

QUALITY OF SYMPTOM ELICITATION IN AN EPIDEMIOLOGICAL SURVEY ON TUBERCULOSIS

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Summary : The quality of symptom elicited by health workers in an epidemiological survey on tuberculosis was assessed by again subjecting a 10% random sample of the persons interviewed, by the supervisory staff, independently. Three thousand four hundred and forty nine persons were thus interviewed twice. The overall estimates for over-diagnosis and under-diagnosis in the elicitation of symptoms by health workers were to the extent of 16% and 8% respectively, with minimal yield of sputum positivity from the discordant groups of persons. The additional load of 16% for sputum examination can thus be considerably reduced if health workers are well trained in symptom-elicitation-screening of the population and their work is monitored through spot supervisory checks

Key words : Symptom elicitation, Tuberculosis survey.

INTRODUCTION

In community surveys conducted to obtain epidemiological information, like disease prevalence and incidence, the population is first screened by application of pre-determined criteria before case detection. The field investigator has got a target population for screening. While eliciting the symptoms, he may miss a real symptomatic and /or pick up an asymptomatic as a symptomatic. In the former case, there could be a chance that a real case is missed which results in under-estimation of the prevalence. On the latter instance, sputum examination done for a wrong person could result in overload of the work. So, it would be worth studying the extent to which the field investigators miss real symptomatics (under-diagnosis) and wrongly identify non-symptomatics as symptomatics (over-diagnosis). With this background, an exercise was carried out to assess the quality of symptoms elicited by the health worker (a field investigator registering and screening the population) in an

epidemiological survey.

OBJECTIVE

To estimate the proportion of symptomatics missed (under-diagnosis) and non-symptomatics wrongly identified as symptomatics (over-diagnosis) by health workers in an epidemiological survey.

MATERIAL AND METHODS

An epidemiological survey for surveillance of tuberculosis was undertaken in 1990 in two panchayat unions of Kadambathur and Tiruvelangadu of Tiruvallur taluk in Chingleput district (now Tiruvallur district) of Tamil Nadu. Thirty villages with a population of about 54,000 were included in the survey. Two screening methods, namely, Symptom and X-ray were used for detection of cases. The health worker visited the households and registered all the persons aged 10 years and above. He identified the symptomatics using the definition of symptomatic as adopted in the

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District Tuberculosis Programme (DTP) and directed all persons for X-ray examination. During the resurvey, which was started in 1993, a routine random check was introduced in the elicitation of symptoms. The quality of the symptoms elicited by the health worker, every day was assessed by a senior staff member on the same day from a random sample of individuals by visiting them and eliciting the symptoms independently.

Sample Size and Sampling Procedure

A 10% random sample of the eligible population screened by the health worker was included in the study. The sample was selected from the list of persons who reported for X-ray, as directed by the technician after symptom screening. The 10% random sample was selected from the list in the following way:

The last digit of the serial number of the first individual who turned up for chest X-ray, was noted which could be any number between 0 and 9. A systematic sample was then taken by selecting every 10th individual starting from the said digit. Thus, a 10% random sample of the population screened every day was obtained for re-elicitation of symptoms by a supervisory staff member. The persons listed for random examination were visited at home by a supervisory staff member who elicited symptoms independently and recorded them in a separate proforma in a manner similar to that used by the health worker. The health worker remained unaware of the identity of the individuals cross-checked by the supervisory staff. Similarly, the supervisory staff was unaware of the nature and duration of symptoms as elicited by the health worker. Sputum was also collected from the new symptomatics as identified by the supervisory staff.

Analysis

The analysis was carried out on the assumption that symptoms elicited by the supervisory staff member were more reliable and these were taken as the standard to be compared with those of the health worker in order to find out the extent of agreement.

Table 1. Extent of agreement between health worker and supervisory staff in elicitation of symptoms.

Health worker	Supervisory staff		Total
	Symptomatics	Asymptomatics	
Symptomatics	690	129	819
Asymptomatics	204	2426	2630
Total	894	2555	3449

Objective assessment of the reliability of the supervisory staff member was not made.

The random sample consisted of 3,449 persons from a population of about 35, 000 persons screened for the survey.

RESULTS

Extent of agreement between health worker and supervisory staff

Table 1 show the extent of agreement between health worker and supervisory staff in identifying the symptomatics. Of the 819 persons identified as symptomatics by the health worker, 129 (15.8%) had no symptom (over diagnosis by the health worker), as elicited by the supervisory staff. Similarly, of the 2630 persons identified as symptomatics by the health worker, 204 (7.8%) had symptoms (under-diagnosis), as elicited by the supervisory staff. The proportion of symptomatics as elicited by the supervisory staff was 25.9% (894 of 3449) compared with 23.7% (819 of 3449) by the health workers. The difference was statistically significant ($P < 0.01$).

Extent of agreement between different health workers and supervisory staff

In all, 35 health workers screened the population. Of these, 6 health workers who had screened a sufficient segment of the population (at least 150) from the sample were used for this comparison. Table 2 shows the comparison between health workers and the supervisory staff in terms of over-diagnosis, under-diagnosis, accuracy and Kappa

Table 2. Extent of agreement between health workers in comparison with supervisory staff in elicitation of symptoms.

Validity measures (%)	Health Workers					
	1	2	3	4	5	6
No. of persons screened	694	396	329	531	157	263
Over-diagnosis	18.1	18.1	16.3	16.5	17.1	17.2
Under-diagnosis	7.1	9.9	7.6	6.0	6.0	6.3
Accuracy	90.2	88.4	90.0	91.3	90.5	91.3
Kappa	73.9	67.2	75.4	77.1	75.4	75.0

Table 3. Distribution of symptomatics by duration of cough.

Duration as elicited by health worker	Duration as elicited by supervisory staff			Total
	0<2 weeks	2 weeks - <1 month	>1 month	
0 -<2 weeks	2883	38	102	3023
2 weeks - <1 month	34	55	33	122
>1 month	48	19	237	304
Total	2965	112	372	3449

statistics. It can be observed that all the health workers, except Health Worker 2 performed well in terms of the extent of agreement with the supervisory staff.

The distribution of the identified symptomatics in terms of duration of symptoms is given in Table 3. Persons having cough of duration less than two weeks were considered as having no cough. Of the 122 persons having cough of duration more than two weeks to less than 1 month, as elicited by health worker, the supervisory staff did not find cough in 34 (27.9%) persons. Three hundred and four persons had cough of duration 1 month and above, as elicited by health worker. Among these, only 237 (78.09%) had cough of 1 month and above, as elicited by the supervisory staff. The over-diagnosis by health worker by health worker by duration of cough was to the extent of 19.2% (82of 426) and (140 of 3923) respectively.

DISCUSSION

The extent of agreement, in eliciting symptoms, between health workers and supervisory staff revealed over-diagnosis by health worker to the extent of 16% which resulted in an additional load of sputum examination. Similarly, under-diagnosis by health workers in elicitation of symptoms was 8% reducing load of sputum examination in respect of these persons. Even though over-diagnosis meant additional load of sputum examinations, it may help in diagnosing more cases which would be missed while screening the population. In the case of under-diagnosis, sputum examination is not done unless their X-ray is abnormal, calling for sputum examination. A high proportion of under-diagnosis may cause underestimation of the prevalence of the disease.

The extent of agreement between various health workers and supervisory staff in eliciting symptoms in general was the same for all the health workers, in terms of accuracy and Kappa statistics which adjusted for any chance agreement between the health worker and supervisory staff.

The duration of symptoms, like cough and chest pain, varied as elicited by health workers in comparison with supervisory staff. Among persons having cough of less than 1 month duration as elicited by health worker, about one fourth did not have cough as elicited by supervisory staff. Similarly, among persons having cough of 1 month or more by health worker, about three-fourth were correctly

categorized but another 16% did not have cough at all, as elicited by supervisory staff. However, the overall agreement (symptom vs no symptom) in eliciting cough and chest pain, irrespective of the duration was satisfactory for health workers and supervisory staff : $K= 0.72$ (95% CI : 0.66-0.78).

Sputum positivity in the two discordant groups (symptomatic by health worker but asymptomatic by supervisory staff and asymptomatic by health worker but symptomatic by supervisory staff) was negligible. The overall proportion of persons eligible for sputum examination based on symptom screening by health worker is about 10%, of which 16% are really asymptomatics and sputum examination is not required for

them. Thus, the overload of sputum examination can be reduced considerably if the population is screened better for identification of symptomatics followed by their sputum examination. This can be achieved by supervisory staff and in-service training given to them, if necessary.

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