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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. Currently, 1/5 of the world's population is infected with *Mycobacterium tuberculosis*.

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 6,200 cases in KSA; 4,900 were incident cases. In the same period, there were 1,100 deaths due to TB. In addition, there were 110 cases of TB and HIV co-infections. According to WHO, 80% of the TB cases were detected, and most of the new cases were smear-positive, the most contagious type. In contrast to other countries in the region, whose prevalence and mortality rates have decreased, the rates in KSA in the last ten years have remained almost unchanged.

To control and eliminate TB, KSA launched a TB surveillance program in 1992. This program is responsible for data collection, analysis, and feedback, as well as the implementation of actions.

Objectives:

To evaluate the quality of the data, the sensitivity of the surveillance, and the completeness of identification and investigation of patient's contacts of TB PHS (Public Health Surveillance) in Al-Madinah province.

Methods:

The study was conducted in KSA during the summer of 2012. The study covered all new TB cases diagnosed between Jan. 1, 2011 and Dec. 31, 2011.

The missed cases (sensitivity) were identified by comparing all of the cases that were reported to the regional coordinator with all of the cases registered in the labs and hospitals.

Due to the highly infectious nature of TB, all of the contact investigations were reviewed. The TB program requires investigation of pulmonary TB patients and their contacts with positive sputum smears.

All notifications sent from any health facilities to the regional coordinator were examined to assess external completeness.

To describe the internal completeness of data, monthly reports sent to the national coordinator were compared with patient treatment cards.

Results:

The results revealed high completeness rates for demographic and disease data and low completeness rates for the test result fields. The lowest completeness was seen in the HIV test result field. The contact identification and investigation showed that 42 smear-positive cases' contacts were not identified. Out of the 448 contacts identified, only 301 (67%) of them were investigated. The review of hospital records and lab registers showed that 244 cases were not reported, in spite of the fact that 213 of them (87.3%) were confirmed by labs.

Category	Issue	Missed	Label it (not done)	Completeness rate
Demographic data	Name	Zero	-	100%
	Nationality	Zero	-	100%
	Age	1	-	99.5%
	Gender	3	-	98.5%
	ID	17	-	91.5%
Contact information	Patient telephone number	21	-	89.5%
	Sign and symptoms	5	-	97.5%
Disease data	Patient's classification	11	-	94.5%
	Treatment plan	11	-	94.5%
	Past history	12	-	94%
	Site of the disease	18	-	91%
Investigation results	Sputum smear	37 (92.5%)	3 (7.5%)	80%
	Chest x-ray	36 (87.8%)	5 (12.2%)	79.5%
	Tuberculin test	90 (83.3%)	18 (16.7%)	46%
	Sputum culture	110 (80.3%)	27 (19.7%)	31.5%
	HIV test	130 (86.7%)	20 (13.3%)	25%
	Admission date	9	-	95.5%
	Hospital name	31	-	84.5%
	Doctor name or signature	41	-	79.5%

Table 1. Completeness Rate of Different Categories on TB Notification Forms, 2011, Saudi Arabia, Al-Madinah Province

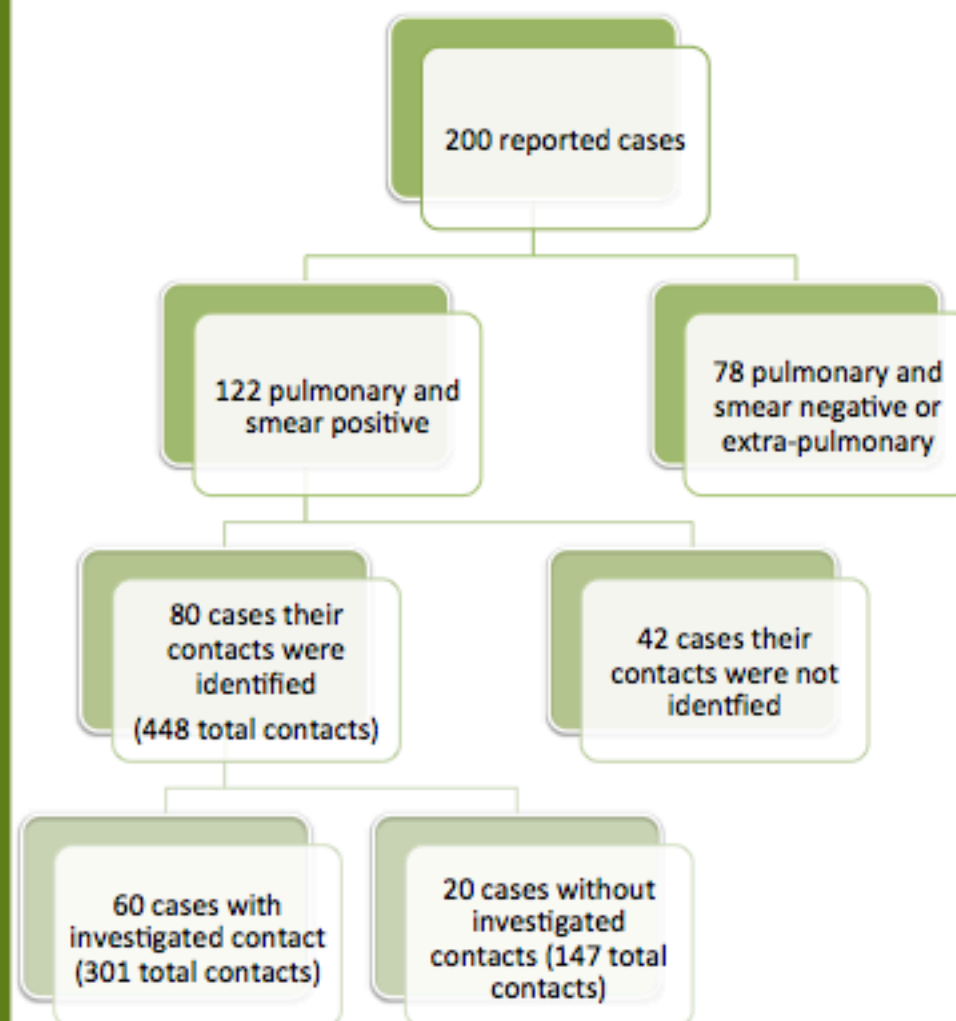


Figure 1. The Identification and Investigation of the Contacts in 2011, Saudi Arabia, Al-Madinah Province.

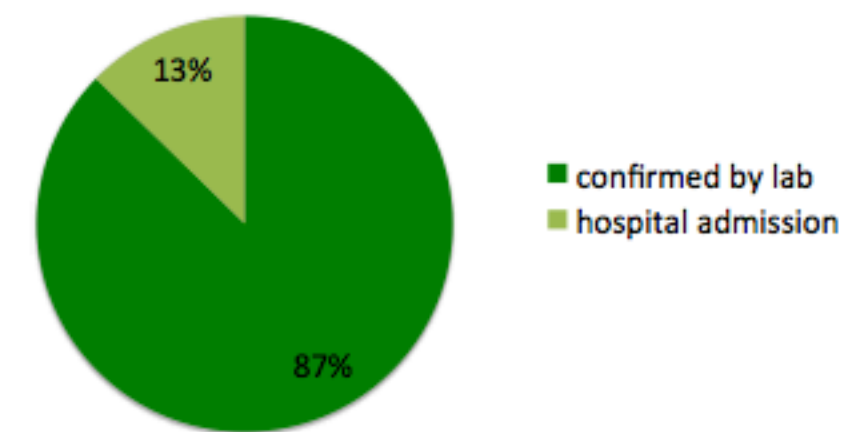


Figure 2. The Distribution of Missed Cases in 2011, Saudi Arabia, Al-Madinah Province

Field	Discrepancies
Result of treatment *	8 (8.5%)
X-ray	16 (8%)
Sputum smear	11 (5.5%)
Treatment plan	6 (3%)
TB code	5 (2.5%)

Table 2. Discrepancies Between Register Book and Monthly Reports, 2011, Saudi Arabia, Al-Madinah Province

* The results in the report that was sent to Ministry Of Health were available for only 94 patients. The rest were not sent until after the data collection.

Recommendations:

Implementation of automated notification and reporting

Rapid and complete reporting is required in order to control and prevent TB. Electronic reporting should include both providers and laboratories. Such a system will reduce incompleteness in data and delays in reporting that result from paper-based notifications.

Mandatory lab and suspected cases reporting

Because laboratories identified most of the missed cases, it is essential to implement mandatory laboratory reports. Also, all suspected cases should be reported to the coordinator even before lab confirmation. By providing a brief summary of suspected cases, the coordinator can follow up on the cases through the hospitals and labs looking for either confirmation or incorrect diagnosis. In addition, s/he can investigate the contacts early and interrupt the transmission. As a result, the rate of underreported cases will be reduced.

Investigation of the contacts

Improving the communication between different health providers, especially in primary care centers, will improve the investigation and facilitate progress.

Other strategies, like initiating a specific outreach program and continuous training program tailored to healthcare providers, will increase doctors' awareness and improve their response rate. Also, a revision of the national TB control program manual, which includes disease information, reporting guidelines and control recommendations, would also increase awareness and improve reporting. Periodic feedback from headquarters to regional coordinators and the dissemination of progress reports will increase the confidence of the providers in the program. Finally, the program should be evaluated periodically to improve its quality and achieve optimum disease control.

Limitations:

First, all data were handwritten, which took a long time to read and evaluate. Second, the lab registrations were unclear and did not contain the whole names. Third, the treatment cards of some patients were not on hand at the coordinator's office. Fourth, there were no other TB patient record systems, so we could not apply the capture-recapture method. Finally, there were no electronic records of the inpatients in the hospitals, so we could not find the missed admitted cases.

Conclusion:

The study showed that the rates of completeness for the different notification report fields varied; the lab results and HIV test fields had the lowest rates of completion. Also, over half of the patients' contacts were not identified or investigated, and there were a significant number of unreported cases, even though most all of them were laboratory confirmed. Finally, there were discrepancies between different records and the reported data.