the adult IDU population by 25% by the year 2020.

Baseline (absolute number of new cases) in 2007: 34.

Source: Department of Tuberculosis and AIDS.

Rationale: Expert opinion. The current decrease in the number of new HIV cases among IDU may likely be the result of two factors: a decrease of new immigrants coming from the Former Soviet Union, which have been the major source of IDU, and a change in behavior, resulting from the implementation of a harm reduction effort: the Syringe Exchange Program (SEP) (20). This intervention is currently being evaluated so that lessons learned can be applied in the near future.

Developmental data objectives

Non-Israeli migrants: Calculate HIV incidence rate in the undocumented immigrant population.

Interventions

Overview

Current interventions are based on good preventive/medical practices recommended by the WHO/UNAIDS (21).

AIDS was already defined as a severe reportable disease by the Ministry of Health back in 1987. A network of seven diagnostic and therapeutic centers has been in existence since the mid-1990s. The overall HIV infrastructure has been extensively described elsewhere (18). In brief, free and confidential HIV screening has been in place since 1986; the testing costs are covered by the MOH (18). The US Preventive Services Task Force recommends HIV screening be offered to all adolescents and adults

at increased risk of HIV infection (22). This screening includes men who have had sex with men after 1975, individuals having unprotected sex with multiple partners, past or present IDU's, individuals exchanging sex for money or drugs or having sex partners who do; individuals whose past or present sex partners were HIV-infected, bisexual, or IDU's, persons being treated for STIs, and persons with a history of blood transfusions between the years 1978-1985. In addition, they recommended HIV screening of pregnant women (22). On the other hand, the US CDC has supported a new HIV testing policy: opt-out screening for *all* patients in all health-care settings and universal prenatal screening of all pregnant women (23). Over the past years, these CDC recommendations have been extensively discussed by a task force at the Israeli MOH. It was decided not to adopt CDC recommendations, but rather continue implementing the current policy of HIV screening of high risk groups. Based on previous epidemiologic trends and the fact that almost all HIV-positive pregnant women in Israel have come from countries with a Generalized HIV Epidemic (OGE – as per WHO/UNAIDS definitions -21), it was decided not to require screening of all pregnant women, but only those specified as high risk by the MOH (24).

Blood products and transplant organs are routinely screened for HIV.

Multifaceted interventions, including health promotion and education and harm reduction programs, have been developed for the general population and for most high risk groups primarily by the Department of Tuberculosis and AIDS, with other partners assisting per topic.

A specific prevention program has been implemented for immigrants from Ethiopia. It is delivered by the Department of Health Promotion and Education at the MOH. Antiretroviral therapy (ART) is covered by Israel's national health insurance.. They are covered by national health insurance and updated regularly for inclusion in the health basket for new technologies and medications.

Specific strategies and interventions

Multifaceted interventions are required and are typically delivered by the Department of TB and

AIDS. The content and target populations and directions for the future are described below:

a) General population

Mass media campaigns for the general population are conducted on an annual basis, with an emphasis in past years on increasing condom use and the empowerment of women (25). In analyzing the impact of our general campaigns (as described above) in the year 2005 as compared with the year 2000 (25), we observed an increase in condom use (Chemtob D. Personal communication). The scope of these campaigns should be increased.

b) Individuals from countries with a generalized HIV epidemic

1) *Israeli migrants*: Most of the HIV patients in this population have been diagnosed since 1990 and came from Ethiopia. Since 1991, all new immigrants from Ethiopia (aged 9 and more) have been screened on arrival for HIV. ART has been introduced since 1997 in Israel. During the last two decades, there was variable implementation of a health education intervention among this population. Culturally-sensitive health education and support programs were first developed for immigrants of Ethiopian origin during 1990-3 (26). These limited activities ceased to exist due to budget constraints between 1993-7. Since 1997, a national program has been developed and implemented by the Department of Health Promotion and Education. Unfortunately, despite these efforts, the incidence rates among this group have remained much higher (30-60 fold) than that of the remaining Israeli population during this period, indicating a continuation of HIV transmission within this subpopulation group (Chemtob D, personal communication).

On the other hand, therapeutic medical treatment (ART) efforts have achieved measurable success. The impact of HIV treatment on morbidity and mortality among Israelis of Ethiopian origin for the years 1990-2006 has been extensively analyzed (and is currently being prepared for publication elsewhere). Survival analysis for those who were under ART demonstrated a very significant delay in the occurrence of AIDS and extended life expectancy as well (Chemtob D, personal communication).

2) *Non-Israeli migrants*: The vast majority of this subpopulation are undocumented, due to illegal entry or expiration of their visas. Therefore, good demographic, behavioral, and epidemiologic data are unavailable. As such, developing a science-based intervention presents a stiff challenge. However, it is estimated that more than 100,000 undocumented migrants live in Israel. Most of them come from countries with intermediate or high levels of HIV endemicity. Unfortunately, they have only limited access to HIV health care. The latter includes free and confidential testing, free ART for newborns, and free ART for pregnant women and at 6 months after delivery. Approximately 100 individuals have sought ART, mostly from NGOs in Israel. The Dept of TB and AIDS has prepared a recommendation to provide free access to HIV treatment, in a culturally sensitive manner for this subpopulation, in line with recommendations of UNAIDS (27). Yet, despite periodic requests for a specific budget for these issues, funds have not yet been forthcoming. Therefore, this policy has remained unimplemented.

c) *Men having sex with men (MSM)*: Web-based and field interventions have been conducted in collaboration with gay non-governmental organizations (e.g., the association for homo, lesbian, transgender and bi-sexual individuals) to enhance safer sex behaviors among MSM, but the absolute number of new cases has continued to increase since early 2000 and intervention efforts have not yet significantly impacted this trend. Several Dept. of TB and AIDS surveys (unpublished surveys and reference 19) have demonstrated the existence of deep-rooted high risk behavior, despite a high level of awareness and knowledge. These surveys were focused on secular populations. However, there are indications that other subpopulation groups (e.g., religious and ultra-orthodox Jews and Arabs) may possess a certain degree of risk, but internal stigmatization has complicated efforts to document these phenomena. We are, therefore, working to further understand the underlying subcultures in order to address relevant issues in a culturally-sensitive fashion. Among the secular Jewish population, there is a need to significantly increase the scope of current efforts.

d) *IDU's*: The syringe exchange program (SEP) and other harm reduction interventions have targeted IDU's and the homeless. It was started as pilot project

(20), and has subsequently been expanded. It is currently under evaluation. Several positive results are already evident (Chemtob D. Personal Communication). Following completion of program, evaluation, expansion and institutionalization are planned. Here too, though, there is a need to secure an adequate budget to ensure the sustainability of these activities.

e) *Adolescents*: Analysis of two national surveys done in collaboration with the Ministry of Education (one among the Jewish population and one among the Arab population) is currently underway by the Department of TB and AIDS to delineate behavioral trends and promising areas of intervention.

Implementation

Currently, with the exception of the program conducted among Ethiopian immigrants, the MOH Department of TB and AIDS has been funded to conduct preventive interventions and voluntary testing and counseling among all residents in Israel. However, a budgetary shortfall is inherent, as the number of HIV tests is constantly rising, but a parallel increase of budget has not been forthcoming. Consequently, the remaining prevention activities have suffered, with the exception of the high priority MSM program. In order to adequately address the present and future needs, an budgetary increases should be allocated over each of the next five years.

Conclusions

The existing TB and HIV/AIDS disease burden, year 2020 objectives and quantifiable targets, and current and future control efforts in Israel have been described. TB control is already at an advanced level compared with many European countries. However, major challenges exist for an immigrant-absorbing country such as Israel. This is particularly important in an era of emerging resistance to TB treatment worldwide, especially since such resistance tends to come from many immigrants' home countries. Therefore there is a strong need for additional resources to conduct and evaluate innovative interventions to meet these challenges.

With respect to HIV control the situation is more complex. Israel is home to a very specific mix of HIV epidemics due to the health history and current behaviors of its varied immigrant groups. To effectively control this complex situation, a multifaceted approach has been developed. However additional resources are needed to bring these efforts to full fruition.

Acknowledgments

We would like to acknowledge the contribution of the Healthy Israel 2020 "Tuberculosis, HIV and STI's" subcommittee members for their important contribution in the situation analysis and in the preliminary phase of setting priorities: Chemtob D (Chair), Chowes M, Dan M, Gandacu D, Shitrit D, Yust I. Thanks also to Dr. Emilia Anis, Chair of the Healthy Israel 2020 committee on Infectious Diseases. We would also like to thank the teams of the Department of Tuberculosis and AIDS and of the District Health Offices for collecting and managing the data analysed in this article, and for all TB and AIDS clinics, wards, and laboratories for having regularly notified these cases. The opinions expressed in this article are those of the authors and do not purport to represent the opinions of the agencies with which they are associated.

References

- [1] WHO-Europe Health21. URL: <http://www.euro.who.int/document/health21/wa540ga199heeng.pdf>
- [2] Healthy People 2010. URL:<http://www.healthypeople.gov/Publications/>
- [3] Rosenberg E, Lev B, Bin-Nun G, McKee M, Rosen L. Healthy Israel 2020: A visionary national health targeting initiative. *Public Health* 2008;122:1217-25.
- [4] Ministry of Health. National Program for the Elimination of Tuberculosis. Jerusalem: Directive Dir Gen, Min Health, 1997;3.
- [5] Chemtob D, Leventhal A, Berlowitz Y, Weiler-Ravell D. The new National Tuberculosis Control Programme in Chemtob D, Levit S, Mell H, Margolis A, Levy A, Leventhal A. "Injecting clean or being clean?" The International and Israeli experiences of syringe exchange program among Injecting Drug Users. *HaRefuah*, 2008;147(7):634-638, 660.
- [6] Israel, a country of high immigration. *Int J Tuberc Lung Dis* 2003;7(8):828-36.
- [7] Chemtob D, Leventhal A, Weiler-Ravell D. Screening and management of Tuberculosis in immigrants: the challenge beyond professional competence. *Int J Tuberc Lung Dis* 2003;7(10):956-66.
- [8] Chemtob D, Rorman E, Pinsker G, Roshal Y, Leventhal A. Multi and extensive drug-resistant tuberculosis burden in Israel, a country with immigration from high endemic areas. 4th Congr Int Union Against Tuberculosis Lung Dis, Europe Region, Riga, Latvia, June 2007:19.
- [9] Chemtob D, Levy A. Rationale and staff evaluation of using a "therapeutic milieu" for substance abusers within a Tuberculosis ward. *Subst Use Misuse* 2009;44(5):672-83.
- [10] Chemtob D. The National Tuberculosis Program in Israel – a decade of implementation. *Ann Sci Meet Isr Soc Pulmonol*, Cesarea, Israel, May 2007:31.
- [11] World Health Organization. Global Tuberculosis Control: surveillance, planning, financing: WHO report 2007. Geneva, WHO, WHO/HTM/TB/2007/376.
- [12] Lubart E, Lidgi M, Leibovitz A, Rabinovitz C, Segal R. Mortality of patients hospitalized for active tuberculosis in Israel. *Isr Med Assoc J* 2007;9:870-3.
- [13] Chemtob D. Mortality of hospitalized tuberculosis patients in Israel. *Isr Med Assoc J* 2008;10(3):245.
- [14] Gandhi NR, Moll A, Sturm AW, Pawinski R, Govender T, Lalloo U, et al. Extensively drug-resistant tuberculosis as a cause of death in patients co-infected with tuberculosis and HIV in a rural area of South Africa. *Lancet* 2006;368:1575-80.
- [15] State of Israel. Screening and prevention of tuberculosis in health care workers. Jerusalem: Directive Public Health Serv, Min Health, 2007;2.
- [16] Chemtob D, Ginsberg G.M, Weiler-Ravell D. Cost-effectiveness Analysis of a new National TB Policy in Israel. *Int J Tuberc Lung Dis* 1997;1(5):S137.
- [17] World Health Organization. WHO policy on TB infection control in health-care facilities, congregate settings and households. WHO Geneva: WHO/HTM/TB/2009.419.
- [18] Chemtob D. HIV/AIDS in Israel: Epidemiological periodic report 1981-2007. Jerusalem: Min Health, 2008.
- [19] Chemtob D, Grossman Z. The epidemiology of adult and adolescent HIV infection in Israel, a country of immigration. *Int J STD AIDS*, 2004;15(10):691-696. Mor Z, Davidovich U, McFarlane M, Feldshtein G, Chemtob D. Gay men who engage in substance use and sexual risk behavior: a dual risk-group with unique characteristics. *Int J STD and AIDS* 2008;19(10):698-703.
- [20] WHO/UNAIDS. Guidelines for second generation HIV surveillance. Geneva: WHO/CDS/CSR/ECD, 2000;5.
- [21] US Preventive Services Task Force. Screening for HIV. Topic Page. Rockville MD: Agency Healthcare Res Quality, 2007. URL: <http://www.ahrq.gov/clinic/uspstf/uspshivi.htm>

- [22] CDC. Revised recommendations for HIV testing of adults, adolescents and pregnant women in health care settings. MMWR 2006, 55(RR14):1-17.
- [23] State of Israel. Early diagnosis of HIV positive woman and her treatment. Directive Public Health Serv, Min Health, 2007;1.
- [24] Chemtob D, Damelin B, Bessudo-Manor N, Hassman R, Amikam Y, Zenilman JM, Tamir D. "Getting AIDS: not in my back yard" – results from a national Knowledge, Attitudes and Practices survey. Isr Med Assoc J 2006;8:610-614.
- [25] Chemtob D, Rosen H, Shtarkshall R, Soskolne V. A culturally specific educational program to reduce the risk of HIV and HBV transmission among Ethiopian immigrants to Israel: A preliminary report on training veteran immigrants as health educators. Isr J Med Sci 1993;29(6-7):437-442.
- [26] UNAIDS. 2008 UNAIDS Annual Report: Toward Universal Access. UNAIDS/09.25E/JC1736E, Geneva, 2009.

Submitted: April 15, 2010.

Revised: June 01, 2010.

Accepted: June 19, 2010.