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Community participation eliminates yaws in Ecuador

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Summary Yaws is no longer a national and international health priority for intervention, but there is still a negative perception of the disease in the few affected communities. A survey in 1988 in the northern region of Ecuador documented a prevalence of 16.5% of clinical cases and 96.3% of serological cases. A continuous, long-term community-based surveillance programme was therefore put in place focusing on yaws as one of the sentinel diseases. The results of this intervention are reported here. In 1993, a second survey showed a reduction in the prevalence of clinical cases to 1.4% and of serological cases to 4.7%. Between 1993 and 1998, no other clinical cases were detected and the serological prevalence in 1998 was 3.5%, corresponding with clinical cases of primary or congenital syphilis, latent yaws under follow-up, and individuals with low serological titres indicating a 'serological scar'. These data indicate that yaws has been eliminated. Another important outcome of the intervention is the increased self-confidence in the communities that health problems can be tackled.

keywords yaws, pian, eradication, elimination, community epidemiology, community participation, Ecuador

Introduction

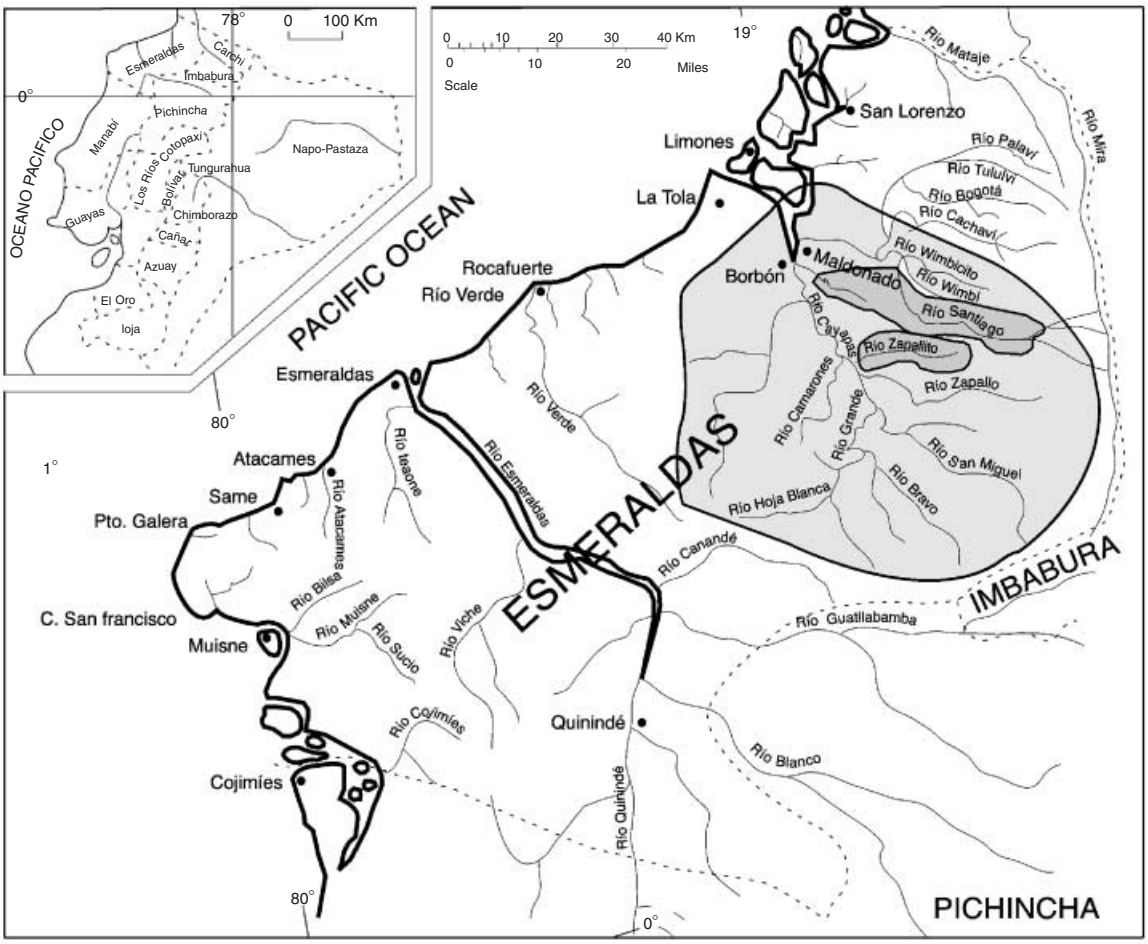
While regularly mentioned among the classical examples of eradication campaigns of the 20th century (Hopkins 1977; Walker & Hay 2000), yaws has disappeared from national and international health intervention agendas. The reasons can be traced to the comparatively low incidence and prevalence, limited morbidity burden, and the fact that most remaining endemic areas are in rural zones with limited access facilities. There is a consensus that endemicity could be eliminated if long-term, well-controlled community health programmes are put in place (Meheus & Antal 1992; Antal *et al.* 2002). Unlike the authorities' perception and practices, the perception of yaws in affected communities is particularly negative: not only is the disease highly disturbing with its manifestations, but it is often viewed as a marker of the 'marginalization' and disregard in which these communities are left. This report covers a yaws-endemic area of Ecuador (Hopkins 1977) and is the first in years describing a successfully field-tested community-oriented approach.

Population and methods

The characteristics of the area of Ecuador, traditionally included in the endemic zones for yaws (Hopkins 1977) are summarized in Figure 1. As in other regions, the prevalence of yaws dropped dramatically as a result of interventions in the 1950s (Gomez-de-la-Torre 1954; Hopkins 1977). Epidemiological and clinical information remained anecdotal until the late 1980s, when even those villages with only sporadic reports of cases were included in a survey conducted by an *ad hoc* trained team, sponsored by the Ministry of Health of Ecuador and PAHO/WHO. Most members of this team were not part of the health personnel working in the area. Altogether, 309 clinical cases were reported, of a screened population of 1868, with a prevalence of 16.5%, and a serological positivity of 96.3% (Guderian *et al.* 1991).

Yaws was included together with malaria, onchocerciasis, malnutrition, diarrhoea, acute respiratory infections (ARI) and other prevalent diseases, in a highly articulated plan of community intervention, which called on a network of local health agents (*promotores de salud*), whose basic training had been focused specifically on essential techniques and instruments of community epidemiology (Tognoni 1997).

The first component of the intervention was continuous surveillance by the local network of health agents, based on case-finding of dermal lesions in all villagers, as described in detail in Figure 2. The second component was the organization of periodic formal surveys (every 5 years) by



Characteristics of the Borbón health district		Characteristics of the endemic area for yaws	
Climatic characteristics:		Climatic characteristics:	
Average temperature	25.5 °C min 17.8 – max 36.2	idem	
Average monthly rainfall:	181 mm min 12.3 – max 669.8		
Geographic and demographic characteristics		Geographic and demographic characteristics	
Surface:	5250 km^2	Surface:	380 km^2
Number of villages:	148	Number of villages:	21
Population:	26 500	Population:	2714
Health services:	1 hospital with 20 beds 12 primary level health centers 44 community health workers	Health services:	3 primary level health centers 14 community health workers

Figure 1 Characteristics of the study area.

the local health system, partly sponsored by PAHO/WHO, for clinical and serological screening, which were included in the local programme of community activities.

Clinical screening for dermal lesions of all persons was carried out by the same local professional team for each survey. All inhabitants present in the area at the time of the survey underwent serological screening using the Rapid Plasma Reagin (RPR) test. All RPR-positive individuals were tested for Quantitative Venereal Disease Research Laboratory (VDRL) and Fluorescent Treponemal

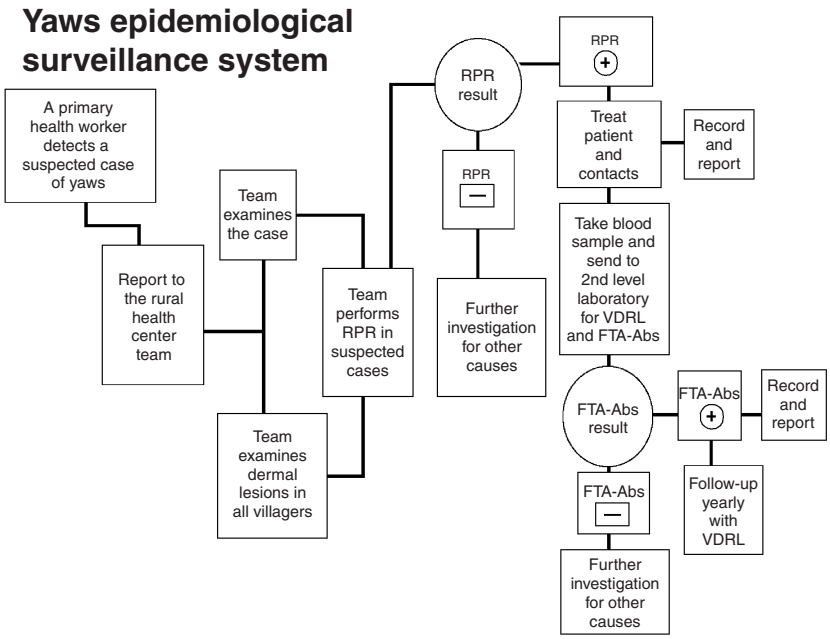


Figure 2 Community-based surveillance system.

Antibody–Absorption (FTA–Abs) tests to confirm serological results and to follow-up latent cases detected in previous surveys. All persons with both RPR and FTA-Abs positive tests were considered serologically positive.

Results

In 1993, 5 years after the 1988 systematic inquiry, a well-planned formal survey was organized with the participation of 13 community health workers, two nurses and two physicians. The results (Table 1a) documented a situation highly suggestive of near elimination (Anselmi *et al.* 1995). Five years later, after another period of intense community involvement, a second survey, conducted with strictly comparable criteria, led to the results documented in Table 1b. No clinical cases compatible with a diagnosis or a suspicion of early-stage yaws were found. After excluding two cases who were clinically and serologically compatible with primary syphilis, one compatible with congenital syphilis, and eight individuals detected in previous surveys as latent yaws cases and under follow-up, the remaining 57 serologically positive individuals were adults with VDRL titres below 1:8, which can be considered as long-term inmunological memory of past exposure ('serological scar') (Arya 1996; Antal *et al.* 2002). The distribution of dermal lesions found in clinical screening is described in Table 2. As of April 2002, no other clinical cases have been reported by the local surveillance system.

Discussion

The overall picture can confidently be defined as indicating elimination of the infection. Like many other countries, Ecuador can now be considered a yaws-free country and the disease can be dropped from the lists of periodically proposed health targets. The achievement of this goal, which had been elusive since the first general campaigns in the 1950s (Gomez-de-la-Torre 1954; Hopkins 1977), is the result of an intervention lasting more than 15 years, involving a community programme coordinated and run by a non-governmental organization under a formal agreement with the Ministry of Health of Ecuador. The intervention was not specifically focused on elimination of yaws, which was part of a comprehensive approach, where some diseases were specifically designated as 'markers' or 'sentinels' against which to measure the effectiveness of the cooperative efforts of the health team and of the community (Tognoni 1997; CECOMET 2001).

There are no established parameters for certifying the elimination of yaws. However, at several technical meetings (PAHO/WHO 1993) an agreement was reached, to consider the absence of clinical cases for 5 years as a criterion for elimination. The data reported in Table 1 meet this criterion.

Yaws is one of the oldest memories and fears of tropical communities; the daily experience of its control and progressive disappearance, and the results of the

Table 1 Prevalence of yaws in Borbón district, Esmeraldas, Ecuador

Endemic focus	Village	Population (*n*)	Examination [*n* (%)]	Clinical cases [*n* (%)]	Positive serology* [*n* (%)]
(a) Survey conducted in 1993					
Santiago	Playa De Oro	170	99 (58.2)	0 (0.0)	2 (2.0)
	Angostura	57	32 (56.1)	0 (0.0)	4 (12.5)
	Playa Tigre, Playa Nueva, Zapote	172	68 (39.5)	3 (4.4)	5 (7.3)
	Palma Real, Guayabal	306	154 (50.3)	10 (6.5)	17 (11.0)
	Chanuzal, Pailón, Picadero	116	50 (43.1)	0 (0.0)	0 (0.0)
	Selva Alegre	538	129 (23.9)	0 (0.0)	0 (0.0)
	Timbiré	324	127 (39.2)	0 (0.0)	1 (0.8)
	Las Antonias	128	52 (40.6)	1 (1.9)	2 (3.8)
	El Porvenir	97	41 (42.2)	1 (2.4)	1 (2.4)
	Negrital	105	45 (42.8)	0 (0.0)	0 (0.0)
	La Peña, Tachina, San Jose Tagua	199	97 (48.7)	0 (0.0)	1 (1.0)
	Rocafuerte	136	90 (66.2)	0 (0.0)	2 (2.2)
Zapallito	Juan Montalvo	114	66 (57.9)	0 (0.0)	11 (16.6)
	Aquí me Quedo, Naranjito	140	68 (48.5)	1 (1.5)	7 (10.3)
Total		2602	1118 (42.9)	16 (1.4)	53 (4.7)
(b) Survey conducted in 1998					
Santiago	Playa De Oro	204	143 (70.1)	0 (0.0)	9 (6.3)
	Angostura	62	53 (85.5)	0 (0.0)	5 (9.4)
	Playa Tigre, Playa Nueva, Zapote	159	119 (74.8)	0 (0.0)	4 (3.3)
	Palma Real, Guayabal	244	163 (66.8)	0 (0.0)	4 (2.4)
	Chanuzal, Pailón, Picadero	162	75 (46.3)	0 (0.0)	1 (1.3)
	Selva Alegre	511	286 (55.9)	0 (0.0)	14 (4.9)
	Timbiré	408	302 (74.0)	0 (0.0)	8 (2.6)
	Las Antonias	120	95 (79.1)	0 (0.0)	0 (0.0)
	El Porvenir	103	78 (75.7)	0 (0.0)	7 (8.9)
	Negrital	102	78 (76.4)	0 (0.0)	0 (0.0)
	La Peña, Tachina, San Jose Tagua	231	180 (77.9)	0 (0.0)	0 (0.0)
	Rocafuerte	144	129 (89.5)	0 (0.0)	0 (0.0)
Zapallito	Juan Montalvo	110	100 (90.9)	0 (0.0)	11 (11.0)
	Aquí me Quedo, Naranjito	154	125 (81.1)	0 (0.0)	5 (4.0)
Total		2714	1926 (70.9)	0 (0.0)	68 (3.5)

* Positive serology – positive RPR confirmed by FTA–Abs.

Table 2 Distribution of dermal lesions

	Number (%)
Cutaneous leishmaniasis	9 (1.4)
Scabies	12 (1.9)
Pyococcal infections	183 (29.2)
Superficial fungal dermatoses*	135 (21.5)
Pityriasis Versicolor or Alba	132 (21.0)
Eczema	22 (3.5)
Onychomycosis	7 (1.1)
Keratoderma plantare	5 (0.8)
Other dermal lesions	122 (19.5)
Total dermal lesions	627 (100.0)
Persons without dermal lesions	1329 (69.0)
Persons with dermal lesions	597 (31.0)
Single	567 (95)
Multiple	30 (5)
Total persons examined	1926 (100)

* Except Pityriasis Versicolor.

epidemiological surveys (shared and discussed with the health workers and the communities), were critical for a strategy calling for low-intensity, but regular, diffuse, long-term surveillance. The lack of operational research has been underlined as one of the reasons for the failure of the eradication campaign; instead of being a futile exercise (Henderson 1998), long-term comprehensive community surveillance led to the elimination of yaws, resulting in a major health gain for this population.

The community health workers' awareness and the increased self-confidence of the communities are certainly other – by no means marginal – end-points.

Interest in yaws has been renewed outside health care in the highly technological area of genetic archeology and paleontology (Rothschild *et al.* 1995; Zimmer 2001). Its disappearance as an element of human suffering symbolic of marginalization, thanks to independent and barely

supported initiatives by a local community is a sobering message in a time of all too global thinking and planning.

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