

# Appropriation and Resistance: Local Responses to Malaria Eradication in Mexico, 1955–1970\*

MARCOS CUETO

*Abstract.* Medical developments in Latin America during the second half of the twentieth century have received little attention. This study examines the Mexican responses to the success and failures of an important international health campaign of the 1950s: malaria eradication. During the 1950s malaria became the disease of central concern for international and US agencies working in developing countries (as yellow fever and hookworm were for tropical health during the early twentieth century). This article outlines the motivations, design and techniques of the campaign. It concentrates on two local responses: first, the enthusiastic support displayed by personnel working in the field; and, secondly, the reactions against the campaign of a local doctor – who revealed some of the inadequacies of malaria eradication – and of two medical anthropologists, who emphasised the scant attention paid to the cultural and social aspects of the campaign.

On 7 September 1956, in a nation-wide radio broadcast, President Adolfo Ruiz Cortines announced the beginning of a national crusade to eradicate malaria from Mexico.<sup>1</sup> Its ‘soldiers’ were sprayers of the insecticide DDT. They dressed in bright khaki uniforms, and were active members of the Comisión Nacional de Eradicación del Paludismo (CNEP). The commission had been established by the government a year before to fight malaria, a parasitic disease predominant in rural areas. This marked the

Marcos Cueto is Professor in the School of Public Health at Universidad Peruana Cayetano Heredia.

\* Research for this article was possible thanks to a visiting fellowship (Spring 2004) at the Woodrow Wilson Center in Washington, DC. In addition, previous valuable support was provided by the Council for International Exchange of Scholars-Fulbright New Century Scholars programme, ‘Challenges of Health in a Borderless World,’ and the National Library of Medicine’s Pisano Travel Award.

<sup>1</sup> ‘Comienza hoy la campaña para la erradicación del paludismo,’ *El Universal* (Mexico) 7 Sept. 1956, p. 1; ‘Es para bien de la patria la campaña contra el paludismo,’ *El Universal*, 8 Sept. 1956, p. 1; ‘Ruiz Cortines dará hoy la orden de marcha contra el paludismo,’ *Excelsior* (Mexico) 7 Sept. 1956, p. 1; ‘Cada mexicano es un Cruzado en la lucha contra el paludismo,’ *Excelsior*, 8 Sept. 1956, p. 1.

beginning of a fascinating encounter between international, national and local health perspectives.<sup>2</sup>

Historical studies have analysed the role played by tropical medicine within the expansion of empires and national states during the turn of the twentieth century.<sup>3</sup> However, few works have examined international health programmes during the second half of the century. There are still fewer studies on the local reception of international health programmes at that time. This is an important, understudied period when new agencies of the United Nations appeared: the World Health Organization (WHO), a renovated Pan American Sanitary Bureau (PASB, the regional arm of the WHO and since 1959 known as the Pan American Health Organization, PAHO), and the United Nations International Emergency Children's Fund (UNICEF). In addition, bilateral agencies, such as the US Department of State's International Cooperation Administration (ICA, the predecessor to USAID) played an important role in the incorporation of US Cold War interests into international health programmes.<sup>4</sup>

The second half of the twentieth century witnessed the full implementation of infectious disease eradication, a concept which has its roots in the first Rockefeller Foundation campaigns of the 1920s. International agencies launched eradication campaigns for yaws, malaria and smallpox, in one or more Latin American countries, during the 1950s.<sup>5</sup> These campaigns achieved mixed results and created debate as to how and when disease eradication would be possible (today smallpox and polio are considered by PAHO the only two diseases eradicated in Latin America).<sup>6</sup> This article will

<sup>2</sup> M. Black, *The Children and the Nations: The Story of Unicef* (Sydney, 1986), p. 122.

<sup>3</sup> See, for example D. Arnold (ed.), *Warm Climates and Western Medicine: The Emergence of Tropical Medicine, 1500–1900* (Amsterdam, 1996), and D. Obregón, 'Building National Medicine: Leprosy and Power in Colombia, 1870–1910,' *Social History of Medicine*, vol. 15, no. 1 (2002), pp. 89–108.

<sup>4</sup> For histories of these organisations, see J. Siddiqi, *World Health and World Politics: The World Health Organization and the UN System* (Columbia, South Carolina, 1995); S. Lee, 'WHO and the Developing World: The Context for Ideology,' in A. Cunningham and B. Andrews (eds.) *Western Medicine as Contested Knowledge* (Manchester, 1997), pp. 24–45; and M. Cueto, *El valor de la salud: historia de la Organización Panamericana de la Salud* (Washington, DC, 2004).

<sup>5</sup> F. L. Soper, 'El concepto de la erradicación de las enfermedades transmisibles,' *Boletín de la Oficina Sanitaria Panamericana*, vol. 42, no. 1 (1957), pp. 1–5; *ibid.*, 'Rehabilitation of the eradication concept in prevention of communicable diseases,' *Public Health Reports*, vol. 80, no. 10 (1965), pp. 855–69.

<sup>6</sup> On eradication in the post World War II period, see L. Williams Jr., 'Malaria Eradication – Growth of the concept and its application,' *The American Journal of Tropical Medicine and Hygiene*, vol. 7, no. 3 (1958), pp. 259–67; A. Cockburn, 'Eradication of infectious diseases,' *Science*, vol. 133 (7 April 1961), pp. 1050–8; W. Dowdle, 'The principles of disease elimination and eradication,' *Bulletin of the World Health Organization*, vol. 76, Supplement 2 (1998), pp. 22–5; W. Dowdle and D. R. Hopkins, *The Eradication of Infectious Diseases* (Chichester and New York, 1998); P. Greenough, 'Intimidation, Coercion and Resistance in the Final Stages of the South Asian Smallpox Eradication Campaign,

not discuss the advantages or limitations of an eradicationist perspective in public health. Rather, it intends through examination of an historical case, to illuminate the contradictory processes of local appropriation and resistance to malaria eradication.

I will briefly describe the global and national motivations for launching malaria eradication and then concentrate on the local Mexican responses.<sup>7</sup> I argue that there were two responses to the antimalaria campaign. First, personnel recruited for malaria eradication ‘Mexicanised’ the campaign and their performance went beyond the expectations of international agencies, particularly in their active use of mass media in health education. Secondly, a minority of provincial medical doctors and health professionals were highly critical of the whole enterprise.<sup>8</sup> Although the archival records give no definitive indication of the extent of these criticisms, they appear to be marginal to the hegemonic official anti-malaria campaign and to the pattern of local

---

1973–1975,’ *Social Science and Medicine*, vol. 41, no. 5 (1995), 633–45; B. Aylward, K. Hennessey, N. Zagria, J. Olive and S. Cochi, ‘When is a Disease Eradicable? 100 Years of Lessons Learned,’ *American Journal of Public Health* vol. 90, no. 10 (2000), pp. 1515–20; A. S. Evans, ‘The Eradication of Communicable Diseases: Myth or Reality?,’ *American Journal of Epidemiology*, vol. 122, no. 2 (1985), pp. 199–207; S. Litsios, ‘Rene Dubos and Fred L. Soper: Their Contrasting Views of Vectors and Disease Eradication,’ *Perspectives in Biology and Medicine*, vol. 41, no. 1 (1997), pp. 138–49; F. Fenner et al., *Smallpox and its Eradication* (Geneva, 1988); P. Yekutieli, ‘Lessons from the Big Eradication Campaigns,’ *World Health Forum*, vol. 2 (1981), pp. 465–90; C. V. Brown and G. J. Nossal, ‘Malaria, Yesterday, Today, and Tomorrow,’ *Perspectives in Biology and Medicine*, vol. 20, no. 1 (1986), 65–76; C. A. de Quadros, ‘Global Eradication of Poliomyelitis and Measles: Another Quiet Revolution,’ *Annals of Internal Medicine*, vol. 127, no. 2 (15 July 1997), pp. 156–8.

<sup>7</sup> Studies on international health and malaria eradication during the 1950s include R. M. Packard, ‘No Other Logical Choice: Global Malaria Eradication and the Politics of International Health in the Post-War Era,’ *Parassitologia*, vol. 40, no. 1–2 (1998), pp. 217–29; R. M. Packard and P. J. Brown, ‘Rethinking Health, Development and Malaria: Historicising a Cultural Model in International Health,’ *Medical Anthropology*, vol. 17, no. 3 (1997), pp. 181–94; R. M. Packard, ‘Malaria Dream: Postwar Visions of Health and Development in the Third World,’ *Medical Anthropology*, vol. 17, no. 3 (1997), pp. 279–96; S. Litsios, ‘Malaria Control, the Cold War, and the Postwar Reorganization of International Assistance,’ *Medical Anthropology*, vol. 17, no. 3 (1997), pp. 255–78; and J. A. Nájera, ‘Malaria and the Work of WHO,’ *Bulletin of the World Health Organization*, vol. 67, no. 3 (1989), pp. 229–43.

<sup>8</sup> This article is based on materials held in the *Archivo Histórico de la Secretaría de Salud* (hereafter AHSS) and the Biblioteca Nacional, located in Mexico, DF. I also use a report from the National Archives, Maryland and publications from the Library of the World Health Organization, Geneva, (hereafter WHO Library) and the National Library of Medicine, Bethesda. During the 1950s the Mexican health agency was called the Secretary of Public Health and Assistance [*Secretaría de Salubridad y Asistencia*]. Studies on Mexico’s public health system during the mid- twentieth century are: X. de la Riva Rodríguez, ‘Salubridad y Asistencia Médico Social,’ in *México, cincuenta años de revolución. La vida social*, vol. II (Mexico City, 1961), pp. 382–444; J. Álvarez Amézquita et al., *Historia de la salubridad y de la asistencia en México* (Mexico City, 1960) and A. C. Rodríguez de Romo and M. E. Rodríguez, ‘Historia de la salud pública en México: siglos XIX y XX,’ *Historia, ciencias, saúde – Mangümbos*, vol. 5, no. 2 (1998), pp. 293–310.

appropriation. However, such criticisms suggest that the lack of a long-term intercultural perspective limited the campaign in rural areas.

Malaria was a tragic reality in rural and semi-rural Mexico during the twentieth century. Before the 1950s Mexican health authorities implemented important control programmes to reduce mosquito breeding areas in some regions of the country. The tools of these programmes were draining marshes to eliminate mosquito breeding places, spraying ponds to kill the larvae of the mosquito, distribution of antimalarial drugs such as quinine to treat and prevent the disease, and equipment of houses with screens.<sup>9</sup> They also used DDT in some areas after it appeared in the mid-1940s. These control activities contributed to a reduction in morbidity and mortality due to malaria – a trend that can be discerned from the early 1950s, before the eradication campaign was launched.<sup>10</sup> In addition, Mexican doctors studied the disease and organised two national malaria congresses before the eradication campaign began.<sup>11</sup> However, many of these efforts were erratic, and never reached a national scale. Consequently, malaria was still a major public health problem in the early 1950s.

In the mid-1950s the malarious areas in Mexico exceeded 1.1 million km<sup>2</sup> (approximately 60 per cent of the country). In 1955 the estimated number of cases reached two million, with a death toll of 19,639, making malaria the third largest cause of mortality in the country.<sup>12</sup> Due to the dimension of the problem in this, one of the largest Latin American countries and one sharing a border with the USA, the fight against malaria in Mexico received significant support. The World Health Organization (WHO) promoted it as an example for other regions of the world.<sup>13</sup>

<sup>9</sup> Secretaría de Salubridad y Asistencia. Dirección General de la Campaña Nacional contra el Paludismo, *Trabajos realizados en la Zona Norte de Petróleos Mexicanos* (Mexico, 1949). On malaria control programmes, see M. Humphreys, *Malaria: Poverty, Race, and Public Health in the United States* (Baltimore, 2001); and G. Harrison, *Mosquitoes, Malaria, and Man: A History of the Hostilities since 1880* (London, 1978).

<sup>10</sup> D. H. Stapleton, 'The Dawn of DDT and its experimental use by the Rockefeller Foundation in Mexico, 1945–1952,' *Parassitologia*, vol. 40, no. 1–2 (1996), pp. 149–58.

<sup>11</sup> A. A. Laeza, *Breve resumen de los estudios acerca del paludismo en los Estados Unidos Mexicanos* (Mexico City, 1911); A. G. Alarcón, *Estudios clínicos y terapéuticos acerca del paludismo infantil* (Mexico City, 1938); E. Beltrán and E. Aguirre Pequeño, *Lecciones de paludología* (Monterrey, 1948); F. McGregor Giacinti, *Mosquitos y paludismo* (Mexico City, 1940); *Memoria del Segundo Congreso Nacional de Paludismo* (Mexico City, 1951).

<sup>12</sup> J. Armas Domínguez, *Las defunciones por paludismo en la República Mexicana: desde el punto de vista de su diagnóstico médico y su clasificación estadística* (Mexico City, 1956), p. 2.

<sup>13</sup> During the mid-1950s 25 species of malaria mosquitoes were identified in Mexico. Of these the main vectors were *Anopheles pseudopunctipennis pseudopunctipennis* and *Anopheles albimanus*. *Plasmodium vivax* was the most common of the 3 versions of malaria that exist in the Western Hemisphere (88 per cent of all malaria cases), M. E. Pesquiera, 'Programa de erradicación del paludismo en México,' *Boletín de la Oficina Sanitaria Panamericana*, vol. 42, no. 6 (1957), pp. 537–47. An important document that explains that the campaign may be

*Metropolitan Decisions*

Although the idea of eliminating malaria had existed since the early twentieth century and Mexico had used residual insecticides in the 1940s, there were insufficient financial resources and political will until the mid-1950s. The XIV Congress of the Pan American Sanitary Bureau (PASB) held in Santiago, Chile, in 1954, endorsed eradication. Following the leadership of Fred L. Soper, a former Rockefeller Foundation officer who directed PASB between 1947 and 1959, PASB initiated a countdown for malaria in the Western Hemisphere. In 1957 the US International Cooperation Administration contributed \$2.5 million to PASB's initiative on the grounds that eradication was better than control in terms of funds, time and resources. For the supporters of eradication, control entailed an endless use of money and health workers in endemic areas, while eradication required a single investment to make malaria disappear. In addition, eradication provided a means to build public health systems through disease-driven campaigns and modern technology.<sup>14</sup> Finally, eradication was portrayed as the only possible path because, since the early 1950s, reports indicated that mild and inconsistent application of DDT, typical of intermittent control interventions, created tolerance among some species of the *Anopheles* mosquito. Thus, according to a leader of eradication, 'the choice is either eradicating malaria or indefinitely enduring a disease transmitted by increasingly resistant vectors'.<sup>15</sup>

Another important event for the eradication campaign in Mexico was the Eighth World Health Assembly (the annual WHO meeting) held in mid-May 1955, in Mexico City. The programme commission and the main plenary session discussed malaria eradication extensively. Only one other topic merited as much attention – the use of atomic energy in medicine. In fact,

---

found in the WHO Library: 'Malaria Eradication, Mexico,' *The Work of WHO 1956*, (Geneva, 1957), pp. 60–3. Historical studies of malaria work in Mexico include: D. G. Cervantes, *Breve reseña de la lucha antipalúdica en México* (Mexico City, 1979); A. E. Birn, 'Eradication, Control or Neither? Hookworm versus Malaria Strategies and Rockefeller Public Health in Mexico,' *Parassitologia*, vol. 40, no. 1–2 (1998), pp. 137–47; and H. Gómez-Dantes and A. E. Birn, 'Malaria and Social Movements in Mexico: The Last 60 Years,' *Parassitologia*, vol. 42, no. 1–2 (2000), pp. 69–85.

<sup>14</sup> Pan American Sanitary Bureau, *Actas de la Decimocuarta Conferencia Sanitaria Panamericana, Santiago, Chile, 7–22 Octubre 1954* (Washington, DC, 1955); D. J. Pletsch, 'Progress toward Malaria Eradication in the Americas with Special Reference to Mexico,' *American Journal of Public Health*, vol. 48, no. 6 (1958), 713–16; J. Alvarez Amezcuita and G. E. Samamé, 'La filosofía y doctrina del concepto de erradicación,' *Salud Pública de México*, vol. 5 (1963), pp. 301–6.

<sup>15</sup> P. F. Rusell, 'The Status of Malaria Today,' in *Industry and Tropical Health III, Proceedings of the Third Conference Industrial Council for Tropical Health Sponsored by the Harvard School of Public Health, April 16–18, 1957* (Boston, 1957), pp. 25–7.

DDT was called by US scientists the ‘atomic bomb’ of insecticides.<sup>16</sup> A resolution sanctioned eradication and created a special WHO fund to support eradication programmes. The publication of scholarly works in Mexico also played a role in reinforcing eradication. Among them was a book by Paul F. Rusell, an officer at the Division of Medicine and Public Health of the Rockefeller Foundation and former director of WHO’s Committee on Malaria, who many considered one of the world’s foremost malariologist.<sup>17</sup>

US foreign policy supported malaria eradication as part of its Cold War objectives. The USA believed that solving health and other social problems in developing countries would help to prevent communism. According to a US Department of State ‘National Intelligence Estimate’, there existed a concern regarding the influence of the Soviet Embassy in Mexico, the proposals of nationalisation of industries made by some politicians, and the strikes actively organised by Mexican workers’ unions.<sup>18</sup> For Roy R. Rubottom, Assistant Secretary for Inter-American Affairs in the late 1950s, the Mexican Vicente Lombardo Toledano was the ‘number one communist labor leader of Latin America’.<sup>19</sup> The campaign was launched when the governments of Mexico and the USA were on friendly terms, having signed accords to regulate the migration from Mexico to the USA of agricultural workers and to control illegal fishery in the Mexican waters of the Gulf of Mexico, and co-sponsored a major construction project: the Falcon Dam on the lower Rio Bravo. Moreover, both governments shared the concern about communism.<sup>20</sup>

For the Mexican government the campaign provided a means to obtain funds from abroad, to reinforce its strong centralised administrative system, to create rural health services in poorly served areas, and to demonstrate that

<sup>16</sup> The term was used from 1945, see E. Rusell, *War and Nature: Fighting Humans and Insects with Chemicals from World War I to Silent Spring* (Cambridge, 2001) p. 177.

<sup>17</sup> ‘Octava Asamblea Mundial de la Salud,’ *Crónica de la Organización Mundial de la Salud*, vol. 9, no. 7 (1955), pp. 217–23. An important work by Rusell was translated and published in Mexico a few years before the meeting: P. F. Rusell, *Paludismo, compendio de principios básicos* (Mexico, 1953).

<sup>18</sup> US Department of State, ‘National Intelligence Estimate, the Outlook for Mexico, Washington, DC, 13 Aug. 1957, NIE 81–57,’ in J. P. Glennon (ed.), *Foreign Relations of the United States, 1955–1957, American Republics; Multilateral; Mexico; Caribbean* (Washington, DC, 1987), pp. 684–5.

<sup>19</sup> R. R. Rubottom Jr. [Assistant Secretary for Interamerican Affairs] ‘Communism in the Americas,’ *Bulletin for the Department of State*, vol. 38, no. 971 (3 February 1958), pp. 180–185. p. 181. See also H. L. Matthews, ‘Anti-US Feeling in Mexico easing,’ *The New York Times* 7 April 1957, p. 10.

<sup>20</sup> H. F. Cline, *Mexico, Revolution to Evolution, 1940–1960* (Westport, 1981); P. H. Smith, *Talons of the Eagle: Dynamic of US Latin American Relations* (New York, 2000); S. G. Rabe, *Eisenhower and Latin America: The Foreign Policy of Anticommunism* (Chapel Hill, 1988); and M. C. Meyer and W. L. Sherman, *The Course of Mexican History* (New York, 1983), pp. 596–651.

it was fulfilling the social promise of the 1910 Mexican Revolution for better health.<sup>21</sup> With the election of Adolfo López Mateos in 1959, the Public Health Secretariat received more federal power and resources for malaria eradication.<sup>22</sup> From the late 1940s Mexican presidents abandoned the populist trend inaugurated with the Revolution and favoured foreign investment, agricultural modernisation, promotion of major public works on highway, irrigation, electricity and construction, and industrial growth through import substitution. During the following four decades the country experienced a sustained rate of economic growth. The Rockefeller Foundation's 'Green Revolution' aimed to increase production of basic food crops through the use of improved seed varieties, fertilisers, and pesticides. During the mid-1950s, the Mexican governments de-emphasised land redistribution and the creation of more *ejidos*, the community land expropriated from large private holdings. Instead, they attempted to create additional arable land in the plateau areas – where malaria was endemic – and encouraged migration from the highlands to the coastal region.<sup>23</sup>

In addition to PASB's support, Mexico's antimalarial programme received financial aid from UNICEF. An agreement signed in Mexico on December 1955, established a three-party agreement between this agency, the Mexican government, and PASB. UNICEF took responsibility for providing equipment, vehicles and material; PASB facilitated technical assistance; and the Ruíz Cortines government provided labour and local leadership, and enacted appropriate legislation. Between 1957 and 1961 the Public Health Secretariat devoted between 11 and 13 per cent of its budget to malaria eradication – which was more than to any other single health programme. UNICEF also made an important contribution, donating about \$15 million to the campaign between 1956 and 1963.<sup>24</sup>

<sup>21</sup> José Álvarez Amezcuita [the Health Secretary], 'La obra de la revolución mexicana en el campo de la salud pública,' *Salud Pública de México* 3 (1961), pp. 9–14; Luis Vargas [a señor CNEP official], 'Fundamentos evolutivos de la teoría del estado y sus alcances en la erradicación el paludismo en México,' *Salud Pública de México*, vol. 2 (1960), 489–99.

<sup>22</sup> G. Schendel, *Medicine in Mexico: From Aztec Herbs to Betatrons* (Austin, 1968), p. 150.

<sup>23</sup> R. J. Alexander, 'Nature and Progress of Agrarian Reform in Latin America,' *The Journal of Economic History*, vol. 23, no. 4 (1963), pp. 559–73.

<sup>24</sup> 'Informe preparado por el Secretario de Salubridad y Asistencia, Feb. 1963,' Folder: Informes de labores rendidos por el Departamento General de Epidemiología. Expediente: 2. Caja: 35. Sección: Subsecretaría de Salubridad y Asistencia. Fondo: Secretaría de Salubridad y Asistencia. AHSS. In 1963 UNICEF donated \$185,000 to 'Salud Materno-Infantil y Saneamiento del Medio Ambiente' and \$393,000 to 'Adiestramiento de Personal Rural de Salud'. The malaria campaign received in that year \$1.3 million, which represented 67 per cent of the total amount that UNICEF donated to Mexico in that year. Miguel Bustamante to José Álvarez Amésquita, Mexico, 29 Jan. 1963. Folder: Tratados y Convenios de esta Secretaría con UNICEF. Expediente: 4. Caja: 64. Sección: Secretaría Particular. Fondo: Secretaría de Salubridad y Asistencia. AHSS. On these amounts also see International Cooperation Administration Expert Panel on Malaria, 'Report and

CNEP enjoyed substantial independence under the Public Health Secretariat. It was only accountable to the Secretary who designed it as a self-contained hierarchical and administrative unit. CNEP was directed by Mexicans, such as the entomologist Luis Vargas – who trained in US medical schools with fellowships from the Rockefeller Foundation, published in prestigious scientific journals and shared the objectives of PASB and WHO.<sup>25</sup> A Mexican CNEP executive member presided over its Board, where PASB and UNICEF were also represented. Special legislation allowed the importing of campaign materials free of duty, and required political, educational and health authorities to report the disease. By 1956, 539 brigades, 2,312 sprayers and 633 vehicles (including jeeps, trucks and boats with an additional two thousand horses and mules) were ready for antimalaria work.<sup>26</sup>

CNEP carried out eradication through a military-style campaign with clear chains of command and an overconfidence about technology that replicated patterns of mosquito-born disease containment in the early twentieth century.<sup>27</sup> However, there were some differences. Previously, the destruction of the *Anopheles*-mosquito breeding sites was limited to the main rural towns. In the mid-1950s the scope of malaria eradication became national – all rural houses were supposed to be sprayed – and only adult mosquitoes were the targets. In addition, plans were much more detailed and the participation of local personnel was greater. CNEP's plan reproduced by a four-stage design of PASB and WHO. The first was 'Preparation', in which they trained personnel and defined the characteristics of malarial areas. The second 'Attack' phase was eradication: a blanket of insecticides spraying, mainly DDT, inside households. They assumed that, if applied thoroughly in two annual cycles, DDT would eliminate the *Anopheles* mosquito before it could develop resistance. Simultaneously, teams searched for remaining cases of malaria. The third, or 'Consolidation' phase, in which spraying ceased, was devoted

---

Recommendations On malaria: A Summary,' *American Journal of Public Health*, vol. 10, no. 4 (1961), pp. 451–502.

<sup>25</sup> Vargas was also the co-author of the first comprehensive entomological studies of Mexican *Anopheles* and a prolific writer. See L. Vargas and A. Martínez Palacios, *Estudio taxonómico de los mosquitos anofelinos de México* (Mexico City, 1950). A biographical sketch appears in S. Ibañez Bernal, 'Daniel Luis Vargas García Alonso,' In J. L. Valdespino Gómez et al., *Una institución académica mexicana y dieciséis investigadores distinguidos, cuadragésimo aniversario del Instituto de Salubridad y Enfermedades Tropicales-Instituto Nacional de Diagnóstico y Referencia Epidemiológicos* (Mexico City, 1994), pp. 127–30.

<sup>26</sup> 'Decreto Presidencial que declara de interés público y de beneficio social la campaña para erradicar el paludismo,' *Diario oficial*, 17 Dec. 1955, volume CCXIII, no. 41. Folder: Comisión Nacional para la Erradicación del Paludismo. Expediente: 1. Caja: 51. Sección: Secretaría Particular. Fondo: Secretaría de Salubridad y Asistencia. AHSS.

<sup>27</sup> See M. Cueto, 'Sanitation from Above: Yellow Fever and Foreign Intervention in Perú, 1919–1922,' *Hispanic American Historical Review*, vol. 72, no. 1 (1992), pp. 1–22.



to treatment with drugs. The last phase, ‘Conservation’ would confirm the end of malaria. In Mexico the timeline was as follows: 1956 for the ‘Preparation’ stage, 1957–1960 for the ‘Attack’ stage, 1961–1963 for the ‘Consolidation’ stage, and 1964 and onwards for the ‘Conservation’ stage. If no malaria cases were reported after three years, the disease would be considered permanently eliminated.<sup>28</sup>

CNEP split the whole country into 14 zones that included a different number of sectors and several spraying brigades. The Mexican army’s general staff, who had the best knowledge of the national territory, led CNEP’s logistics. Each zone was headed by a malariologist, supported by, Health engineers and entomologists, with a large number of clerks, drivers, and sprayers occupying the lower rungs of the hierarchy. Brigades consisted of one chief inspector and four inspectors. During the initial campaign years CNEP’s staff grew to over 4,000 officers. They were full-time workers in rural areas, an unusual phenomenon in Mexican public health. CNEP’s task was enormous. In its first year, 1956, over 3.3 million houses needed to be sprayed. Detailed maps of towns and even drawings of the houses’ interiors were made available for the sprayers. The level of detail was high: estimates for each sprayer’s daily chores neared 8.6 houses (an average that subsequently increased). DDT, the main weapon of the campaign, remained relatively low-cost and had effects lasting up to six months. By the early 1960s, CNEP’s work proved to be impressive. Between 1957 and 1962 sprayers visited more than four million houses, over 27.2 million spraying operations were carried out, a little more than 6 million blood samples were taken, and 11.2 million pills of anti-malarial drugs were used.<sup>29</sup>

<sup>28</sup> A complete account of the malaria eradication programme appears in WHO Expert Committee on Malaria, *Sixth Report* (Geneva, 1957). Mexico’s plan is explained in H. Romero Álvarez, ‘Comisión Nacional para la Erradicación del Paludismo,’ *Salud Pública de México*, vol. 6 (1964), pp. 1123–52; L. Vargas, G. Román y Carillo and A. Almaraz y Ugalde, ‘Organization and Evaluation of the Malaria Eradication Campaign in Mexico during the first year of complete coverage,’ *Bulletin of the World Health Organization*, vol. 19, no. 4 (1958), pp. 621–35; and L. Vargas, ‘Aspectos socioeconómicos de las zonas rurales mexicanas en relación con la erradicación del paludismo,’ *Revista del Instituto de Salubridad y Enfermedades Tropicales*, vol. 18, nos. 3–4 (1958), pp. 147–86.

<sup>29</sup> The draft was ‘Plan tripartito de operaciones para un proyecto de erradicación del paludismo en México, 1954’ Folder ‘Generalidades de convenios celebrados entre la CNEP y la OMS y el Fondo de las Naciones Unidas para la Infancia, Manuel B. Márquez Escobedo.’ Expediente: 3. Caja: 1. Sección: CNEP-Dirección. Fondo: Secretaría de Salubridad y Asistencia. The information in this paragraph comes from ‘Datos principales del desarrollo del programa de erradicación del paludismo en México, 1958’. Folder: Comisión Nacional para la Erradicación del Paludismo, Informe de labores. Expediente: 1. Caja: 80. Sección: Subsecretaría de Asistencia. Fondo: Secretaría de Salubridad y Asistencia. AHSS; L. Vargas, ‘Realizaciones del programa de Erradicación,’ *Salud Pública de México*, vol. 7 (1965), pp. 737–40; D. Stapleton, ‘The Short-Lived Miracle of DDT,’ *Invention and Technology*, vol. 15 no. 3 (2000), pp. 34–41.

Although the precise demographic impact of the malaria eradication campaign in Mexico is yet to be studied, it seems to have had a positive impact on the decline of mortality. The campaign dramatically reduced the number of deaths caused by malaria in Mexico and freed several areas from the disease, including the cities of Veracruz, Acapulco and Guadalajara. The disease practically disappeared around most of the Gulf of Mexico and the northern area of the country, but it persisted in the south, especially along the Pacific coast. It proved more difficult to eliminate malaria in areas such as Chiapas and Guerrero, where 75 per cent of the population was rural.<sup>30</sup> Another benefit of the campaign was the decrease of dengue and yellow fever transmitted by *Aedes aegypti*, a more vulnerable mosquito than the *Anopheles*.<sup>31</sup> Fewer people died of malaria, which was a remarkable achievement. According to one estimate, if the agencies had done nothing in Mexico, 30,393 people would have died of malaria in 1967 in Mexico. In fact, only 29 died.<sup>32</sup> The positive impact of eradication on morbidity is suggested by official figures that contrasted a rate of 136.7 per 100,000 inhabitants in 1955 (or 40,591 cases) with that of 10.2 in 1960 (3,665 cases).<sup>33</sup>

However, it is necessary to view these figures with caution because this contrast was partly due to the indicators selected. After 1957 it was mainly only laboratory-confirmed cases that were included in the statistics, whereas before malaria was diagnosed by clinical symptoms, mainly recurrent fever. It seems plausible that although clinical diagnosis and clinicians overstated malaria before eradication, after 1957 many cases escaped confirmation since the laboratory facilities were insufficient.<sup>34</sup> CNEP could not fully implement its surveillance based on blood tests. In 1963, a health officer admitted that only 50 per cent of all death registries in the country were undertaken by physicians, the remaining 50 per cent frequently being done by civil judges, who, especially in the rural areas, 'had no capacity to judge the causes of death'.<sup>35</sup>

In 1963, three quarters of the territory originally considered as malarious (860,000 km<sup>2</sup>, entailing 82 per cent of the population) became the

<sup>30</sup> 'Población urbana y rural del país por entidades federativas 1960 y 1965,' in México, Dirección General de Estadística, *Anuario Estadístico Compendiado de los Estados Unidos Mexicanos, 1968* (Mexico City, 1969), p. 18.

<sup>31</sup> Vargas, 'Realizaciones,' p. 739.

<sup>32</sup> G. Gramiccia and J. Hempel, 'Mortality and morbidity from malaria in countries where malaria eradication is not making satisfactory progress,' *Journal of Tropical Medicine and Hygiene*, vol. 75, no. 10 (Oct. 1972), pp. 187–92.

<sup>33</sup> J. Fernández de Castro, 'El paludismo en México y la lucha para su control,' In J. Kumate and A. Martínez Palomo (eds.), *A cien años del descubrimiento de Ross: el paludismo en México* (Mexico City, 1998), pp. 227–35.

<sup>34</sup> G. Román y Carrillo, 'El paludismo en México,' *Gaceta Médica de México*, vol. 110, no. 6 (1975), pp. 401–410.

<sup>35</sup> J. Álvarez Amezquita, '¿Hay defunciones por paludismo en México?,' *Salud Pública de México*, vol. 5 (1963), 748–9, p. 748.

‘consolidation territory’, the penultimate stage of the campaign. Malaria disappeared from most sub-urban areas too, contributing to the rapid rate of growth of the urban population. However, in some areas orthodox techniques made little progress. One of the main technical problems was that the resistance of mosquitoes to insecticides was higher than expected. An additional problem was an uncontrolled pocket of malaria in the southwest corner of Mexico, where migrant Guatemala peasants working on Mexican coffee plantations carried malaria back and forth. By the mid-1960s it was estimated that 196,000 Mexicans lived in malaria areas. As a result, the original deadline of eradication was not met.<sup>36</sup>

### *Appropriation*

Almost from the start, the campaign exceeded its technical scope. Authorities oversold the benefits of eradication in order to obtain support. They often advertised malaria eradication as an instrument for improving agricultural productivity, tourism and rural progress.<sup>37</sup> In addition, there existed a belief that the campaign would help to advance Western medicine and overcome the supposed feelings of apathy and fatalism among ailing rural people. For this purpose, the anaemia and physical lassitude typical of malaria were stressed and contributed to a racialised version of the disease: indigenous peoples were often perceived as disease carriers and their culture as an obstacle to health progress. A corollary was that medical doctors and CNEP workers would banish traditional medicine. According to a Mexican health officer the eradication campaign would help to uproot ‘prejudice and superstitions ... strongly rooted in the rural milieu.’<sup>38</sup>

<sup>36</sup> Vargas, ‘Realizaciones del programa’; J. de Zulueta and C. G. Garret-Jones, ‘An Investigation of the Persistence of Malaria Transmission in Mexico,’ *American Journal of Tropical Medicine and Higiene*, vol. 14, no. 1 (1965), pp. 63–77; G. Román y Carrillo, H. Romero Álvarez and I. Gómez Mendoza, ‘Epidemiología del paludismo residual en México,’ *Salud Pública de México*, vol. 7 (1965), pp. 501–4; L. Vargas, ‘El fenómeno de la resistencia a insecticidas en *Anopheles* transmisores de paludismo,’ *Salud Pública de México* vol. 15 (1973), pp. 21–27, R. Moreno Valle and G. Suárez Torres, ‘Evolución del paludismo en la frontera mexicano-guatemalteca en 1964 y Plan de Acción para 1965,’ *Salud Pública de México*, vol. 7 (1965), pp. 33–40; and R. W. Babione, ‘Special Technical Problems in malaria eradication in Latin America, 6 Feb. 1964,’ World Health Organization. [http://whqlibdoc.who.int/malaria/WHO\\_Mal\\_430.pdf](http://whqlibdoc.who.int/malaria/WHO_Mal_430.pdf) [last accessed 30 October 2004].

<sup>37</sup> L. Vargas, ‘Consideraciones generales sobre la epidemiología de la malaria evanescente en México,’ *Gaceta Médica de México*, vol. 88, no. 9 (1958), pp. 613–33.

<sup>38</sup> C. Sergio Escobar, ‘La erradicación del paludismo; producto del esfuerzo conjunto nacional,’ *Salud Pública de México*, vol. 5 (1963), pp. 727–31.

The Mexican campaign attached great importance to the mass media as a tool for health education.<sup>39</sup> During its first years, materials were prepared for 148 radio stations, 76 publications (articles in newspapers, and magazines), and three television programmes. Three audiovisual mobile units worked with CNEP, which distributed millions of pamphlets and 150,000 posters with slogans urging the need for development and communal responsibility such as ‘National Prosperity without Malaria’ and ‘All [houses] must be sprayed’.<sup>40</sup> Subsequent posters carried messages strongly appealing to nationalist sentiments; for example, ‘I am a Patriot’ (distributed to people whose houses had been sprayed) and ‘My house has already been sprayed. War against Malaria is for Mexico’. A further CNEP poster linked nationalism with motherhood by presenting a woman saying: ‘In Defence of my Homeland, in Defence of my Children, war on Malaria’.<sup>41</sup> As in the US public health campaigns before and during World War II, technology, family values and war metaphors were interwoven.<sup>42</sup> These features were important as Mexican nationalism had played an important role since the 1910 Revolution and because Catholicism glorified mothers. As shown by Joseph, Rubenstein and Zolov, post-war Mexican governments made a remarkable effort to promote a national popular culture as a form of political validation.<sup>43</sup>

The most fascinating publications of the campaign were the primitive – usually offset – monthly bulletins from some of the 14 different campaign zones. Most carried ingenious names, such as *El Chamula*, a term of an indigenous town. This was a smart move in a region like Chiapas, home to a large indigenous population (with the third highest rate of malaria mortality, after Oaxaca and Tabasco). In addition, there was *El Transmisor*, which alluded to mosquitoes, and *La Cotorra*, that referred not only to the distinctive crested bird but also to a person who echoes another’s words.<sup>44</sup> One editorial in *La Cotorra*, published in

<sup>39</sup> In 1960 the director of CNEP’s educational programme and an officer of the same programme explained the important role played by audiovisual materials, F. Villaseñor, ‘Los medios audiovisuales en la enseñanza,’ *Salud Pública de México*, vol. 2 (1960) pp. 77–80; and J. Chargoy Martínez, ‘La cinematografía y la educación higiénica,’ *Salud Pública de México*, vol. 2 (1960) pp. 81–4.

<sup>40</sup> These posters are kept in Comisión Nacional para la Erradicación del Paludismo, Informe de labores. Expediente: 1. Caja: 80. Sección: Subsecretaría de Asistencia. Fondo: Secretaría de Salubridad y Asistencia. AHSS.

<sup>41</sup> In ‘Memoria del CNEP,’ *Boletín del CNEP*, vol. 11, no. 4 (1958), pp. 3–55.

<sup>42</sup> Russell, *War and Nature*.

<sup>43</sup> G. M. Joseph, A. Rubenstein and E. Zolov (eds.), *Fragments of a Golden Age: The Politics of Culture in Mexico since 1940* (Durham, NC, 2001).

<sup>44</sup> According to Pesquiera, the malaria mortality rate for Chiapas was 308.3 per 100,000 inhabitants, ‘Programa de erradicación,’ p. 541.

the mainly indigenous state of Guerrero, revealed differences about the perception of malaria between urban and rural people. It also underscored the importance of fighting diseases as a means towards progress:

Perhaps these figures [of malaria cases] do not mean anything important to the people of large cities in the nation, but they remind us of dramatic nights in fever, watching the slow end of a child, a wife, or a sibling's life in the hot, dusty, peasant, lands of Veracruz, Chiapas, [and ] *Lacandona* forest [...] They remind us of the misery of households due to the lack of a wage not earned because of disease [...] They mean peoples without hope and faith in the future and with no will to fight for it.<sup>45</sup>

Another gimmick used in these publications was to change the lyrics of popular songs and publish poems as advertising tools. One bulletin reproduces the lyrics of a '*Corrido a la CNEP*', which linked nationalism and prosperity: 'death to paludism, death to paludism/ and long live my motherland!'<sup>46</sup>

Bulletins in several CNEP areas helped unite, discipline, and give a vision to health workers. According to another article in *La Cotorra*, a 'sound health morale' was absolutely necessary so that 'each one ... feels responsible for their work'. Likewise, CNEP advised campaign workers to behave properly and demonstrate absolute respect for their fellow citizens. According to the publication, this was the most effective means to 'create trust, friendship and ... respect from the great Mexican family'.<sup>47</sup> Bulletins celebrated field workers' devotion. An editorial entitled 'Pillar and Giant in the Programme' worshipped sprayers as heroic workers who reached the most remote regions defying sun and rain, with the sole objective of spraying all houses.<sup>48</sup>

The articles in these bulletins also constituted an effort to bring eradication into popular thinking on health. Hitherto, many considered it an inevitable fact of life. A poem suggests that the campaign also tested a popular dimension, ridiculing how *Calaca* (death) – considered in popular culture as

<sup>45</sup> 'Editorial: Por que se hizo campaña' *La Cotorra, periódico al servicio del personal CNEP, Zona 8*, Sept. 1960. In Expediente: 3. Caja: 84. Sección: Subsecretaría de Asistencia. Fondo: Secretaría de Salubridad y Asistencia. AHSS.

<sup>46</sup> *El Tarasco; boletín para el personal CNEP Zona 10, Morelia, Michoacán*, kept in Expediente: 3. Caja: 84. Sección: Subsecretaría de Asistencia. Fondo: Secretaría de Salubridad y Asistencia. AHSS.

<sup>47</sup> In *La Cotorra*, Oct. 1960. Expediente: 3. Caja: 84. Sección: Subsecretaría de Asistencia. Fondo: Secretaría de Salubridad y Asistencia. AHSS.

<sup>48</sup> 'El Rociador: pilar y gigante en el programa de erradicación del paludismo,' *Boletín mensual, para el personal de la Zona 2*, Sept. 1960. Expediente: 3. Caja: 84. Sección Subsecretaría de Asistencia. Fondo: Secretaría de Salubridad y Asistencia. AHSS.

a character with will and malice – felt because malaria was brought under control:

Death, very indignant  
at seeing everybody happy said  
'I'll take them, I'll take them'  
flapping her arms around ...

I'll take them altogether  
Before an earthquake comes,  
They are leaving me jobless,  
These paludism guys ...

The *Calaca* is surprised  
And dives into the abyss  
When visiting this Zone  
And not finding Paludism.<sup>49</sup>

Another component of the Mexican campaign was the recruitment of voluntary community collaborators called 'Hygienic Education Honorary Auxiliaries' (*Auxiliares Honorarios de Educación Higiénica*, hereafter, AHEH), also known as 'notifiers' because their responsibilities included identifying malaria cases. They were also in charge of recruiting supporters of anti-malaria work in small communities and of creating with them Educational Action Groups (*Grupos de Acción Educativa*). AHEHs received a diploma from the Secretary of Public Health and a toolkit with epidemiological forms, lancets, cotton, alcohol, plates and some drugs – all a mark of prestige. They periodically visited houses to inform people about the campaign, identify fever cases and take blood samples. They often provided first aid help and practised traditional medicine on them. AHEH contributed to an important change whereby medicine was given to fever patients from the start. In a culture that perceived treatment – more than prevention – as a symbol of medical concern, this decision consolidated AHEHs' authority. It must also have been the most appropriate way to defeat the population's reluctance to take the bitter antimalarial drugs that had secondary effects.<sup>50</sup>

According to the 1950 census, around one third of the country population lived in localities containing between 1 and 499 inhabitants.<sup>51</sup> By mid-1958, there were already 23,388 AHEH, and more than 56,000 in 1961. In the

<sup>49</sup> *El Transmisor; órgano de información para el personal CNEP Zona 7. Tamaulipas, Nuevo León, Coahuila*, Expediente: 3. Caja: 84. Sección: Subsecretaría de Asistencia. Fondo: Secretaría de Salubridad y Asistencia. AHSS.

<sup>50</sup> *Boletín mensual, para el personal, Zona*, 2 Sept. 1960. Expediente: 3. Caja: 84. Sección: Subsecretaría de Asistencia. Fondo: Secretaría de Salubridad y Asistencia. AHSS.

<sup>51</sup> Cited in Vargas, 'Aspectos socioeconómicos,' p. 151.

mid-70s, AHEHs still existed, and many considered their work to be key to the health system.<sup>52</sup> A bulletin of the Yucatán zone included in one of its 1962 issues, an article about an AHEH named Olegario Cime, a primary schoolteacher in two towns within the Camino Real de Campeche. His house proudly exhibited the number that CNEP had assigned him and a sign reading: ‘Notification Post’. The 50-year-old Cime was a native of the region where he lived, spoke Maya, had suffered malaria, and was the father of seven children. Many schoolteachers became AHEHs. They could read and write, were influential in the community, and could check if there were cases of malaria in the families through the children. The community knowledge from AHEH volunteers allowed the linking of an international health campaign to local motivations.<sup>53</sup>

The bulletins also illustrated how this work prompted encounters between different cultures and on rare occasions gave room to re-examine traditional medicine. Initially, CNEP conceived malaria eradication as a tool for the expansion of Western medicine in the rural milieu, presenting the defeat of peasant scepticism regarding malaria as a campaign achievement.<sup>54</sup> A few years later, a campaign officer pointed out that an important CNEP’s achievement was ‘rural penetration’ on a ‘periodical, routine, and systematic’ basis.<sup>55</sup> Socioeconomic factors beyond the scope of this article also encouraged that penetration, such as urbanisation and literacy.<sup>56</sup>

<sup>52</sup> The information on AHEH from ‘La Erradicación del paludismo en México’ by Ignacio Morones Prieto, Health Secretary and President of CNEP, Manuel Márquez, General Director of CNEP, and Luis Vargas, Director of the Office of Evaluation of CNEP. Paper presented to the VI Congreso de Medicina Tropical y Paludismo, Lisbon 15–18 Sept. 1958. Folder: Paludismo, Congresos. Expediente: 2. Caja: 18. Sección: Secretaría Particular. Fondo: Secretaría de Salubridad y Asistencia. AHSS, and Guillermo Suárez Torres, *La Campaña Nacional para la Erradicación del Paludismo y su importancia para la salud pública* (Mexico, 1973), p. 85.

<sup>53</sup> On Cime, see ‘El notificante, ciudadano ejemplar, ¿Quién es Olegario Cime?,’ in *El Informador, Boletín CNEP Zona 1 Mérida, Yucatán*, May 1962. Folder: Revistas, publicaciones, boletines, folletos de la Comisión Nacional de Erradicación del Paludismo. Expediente: 1. Caja: 93. Sección: Subsecretaría de Asistencia. Fondo: Secretaría de Salubridad y Asistencia. AHSS.

<sup>54</sup> L. Vargas and A. Almaraz Ugalde, ‘Evaluación epidemiológica de la erradicación del paludismo en 1959, tercer año de cobertura integral,’ *Salud Pública de México*, vol. 5 (1963) pp. 257–69.

<sup>55</sup> Vargas, ‘Realizaciones del programa,’ p. 740.

<sup>56</sup> A. M. Kapeluz-Poppi, ‘Rural Health and State Construction in Post-Revolutionary Mexico: The Nicolaita Project for Rural Medical Services,’ *The Americas*, vol. 58, no. 2 (2001), pp. 261–83; A. E. Birn, ‘A Revolution in Rural Health?: The Struggle over Local Health Units in Mexico, 1928–1940,’ *Journal of the History of Medicine and Allied Sciences*, vol. 53, no. 1 (1998), pp. 43–76; A. E. Birn, ‘Wa(i)ves of influence: Rockefeller Public Health in Mexico, 1920–50,’ *Studies in History and Philosophy of Biological and Biomedical Sciences*, vol. 31, no. 3 (2000), pp. 381–95.

There was little effort to sustain an intercultural perspective in the campaign.<sup>57</sup> As a result, after a few years the health education efforts of AHEH and CNEP concentrated on obtaining community acceptance of DDT spraying and blood testing. The limitations of malaria eradication in Mexico became evident at the crossroads of the campaign and the indigenous culture.

### *Resistance*

At the end of 1956, CNEP members visited the physician José Villalobos Revilla from the town of Juchipila, in Zacatecas, and asked him for his help in convincing the peasants to open their houses to sprayers. Opposition had been strong, sometimes armed.<sup>58</sup> Villalobos was no ordinary doctor. He had graduated a few years before as a surgeon and obstetrician in Mexico City.<sup>59</sup> Like other provincial doctors, he was familiar with a diverse array of medical conditions such as malaria, typhoid fever, trichinosis and rabies transmitted by bats. More importantly, he knew how to earn the peasants' trust. Villalobos' background suggests that the criticisms he made of malaria eradication were partly inspired by a resentment of the displacement of the traditional clinical knowledge by the new public-health knowledge promoted by CNEP.

Villalobos asked CNEP officers a series of questions that they could not answer. He raised – with little elaboration – topics of great importance, such as the uncontrolled rural migration patterns and the precarious housing conditions of peasants. He asked, 'who will control the migration of workers

<sup>57</sup> An exception was an article published in CNEP's main bulletin that praised San Cristobal de las Casas' traditional medicine as 'part of a systematic, albeit different, way of seeing the world' and which called health workers to 'be more tolerant and even to make some concessions to the traditional ways of healing malaria based on beverages, prayers and *temazcal* [therapeutic steam baths] ... so campaign services will be accepted.' In 'Medicina y cultura,' *El Chamula*, Aug. 1961 Folder: Revistas, publicaciones, boletines, folletos de la Comisión Nacional de Erradicación del Paludismo. Expediente: 3. Caja: 84. Sección: Subsecretaría de Salubridad y Asistencia. Fondo: Secretaría de Salubridad y Asistencia. AHSS.

<sup>58</sup> Villalobos' comments appear in 'Síntesis del trabajo realizado durante los años 1956–1959 en la región de Juchipila, Estado de Zacatecas, relacionado con la campaña de erradicación del paludismo,' in Folder: Comisión Nacional para la Erradicación del Paludismo. Expediente: 1. Caja: 51. Sección: Secretaría Particular. Fondo: Secretaría de Salubridad y Asistencia. AHSS.

<sup>59</sup> His medical thesis was J. Villalobos Revilla, *Informe médico de la población de Jalpa, Zacatecas, Índice de Ross. Tratamiento de la ulcera gastroduodenal por la uroenterona (Kutrol). Informe y tesis para sustentar examen profesional de médico cirujano y partero* (Mexico City, 1954). It was published as a pamphlet by the School of Medicine of the Universidad Nacional Autónoma de México. A copy is kept at the Biblioteca Nacional, Mexico, DF.



from malaria to non-malaria areas, and back?<sup>60</sup> In the following years, migration became a major problem for CNEP. For example, in 1963 the sugarcane areas of Tuxtla (in Veracruz), Campeche and Mante (in Tamaulipas), with few cases of malaria, attracted in the harvest period 20,000 individuals from the states of Oaxaca, Guerrero and Michoacán, who came from some of the worst-affected regions. Around the same year, workers from all over the country were drawn to work on the hydroelectric project in Tecpan, Chiapas – a project that created larvae reservoirs in an area with malaria. Religious festivities attended by pilgrims and handicraft markets organised in several towns in Chiapas increased migration and the problems for anti-malaria work.<sup>61</sup>

Despite his own criticisms, Villalobos initially collaborated with CNEP, even joining in with the sprayers in the fields in 1957. He started to worry when he realised that insecticides eliminated not only *Anopheles*, but also other kinds of insects, bees, butterflies and all mice. Villalobos wrote, ‘Spring has arrived and so have swallows, but ... their eggs ... were left dead in their nests’, which he believed to be the result of an indiscriminate use of the insecticides. Sprayers not only applied insecticide to walls, doors and furniture, but also to children and adults’ hair, drinking water wells, storage areas, cattle forage, and they sometimes even bathed dogs and cats with DDT.<sup>62</sup> Moreover, according to Villalobos, spraying was sometimes accepted only at the expense of the sprayers’ health; in many settlements sprayers drank a glass full of insecticide to prove that the substance was not harmful. In spite of these demonstrations, environmental and food pollution as well as cases of intoxication were evident.

This became more serious during the second insecticide spraying cycle, when two-thirds of schoolchildren experienced stubborn conjunctivitis, which returned in some cases after it had been apparently cured. Villalobos emphasised the harm done by DDT to children, and in a 1958 newspaper article that praised his civic valour, he called for the end of spraying because it caused hepatitis and blindness. He claimed to have isolated in his microscope ‘crystals of DDT in the ocular secretion’ of two blind children.<sup>63</sup>

<sup>60</sup> Villalobos’ comments appear in ‘Síntesis del trabajo realizado durante los años 1956–1959 en la región de Juchipila, Estado de Zacatecas, relacionado con la campaña de erradicación del paludismo.’ In Folder: Comisión Nacional para la Erradicación del Paludismo. Expediente: 1. Caja: 51 Sección: Secretaría Particular. Fondo: Secretaría de Salubridad y Asistencia. AHSS.

<sup>61</sup> On the challenges created by migration, see I. Gómez Mendoza, ‘Perspectiva de la erradicación del paludismo en México,’ *Salud Pública de México*, vol. 5 (1963), pp. 741–7, p. 73; and ‘Consideraciones sobre factores humanos para la erradicación del paludismo,’ *Salud Pública de México*, vol. 8 (1966), pp. 379–82.

<sup>62</sup> Villalobos, ‘Síntesis del trabajo realizado.’ AHSS.

<sup>63</sup> *El Heraldo de Aguascalientes*, Aguascalientes, 29 Sept. 1958, p. 1.

According to Villalobos, the third spraying at the end of 1957 did not kill flies, mosquitoes, cockroaches, wasps, scorpions, spiders or bedbugs. On the contrary, they were larger and became real pests. Initially the sanitarians insisted that this was only an inconvenience. However, in 1962 a proposal was made for the creation of an official programme to fight ‘*chinches*’ in order to improve CNEP’s public relations.<sup>64</sup> According to Villalobos, pollution especially affected livestock and animals; there was a decrease in the production of milk, many cows had miscarriages, most hens died, and not a single cat was alive. His own cat died in his hands while vomiting blood. Villalobos examined the corpse to find its liver swollen, confirming his suspicions of severe intoxication.

It is important to point out that, besides DDT, Dieldrin, another very toxic insecticide, was also sprayed in Mexico. Initially Dieldrin generated great expectations. Lasting up to twelve months, it seemed ideal for remote areas. About 400,806 kilos of this insecticide were sprayed between 1957 and 1958 (less than the 4.4 million kilos of DDT were used in those same years) before it was discontinued.<sup>65</sup> However, its toxic effects on humans were greater than DDT, and it was banned.<sup>66</sup>

Besides the toxic effects of insecticides, problems arose when there was a lack of sprayable surfaces (such as reed walls or the absence of walls); many people slept outside the house in the summer, or constructed rooms after spraying. A poster placed on the doors of houses the day before they were due to be sprayed suggests the complexity of the operation. Peasants were instructed to move all furniture, pictures and lightweight objects away from the walls, provide the sprayer with water to mix the insecticide, and prevent their animals from eating the insects and small animals that died from insecticide spraying. In addition, it was expected that the week following spraying, peasants would not sweep the floors, burn the waste or wash or paint walls, ceilings or furniture.<sup>67</sup>

Villalobos travelled to Aguascalientes, a larger town, taking patients with ‘marked anaemia, pre-hepatic jaundice, and conjunctivitis’ produced by the toxic effects of spraying in order to denounce the campaign. He later travelled to Mexico City to interview CNEP’s authorities as well as having a three-hour meeting with Dr Donald J. Pletsch, PASB chief technical advisor

<sup>64</sup> Luis Vargas, ‘Anteproyecto para un programa de la CNEP de Combate contra los Chinchas, 25 octubre 1962.’ Expediente: 1. Caja: 8. Sección: CNEP-Dirección. Fondo: Secretaría de Salubridad y Asistencia. AHSS.

<sup>65</sup> L. Vargas, ‘El tamaño de la localidad como factor epidemiológico en malariología,’ *Revista del Instituto de Salubridad y Enfermedades Tropicales*, vol. 20, no. 1 (1960), pp. 193–211, p. 207.

<sup>66</sup> This is discussed in H. Romero Álvarez, ‘Estrategia y tácticas de la erradicación,’ *Gaceta Médica de México*, vol. 10, no. 6 (1975), pp. 410–7.

<sup>67</sup> *Escuela Médico Militar*, in Folder: Escuela Médico Militar. Expediente: 1. Caja: 55. Sección: Secretaría Particular. Fondo: Secretaría de Salubridad y Asistencia. AHSS.

in Mexico. Villalobos complained that Pletsch repeatedly asked the same question: ‘Then, are you against the Anti-Malaria Campaign?’ The insistence of the question suggests that loyalty to CNEP was above any other consideration. His response was: ‘I would not be a physician if I were against the campaign’, but that he was against the way in which ‘they’ pretended to eradicate malaria. Villalobos went back home discouraged, later declaring that the 14 critical articles he published in *El Heraldo de Aguascalientes*, *El Excelsior* and *El Universal* landed him in jail in 1958. It was not clear what the charges against him were, but his imprisonment lasted several months.<sup>68</sup>

The Bishop of Zacatecas thanked Villalobos for his report on the dangers to malnourished people who eat food sprayed with DDT, attaching to the letter a note by Villalobos, in which he claimed to have a petition signed by 700 people denouncing that CNEP ‘[wants] to finish us off’.<sup>69</sup>

One issue raised by the doctor was the relationship between the patients he looked after and ‘viral mutations due to environmental changes’, a subject he claimed to know about from two scientific articles in American journals. He also thought that the increase in cancer cases was the consequence of the pollution produced by the insecticide. He later found further references that he thought proved his point in two articles in the Spanish version of *Readers’ Digest* – an interesting hybrid use of scientific journals and a popular magazine to reject a US donor-driven campaign.<sup>70</sup> Inspired by his heterodox readings, Villalobos prepared a paper for the Mexican Congress of Public Health in 1960 in Hermosillo with a neutral title: ‘Some data on the loss of viral specificity (mutation) observed in the rural population of the Mexican Republic and its determining factor.’ To counter specialist criticisms, Villalobos simply observed that, ‘all works are generally presented with a

<sup>68</sup> Villalobos, ‘Resultado de la Campaña Nacional para la Erradicación del Paludismo (CNEP) en la República Mexicana. Estudio y Conclusiones, 1957–1958,’ *El Heraldo de Aguascalientes*, 4 Oct. 1958, p. 1. Folder: Comisión Nacional para la Erradicación del Paludismo. Expediente: 1. Caja: 51. Sección: Secretaría Particular. Fondo Secretaría de Salubridad y Asistencia. AHSS.

<sup>69</sup> Letter of Antonio Obispo de Zacatecas to José Villalobos, 19 Nov. 1959. Folder: Comisión Nacional para la Erradicación del Paludismo. Fondo: Secretaría de Salubridad y Asistencia. Expediente: 1. Caja: 51. Sección: Secretaría Particular. Fondo: Secretaría de Salubridad y Asistencia. AHSS. For similar fears, see D. Arnold, *Colonizing the Body: State Medicine and Epidemic Disease in Nineteenth-Century India* (Berkeley, 1993) and L. White, *Speaking with Vampires: Rumor and History in Colonial Africa* (Berkeley, 2000).

<sup>70</sup> Villalobos’ references cite without details: *Bulletin of the New York Academy of Medicine*, vol. 33 (1957); *American Journal of Clinical Pathology*, vol. 27 (1957); *Selecciones de Reader’s Digest* (April 1959) and (Sept. 1959). The first article was probably Mark H. Adams, ‘The Nature of Viruses’ that appeared in no. 5 of that volume, pp. 397–404. After checking the 1957 issues of the *American Journal of Clinical Pathology*, I have been unable to identify the article mentioned by Villalobos. Neither is it clear either which was *Reader’s Digest’s* first article. The second might have been Harland Manchester, ‘The New Age of Atomic Crops,’ *Readers Digest*.

bibliography but there is none in this one', reflecting the scant regard he had for the academic rules so prized by the leaders of CNEP. Attending this event also gave Villalobos a chance to leave a province where his warnings were not heeded and move to Mexico City. One of his final criticisms against CNEP was made in a telegram sent to the US-Mexico Border Public Health Association meeting in Hermosillo: 'CNEP goes against the laws of nature, decimating useful species ... and enormously increasing malnutrition in the rural milieu ... An urgent and serious investigation is needed.'<sup>71</sup>

The case of Dr Villalobos suggests a tension between health authorities and provincial doctors during the antimalaria campaign. According to CNEP, some doctors were uncooperative and refused to accept the campaign's success because they were losing their traditional malaria patients.<sup>72</sup> The disagreement also suggests that few links existed between CNEP and other medical services working in rural areas. Creating links was difficult because of lack of resources and a tradition of institutional fragmentation within the Health Secretariat.<sup>73</sup> Moreover, CNEP's overspecialisation and concentration of resources was resented by local physicians, in a context where the rural population was scantily supplied with health centres to deal with common ailments.<sup>74</sup>

Although health authorities never publicly debated with doctors such as Villalobos, his criticism resurfaced in the early 1970s, when it was evident that malaria eradication had not met its objectives. Encouraged by the presidency of Luis Echeverría, Villalobos sent a letter to the health authorities. A senior CNEP executive member responded with a report that mentioned similar cases of resistance among physicians. The report – used only for internal purposes – recognised a number of mistakes, such as sprayers swallowing insecticides and the little attention paid to migration patterns.<sup>75</sup> One of the conclusions of the report was to avoid a discussion because: 'The dissemination given to this debate would be extremely harmful to [the anti-malaria] programme.'

<sup>71</sup> José Villalobos, Telegram to Frank J. Von Zuben, México DF, 6 April 1960. Folder: OMS. Expediente: 4. Caja: 33. Sección: Secretaría Particular. Fondo: Secretaría de Salubridad y Asistencia. AHSS.

<sup>72</sup> Guillermo Suárez Torres to José Jiménez Cantú, Secretaría de Salubridad y Asistencia, 23 Jan. 1971. Folder: Comisión Nacional para la Erradicación del Paludismo. Expediente: 1. Caja: 1. Sección: Secretaría Particular. Fondo: Secretaría de Salubridad y Asistencia. AHSS.

<sup>73</sup> 'Antecedentes del Programa de Bienestar Social Rural,' *Salud Pública de México*, vol. 2 (1960), pp. 23–31.

<sup>74</sup> See L. Cañedo, 'Rural Health Care in Mexico,' *Science*, vol. 185 (27 Sept. 1974) pp. 1131–7; and [no author], 'Rural Health Services in Latin America,' *WHO Chronicle*, vol. 22, no. 6 (1968), pp. 249–53.

<sup>75</sup> Guillermo Suárez Torres to José Jiménez Cantú, Secretaría de Salubridad y Asistencia, 23 Jan. 1971. Folder: Comisión Nacional para la Erradicación del Paludismo. Expediente: 1. Caja: 1. Sección: Secretaría Particular. Fondo: Secretaría de Salubridad y Asistencia. AHSS.

*Criticism*

A different strand of criticism of the malaria eradication in Mexico emanated from an anthropological concern about the clash between the campaign and indigenous culture. It was led by Mexican archaeologist Héctor García Manzanedo and Isabel Kelly, a young American anthropologist who had lived most of her life in Mexico. Most of Kelly's publications were in archaeology, but she had also developed an interest in rural midwives and traditional medicine. Initially, the Smithsonian Institute for Social Anthropology supported her work, but after the closure of that organisation in 1952 she formed part of the Inter-American Affairs Institute, an organisation originally created by Nelson Rockefeller and supported by the US State Department. García Manzanedo was a member of the Public Health Experimental Studies Bureau, an organisation supported by the Rockefeller Foundation. The relationship of Kelly and Manzanedo with official institutions and their criticisms illustrate an insider, less radical approach than Villalobos.<sup>76</sup> The basis and framework of García Manzanedo and Kelly's study on malaria was the remarkable work done by Mexican anthropologists in the mid-1950s, especially Gonzalo Aguirre Beltrán, who examined the challenges faced by Western medicine in indigenous cultural settings.<sup>77</sup>

Shortly after malaria eradication started, García Manzanedo and Kelly prepared a report critical of the official campaign. Their criticism centred on the absence of an intercultural perspective of health education in a country of indigenous diversity. In later years, a positive response emerged to some of these criticisms, as demonstrated in the work done by locally recruited AHEHs. Such a trend was also evident in the 1960 in the elaboration of guidelines and manuals on health education for malaria health workers.<sup>78</sup> The criticisms of Villalobos, Kelly and García Manzanedo should not, then, be taken as applicable to the whole programme. However, while they recognised that the campaign took into account a number of technical and geographic factors, they insisted that it overlooked an essential issue in the great diversity of indigenous languages and dialects, especially in the worst malaria stricken areas such as the Yucatán peninsula, Oaxaca and Chiapas. According to García and Kelly, although the majority of the rural population (over 19.2 million) spoke Spanish, 1.6 million spoke Spanish and

<sup>76</sup> Biographical sketches include Y. González (ed.), *Homenaje a Isabel Kelly* (Mexico, DF, 1989) and 'Isabel Kelly (1906–1982),' See also I. Kelly 'El adiestramiento de parteras en México desde el punto de vista antropológico,' *América Indígena*, vol. 15, no. 2 (1955), pp. 109–17; and *Folk Practices in North Mexico: Birth, Customs, Folk Medicine and Spiritualism in the Laguna Zone* (Austin, 1965).

<sup>77</sup> G. Aguirre Beltrán, *Programas de salud en la situación intercultural* (México, 1955).

<sup>78</sup> Segundo Braña Blanco, 'El programa de educación higiénica en la Comisión Nacional para la Erradicación del Paludismo,' *Salud Pública de México*, vol. 2 (1960), pp. 27–32.

an indigenous language, and 795,069 people spoke only an indigenous language.<sup>79</sup> After a few years of work, the CNEP found that one of their main obstacles of the campaign was the several names of paludism. *Paludismo* was a French-inspired term used by the medical elite of Mexico City. According to one sanitarian, about 30 different Spanish and indigenous names were used by indigenous people and provincial offices of civil registry to describe malaria.<sup>80</sup> Consequently CNEP tried to dismiss local reports on malaria morbidity and reinforced the longstanding trend for the term *paludismo* to become the hegemonic denomination for the different clinical manifestations of malaria.

García Manzanedo's and Kelly's report ridiculed the emphasis on technology: 'communications, in Mexico, everything from telephones to rural roads have been analysed. However, basic communications, words, are still a very serious problem'. Initially, the programme did not attach much importance to hygiene education. The report suggested training bilingual sprayers and increasing the number of schoolteachers. Yet after some years, CNEP did place greater emphasis on health education as well as recruiting priests and schoolteachers into the campaign.<sup>81</sup>

García Manzanedo and Kelly made an equally serious point in noting that in many rural localities there were no health entities supporting the campaign or providing basic health services. Regarding insecticides, they expressed a fear that Villalobos had articulated more crudely – that several insects became immune and that spraying was dangerous for children. They also pointed out that the intoxication of hens and bees damaged peasant families' diet, since they obtained eggs, meat and honey from these animals.

The most interesting criticism of García Manzanedo and Kelly concerned the cultural dimension, which was not anticipated in the general plan and which was also absent in the work of many AHEHs. According to the anthropologists, eradication did not take into account indigenous beliefs and concepts regarding the body, blood and fevers. The Indians had their own explanation for the origin of malaria. Some thought that the disease came

<sup>79</sup> Héctor García Manzanedo and Isabel Kelly, 'Comentarios al proyecto de Campaña para la Erradicación del Paludismo en México, 1955'. Folder: Informes e investigaciones. Expediente: 6. Caja: 49. Sección: Subsecretaría de Salubridad y Asistencia. Fondo: Secretaría de Salubridad y Asistencia. AHSS. The national malaria mortality rate per year for the period 1949 to 1953 was 89.9 per 100,000 inhabitants. For Oaxaca it was 449.2. Pesquiera, 'Programa de erradicación,' p. 541.

<sup>80</sup> Vargas, 'Realizaciones del Programa,' p. 739. These names were: '*amarillas, calenturas pega, calenturas, calentura con frío, calentura entre cuerpo y carne, ceel, costeadado chabuiste, espantado, fiebre con fríos, fiebre del bazo, fiebre de la costa, fiebre remitente, fiebres barranqueñas, fríos costenos, fríos criollos, fríos y calenturas intermitentes, jacaltamal, latido con bazo, los fríos, maduro por los fríos, mal de espanto, miseria fisiológica por paludismo, morrongo, tenabuiste, tener bazo, tiricia, toabusite, tenabuistle.*'

<sup>81</sup> García Manzanedo and Nelly, 'Comentarios al proyecto de Campaña,' AHSS.

from sudden temperature changes such as bathing in cold water after working in the sun and that medicinal plants or strong alcoholic beverages would provide a cure. Another conflict area was the human body itself. According to the principles of the campaign, blood samples had to be obtained to confirm the presence of the malaria parasite. However, García Manzanedo and Kelly signalled that it would be difficult to obtain blood from some indigenous groups and even from some mixed populations. According to a popular belief, blood that was lost decreased an individual's strength, produced sterility in men, and was never recovered. Likewise, the people feared this test because blood was typically used to cause poisoning or other 'magical' harm. Finally, a rumour abounded that indigenous blood was being sold to 'the Americans'. According to García and Kelly, the Indians could not understand why the campaign personnel said they were concerned about their health, yet took blood from them, weakening them and making them susceptible to getting other diseases.

The various meanings attached to human blood illustrate the tension between the indigenous conceptions of health and those of CNEP officers, a tension that was never completely resolved during the malaria campaign. The few state-supported rural health services organised by the Social Security System and the Public Health Secretariat before the 1950s managed to overcome peasant resistance at some levels, yet malaria eradication coexisted uneasily with indigenous ideas about the body and fevers. As a result, a form of medical pluralism developed in the rural areas where Western medicine was accepted as a resource for some conditions and coexisted with traditional medicine.<sup>82</sup>

The anthropologists admitted they did not have a solution for the cultural mismatches because, 'it is not possible in such a large area and with such a large set of different indigenous cultures, to provide a universal prescription for said acceptance'. They simply signalled the campaign's lack of flexibility, expecting that some changes would thereby be made. The lack of specific suggestions reflects the hegemonic position of CNEP and the limited room for alternative paths during the campaign.<sup>83</sup>

The cultural tension between western and traditional medical ideas persisted as part of broader problem: health was often perceived as a short-term intervention furnished by the state, not as a continuous preventive work done from the community. The cultural strains and the perception of public health as a resource that can be obtained from, or blocked, by a paternalistic

<sup>82</sup> R. Vargas Lozano, 'Dirección de Servicios Médicos Rurales Cooperativos,' *Salud Pública de México*, vol. 6 (1964), pp. 967–78 and H. Hernández Llamas (ed.), *La atención médica rural en México, 1930–1980* (Mexico, 1984). On medical pluralism, see H. Fabrega Jr. and D. Silver, *Illness and Shamanistic Curing in Zinacantan* (Stanford, 1973).

<sup>83</sup> García Manzanedo and Kelly, 'Comentarios al proyecto de campaña'. AHSS.

authority appeared in the mid-1970s in a letter addressed to the president by a group of peasants from Cosolapa, Oaxaca, who demanded the end of a campaign that they considered:

just a waste of money for the Mexican nation and a loss of useful time and we are sorry that our nation has been fooled with [the idea] that with this powder paludism will end [...] not even medical doctors realise what is paludism; paludism has several causes:

1. Bad nutrition
2. The person is working and goes for a bath or receives rain [...]
3. When someone drinks too much water before eating [...]
4. When the patient is cold and then the fever gets into him [...]

Since this powder arrived, all the peasants are losing. All the chickens and hens, the pigs and even the dogs and cats [...] the brigades come [...] they don't care about spilling in the water or in the food, is this fair? And if there is a very sick person, they do not care, they spray him [...] and they threaten us if we oppose, they take us to jail, is this good? No Mister President, you must stop all the brigades and save our nation and we Mexicans will be grateful to you who knew how to look after your children.<sup>84</sup>

From the mid-1960s the initial enthusiasm for eradication in Mexico and abroad began to wane. The commitment of PASB to malaria eradication was less intense after 1959, when Soper retired from the organisation. In 1966 UNICEF gave up malaria work in Mexico. According to one Mexican source, UNICEF considered that insecticides were being used excessively.<sup>85</sup> A history of UNICEF argued it 'psychologically abandoned' malaria eradication in many parts of the world because of the lack of support from governments.<sup>86</sup> Other international organisations, such as WHO, also sought to throw a veil over eradication without a complete assessment, as a nightmare better forgotten, but only officially reversed the policy in 1969.

The Cold War political context that initially validated the intervention was also vanishing. Agencies such as the World Bank began to blame malaria eradication for contributing to the population explosion in less-developed countries with its concomitant pressure upon subsistence resources and

<sup>84</sup> CNEP's response was to order local authorities to give 'advice' to those who had signed the letter, probably thinking that, as in the case of Villalobos, it was a matter of poor public relations. Juan José Bremer, Private Secretary of the Presidency, to Dr. Jorge Jiménez Cantú, 22 March 1974, who on 18 Feb. 1974 asked the president 'for a more profound study of the malaria problem'. The letter is signed by Laureano Solano, Gonzalo M. Torres and Lusio Herrera Gomes, Cosolapa, Oaxaca. Folder: Campaña Contra el Paludismo. Expediente: 2. Caja: 249. Sección: Secretaría Particular. Fondo: Secretaría de Salubridad y Asistencia. AHSS.

<sup>85</sup> 'Nota informativa de la sesión efectuada en la Sala de Acuerdo de la Secretaría de Salubridad y Asistencia, 22 Noviembre 1973.' Folder: Informe de labores de la CNEP. Caja: 96. Expediente: 1. Sección: Subsecretaría de Asistencia. Fondo de Salubridad y Asistencia. AHSS.

<sup>86</sup> Black, *The Children*, pp. 129, 131.



national economies. President of the World Bank Eugene Black supported a study entitled *Does Overpopulation Mean Poverty?* that questioned the role played by ‘miracle drugs and insecticides’ in the decline of infectious diseases within a context of high birth rates and poor living conditions in developing countries.<sup>87</sup> Some years later a professor at Johns Hopkins University who considered overpopulation ‘the most serious problem we face today’ was more blunt: ‘A contributing factor ... is the control of malaria and other diseases. Withdrawal of DDT would reinstitute one national check on the human population’.<sup>88</sup> Moreover, the confirmation of the toxic effects of pesticides and insecticides made them unpopular. When the Environmental Protection Agency (EPA) was created in the early 1970s, DDT was the first pesticide it banned in the USA.

Yet, despite the lack of international support, the Mexican health authorities considered that abandoning eradication meant wasting an important investment in people and ideals. Doctors resented the pressure of international agencies suggesting that funds from abroad were insufficient and that their government had spent more funds than expected. They also criticised local politicians who depicted the threat of disease as exaggerated. According to these physicians this posture was similar to that of a careless patient who, having received an antibiotic prescription for a period of weeks, abandons it after a few days, just when the fever is lowering.<sup>89</sup>

In 1963 the Mexican Public Health Secretariat proposed a five-year plan of intense surveillance and treatment to achieve malaria eradication, setting a deadline in 1968. One factor that might have played a role in this decision was that pesticides and DDT was now being produced in Mexico, especially for commercial agriculture.<sup>90</sup> According to the new plan of 1963, almost

<sup>87</sup> J. M. Jones, *Does Overpopulation Mean Poverty? The Facts about Population Growth and Economic Development* (Washington, 1962), p. 7. See also R. Barlow, ‘The Economic Effects of Malaria Eradication,’ *American Economic Review*, vol. 57, no. 2 (1968), pp. 130–48, and R. Symonds and M. Carder, *The United Nations and the Population Question, 1945–1970* (New York, 1973).

<sup>88</sup> L. E. Rozeboom, ‘DDT—the life saving poison,’ *The Johns Hopkins Magazine*, vol. 22 (Spring 1971), pp. 29–32, cited by M. A. Farid, ‘The Malaria Programme—Euphoria to Anarchy,’ *World Health Forum*, vol. 1 (1980), pp. 8–33, on p. 16.

<sup>89</sup> ‘Nota informativa de la sesión efectuada en la Sala de Acuerdo de la Secretaría de Salubridad y Asistencia, 22 Noviembre 1973’. Folder: Informe de labores de la CNEP. Expediente: 1. Caja: 96. Sección: Subsecretaría de Asistencia. Fondo: Secretaría de Salubridad y Asistencia AHSS.

<sup>90</sup> T. R. Dunlap, *DDT, Scientists, Citizens, and Public Policy* (Princeton, 1981); and J. Gracia Fadrique, (ed.), *Estado y fertilizantes, 1760–1985* (Mexico City, 1988). In 1970 and again in 1978, plans to eradicate malaria in Mexico reappeared: G. Suárez Torres, ‘El programa de erradicación del paludismo,’ *Salud Pública de México* vol. 12 (1970), pp. 751–73; D. G. Cervantes, ‘Programa de erradicación del paludismo en México y nuevos enfoques de su estrategia,’ *Salud Pública de México*, vol. 20 (1978). On DDT environmental problems in México, see pp. 613–42. L. López Carrillo, L. Torres-Arreola, L. Torres-Sánchez, F. Espinosa-Torres, C. Jiménez, Mariano Cebrian, S. Waliszkeski and O. Saldade, ‘Is DDT Use

half of the budget would have to be obtained from abroad because the Secretariat faced a clear dilemma: 'Either to continue with insufficient budgets during a still not defined number of years, not spraying the areas appropriately ... or the necessary sums are gotten.'<sup>91</sup> The necessary sum was never obtained.

During the 1970s the political and economic context that had stimulated anti-malaria work underwent marked change, as illustrated by the clash between university students and the government, the emergence of guerrillas and a growing disillusionment with the one-party system.<sup>92</sup> CNEP continued to exist during the 1970s, but most of its budget went to fieldwork and little was done to research the diverse ecological and epidemiological conditions of the disease. The work of AHEH, weakened by a marked reduction in the visits of health personnel to motivate them and provide them with material, became sporadic. CNEP's unions, with 5,000 members, were a powerful lobby unwilling to eradicate malaria because it was felt that it would eliminate the work of its members.<sup>93</sup>

From the late 1970s onwards, health agencies became convinced that work on malaria had no 'magic bullet', needed to be undertaken on many fronts, and required the creation of permanent rural health services. As an evaluation of the 1970s suggested, 'prospects to eradicate malaria cannot be examined outside the context of the country's overall development problems'.<sup>94</sup> This new perspective held that anti-malaria health workers should understand the living conditions and cultural beliefs to the recipient communities and promote an active participation of local leaders in comprehensive health programmes.

---

a Public Health Problem in Mexico?', *Environmental Health Perspectives*, vol. 104, no. 6 (1996), pp. 584–7.

<sup>91</sup> 'Informe preparado por el Secretario de Salubridad y Asistencia, Feb. 1963,' Folder: Informes de labores rendidos por el Departamento General de Epidemiología. Expediente: 2. Caja: 35. Sección: Subsecretaría de Asistencia. Fondo: Secretaría de Salubridad y Asistencia. AHSS.

<sup>92</sup> T. E. Skidmore and P. H. Smith, *Modern Latin America* (New York, 2001), pp. 242–6.

<sup>93</sup> 'Información sucinta sobre los factores administrativos que originaron el deterioro de la Campaña contra el Paludismo en México, 1983'. Folder: Campaña contra el Paludismo. Expediente: 2. Caja: 249. Sección: Secretaría Particular. Fondo: Secretaría de Salubridad y Asistencia. AHSS. See also See J. S. Tulchin, 'The United States and Latin America in the 1960s,' *Journal of Interamerican Studies and World Affairs*, vol. 30, no. 1 (1988), pp. 1–36.

<sup>94</sup> Romero Álvarez, 'Estrategia y tácticas,' p. 417. Malaria eradication was re-examined from the second half of the 1960s (see Pan American Health Organization, *Informe del Seminario sobre la Misión de los Servicios Generales de Salud en la Erradicación de la Malaria, Cuernavaca, México 4–13 Marzo 1965, Scientific Publication No 118* (Washington, DC: PAHO, 1965); and World Health Organization, *Twenty-Second World Health Assembly, Boston, Massachusetts, 8–25 July 1969, Part II, Plenary Meetings, Committees, Summary Records and Reports* (Geneva: WHO, 1969). WHO Library.

*Concluding remarks*

The campaign to eradicate malaria in Mexico did not achieve its goal, but dramatically reduced the incidence of the disease, contributing to the growth of urban population, and revealing the different conceptions of the nature and consequences of malaria. Although the nation's malaria areas grew during the 1970s, the disease never reached the proportions of the mid-1950s.

A number of local health workers adapted the meanings and technologies brought from abroad by the international agencies. The intense work of the AHEH volunteers often expressed feelings of solidarity and compassion under adversity and a search to meet fundamental aspirations of the poorest: relieving pain, enabling work, protecting loved ones, delaying death. The criticisms of provincial Doctor Villalobos, and of insider anthropologists García Manzanedo and Kelly, signal the search for a holistic effort to understand the social and cultural dynamics of health.

The original design of the anti-malaria intervention, undertaken from above on the assumption that a biomedical and natural reality needed an energetic technological solution, was transformed by local processes of appropriation of resistance. Criticism by sprayers and AHEH volunteers demonstrated that malaria was indeed a socially- culturally- and economically-sustained reality, requiring a broader political solution that confronted the unequal access to basic medical services between urban and rural areas and that overcame the perception that public health work was a short-term intervention coming from above.