

# The campaign against yaws in postcolonial Indonesia

In 1950, Prime Minister Abdul Halim's cabinet identified malaria, tuberculosis, yaws, and leprosy as the 'Big Four' endemic diseases [*Penjakit Rakjat*] that enervated the overall vitality of the country's population. Unlike leprosy, yaws is a disease that has escaped public consciousness worldwide. Although not fatal, the disease was the leading cause of disability in Indonesia during the 1950s. Indonesia's anti-yaws campaign, launched in 1950, was the world's most comprehensive attempt to combat this disease at the time. Yet to date, victory against yaws has remained elusive.

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YAWS, ALSO KNOWN AS *FRAMBÖSIE* IN DUTCH and *patek* in Bahasa Indonesia, is a neglected tropical disease that affects the skin, bones, and cartilage of the human body. The disease is caused by a spirochete *treponema pallidum pertenue*, a bacterium that is closely related to the bacterial family of treponemal infections, which cause syphilis. Yaws is transmitted through person-to-person non-sexual contact with fluid from the sores of the infected patient. Within two weeks after infection, individuals develop raspberry-like sores on the skin where the microbe initially entered the body. Soon, these sores disappear. Later, skin lesions appear all over the body. Other symptoms of yaws include bone pain and disfigurement of the skin. If the disease is not treated within five years of the initial infection, the nose and bones of the patient become disfigured.

Yaws has been metaphorically referred to in international health literature as a 'disease at the end of the road' – the road being the symbol of socio-economic development – and is deemed to be caused by inadequate hygiene. Since World-War II, yaws can be easily cured using penicillin, and the results of treatment are self-evident within a few days. During Indonesia's anti-yaws campaign, villagers uncritically accepted penicillin injections as a cure for the disease, but in the process, they failed to implement long-lasting preventative measures such as community hygiene.

## In search of a magic bullet

The World Health Organisation (WHO) was founded in 1948 with the utopian vision of building a decent, peaceful, and humane world through the deployment of medical science. Three of the most important medical discoveries during the 1940s – penicillin against yaws, streptomycin against tuberculosis, and dichlorodiphenyltrichloroethane (DDT) to protect against malaria – reinforced worldwide optimism that disease eradication was achievable through the deployment of the proverbial 'magic bullet'. But, speaking at the first WHA (World Health Assembly), in 1948, Andrija Štampar, a distinguished scholar of social medicine from Croatia, stressed that health is not merely a technical matter relegated to the control of individual diseases, but it has socio-political, economic, and cultural dimensions as well. Despite Štampar's contribution, WHO continued to emphasize mass campaigns against individual diseases. Between 1948 and 1969, the prevalent thinking within WHO was that disease created lethargy, robbed people of their vitality and resulted in under-development. The United Nations (UN) agencies quantified the benefits of disease eradication in purely economic terms, a trend visible in newly-decolonised nations of Southeast Asia, particularly Indonesia and the Philippines. The economic rationale of disease eradication was criticised within Indonesia by nationalist physician Boentaran Martoatmodjo, who served as Indonesia's first Health Minister between August and November 1945. Martoatmodjo argued to the effect that poverty was not caused by disease alone, but by prevailing socio-economic inequalities, political structures, and the environment.

## Raden Kodijat: architect of Indonesia's anti-yaws campaign

The global campaign to eradicate yaws began in Indonesia in 1950 as a national initiative, spearheaded by retired regency physician Raden Kodijat. Approximately 15% of Indonesians were afflicted by yaws in 1950; as a result of the campaign, its prevalence declined to infinitesimal levels by the early 1960s. The Indonesian anti-yaws campaign was successful, so much so that British Malaya – which was yaws-endemic at the time – appropriated the epidemiological strategies initiated by Kodijat.

Born in 1890 in central Java, Raden Kodijat was a product of the Dutch educational system in the Netherlands Indies. After graduating from the *School Tot Opleiding van Indische Artsen* [School for the Training of Native Doctors in the Dutch East Indies – STOVIA] in 1914, he earned a doctorate in Medicine from the University of Amsterdam in 1925. Subsequently, he returned to the Dutch East Indies to pursue a career as a regency doctor in Kediri (East Java) between 1930 and 1942. The Kodijat Method—born during his tenure as a regency doctor—aimed to prevent the recurrence of yaws in Kediri through the detection of the disease among the entire village population at intervals of six months. Only individual patients with actual yaws lesions (active yaws) and their immediate contacts were treated using neosalvarsan or arsenicals until their symptoms disappeared, reducing the overall prevalence of yaws in Kediri from 10.1% in 1934 to 1.7% in 1936. Unfortunately, villagers came to believe that neosalvarsan was a cure-all for every disease and began to approach polyclinics in large numbers. In addition, with just one salvarsan injection, yaws symptoms were reduced drastically. For this reason, several patients did not complete their treatment, and as a consequence, relapses of yaws occurred.

In 1950, a year after the transfer of political sovereignty to the Indonesian Republic, Indonesia implemented the Treponematoses Control Project (TCP), the focus of which was based on the control of yaws and congenital syphilis. At the time, Johannes Leimena (Indonesia's Minister of Health in Natsir's cabinet between 1950 and 1951) observed that the majority of those afflicted by yaws were children. Accordingly, he enlisted the financial support of the United Nations Children's Fund (UNICEF). The programme was initially executed in Jakarta and Yogyakarta, where congenital syphilis and yaws were treated with an injection of procaine penicillin G (particle size in oil) with 2% aluminium monostearite (PAM), as a one-shot treatment schedule that reduced the per-capita cost of the yaws treatment. The Indonesian government, under Soetopo's directive (Indonesia's Minister of Health in Abdul Halim's cabinet between January and June 1950) pursued a policy of mass treatment of entire village populations using penicillin, irrespective of whether or not villagers were infected with yaws. Kodijat, who opposed what he saw as the wasteful expenditure of UNICEF funds, advocated that penicillin should only be administered to patients with active yaws. He was aware of the potential side-effects that injections could induce in patients.

Initially, Soetopo questioned the feasibility of the Kodijat Method for two reasons: (a) the country suffered from an acute shortage of doctors and nurses needed to execute the anti-yaws campaign; and (b) the limitations placed on the Kodijat Method because of not treating latent yaws cases (patients who did not manifest evidence of yaws lesions), as the latent yaws cases constituted a potential reservoir for the transmission of future infections. In an attempt to remedy the perceived shortcomings of the Kodijat Method, Soetopo designed a two-pronged strategy, a modified version of the Kodijat Method, officially known as Treponematoses Control Programme Simplified (TCPS), which advocated: (a) that the Kodijat Method would be used for densely-populated Java; and (b) that total mass treatment (using penicillin injections) of all village residents would be undertaken in the Indonesian Outer Islands where the population was sparse and dispersed, and where distances covered by the TCPS teams were enormous. In order to overcome the acute shortage of physicians, Soetopo appointed *djuru pateks* (yaws scouts with elementary education) to detect yaws cases and administer treatment, conduct periodic resurveys of the population, and to follow up treated patients.



The TCPS was designed to fit into Indonesia's decentralised health services of the 1950s. The focal point of the anti-yaws campaign was the subdistrict [*ketjamatan*] polyclinics. Because they had financial backing from the regency administration [*Dewan Pemerintah Daerah*], they could finance the campaigns from their annual budget. Subsequent to the introduction of the TCPS in a given district, the regency medical officer would meet with subdistrict and village heads [*lurah*], provide education vis-à-vis yaws and enlist their support. *Mantris* (male nurses) supervised the implementation of the programme at the subdistrict level. The village headman assisted the TCPS by drawing up a census of the village population. In a normal working week, the TCPS operations would begin on a Monday morning: the villagers would assemble at the home of the *lurah* before the *djuru patek* arrived. Soon after the latter's arrival, which was signified by the striking of a wooden gong [*kenthongan*], the village secretary would call out the names of all families present in the village and mark their attendance. The *djuru pateks* would then examine the hands and feet of individual patients for symptoms of yaws, and note the names of those suspected to have been infected. The suspected patients were called together when the *mantris* arrived to administer penicillin injections. The *djuru pateks* and *mantris* would cover the subdistrict in less than eight months. Soon after the prevalence of yaws was determined, the infected patients would be treated with penicillin injections and resurveys were undertaken to anew determine the prevalence of the disease and the efficacy of treatment administered.

The highest incidence of active yaws occurred in boys between three and ten years old, as they were most prone to injuries sustained during sporting activities.<sup>1</sup> The yaws surveys and resurveys in the subdistrict Driyo – one of the first subdistricts in East Java to have witnessed implementation of the TCPS in 1951 – revealed a patchy prevalence of yaws, representative of Indonesia. For example, a village with a prevalence of 15% was found adjacent to a village with a prevalence of 7%. The prevalence of yaws was correlated to population density in Java, with densely-populated villages revealing a higher prevalence than others. Unlike the densely-populated Javanese villages, where it was easy to congregate villagers for yaws examinations, in the Outer Islands, settlements were dispersed and the distances covered by TCPS personnel were huge, yet prevalence was still high enough to warrant treatment. In such situations, hiring a full-time *djuru patek* engaged in yaws-surveillance became difficult and Total Mass Treatment of the entire population was the best option. This required administering full-penicillin doses to villagers with active yaws lesions and half-doses to uninfected individuals, latent yaws cases, and personal contacts of patients. To offset the lack of *mantris* and

Above:  
A young yaws patient with severe skin deformities in Ambon, Maluku (mid 1920s).  
Courtesy:  
Tropenmuseum Image Collection (The image is in the public domain).

# Forgotten disease, incomplete victories

paramedical personnel, *djuru pateks* were utilised not only to diagnose yaws, but also to administer penicillin injections.

Yaws eradication in Indonesia during the 1950s was internationally well-recognised. Soetopo was nominated as a member of the WHO Expert Committee on Venereal Diseases and Treponematoses in 1953, which was constituted by WHO to study the worldwide prevalence of yaws and venereal diseases, and to design suitable epidemiological interventions for affected countries. But, it was Kodijat who would become a national hero in Indonesia's campaign against yaws. He had the reputation of being soft-spoken, yet iron-willed. UNICEF had to convince him of the therapeutic efficacy of penicillin against yaws. Only after he had tested penicillin at his hospital in Yogyakarta, and had carefully analysed its effects, did he agree to accept penicillin in treating yaws patients. His painstaking experiments with penicillin used in the TCPS, and his immaculately-kept field data and survey maps, were a model for international epidemiologists. For his exemplary community leadership in organising the TCPS in Java, Kodijat was awarded the Ramon Magsaysay Prize in 1961.

TCPS was a public health achievement for Indonesia in terms of reducing the overall prevalence of yaws from 16% in 1949 to approximately 0.58% in 1960. The TCPS was successful in remedying the acute shortage of skilled medical personnel throughout Indonesia through the recruitment of *djuru pateks* amongst villagers themselves. Once the prevalence of yaws in a given subdistrict had dropped below 0.5%, *djuru pateks* were additionally used to detect leprosy patients, as was the case in Kampong Melayu (Jakarta) and Menganti (East Java). The integration of leprosy control activities into the overall activities of the TCPS was successful in reducing the cost of TCPS activities fourfold.

## What went wrong?

By the late 1960s, the complete elimination of yaws in Indonesia seemed increasingly unattainable. Flawed epidemiological strategies and administrative bottlenecks emerged as the two most decisive factors contributing to the continuance of yaws across the Indonesian archipelago. Yaws detection and treatment were two components of the TCPS. Yaws detection was a weak arm of the programme in Java as the *mantris* and paramedical personnel were authorised only to treat active cases whereas patients without lesions (but possibly infected) were left untreated, thus contributing to a potential reservoir for future infections. *Mantris* and *djuru pateks* were not trained in how to contain importation of yaws cases from outside. The use of paramedical personnel, particularly *djuru pateks*, proved problematic for accurate diagnosis of yaws as there were discrepancies between the serological diagnoses made by doctors and diagnoses made by *djuru pateks* on the basis of clinical observations. During TCPS surveys and resurveys, individual villagers, often at the insistence of their families who had witnessed the therapeutic efficacy of penicillin injections

against yaws, presumed that a single injection would protect them against disease in general and were occasionally successful in having penicillin injections administered to them. But, WHO cautioned the Indonesian government that the supply of a wonder drug like penicillin was not in itself the sole decisive factor in ensuring the elimination of yaws from the country: other preventative health measures such as ensuring basic sanitation and hygiene, which were lacking in the rural areas, were also crucial.

The central government officially devolved the financing of the TCPS to the provinces and local governments. While the Indonesian government pledged one-third of the expected penicillin demand, the Indonesian Ministry of Finance did not cooperate with the Ministry of Health in funding the TCPS paramedical and medical personnel. The local governments and provincial governments were unable to fund the full cost of implementing the anti-yaws campaign. The Indonesian Ministry of Health and international agencies, UNICEF in particular, had to break with administrative protocols in order to facilitate the appointment of *mantris* and *djuru pateks*. But, due to the political uncertainties in Indonesia during the transition from the Soekarno to the Soeharto era (1965-1967), UNICEF suspended financial assistance to the TCPS, and the detection and treatment of yaws patients was consequently put on hold. By 1969, although the overall prevalence of yaws in Indonesia had been reduced to 0.44%, there were sharp discrepancies across the country's various provinces. Where the provinces of Java recorded an overall prevalence rate of 0.23%, in the Outer Island provinces, particularly West Irian, nearly 18% of the population was infected. The unsettled conditions during the 1960s, arising from the political differences between Java and the Outer Islands, impeded effective implementation of the TCPS in the latter.

## Relevance of the campaign

By the early 1990s, yaws had been banished to the status of a neglected tropical disease; few people were aware of it. The global anti-yaws campaigns of the 1950s and 1960s had decimated yaws to infinitesimal levels such that the campaign became a victim of its own success. Before long, eradication efforts were neglected in several countries, including Indonesia. Today, the disease retains a foothold in Papua New Guinea, Indonesia, Timor Leste, Solomon Islands, Ghana, Togo, Benin, Congo, and Central African Republic. But, there is room for guarded optimism vis-à-vis eradicating yaws globally by 2020, as only humans (and no other animals) are the reservoir of the disease. Following the development in 2012 of an orally-administered antibiotic (azithromycin), WHO has again targeted the disease for eradication. Unlike the TCPS of the 1950s, which widely used penicillin injections in the treatment of yaws, the current WHO anti-yaws strategy envisions the use of a single dose of azithromycin to treat the disease. Azithromycin overcomes the logistical and medical

Raden Kodijat (1890-1968). Architect of Indonesia's Anti-Yaws Campaign. Courtesy: Ramon Magsaysay Foundation. (The image is in the Public Domain).



disadvantages of penicillin injections: it avoids the need for injection equipment and medically-trained personnel who could be scarce in countries like Indonesia with an overstretched public health infrastructure; it prevents the injection-related risks and side-effects; and, it can be safely administered to individuals with a penicillin allergy. Unfortunately, funding for the procurement of a generic version of the antibiotic is a serious problem for several countries; in addition, WHO has also expressed concerns that the bacterium causing yaws may turn resistant to azithromycin.

The Indonesian Ministry of Health's National Programme to Control Leprosy and Yaws has seen the number of yaws cases increase since 2001. By the end of 2009, there were 7751 cases of yaws, of which most of the cases (7400) were detected through yaws surveys carried out in six endemic districts of East Nusa Tenggara province only. Today, the anti-yaws campaign in Indonesia is paralysed by a lack of leadership. Again, as during the 1950s, the Indonesian Ministry of Health has entrusted yaws eradication to provincial and local governments. While administrative decentralisation may engender tailor-made interventions to local health problems, decentralisation also imposes bottlenecks on disease surveillance across political borders. Controlling yaws demands coordination between various levels of government across Indonesia that is lacking at present. Although the Indonesian TCPS of the 1950s may be relegated to history, elements of the TCPS survive in the Ministry of Health's current strategy, implemented since 2011: active case finding and treatment, mobilisation of community support, and capacity building of health staff in detection and management of yaws. It was hoped that Indonesia would eliminate yaws by 2013 as the Ministry of Health had aligned its anti-yaws strategy with WHO recommendations that advocated a search and treatment strategy of all yaws-suspected cases and contacts. Unfortunately, the scarcity of benzathine penicillin – currently still used in treating yaws cases in Indonesia – and the absence of a cheaper locally available generic version of the drug have yet again postponed complete yaws eradication.

Even today, yaws elimination continues to elude Indonesia. In this regard, the disease eradication campaigns of the 1950s have valuable lessons to offer. The TCPS, in particular, is instructive in terms of how to organise a mass disease control campaign with optimal utilisation of scarce financial resources in an archipelagic country with variable population densities, and, how to contend with epidemiological conditions in locales wherein a standard epidemiological strategy will not work. Although the Indonesian economy is performing relatively well today, compared to the 1950s and 1960s, the country continues to spend less on healthcare per capita than countries with a similar economic profile. Key health indicators such as ratio of physicians to the total population are also lagging. Indonesia's physicians seem to be prisoners of the country's bureaucracy that leaves little scope for individual initiatives in public health. To successfully eliminate yaws within the next five years, Indonesia would need to (a) balance on a knife edge the thoroughness required to track all suspected yaws cases in a community and the speed required to contain an outbreak; and (b) skilfully coordinate between various governmental levels.

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