nomenon. The significant features of this case was the evidence of sebaceous gland hyperactivity and the absence of AFB in the smear as well as in the tissue. Presenile sebaceous gland hyperplasia is a progressive disease, has an early onset at puberty and occurs sporadically or in families on the face, especially on the forehead and cheeks, resulting in the skin thickened and furrowed but sparing the periorbital and perioral regions ([6]). It is seen more in males and associated with excessive sebum secretion, suggesting a probable androgen activity. Isotretinoin, a synthetic retinoid, is effective even in a low dose, as in the present case. It inhibits sebaceous gland differentiation and shrinks them ([1]).

In the second case, the thin scars on the legs indicate that she might have contracted yaws at an early age, since she is from an area which was endemic for yaws during the Japanese occupation of the then Malaya in the 1940s ([3]). Yaws is rare now since the mass penicillin campaign by the World Health Organization in 1950s ([3]) but late cases are seen sporadically ([4]). Gangosa or mutilating rhinopharyngitis and goundou or subperiosteal deposition of new bone over the nasal processes of the maxilla are features of late yaws ([4]). The serological tests for syphilis are positive since yaws is caused by *Treponema pertenue* which is similar to *Treponema pallidum*. The three granulomatous disorders which affect the bones and cartilages producing especially the destruction of the nasal septum, resulting in saddle nose deformity, are leprosy, syphilis (congenital) and yaws. These patients highlight the importance of establishing the diagnosis of leprosy before starting treatment and also to be aware of yaws, although it is eradicated.

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Leprosy Case Detection Through Community Volunteers—a Low Cost Strategy

TO THE EDITOR:

The high cost of case detection by engaging a trained salaried class of workers in the declining phase of leprosy endemicity is causing concern to nongovernmental organizations (NGOs) which depend solely upon raising funds from the public. If the donors' money is to be used in a cost-effective manner, field experiments on cost management in relation to case detection are urgently needed.

We designed a field study to calculate the cost per case detected, especially skin-smear-positive cases, utilizing volunteers derived from slum communities in Bombay, India. The study was undertaken in three municipal wards, namely, H East, G North and G South. Trained paramedical workers recruited the youths, both male and female, living in the local slums. Some leprosy patients also formed a part of the team which consisted of 15 volunteers (Fig. 1). The volunteers were oriented in suspecting leprosy by using a "Suspect Card." These community volunteers (CVs) were paid Rupees 30 (US$0.66) for 4 hours of fieldwork. Additional incentives were given if the suspected cases were confirmed as definite leprosy patients by the field supervisors. Ru-

FIG. 1. A group of community volunteers participating in case detection in the slums of a western suburb of Bombay, India.

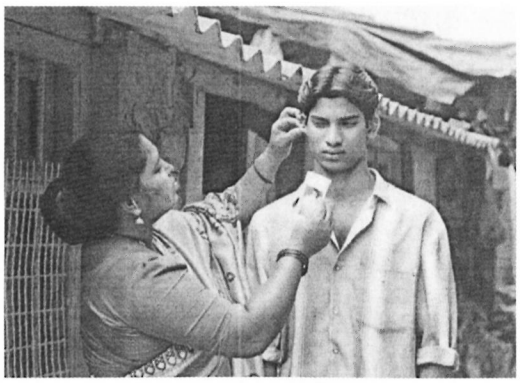

FIG. 2. A slum dweller examining a suspected case (a migrant from Bihar) with minimal clinical signs who was later found to be smear positive (BI 2.5+).

pees 20 (US$0.44), 15 (US$0.33), 10 (US$0.23) and 5 (US$0.11) were paid for one skin-smear positive, one smear-negative multibacillary (MB; >5 lesions), one paucibacillary (PB; 2–5 lesions) case and one single skin lesion-paucibacillary (SSL-PB) leprosy patient, respectively (1US$ = 45 Indian Rupees).

A total of 23 cases were identified by rapid screening of 78,705 slum dwellers by 15 CVs within a period of 31 days. The regular staff detected the remaining 10 during their field supervisory operations. This gave an overall detection rate of 42/100,000 population. The volunteers alone detected 29 cases per 100,000 population. This rate of detection is more or less comparable to the case detection rate of 56 in India ([1]) and 66 per 100,000 population in Maharashtra State, India ([2]). Two cases out of 33 were found to be skin-smear positive and were identified by these volunteers in G South ward, believed to be a low endemic area (Fig. 2). Out of these two, one had relapsed after dapsone monotherapy; the other one is an untreated borderline lepromatous case recently migrated from Bihar.

The mean cost per case detection is Rupees 879 (US$20); per skin-smear-positive case, Rupees 14,500 (US$322). In an earlier study undertaken by us in 1996, trained and salaried paramedical workers examined 161,800 slums dwellers within a period of 42 days, and 76 patients (3 MB and 73 PB) were identified. The detection rate was 47 per 100,000 population. The total cost of detection of three skin-smear-positive cases in 1996 was Indian Rupees 31,666 (US$880) ([3]). The cost of detection of one patient with leprosy in some parts of Cambodia was as high as Rupees 4320 (US$120)([4]).

The costs reported in this study may vary from region to region. Even in this megacity, there are areas of relatively lower endemicity where the detection rates are less. We advocate such innovative methods for NGOs to sustain their leprosy work. Whether governments can adopt these methods as part of their normal activities remains to be seen, although during the MLEC (Modified Leprosy Elimination Campaign) the involvement of the community for case detection as a short-term policy was accepted.

THE TABLE. *Ward-wise leprosy case detection rate.*

Area	Enumeration	Examination	New cases			Total	Detection rate per 100,000
			SSL-PB	PB (2–5 lesions)	MB (>5 lesions)		
H East	47,212	28,435	17	5	1	23	81
G North	45,543	34,486	4	1	2	7	20
G South	21,109	15,784	—	1	2	3	19
Total	113,864	78,705[a]	21	7	5	33[b]	42

[a] Examination rate 69%.

[b] Of these, 23 were actually identified by the volunteers; the rest were detected by the supervisory staff.

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Comparative Characteristics of Antigenic Profile of *M. leprae* and *M. lufu*

TO THE EDITOR:

Mycobacterium leprae, being an obligate intracellular parasite, fail to be cultivated *in vitro.* Isolation of the leprosy bacilli from *M. leprae*-infected tissues of laboratory animals is a rather intricate and multi-step process affecting the physical and chemical integrity of mycobacterial cells. Biological reagents from *M. leprae* purified from host cells in various world laboratories are not standardized, and they differ by their antigenic composition. Therefore, there is a need for cultivable mycobacteria with biological properties that might permit using them for diagnostic and other purposes instead of *M. leprae.*

M. lufu isolated from the soil in Zaire are noted for their dapsone sensitivity ([7]) which permitted using them for primary screening of antileprosy drugs. At the Leprosy Research Institute in Astrakhan, Russia, evidence for the protective properties of *M. lufu* as related to experimental infection with *M. leprae* were obtained. It was also proved that *M. lufu* were able to detect delayed-type hypersensitivity (DTH) reactions in *M. leprae*-sensitized animals ([3, 4]). We propose a test system with *M. lufu* as an antigen for the serological diagnosis of leprosy ([10]).

At the Leprosy Research Institute, *M. leprae* and *M. lufu* were comparatively studied for their protein composition, and the comparative characteristics of humoral responses of leprosy patients toward different antigenic determinants of both mycobacteria were stated.

M. leprae were isolated from the foot pads of mice with experimental leprosy infection according to Draper ([1]). *M. lufu* were cultivated on Lowenstein-Jensen medium. *M. leprae* and *M. lufu* were suspended in 0.85% solution of NaCl and then sonicated for 7 min at 18 kHz at repeated intervals in an MSE-100 sonifier. The sonified bacilli were centrifuged at 10,000 *g* × 10 min, and the supernatant was used as antigen. Protein in the sonicates was estimated according to Lowry, *et al.* ([5]) and equaled 1.5–2.0 mg/ml. Preparations were kept at –20°C until used.

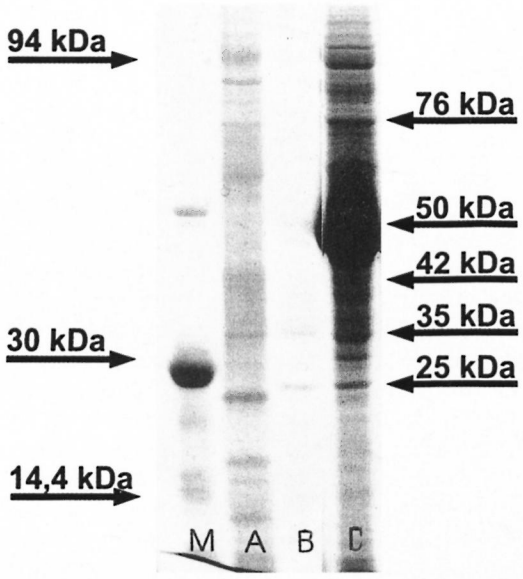

FIG. 1. Electrophoresis of mycobacterial sonicates. A = *M. leprae* isolated from nine-banded armadillos; B = *M. leprae* passed in mice; C = *M. lufu;* M = markers.