



# Successful Eradication Of Yaws In Tamil Nadu, India: A Model Programme

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**Citation:** D. Sharmila (2024), Successful Eradication Of Yaws In Tamil Nadu, India: A Model Programme, *Educational Administration: Theory and Practice*, 30(5), 5732-5736, Doi: 10.53555/kuey.v30i5.3843

## ARTICLE INFO ABSTRACT

**Background:** *Treponema pallidum* subspecies *pertenue* is the cause of Yaws, a chronic infectious non-venereal disease that mostly affects underprivileged populations. It mainly affects tribal tribes in remote forested areas of India.

**Methods:** The Yaws Eradication programme (YEP) was initiated in India in 1996, targeting endemic states. It included case detection, multi-level monitoring, treating contacts and cases concurrently, and providing comprehensive health education.

**Results:** After 2000, there was a steady decline in the number of reported instances of Yaws. India became an elimination country in 2004 after three years with no cases reported. In May 2016, the World Health Organisation declared India to be Yaws-free.

**Discussion:** Yaws, once endemic in India, has been successfully eradicated through a comprehensive national program. This achievement adds to India's track record of eradicating infectious diseases and demonstrates the effectiveness of focused efforts and community involvement.

**Key Words:** Yaws, *Treponema pallidum*, Eradication, Public Health, Health Education, India, Tamil Nadu.

## INTRODUCTION

A deformative and debilitating chronic infectious non-venereal disease, yaws is contagious and spreads from person to person. Its primary cause is *Treponema pallidum* subspecies *pertenue*, and it mostly affects the skin and bones. Humans are the only known natural source of infection. People who live in hilly and forested areas in districts that are home to tribal people in Andhra Pradesh, Assam, Chhattisgarh, Gujarat, Bihar, Madhya Pradesh, Maharashtra, Odisha, Tamil Nadu, and Uttar Pradesh, among other states, have been reported to have the disease<sup>2</sup>. Young children are the ones most affected; they suffer disabilities, stigma, and are unable to finish elementary school. There have been reports of yaws incidence in Tamil Nadu in Dharmapuri, Salem, Kallakurichi, Karur, Dindigul, Coimbatore, Palani, and Theni. The Assam district of Cachar, India's tea plantation workers reported the first cases of yaws in 1887. In the 1940s, yaws was widespread throughout the nation, affecting physically contagious regions in Central India such as the districts of Sarguja, Bastar, and Bilaspur in Chhattisgarh, as well as Uttar Pradesh's Mirzapur and Bihar's Palamu (which is now a part of the state of Jharkhand)<sup>1</sup>. But by 1965, it had significantly decreased everywhere, including in India. In India, the tribes most impacted in each place are usually the ones that are aware of the disease. Thus, the sickness is called "Madia Roga" and "Gondi Roga" in Baster, Chhattisgarh and Sironcha, Maharashtra; "Koya rogam", in Andhra Pradesh and Odisha; and "Peekali Mariyerha" and "Urubai Kilangamariyerha" in Tamil Nadu<sup>16</sup>. Certain synonymous for yaws are based on clinical symptoms; in Assam, for example, "Domaru Khahu" refers to an eruption that resembles a fig. Chakawar is the term for chronic ulcers in parts of Uttar Pradesh and Central India<sup>2</sup>.

## YAWS ERADICATION PROGRAMME (YEP)

The global narrative surrounding the eradication of yaws has had mixed results. Yaws was once intended to be eradicated worldwide in the postwar period. The campaign effectively treated about 50 million people between 1952 and 1964, resulting in a greater than 95% reduction in the disease's prevalence. However, control attempts were weakening even as last-mile issues persisted. In the 1970s, this led to the disease's reappearance.

Though little-known, the tale of Yaws extinction by India is uplifting. In order to eradicate the illness, there must be no more cases, continuing transmission for three years, and appropriate serological surveys to confirm this. The last known case of Yaws in India was in 2004<sup>20</sup>.

### CONTROL EFFORTS IN INDIA

Efforts to survey and control yaws in India can be divided into three phases: 1952-1964, 1965-1964, 1965-1996, and since the commencement of the yaws Eradication Programme in India in 1996-97.

WHO and UNICEF supported the global anti-yaws effort in the 1950s after penicillin was found to be an effective tool for managing yaws in the late 1940s. The scheme ran from 1952 to 1964 in the Indian states of Tamil Nadu, Madhya Pradesh, Maharashtra, and Andhra Pradesh. All of the union areas and states where yaws were endemic prior to the 1950s provided information. Four anti-yaws squads were operated in the states of Tamil Nadu, Andhra Pradesh, Maharashtra, and Odisha<sup>1</sup>. With the intention of eliminating all diseases from India by the year 2000, the Indian government launched the Yaws Eradication Programme in 1996<sup>3</sup>. Consequently, the last known case of yaws was in 2003, and in 2004 India declared Yaws extinct. In May 2016, the World Health Organisation (WHO) proclaimed India to be Yaws-free after a panel of experts certified that disease transmission has stopped in the nation. This comes after India's polio-free declaration<sup>14</sup>.

### Tamil Nadu

Yaws Eradication Programme was one of the initiatives featured in Tamil Nadu's Third Five-Year Plan. There are eight operational units, each in charge of the activities of an entire taluk or sub-taluk. Work aims to tour villages, assess populations, locate Yaws patients, and provide required treatment<sup>6</sup>.

In April 1960, the government authorized a centrally supported Yaws control system. In the state, eight units have been established. We can easily cure yaws, and by working together, we can totally eradicate the illness<sup>5</sup>. This illness has spread throughout the Coimbatore district. A sum of Rs. 8 lakhs has been aside to organize an eradication campaign<sup>18</sup>. This programme was carried on in the district of Coimbatore. Resurveys were also conducted in highly endemic areas<sup>7</sup>.

Aside from treating cases of yaws, minor maladies such as Scabies, conjunctivitis, fever, and so on were also treated, and health education work was organised<sup>8</sup>. Up to the 28th of February 1966, eight units in the Yaws eradication effort in the Coimbatore district were operational under the third five-year plan. The scheme's re-organized setup began on March 1, 1966, with only three units operating in Coimbatore, Udumalaipettai, and Perundurai. A survey was also conducted in the neighbouring districts of Tiruchirappalli and Madurai, where the disease is common. All people suffering from yaws received complimentary soap. Contacts of Active Infections cases were also treated concurrently to prevent illness spread<sup>17</sup>.

In 1965<sup>9</sup>, the eradication programme was continued in the Coimbatore district with the necessary staff and equipment under the overall supervision of the Research Health Officer in the Office of the Director of Public Health, Madras.

The districts of Madurai and Tiruchirappalli are the sites of the yaws Eradication Programme. With three section run by three health inspectors and overseen by a special Health Officer based in Dindigul, this project works across the districts of Tiruchirappalli and Madurai<sup>4</sup>.

With four units staffed by four Health Inspectors and overseen by a special Health Officer based in Dindigul, the initiative is running in the districts of Tiruchirappalli, Madurai, and Dharmapuri. Every unit includes a jeep. Additionally, through conversations, the staff members of the yaws eradication programme offered Health education<sup>10</sup>.

There were four units in operation in 1972: Dharmapuri, Palani, Periyakulam, and Karur. In their separate jurisdictions, these units treated yaws cases and carried out in-depth surveys. Communities received speeches as a form of health education. Contacts of active infectious yaws cases received treatment as well. Minor illness treated included dysentery, fever, and diarrhea.

There were four operational units in 1973, with headquarters located in Dharmapuri, Palani, Periyakulam, and Karur. These units carried out in-depth surveys and therapies in their respective jurisdictions. Communities received speeches as a form of health education. Contacts of active infectious yaws cases received treatment as well.

Six yaws control units were operational in the districts of Madurai, Trichy, Dharmapuri, South Arcot, and Salem during the 1974 report year<sup>12</sup>. The program's major functions are to conduct Yaws surveys, detect cases of Yaws, and treat them with P. A. M. The current unit is surveying the Kalrayan Hills<sup>11</sup>.

The National Institute of Communicable Diseases (NICD) called a meeting in 1986 to develop a plan for the eradication of Yaws, inspired by the accomplishments of the 1970s smallpox epidemic and the early 1980s progress made in the elimination of Guinea worm disease<sup>13</sup>. The program's nodal agency for coordination, planning, oversight, monitoring, and evaluation is the NICD. With the cooperation and support of the Department of Tribal Welfare and other relevant departments/institutions, the State Health Directorates of the States where yaws is prevalent carry out the programme by utilizing the current healthcare delivery system<sup>1</sup>.

The National Institute of Communicable Diseases (NICD) in Delhi hosted a "Workshop on Yaws Eradication" from January 19-22, 1987. The purpose of the workshop was to establish strategies and assess the viability of eliminating yaws from the country. Following a discussion of eradication strategies, a national project to

prevent disease transmission in afflicted states and ultimately eradicate the disease from the nation was agreed to be initiated. Consequently, in 1995, NICD produced a project document on the "Yaws Eradication Programme" (YEP) in India and submitted it to the Government of India. A further benefit of YEP came from the fact that Tribal Welfare is a national priority as stated in Article 275(1) of the Indian constitution, in line with the national motto of "Health for All and in particular for Underprivileged (HFU)" and the "International Decade of World's Indigenous People" (1995-2004). In the undivided koraput district of Odisha, the government of India approved the Yaws eradication programme as a central sector health scheme as a pilot project for the fiscal year 1996-1997. In March 1999<sup>16</sup>, it was determined to broaden the program's operations to include all endemic states, taking into account the lessons gained and outcomes of the pilot project.

The National Health Policy of 2002 set the elimination of yaws as a goal. There were reports of cases in 2003, and in order to meet the requirements for the eradication of yaws, there must be no reporting for three years in a row. Consequently, it was decided that elimination could be accomplished first, and that the same status could be maintained for three years before starting on the eradication declaration. This meant that the process of eradication certification might have started as early as 2007.

### PROGRAMME STRATEGY

A component of the program's strategy is manpower development. Case detection; treating contacts and cases concurrently; and IEC operations making use of a multi-sectoral approach. To help with case detection, coloured disease recognition cards and other health education resources have been developed. Cases discovered in this way are handled concurrently, along with their contacts, as soon as they are discovered. Infusion One dose of benzathine penicillin is the preferred antibiotic. For 15 days, patients who are sensitive to penicillin should take the prescribed dosages of erythromycin or tetracycline<sup>1</sup>. But the World Health Organisation currently states that the best course of treatment is to take azithromycin once<sup>15</sup>.

As a result, 49 districts from ten states have been recognised as affected locations where YEP is being implemented. Tamil Nadu's endemic districts include Palani, Theni, Karur, Dindigul, Dharmapuri, Salem, and Kallakurichi<sup>16</sup>. The number of yaws cases reported to the nodal agency NICD has decreased dramatically from 735 in 1997 to 'Nil' in 2004. The reported number of cases also reflects the efficacy of surveillance efforts. Only after the year 2000 did the number of instances begins to decline. Only one district in Orissa and Andhra Pradesh reported instances in 2003. The total number of cases recorded from different states from 1997 to 2004 was 34 in Tamil Nadu in the year 2000<sup>1</sup>. The number of instances has steadily decreased since 2000. Only two districts reported instances in 2003. For the past three years (2004-2006), no cases have been reported<sup>3</sup>.

Multi-level monitoring was a part of the Yaws eradication programme. Task groups established by the Ministry of Health and Family Welfare oversaw the programme centrally. Additionally, there were biannual independent evaluations<sup>3</sup>. Independent Appraisal Teams conducted frequent evaluations of the programme. There were three of these independent evaluations carried out in the impacted states up until 2004. Senior public health authorities, physicians, and dermatologists comprise the appraisal team. Local health officers from the state health directorates and nodal agency provide support. April 24 – May 3, 2000 was the first appraisal period, and February 18 – February 27, 2002 was the second appraisal period<sup>1</sup>.

A few lines about the findings of the 3rd Independent YEP Appraisal will not be out of place here. The appraisal was conducted from January 27th to February 5th, 2004, and covered 9 districts, 18 PHCs, and 50 villages in 6 yaws endemic states: Andhra Pradesh, Chhattisgarh, Gujarat, Maharashtra, Orissa, and Tamil Nadu. The crew found no evidence of yaws was examined. All of the reported instances that researchers (or accompanying dermatologists) confirmed were not yaws. The general quality of search coverage was deemed adequate. A task force headed by the Government of India's Director General of Health Services was established in April 2000 with the responsibility of assessing the program's implementations progress and suggesting any required changes to the strategies<sup>16</sup>. India attained nil yaws case status in 2004. The programme stipulated that requirements needed to be verified prior to the official declaration of yaws eradication. After then, the Independent Appraisal of YEP was carried out, and a tour to multiple locations confirmed that there were no yaws cases, despite what the states had claimed. As a result, on April 25, 2006, an expert panel was formed to discuss the status of Yaws Elimination at the NICD in Delhi. The Expert Group deliberated and determined that yaws elimination may be declared based on a review of the programme activities, the report of the independent appraisals, interactions with experts, and the results of laboratory samples examined at the NICD laboratory. The Director General of Health Services presided over a Task Force meeting on May 31, 2006, which endorsed the expert group's decision to "Declare Elimination of Yaws from India" in accordance with its recommendations<sup>16</sup>.

### ERADICATION OF YAWS

As a result, India embarked on the mission to eradicate yaws from India. Apart from continuing initiatives, three new activities were launched during the post-elimination phase: a sero-survey conducted of children to evaluate the end of disease transmission during the following three to five years. Investigation and a financial reward plan to encourage the community's voluntary reporting of the case.

The seventh Taskforce meeting on YEP, chaired by DGHS and held on July 25, 2014, recommended that India seek yaws eradication status<sup>15</sup>. This decision was based on the suggestions made by the sixth independent review. After that, a certification of yaws eradication was requested from WHO. In this regard, between October 4-17; 2015, WHO sent an International Verification Team (IVT) of specialists to evaluate India's position as a yaws-free country. The members of the IVT for evaluation of Yaws free status in India met on October 16, 2015, to finalize the report of their observations and suggestions regarding the Yaws free status in India. The committee members reviewed reports from multiple evaluations of the Yaws Eradication Programme of India conducted by the Ministry of Health and Family Welfare in addition to the country report of the programme<sup>19</sup>. The team, led by an independent team of international specialists, was formed of foreign and national experts from diverse areas and streams with competence in the management of the Yaws disease. The group travelled to the following five states' districts: Kallakurichi (Tamil Nadu), Koraput (Odisha), Dang (Gujarat), Khammam (Andhra Pradesh), and Gadchiroli (Maharashtra). Examining documents and reports, assessing the surveillance system, and verifying Yaws' Nil status<sup>19</sup> were the objectives of the field visit. Based on the IVT's recommendations, the WHO Director-General declared India free of Yaws on May 5, 2016. The National Media Centre, Raisina Road, New Delhi, had a party on July 14, 2016, to commemorate the end of yaws from India. Attendees included representatives from the Indian government's Ministry of Health and Family Welfare, as well as special invitees from the local government, district and state health officials, and non-governmental organisations (NGOs) operating in the erstwhile Yaws endemic state of India. At the event, the Honorable Union Minister of Health and Family Welfare proclaimed India to be free of Yaws in front of the august legislature. Under the competent guidance of the National Centre for Disease Control, the national nodal body for the yaws eradication plan, he commended the conscientious and focused work of endemic state/district health authorities in executing and overseeing the programme. Furthermore, a monograph titled "Yaws Disease- End of Scourage in India" was released by the dignitaries<sup>15</sup>.

## CONCLUSION

Yaws the most prevalent infectious treponemal disease, caused by *Treponema pallidum* subspecies *pertenue*, primarily afflicts warm, humid, and tropical regions. India, having triumphed over smallpox and Guinea worm disease, now aspires to eliminate yaws. The disease predominantly affects indigenous communities residing in remote, challenging terrains, with human-to-human transmission as the sole source of infection. Eradication programs have yielded promising results, traditionally relying on a single benzathine benzyl penicillin injection for treatment. However, the World Health Organisation now advocated azithromycin as the preferred treatment. The number of reported cases has dramatically dwindled, with only 34 cases in Tamil Nadu in 2000, and subsequent continuous decline. The last known case in India surfaced in 2003. In May 2016, the World Health Organisation acknowledged India as Yaws-free, marking another milestone alongside its earlier declaration as a polio-free nation.

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