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Evaluation of tuberculosis public health surveillance, Al-Madinah province, Kingdom of Saudi Arabia, 2012

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Abstract The objective of the study is to evaluate the quality of the data, the sensitivity of the surveillance, and the completeness of identification and investigation of tuberculosis (TB) patient's contacts. The study covered the TB surveillance program in Al-Madinah province in 2011. First, we reviewed all the notifications, treatment cards, and register books, as well as monthly and quarterly reports, for completeness and accuracy of data. Then, we searched for the missed cases that were not reported. Finally, we reviewed all the patients' household contacts' reports to assess the degree of completion of identification and investigation. There were 444 cases detected during the study period; only 200 cases were reported. The sensitivity of the TB surveillance system was 45%. Among the 200 reported cases, the results revealed high completeness rates for demographic and disease data and low completeness rates for the test result fields. The contact identification and investigation showed that 34.4% of smear-positive cases' contacts were not identified. Only 67% of identified contacts were investigated. The review of hospital records and lab registers showed that 244 cases were not reported. In conclusion, the TB surveillance system has several areas that need improvement.

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1. Introduction

Tuberculosis (TB) is a significant global health problem. Among infectious diseases, TB is the second leading cause of death globally and the single most infectious killer among youth and adults [1]. Currently, one-third of the world's population is infected with *Mycobacterium tuberculosis* [2]. Not all TB cases are identified, and some that are identified are not treated. Untreated active TB patients can infect 10–15 additional persons annually [3].

The Kingdom of Saudi Arabia (KSA) does not have a high TB burden, yet it faces real challenges in controlling and preventing TB due to its huge number of pilgrims and migrant workers. In 2011, there were 6200 total cases in KSA, of which 4900 were incident cases. In the same period, there were 1100 deaths due to TB. In addition, there were 110 cases of TB and HIV co-infections. According to WHO, 80% of TB cases were detected, and most of the new cases were smear-positive, the most contagious type. WHO estimated that MDR-TB comprised 1.8% of all TB cases. The prevalence and mortality rates over the last 10 years have remained almost unchanged [4]. In the Madinah province, the annual incidence rate of TB cases was 8.6–9.6 per 100,000. The TB surveillance program encompasses the whole province population, which totals 1,858,000 persons.

KSA, like many countries in the world, has a TB surveillance program, which is responsible for data collection, analysis, and feedback, as well as the implementation of actions. The quality of data that are collected by surveillance is a critical attribute. More accurate and complete data increase the usefulness and utilization of information. High detection rates coupled with accurate and complete data help health officials understand trends of diseases in a country and their characteristics in addition to disease burden. The identification of new TB cases among contacts is one of the key steps in prevention. Contacts are defined by KSA's TB surveillance system as those who share the same home as the patient. A strong surveillance system helps decision makers establish and evaluate different interventions for prevention and control. Further, it assures appropriate medical therapy and follow-up. Beyond that, data can be used to make comparisons between regions, as well as other countries.

The National Tuberculosis Control Committee in KSA was established in 1992 to implement a program throughout the country. They launched the public health surveillance (PHS) and created a manual. When any suspected TB cases are identified in any health care facility, they will be referred to the

hospitals for confirmation by sputum smear microscopy, mycobacterial culture, radiography and histopathology. Those with pulmonary TB and sputum smear positive results are admitted to the hospitals for 2 months and their household contacts are investigated for TB. When hospital admission is not required, the hospital or primary health care center will track the case and ensure compliance to the treatment. Due to TB's public health importance, prevention and treatment related services for TB patients and their contacts are administered through a MOH team regardless of patients' citizenship or reason for visiting the kingdom.

PHS consists of multiple, consecutive steps. The suspected case is registered in a special logbook and referred for confirmation to the nearest hospital by the physicians. After confirmation, the case is reported to the hospital TB coordinator who is responsible for notification of the regional coordinator. All patients' lab results and treatment outcomes will be sent to the regional TB coordinator. The regional TB coordinator (1) sends the public health team from the nearest primary health care center to identify and investigate the patient's household contacts, (2) gives the patient a unique number and sends this number to the hospital to label the patient's treatment card, and (3) monitors the defaulted cases and persuades them to complete their treatment. Monthly, regional coordinators submit a report of the new and relapsed cases as well as the lab results and treatment outcomes to the central unit [5–7].

To improve PHS, it is essential to evaluate it regularly to ensure that the disease is monitored efficiently and effectively. Different PHS attributes can be assessed depending on the purpose of the program and the aim of the evaluation. The evaluation methods should highlight the program's substantial features since the PHS programs differ in their purposes, objectives, methods, and target populations [8]. After each evaluation, the recommendations should be adopted to improve the quality, efficiency, and usefulness of the program.

2. Methods

This study was conducted in Al-Madinah, KSA, during the summer of 2012 in order to evaluate Al-Madinah's TB PHS in 2011. Evaluation was based on all new TB cases diagnosed between Jan 1, 2011, and Dec 31, 2011. We reviewed register books from the three laboratories in Al-Madinah, the admission reports and patients' diagnoses in hospital records, and the register books in the infection control or public health departments;

