TOOL FOR SUPERVISION OF SCREENING FOR TUBERCULOSIS PATIENTS IN DISTRICT HOSPITALS.

Key words: tuberculosis, tool, supervision, screening, district hospital

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บทพยาม

สถานที่: โรงพยาบาลเชิงทฤษฎีนวัตกรรมวิทยาศาสตร์ ภาคตะวันออกเฉียงเหนือ, ประเทศไทย
วัสดุสืบเนื่อง: เต็มต้นแบบเครื่องมือการตัดสินใจเพื่อช่วยให้ผู้มีความสามารถประเมินคุณภาพการตัดสินใจผู้มีความสามารถในการตัดสินใจวิเคราะห์สถานการณ์ให้ถูกต้องได้โดยง่าย
วิธีการ: ผู้ที่ให้ความรู้แก่ผู้ที่มีมีประสบการณ์ในการตัดสินใจและมีการวางแผนเครื่องมือ และเทคนิคการใช้เครื่องมือโดยมีการใช้และตกแต่งในระบบที่ดี
ผล: ได้เครื่องมือสำหรับผู้มีเหตุที่สามารถการทดสอบแล้วซึ่งประเมินค่าร่างได้แก่ ผลลัพธ์ของผู้มีการสังคายณ์โรคที่ตรวจพบซึ่งมาจากแผนที่ต้นต้น และผลลัพธ์ของผู้มีการสังคายณ์โรคที่ได้รับการตรวจพบของเครื่องและตามการปลูกต้นโรคยังคงอยู่ในสถานะของผู้สังคายณ์โรค อย่าง เกณฑ์ที่ใช้คัดค้านเหตุการณ์ของผู้สังคายณ์และแนวทางการดำเนินการที่มีวิธีปฏิบัติ การได้รับการสังคายณ์โรคที่มีการสังคายณ์โรคที่มีผลต่อผู้สังคายณ์โรค

สรุป: เครื่องมือสำหรับการสังคายณ์โรคที่มีการสังคายณ์โรคในประเทศไทยยังคงมีการพัฒนาซึ่งนั้นจะต้องการใช้ประโยชน์ เป็นต้นและการสังคายณ์ ที่มีการผู้ให้กับการประเมินผลของผู้สังคายณ์โรคจะนำไปสู่การปรับปรุงทุกขั้นตอนให้ทันสมัยได้
Abstract

Setting: The tuberculosis control programme in Khon Kaen province, North East Thailand.

Objective: To develop a tool for supervisors to easily assess the quality of screening for tuberculosis suspects in peripheral health units.

Methods: Field exploration, tool development and field testing by researchers and health professionals.

Results: A tested supervisors tool measuring the proportion smear positive tuberculosis suspects and the proportions suspects with two and three smears examined, indicative for screening performance. Defined acceptable levels of performance and remedial action to be taken.

Conclusions: The tool is simple to use by the supervisors, is acceptable to supervisors and stimulates to self assessment and improvement.

Key words: tuberculosis, tool, supervision, screening, district hospital

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INTRODUCTION

In most developing countries detection of tuberculosis cases is done mainly passively: patients with chest symptoms who report themselves at the hospitals and clinics are screened for tuberculosis. This method is also advocated by the International Union against Tuberculosis and Lung Disease (IUATLD) and the WHO (1,2). The screening process is done by a doctor or paramedic who takes the history of the patient, and decides if the patient is a tuberculosis suspect. Usually the criteria are cough for more than 3 weeks and/or cough with blood stained sputum. In case of a tuberculosis suspect sputum samples are collected and examined in the laboratory for acid fast bacilli (AFB). In (busy) hospitals equipped with an X-ray machine a chest X-ray can be made first and only if the X-ray is abnormal sputum samples are examined.

This case detection process is important because smear positive cases are the main sources of tuberculosis infection (3). It is also an important step to achieve the WHO global target of detecting 70% of existing smear positive tuberculosis cases (4,5,6). Supervisors of tuberculosis control programmes therefore should specifically assess the performance of this screening process and assist the staff in the health facility to improve performance if necessary.

A tool to make the performance assessment in screening easier was developed by the MURLEP project and is described below. This tool assesses the first two parts of the case detection process in a peripheral health unit: a) the selection and referral of tuberculosis suspects to the laboratory and b) the collection of three consecutive sputum samples for AFB. In another publication a tool for the quality control of the sputum smear examination itself is described.

The MURLEP project is a multidisciplinary health systems research project carried out by university researchers in cooperation with health service staff in Khon Kaen province, Thailand, aiming at the development of tools for tuberculosis control programme managers to easily assess the quality of the programme and to identify appropriate interventions to improve performance.
METHODS

In Khon Kaen province there are 19 district hospitals. After exploration of the practices and conditions in some district hospitals, the researchers designed the tool for supervision of tuberculosis screening performance and tested it out in 3 district hospitals. After several revisions the zonal tuberculosis supervisors were trained in the use of the tool. They informed the district hospitals by radio message about their supervision schedule. A few weeks later they went on a supervision tour along 15 district hospitals. During these visits they also had to try out a few other supervision tools. One researcher went along to observe the tool application but did not intervene. Two supervision visits, six months apart, were made to each hospital. The feasibility and ease of use were discussed with all staff involved and the tool adapted to its present format.

RESULTS

Forms and description of the tool

A condition for the application of the tool is that the peripheral laboratory uses a register for sputum smear results that contains the same information as in the IUATLD model laboratory register given in figure 1 (1). If such a register is not present it should be provided and the laboratory technicians instructed how to use it.

The application of the tool consists of the following parts:

1. During the supervision visit the supervisor selects the last 10 pages of the laboratory register (see figure 1) or so many pages as to obtain smear results of at least 50 tuberculosis suspects.

2. On each selected page the supervisor adds up the number of positive and negative smear results in each of the three columns (1st, 2nd and 3rd sputum examination results) and writes the totals at the bottom of the columns (in pencil).

He should not count the smear results of 'follow-up patients', but only of 'diagnosis' patients. Subsequently the supervisor copies the register page numbers and the column totals on the worksheet (see figure 2).

3. On this worksheet the supervisor fills out the row "Totals" and calculates the indicators according to the formula’s. If the proportion of tuberculosis suspects with a positive 1st smear is between 5 to 10% and the proportion of tuberculosis suspects with two resp. three smears examined is 85% resp. 65% or more, the supervisor concludes that performance is acceptable. Otherwise he concludes that performance is not acceptable. For considerations on these acceptable levels of performance see the section ‘discussion’.

4. The supervisor discusses the results with the district hospital staff and agrees on solutions for improvement. Guidelines for discussion:

- The percentage of suspects with a positive first smear is less than 5%. The staff suspects too many patients of tuberculosis. This causes an overload of work in the laboratory and may decrease the quality of the laboratory results.

The proper criteria of a tuberculosis suspect should be discussed (daily cough for more than two to three weeks and/or cough with bloodstained sputum (1,7,8)). Also it should be investigated whether the suspects referred from the outpatient department to the laboratory are arriving there and are served within a reasonable waiting time: some suspects may get lost or do not have enough time to wait for hours.

- The percentage of suspects with a positive first smear is more than 10%. The staff suspects too few patients of tuberculosis,
and possibly real tuberculosis cases are not detected. Again the proper criteria of a tuberculosis suspect should be discussed.

The percentage of suspects with two resp. three smear results is less than 65% resp. 65%; If not at least three smears (two smears suffice if both are positive) examined of each suspect, a real case of tuberculosis can be missed. Discuss with the staff their problems in collecting three smears and plan solutions.

Experience from the application of the tool

The supervisors stated that the application of the tool itself was easy. During supervision they have trained the district hospital staff to do self-evaluation. The district hospital staff understood the method quickly. The supervisors were enthusiastic and wanted to continue the tool in the routine programme. A few months after the 2nd supervision visit, a director of district hospital expressed during a focus group discussion that his district hospital has detected many more smear-positive tuberculosis patients than in the past when the hospital staff did not yet pay good attention to the tuberculosis suspect criteria and to collect three sputum samples.

In the same discussion another director related that he was surprised by the poor performance, checked the indicator again, then called for a special meeting among his staff to find a way to improve the situation.

The staff of most district hospitals appreciated the suggestion of the supervisors to examine 3 smears as spot-collection-spot (one sputum sample is collected on the spot at the first visit, a sputum container is given to the patient for an early next morning sputum sample at home, and a third, second spot, sputum sample is taken when the patient returns the next morning, so only 2 days of visits are required). The staff was used to a spot-collection-collection method in which 3 visits are required. Both ways of examinations have been accepted by the

Thai national tuberculosis control programme(7), but the former has a higher chance of the suspect to complete the examination, and has been advocated internationally(1,9).

DISCUSSION

We decided that two indicators for the quality of tuberculosis screening of district hospital need to be measured: the proportion of tuberculosis suspects with a positive 1st smear and the proportions of tuberculosis suspects with 2 and 3 smears examined. The reason for the first indicator has been advocated by Crofton et al (9), who stated that "...because chronic cough may be due to smoking, chronic bronchitis, etc., many specimens of sputum will be negative. In good programmes only 5-10 percent of patients usually turn out to have a positive sputum". This has been confirmed by many authors (10,11,12,13,14,15). The cut-off point of 5-10% patients is mostly derived from examination of three sputum smears. In our method we regarded only the first sputum smear to make the calculation from the laboratory register easier, and because often only one or two sputum smear results per tuberculosis suspect are recorded. Since one smear detects about 75% of the positive cases compared to three smears (16,17,18), in our method the cut-off point should have been 75% of 5-10%, which is about 4-6%.

Since the range is rather wide, the difference is small and has no operational implications we decided, together with the health service managers, to stick to the 5-10%.

The interpretation of the meaning of a proportion of smear positive suspects lower than 5% and higher than 10% may be clear from point 4 of the deterioration of the tool.

The indicator is less meaningful if the quality of microscopic sputum smear examination at the laboratory is poor. Many false positives or false negatives cause the indicator to be too high or too
low. Periodic quality control of sputum collection, smearing, staining and reading is a prerequisite. A laboratory quality control method developed by our project is described in another article.

The rationale for the indicator proportions suspects with two and three smears examined is given by the fact it is recommended to examine at least three smears of every suspect but that when the first two are positive no third smear is required. Often only one sputum sample is collected, and 25% of the cases that can be diagnosed by examining 3 samples will be missed (19).

In Thailand, all district hospitals have been equipped with a X-ray machine. If a chest X-ray is suggestive for tuberculosis one positive sputum smear usually means that the WHO diagnostic criterion for a smear-positive tuberculosis patient (2,20) is met. Still it is important to collect at least two, better three sputum smears to confirm the diagnosis. To keep the indicator easy to understand the proportion suspects with two smear results as well as the proportion suspects with three smear results are computed. The acceptable levels of performance we chose allow for the fact that sometime only two positive smears are sufficient and to accept the reality that it cannot be perfect. When performance in a health unit improves the acceptable level of performance can be increased.

ACKNOWLEDGEMENTS

We thank the Netherlands Leprosy Relief Association and the Commission of the European Union for their generous financial support. We are grateful for the support of the Ministry of Public Health in Bangkok and Khon Kaen in carrying out the research and to the research committee and health workers for their useful comments.

REFERENCES


Figure 2:

**TUBERCULOSIS CONTROL**

**WORKSHEET FOR TUBERCULOSIS LABORATORY REGISTER INDICATORS FOR ANALYSIS OF SCREENING PERFORMANCE FOR TUBERCULOSIS SUSPECTS.**

_Instructions on reverse side_

<table>
<thead>
<tr>
<th>District Hospital:</th>
<th>Date of Report: ___ / ___ / ___</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervisor:</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Page number in lab register</th>
<th>Results of sputum smears of tuberculosis suspects</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1st smear</td>
</tr>
<tr>
<td></td>
<td>positive</td>
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</tr>
</tbody>
</table>

| Totals | a= | b= | c= | d= | e= | f= |

The proportion of suspects with a positive first smear:

\[
100 \times \frac{a}{(a+b)}
\]

\[ALP^* \text{ = } 5 - 10\%
\]

The proportion of suspects with a second smear examined:

\[
100 \times \frac{a+d}{(a+d+b)}
\]

\[ALP^* \text{ = } 85 - 100\%
\]

The proportion of suspects with a third smear examined:

\[
100 \times \frac{a+d+e}{(a+d+b+c+e+f)}
\]

\[ALP^* \text{ = } 65 - 85\%
\]

*ALP = Acceptable level of performance*