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ORIGINAL ARTICLE

# Tuberculosis situation in Port Said governorate (1995–2011) before and after Direct Observed Therapy Short Course Strategy (DOTS)



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## KEYWORDS

TB;  
Dots;  
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**Abstract** *Background:* Tuberculosis (TB) is a major cause of illness and death worldwide, especially in Asia and Africa. In the early 1990s tuberculosis control in Egypt faced many problems. Major progress in global tuberculosis control followed the widespread implementation of the DOTS strategy.

*Aim:* The objective of this work was to study the tuberculosis situation in Port Said governorate from (1995–2011) before and after Direct Observed Therapy Short Course Strategy (DOTS).

*Methods:* This was a retrospective clinical cohort study carried out at the Port Said governorate. The registered data about all TB cases over a period of 16 years (1995–2011) before and after the application of DOTS were collected from the chest hospital and TB registration units.

*Results:* Percentages of cure and complete treatment significantly increased after DOTS (48.7% and 29.3% respectively) than before (19.5% and 13.7% respectively) ( $P < 0.001$ ). On the other hand, failure, death, default and transfer out decreased after DOTS (5.9%, 3.2%, 7.5% and 5.4% respectively) than before it (6.5%, 6.1%, 34.7% and 19.5% respectively), the results were significant ( $P < 0.05$ ) for all of them except treatment failure. The mean values of incidence rates (new and relapse cases, all cases and new smear positive pulmonary TB cases) of TB significantly ( $P < 0.05$ ) decreased after the application of DOTS. Also, the cure rate and treatment success rate significantly increased ( $P = 0.001$ ), while retreatment TB cases rate, default rate, transfer out rate and retreatment failure rate significantly decreased ( $P < 0.05$ ). Finally new pulmonary TB cases with no smear result significantly ( $P < 0.05$ ) increased after DOTS.

*Conclusion:* The introduction of DOTS in the Port Said governorate has led to a significant increase in the treatment success (82.7%) (Near the WHO target “85%”), and a decrease in the default and failure rates.

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## Introduction

Despite the availability of highly efficacious treatment for decades, TB remains a major global health problem. Globally, 9.2 million new cases and 1.7 million deaths from TB occurred in 2006, of which 0.7 million cases and 0.2 million deaths were in HIV-positive people [19].

In the early 1990s tuberculosis control in Egypt faced many problems, the most important of these problems were: Refusal by tuberculous patients to be hospitalized for their treatment, high defaulter rate, increasing levels of resistance against anti-tuberculous drugs and insufficient and deficient health education to both community and health staff [11].

Directly observed therapy short course (DOTS) means that a trained health care worker or other designated individuals provides prescribed anti-tuberculous drugs and watches the patient while swallowing each dose [3]. The main goals of tuberculosis treatment are to cure individual with the disease and minimize the transmission of mycobacterium tuberculosis to others in the community [6]. Major progress in global tuberculosis control followed the widespread implementation of the DOTS strategy. The Stop TB Strategy, launched in 2006, builds upon and enhances the achievements of DOTS. The five components of DOTS are: Sustained government commitment to TB control, case detection through sputum-smear microscopy in the general health services, standardized short-course chemotherapy to all TB cases under proper case management conditions, regular, uninterrupted supply of all essential anti-tuberculosis drugs and monitoring system for program supervision and evaluation [14].

The DOTS strategy has been implemented successfully in many countries and contexts. Through 2003, DOTS has been implemented in 182 of 211 countries, covering 77% of the world's population. In 132 countries, including most of the industrialized world, DOTS is available to more than 90% of their population. Average treatment success among all national DOTS programs is 82%, close to the 85% global target. By 2005, more than 20 million patients have been treated under DOTS, with an expected case detection rate of close to 50%. While the case detection rate has been increasing over the past decade, it is still below the 70% target [18].

A more positively, and reinforcing finding first reported in 2007, is that the number of new cases has been falling globally since 2003. Globally, the rate of case detection for smear positive cases reached 61% in 2006 compared with the target of at least 70%; and the treatment success rate improved to 84.7% in 2005 [19].

A study conducted to assess the cost-effectiveness of DOTS in Egypt, comparing DOTS delivered through primary health care centers (PHCs), chest clinics and chest hospitals with non DOTS. Costs are calculated for both patients and health services. Measurement of effectiveness is the number of patients cured. The study showed that DOTS delivered through PHCs is the most cost effective way of treating TB. The study also found that DOTS delivered through PHCs does not increase the cost to the patient and the lower defaulting rates suggest a reduction in future retreatment costs comparing the alternative treatment options [12].

**Aim:** The objective of this work was to study the tuberculosis situation in the Port Said governorate from (1995–2011)

before and after the application of Direct Observed Therapy Short Course Strategy (DOTS).

## Methodology

This was a retrospective clinical cohort study carried out at the Port Said governorate. The registered data about all TB cases over a period of 16 years (1995–2011) were collected from the TB registration units in the Port Said governorate. This period includes 2 stages; two years (1995, 1996) before the application of DOTS and fifteen years (1997–2011) after it.

### - The Collected data included:

- (1) TB registration code and the year.
- (2) Socio demographic data which included name, age, sex and residence.
- (3) Forms of tuberculosis; either: Pulmonary (either smear positive or smear negative) or extra pulmonary (and its site as LN, intestine, meninges, breast, renal).
- (4) History of previous treatment if present (Category of patients or type of the patient); either new, relapse, treatment after failure, treatment after default, transfer in or others.
- (5) Schedule of treatment (Recommended standardized treatment regimen) according to NTP [13].
- (6) The recorded follow up for smear-positive pulmonary tuberculosis included sputum smear microscopic examination for acid fast bacilli, at the end of the 2nd month, at the end of the 5th month and at the end of treatment [13].
- (7) Outcome: which included: Cure, treatment completed, treatment failure, died, default and transfer out.
- (8) Culture result: The total number of cases examined yearly by culture and its result.

- **TB indicators** designed by The World Health Organization [17] to determine national TB program (NTP) quality and effectiveness were calculated, These indicators are:

- Incidence rates (case notification rate): For new cases, new and relapse cases, all cases and new smear positive pulmonary cases.
- New pulmonary TB cases with no smear result.
- New adult smear positive cases.
- Re-treatment TB cases.
- New extra pulmonary TB cases.
- New TB cases with no smear conversion result.
- Sputum conversion rate at the end of the initial phase of treatment.
- Cure rate.
- Treatment completion rate.
- Death rate.
- Treatment failure rate.
- Default rate.
- Transfer out rate.
- Re-treatment failure rate (chronic TB rate).
- Comparison of indicators before and after DOTS was carried out.

## Statistical analysis

The collected data were tabulated and analyzed using SPSS version 16 software, categorical data were presented as number and percentages while continuous variables were presented as

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