

Low tuberculosis case detection in Gokwe North and South, Zimbabwe in 2006

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Abstract

Background: Case detection is an important component of tuberculosis control programmes. It helps identify sources of infection, treat them, and thus break the chain of infection.

Objective: To determine the reasons of low tuberculosis case detection in Gokwe Districts, Zimbabwe.

Methods: A descriptive cross sectional study was conducted. We used interviewer administered questionnaire for nurses and patients, checklists, key informant interviews.

Results: Thirty-eight nurses, forty-two patients and seven key informants were interviewed and 1254 entries in tuberculosis register were reviewed. Nurses correctly defined pulmonary tuberculosis, listed signs and symptoms, preventive measures and methods of tuberculosis diagnosis. Exit interviews showed 9/42 (21%) of patients presenting with cough were asked to submit sputa for examination and asked about household contacts with tuberculosis. About 27% of patients who were sputum positive in the laboratory register were not recorded in the district tuberculosis register. This contributed to the high proportion of early defaulters among tuberculosis suspects.

Conclusion: Low tuberculosis case detection was because nurses were not routinely requesting for sputum for examination in patients presenting with a cough or history of previous treatment for cough. Nurses should routinely request for sputum for examination in patients presenting with a cough or history of recent treatment for cough.

Key words: case detection, tuberculosis, Gokwe North and South, Zimbabwe

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Introduction

Tuberculosis is caused by *Mycobacterium tuberculosis* and is spread through droplet nuclei from person to person. Pulmonary tuberculosis mainly presents with a cough of more than 2 weeks, chest pain, coughing up blood or sputum, weakness, weight loss, poor appetite, fever and night sweats¹

Targets for tuberculosis control are detection of 70% of new smear positive cases and treatment success rate of 85% of detected cases made possible through systematic patient education, short course chemotherapy, decentralized clinic organisation and defaulter retrieving. This is complemented by public education, passive case finding with sputum smear microscopy and systematic investigation of household contacts.²⁻⁵. Case-finding is an essential component of the control

of tuberculosis through identification of individuals discharging numerous tubercle bacilli. Treatment of these individuals rapidly renders them noninfectious, thereby cutting the chain of transmission. A secondary benefit is minimizing the delay in initiating treatment, thereby increasing probability of cure⁴

Bacteriology remains the recommended method of tuberculosis case detection, first using sputum smear microscopy and then culture³. Missed cases are infectious until commenced on treatment. Each case has the potential of infecting 10-15 healthy individuals annually⁶.

Globally every year about 100 million people are infected, 9 million develop active tuberculosis and 2 million die from it. Annual tuberculosis incidence is increasing by 1% per year globally⁷. In Africa the rate of increase is much higher due to higher HIV. WHO estimates that 1.6 million new infectious cases of tuberculosis and 600000 deaths occur annually making tuberculosis one of the commonest preventable causes of death in Africa⁸.

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District Tuberculosis and Laboratory registers and stock cards were reviewed from January to December 2005. If a patient was sputum positive in the laboratory of April 30, they were documented in May in the district TB register as sputum positive in April even though registration was in May. The patient appeared in the district TB register as an April patient, which date they were found positive. Following the spot, morning procedure for collecting sputum, patients submit 2 sputum specimens at one time and they are given one serial number. If the two specimens are both positive they are counted as one.

We calculated the proportion of health workers with correct knowledge of the signs and symptoms of tuberculosis, proportion of nurses doing the correct thing when they met suspects and the proportion of suspect tuberculosis patients that were missed.

Verbal consent was obtained from individual who participated in the study and confidentiality was assured. Patients who had cough for 2-3 weeks who were not screened were referred for reassessment. Permission was obtained from the Provincial Medical Director, the District Medical Officer for Gokwe and the Health Studies Office.

Results

Findings from Health Workers

Demographic Information

We interviewed all 38 nurses. The median length of service in the Ministry was 2.5 [$Q_1=1$; $Q_3=15$]. Only two nurses (5.3%) had received refresher training in tuberculosis management. The demographic characteristics of nurses are shown in Table 1.

Table 1: Demographic Characteristics of Nurses and Patients Interviewed in Gokwe North and South Districts, 2006

Demographic variable	Value
Nurses median years of experience (n = 38)	2.5 years ($Q_1=1$; $Q_3=15$)
Nurses median length of stay at institution	2 years ($Q_1=1$; $Q_3=6$)
Median age of respondents (n=42)	27 years ($Q_1=16$; $Q_3=37$)
Occupation	
Formal employment	9
Informal employment	4
Unemployed	15
Children	13

Continuation of table 1

Demographic variable	Value
Smoking status	
Current smoker	7
Ex-smoker	4
Never smoked	29
Median distance to health facility	5km ($Q_1=2$; $Q_3=7$)

Knowledge

A correct definition of tuberculosis was given by 35 (92%) nurses. Persons mentioned as being at risk of getting tuberculosis were those with compromised immunity, children under five years and those living in overcrowded places.

Knowledge was high if respondents could give 3 or more symptoms of tuberculosis. Eighty seven percent gave 3 or more signs and symptoms of tuberculosis. Main symptoms mentioned were weight loss, cough lasting more than 2 weeks, haemoptysis and night sweats

The mode of transmission was well known with 36/38 (95%) mentioning that tuberculosis was airborne. About a third of the nurses mentioned correct prevention measures. The correct duration of treatment was mentioned by 35/38 (92%) nurses and tuberculosis treatment drugs were well known. Nurses observed patients that had paid for chest X-ray (22/38) (58%) and sputum examination (11/38) contrary to national TB policy which states that these services should be free.

Tuberculosis Diagnosis

Nurses are expected to identify suspects, advise patients to cough up sputa after providing a specimen jar, complete the laboratory request form, direct the patient where to submit sputa (laboratory), collect results and document them on patient's card and then refer patient to the physician.

Nurses knew the different methods of diagnosing tuberculosis. The gold standard for tuberculosis diagnosis was said to be sputum microscopy by 20/38 (53%) nurses. All the nurses knew that three sputum specimens were required for tuberculosis diagnosis but the correct frequency of sputum collection was known by 4/38 nurses. Table 2 shows when nurses said they would begin to suspect tuberculosis in a patient.

Table 2: Situations that aroused suspicion for tuberculosis in nurses

When tuberculosis suspicion is aroused	Frequency (N=38)
When there is sputum production and weight loss	32
When there history of cough for more than 2 weeks	30
If a household contact is diagnosed tuberculosis	10
When there is recent history of previous treatment for cough	10

Questions nurses asked to confirm tuberculosis suspicions were mainly history of household contacts with tuberculosis and history of night sweats. They would proceed to take weight (29/38), temperature (27/38), pulse (8/38), respiration (2/38). They would order sputum examination (37/38) and a chest X-ray (28/38). For tuberculosis diagnosis in children 14/38 nurses would check for growth faltering, another 14/38 respiratory symptoms lasting more than 3 weeks after antibiotic treatment and 9/38 would ask for history of household contact with smear positive tuberculosis. All nurses at clinic level (13/38) reported they would refer suspects to the next level on suspicion of tuberculosis. Main reasons for patient referral were suspicion of tuberculosis, failure to respond to antibiotic therapy and history of recent treatment for tuberculosis.

Most nurses (32/38) said they had no tuberculosis suspect registers in their institution. Registers were not available for inspection where nurses reported having them. Most nurses (23/32) reported no means of suspect follow up while 9/32 said they referred issues of follow up to the tuberculosis office.

Actions on diagnosis of sputum positive tuberculosis

The nurses stated that they would give health education on tuberculosis (13/38), initiate contact tracing (7/38), examine contacts (3/38) and refer patients for voluntary counseling and HIV testing (1/38) following diagnosis of sputum positive tuberculosis

Findings from patient exit interviews

Exit interviews were done with 42 patients, (24 men and 18 females), whose median age was 27 years (Q₁ = 16; Q₃ = 37). Those formally employed were 9/42 while 4/42 were informally employed, 15/42

were unemployed, 7/42 were school children and 6/42 was below school and employment age. Interviews showed that 26/42 had never smoked, 7/42 were current smokers and 4/42 were ex-smokers. Table 1 shows the demographic characteristics of the patients.

All the 42 patients interviewed had a cough history of 2weeks or more. More than half of the respondents (26/42) had a cough of 2-3 weeks while 10/42 had cough that was between 3 weeks and 3months and 6/42 had a cough of longer than 3 months. A history of previous treatment for cough was reported in 15/42 patients of which 6/15 said the cough was productive and 1/15 reported the sputum being blood stained. Only 1/21 patients remembered being asked about household contacts for the previous cough episode while 13/42 had been asked about household contacts with a cough for the current cough episode.

We reviewed patients' cards. Twenty two patients had two cough episodes. On the first cough episode, 7/22 patients sought treatment for both cough and chest pain, 13/22 for cough only and 2/22 for chest pain only. Out of these, 4/22 were asked to submit sputa for examination and all were negative. On the current episode (coinciding with period of study) one of the patients who were initially sputum negative on the previous cough episode had converted to sputum positive.

Most of the patients, 21/22 had sought help from a health facility. Patients reported having last sought medical help 1-3months previously were 11/22, more than 4 months were 7/22 and less than month were only 4/22.

Patient knowledge on tuberculosis

Most of the patients or their caregiver (38/42) had heard about tuberculosis before and 34/38 could give a lay definition of tuberculosis. Knowledge on how it was transmitted was correctly stated by 29/38 patients while 31/38 gave the correct signs and symptoms of tuberculosis.

Findings from records

Patient Management by Nurses

Weight was measured in 39/42 patients, there was no history of weight loss in 38/42 and chest pain or breathlessness in 34/42. No history of smoking was documented by nurses. Records of treatment for previous cough episode were available for 21 patients. On that episode of cough 4/21 were asked to submit sputa for laboratory examination and the

results of all four were negative. Two of the nineteen were asked to go for chest X-ray which they all did. On the current episode of cough that they had 9/42 had been asked to submit sputa for examination which they all did. Results were positive for 4/9 samples submitted. All four patients found sputum smear positive were notified and started on treatment. Two patients were asked to go for chest X-ray and one had the x-ray taken but the other did not as there were no more films. No patient had history

of household contact(s) documented for both previous and current cough episodes.

Tuberculosis Registers Review 2005 Results

We reviewed the district tuberculosis and laboratory registers. One laboratory served the two districts but separate district TB registers were maintained. Sputum positive patients in the laboratory register missing in the district tuberculosis register were 30/112 (27%) as shown in Table 3.

Table 3: Numbers of Tuberculosis Patients Found in Registers for Gokwe North and South by Month, 2005

Month	Laboratory tuberculosis Register		Sputum Positive cases in district tuberculosis registers			No. of sputum Positive patients lost
	Specimens Examined	No sputum positive	Gokwe South	Gokwe North	Total	
January	119	13	8	2	10	3
February	100	7	2	3	5	2
March	166	6	3	0	3	3
April	92	6	4	1	5	1
May	126	14	10	1	11	3
June	131	11	7	2	9	2
July	112	12	3	1	4	8
August	92	5	2	1	3	2
September	82	6	3	3	6	0
October	73	10	8	1	9	1
November	81	11	8	1	9	2
December	80	11	7	1	8	3
Total	1254	112	65	17	82	30

Laboratory Services and Equipment Checklist

No stock outs of laboratory materials recorded in 2005. No breakdown of laboratory equipment was experienced. Spares were available. The X-ray machine had one major breakdown for about two weeks.

Other Findings

We reviewed with 5 key informants' tuberculosis patient flow within the hospital to identify possible points of loss of patients. Five key informants reported patients disappeared from outpatients department after submission of sputum specimens. Four reported patients were discharged from the wards before sputum results are out.

Three reported patients were discharged from the wards before registration and decide not to report to the tuberculosis office. Another three key informants reported that those patients from the laboratory and wards that have inadequate identifying information recorded to allow for follow up were lost.

Figure 1 shows the activities that occur from the moment a suspect presents at the outpatients department or rural health centre.

Discussion

Knowledge of tuberculosis among the clinicians was high. This high level of awareness is strength for the tuberculosis programme as it is likely to be associated with good case detection if it is accompanied by a high level of suspicion. Despite the good knowledge nurses had, they were not putting it into practice.

The nurses' reported index of suspicion for tuberculosis was aroused by cardinal signs of disease but a few nurses remembered to consider previous history of treatment for cough and presence of a household contact with tuberculosis. This resulted in some suspects repeatedly treated for cough or living with a contact not being screened for tuberculosis contributing to low case detection. This was confirmed by findings of exit interviews where very few patients reported being asked about household

contact with tuberculosis. The knowledge that nurses had did not translate into practice. A study in Harare found that among children who were contacts of sputum positive index cases, forty nine percent of the children evaluated had probable tuberculosis, 28% had suspected tuberculosis and 23% had no tuberculosis¹⁶. Children below five years who are contacts to sputum positive patients are at higher risk of getting tuberculosis¹⁷ and not asking about household contacts and investigating for tuberculosis in them resulted in missed cases.

A study in Malawi showed that far less patients were requested to submit sputum than should have and this deficiency contributed to low case detection¹⁸. Requests for sputum examination were low in this study. With the high laboratory pick up rate seen from the sputa patients in this cohort submitted, more tuberculosis cases could be picked if sputa were submitted for more patients.

No mechanism was available for tracking suspects. Infectious suspects who never turn up for investigation at hospital level continue to spread infection as missed cases. Suspect registers enable follow up of suspects and would improve case detection. The study reported very few nurses initiating contact tracing after the diagnosis of a sputum positive case. These cases are likely to infect close contacts at home or at work. A study in Peru showed that contact tracing was a powerful means of improving case detection rates for active tuberculosis disease¹⁹. Not initiating contact tracing and examination of contacts is a weakness and contributes to low case detection.

The behaviour of seeking help first from health facilities is strength for improving case detection because most patients come to the health system first for help where diagnosis should be done correctly and promptly.

Patient and caregiver knowledge on tuberculosis was high. Tuberculosis has become more and more common with the presence of HIV in the population. Most individuals, households or families have come in contact with tuberculosis either in the homes or at work.

Record keeping and reconciliation is critical for improving case detection. Cases missing in the district register are probably due to delays in reconciling the two registers. Missing patients are as good as undetected patients because they continue to spread the infection.

Also contributing to loss of cases is the patient flow around the hospital. The tuberculosis office is not

conveniently located for patient access and thus patients may decide to move out of the institution without getting there.

Study limitations

We relied on what the laboratory reported. We did not have another laboratory scientist to perform test on negative(s) for confirmation as true negative. We may have missed cases this way. We did not conduct exit interviews at rural health centres and this might have increased or decreased case detection depending on the performance of nurses at these clinics

Conclusion

Low tuberculosis case detection was because nurses were not routinely requesting for sputum for examination in patients presenting with signs and symptoms of tuberculosis. The district was missing sputum positive tuberculosis cases due to delays in reconciling laboratory and district tuberculosis registers and inadequate identification details and addresses for follow up purposes resulting in early defaulters between diagnosis and registration.

Recommendations

We recommended that nurses should routinely ask about household/work contacts and request for sputum examination among patients presenting with a cough or a recent history of treatment for cough. The Tuberculosis Officer should conduct weekly reconciliation of laboratory and district tuberculosis registers to reduce on missed cases

The district health executive should introduce a tuberculosis suspect register to all its health facilities to ensure that all tuberculosis suspects are captured and followed up.

Contribution of the Research to Case Finding

The study has shown that it is important to devise mechanisms for tracking TB suspects. Conducting exit interviews with a focus on TB case detection helps to detect TB cases that might have been missed during consultation. Good record keeping and regular reconciliation of Laboratory and District TB Registers is critical for improving case detection.

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