

**SHORT COMMUNICATION****Relationship between education and training activities and tuberculosis case detection in Fiji, 2008–2011**M. Y. Delai,¹ S. Gounder,² K. Tayler-Smith,³ R. Van den Bergh,³ A. D. Harries^{4,5}<http://dx.doi.org/10.5588/pha.12.0064>

Due to concerns about under-reporting of the tuberculosis (TB) case burden in Fiji, efforts have been put into national training, education and awareness activities in the formal health sector and among village health workers, health volunteers and the community since 2010. There has been an absolute increase in TB registrations, and TB case notification rates during the period of training activities in 2010 (21.3 per 100 000 population) and 2011 (23.6/100 000) were significantly increased compared with TB case notification rates in 2008 (12.4/100 000) and 2009 (14.6/100 000), when no training activities took place ($P < 0.01$). These findings support the use of ongoing training efforts.

Fiji is classified as a low tuberculosis (TB) burden country. Although TB case detection rates are estimated to be $\geq 80\%$,^{1,2} there is concern that case detection may actually be lower due to poor access to TB diagnostic services in certain communities, particularly those in interior mountainous settings, coastal regions and on islands.

To address this issue and with support from the Global Fund to Fight AIDS, Tuberculosis and Malaria (The Global Fund), in April 2010 the Fiji Red Cross Society (FRCS) started community awareness training among hard-to-reach populations, village health workers and volunteers in areas where the TB burden was considered to be high. Key messages covered symptoms of pulmonary TB (PTB), the need for sputum submission for diagnosis and where established TB diagnostic services could be accessed. During the same year, the Fiji National TB Programme (NTP) also provided training on TB to health care workers in the formal health sector.

The aim of this study was to determine whether these education and awareness training activities were associated with any increase in TB case notifications. Specific objectives were to document 1) education and awareness training activities in the health sector and the community at large in 2010 and 2011, and 2) TB registrations and TB case notification rates in 2008 and 2009 (before training) and in 2010 and 2011 (during training).

METHODS

This was a cross-sectional study involving a record and file review. The Republic of Fiji consists of 332 islands,

of which 130 are inhabited, some of which are several hundred kilometers from established TB services. The country has a well-developed, comprehensive public health system with three divisions (Central Eastern, Northern and Western Divisions), each with a central hospital. Additional health services are provided through a network of 17 subdivisional hospitals, 78 health centres and 101 nursing stations.³

Established in 1951, the Fiji NTP has applied the DOTS strategy since 1997. Current Fiji TB guidelines recommend that any person suffering from cough of >2 weeks should submit three sputum specimens for acid-fast bacilli microscopy to one of four laboratories in the country.⁴ Patients diagnosed with smear-positive sputum are registered as smear-positive PTB, while those with smear-negative sputum or with symptoms and signs of extra-pulmonary TB are further investigated, registered and treated for TB if the diagnosis is made. All TB patients in Fiji are registered in a TB patient register, one of which is kept in each of the three DOTS centres in each division of the country. Definitions of TB are in line with World Health Organization (WHO) TB guidelines.⁵

Data on education, awareness and training activities in 2010 and 2011 (training courses, duration of courses, facilitators, trainees) were collected from the quarterly FRCS activity reports and monthly NTP reports. Data on all TB patients (numbers of cases, stratified by type of TB) registered from 2008 to 2011 were collected from the TB patient registers at the three DOTS centres. Information on population estimates for Fiji was obtained from the Health Information Unit, Ministry of Health, Fiji. These data were collected into a structured pro forma between October 2011 and June 2012, and single-entered into an electronic database (Excel, Microsoft, Redwoods, WA, USA). Analyses were performed in relation to the introduction of the education, awareness and training activities, i.e., before (2008 and 2009) and during the activities (2010 and 2011). The χ^2 test was used to assess differences in TB case notifications before and during the training activities, with odds ratios (ORs), their 95% confidence intervals (CIs) and P values calculated as appropriate. Differences at the 5% level were regarded as significant.

Ethics approval was obtained from the Union Ethics Advisory Group, Paris, France, the National Health Research Committee and the Fiji National Research Ethics Review Committee, Ministry of Health, Suva, Fiji.

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KEY WORDS

tuberculosis; Fiji; training and education

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TABLE 1 Training, education and awareness activities for the formal health sector, village health workers, health volunteers and the community at large, Fiji, 2010–2011*

Training activity	2010	2011
Formal health sector		
Number of training courses conducted	5	17
Number of health care workers trained	52	299
Doctors	12	44
Nurses	17	117
Others	23	138
Education and awareness training courses in the community		
Number of training sessions for village health workers and Fiji Red Cross Society health volunteers	3	3
Number of persons trained	80	87
Number of training sessions and awareness activities for the community, including community leaders	0	15
Number of persons trained	0	1231

*Training was delivered as follows: among health care workers, the key messages were on symptoms and signs of TB and how to diagnose TB in the routine health services. Training interventions usually lasted 1–3 days. Participants came from all three divisions and from central and subdivisional hospitals, health centres and nursing stations. Training was delivered by the National Training Programme Technical staff of the Ministry of Health, and in the case of technical training on laboratory reference systems and quality assurance for the TB Laboratory staff, it was facilitated by the Queensland Mycobacterium Reference Laboratory in Australia. All training for doctors and nurses was face-to-face. There was no specific in-service training on TB. In the community, the key education messages were on symptoms of pulmonary TB, the need for sputum submission for diagnosis and where established TB diagnostic services could be accessed. Training duration for village health workers and Red Cross volunteers was similar to formal health sector training courses, at 1–3 days, while training courses and awareness activities in the community usually lasted 1 day. The courses were delivered by the Fiji Red Cross Society's Health & Care Programme staff. TB = tuberculosis.

RESULTS

The number of education and awareness training activities and their details in the health sector and community for 2010 and 2011 are shown in Table 1. The numbers of patients registered with TB and TB case notification rates in 2008 and 2009 (before training) and in 2010 and 2011 (during training) are shown in Table 2. The total number of registered TB cases in 2010 and 2011 increased compared with the previous 2 years. The TB case notification rate was significantly increased in 2010 (OR 1.5, 95%CI 1.2–1.8, $P < 0.001$) and 2011 (OR 1.6, 95%CI 1.3–2.0, $P < 0.001$) compared with 2009, and the smear-positive TB case notification rate in 2011 was significantly increased compared with 2009 (OR 1.5, 95%CI 1.1–2.1, $P < 0.01$).

DISCUSSION

This study shows that TB training, education and awareness activities were associated with an increase in the number of patients registered for TB and in TB case notification rates in the first 2 years after implementation of these activities. Although we cannot ascribe cause and effect in this study, the results are encouraging and are supported by findings from elsewhere.^{6–8} Despite a total cost of training of approximately US\$170 000 for 2010 and 2011,^{9,10} our findings support the continued use of this approach and ongoing attention to TB case registration and notification rates in 2012 and beyond.

TABLE 2 Patients registered with TB and TB case notifications, Fiji, 2008–2011

Categories of TB	Before training		During training	
	2008 <i>n</i> (%)	2009 <i>n</i> (%)	2010 <i>n</i> (%)	2011 <i>n</i> (%)
Patients registered with TB				
All types of TB, <i>n</i>	109	129	191	213
Smear-positive PTB	79 (72)	71 (55)	96 (50)	109 (51)
Smear-negative PTB	9 (8)	31 (24)	46 (24)	63 (30)
EPTB	21 (20)	27 (21)	49 (26)	41 (19)
TB case notification rates				
Population estimates for each year	879 031	882 066	893 024	901 208
TB case notification rates/100 000	12.4	14.6	21.3	23.6
Smear-positive PTB case notification rates/100 000	9.0	8.0	10.7	12.1

TB = tuberculosis; PTB = pulmonary TB; EPTB = extra-pulmonary TB.

The strengths of the study are that all training activities were documented and all registered TB cases in Fiji over a 4-year period were included, during which the same standardised systems of recording and reporting were used. Limitations include the operational nature of the study and single entry of data; furthermore, no account is taken of other confounding factors possibly associated with increased case detection, including support for laboratory infrastructure and better supervision. As there was no change in numbers or distribution of human resources for health during the study, these potential confounders were not relevant to our study.

Various innovative strategies have been associated with increased TB case detection,^{6–8} and the training described in this study can be added to the list. More sophisticated research to determine whether this training, with all inherent costs, is causally associated with improved case detection would be merited.

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En raison des préoccupations concernant les sous-déclarations du fardeau des cas de tuberculose (TB) aux Iles Fiji, des efforts ont été mis en route depuis 2010 en matière d'activité nationale, de formation, d'éducation et de prise de conscience dans le secteur de santé officiel et parmi les travailleurs de santé des villages, les volontaires de santé et la collectivité. On a noté une augmentation absolue des enregistrements de TB, et les taux de déclaration des cas de TB pendant

la période d'activité de formation en 2010 (21,3/100 000) et en 2011 (23,6/100 000) ont été significativement supérieurs par comparaison aux taux de déclaration des cas de TB en 2008 (12,4/100 000) et en 2009 (14,6/100 000), moment où aucune activité de formation n'avait eu lieu ($P < 0,01$). Ces observations plaident pour l'utilisation d'efforts continus de formation.

Debido a la inquietud por la subnotificación de la carga de morbilidad por tuberculosis (TB) en Fiji, se emprendieron desde el 2010 iniciativas de capacitación, educación y sensibilización a escala nacional en el marco del sector formal de la salud y dirigidas a los trabajadores sanitarios de las aldeas, los auxiliares voluntarios y la comunidad en general. Se observó un aumento absoluto del número de casos de TB registrados y de la tasa de notificación durante el período de las acti-

vidades de capacitación en el 2010 (21,3 por 100 000 habitantes) y en el 2011 (23,6/100 000), en comparación con las tasas de notificación del 2008 (12,4/100 000) y el 2009 (14,6/100 000), años en los cuales no se realizó este tipo de actividades ($P < 0,01$). Estos resultados apoyan el mantenimiento de las iniciativas continuas de capacitación.