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SPECIAL PAPER

Leprosy control in Myanmar 1952–2003 – a success story

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The magnitude of the problem

Leprosy has been well known to be endemic in the Union of Myanmar for many centuries. However, the earliest scientific record regarding the magnitude of the leprosy problem in the country was first reported by the Leprosy Commission of India (1890–1891), as Myanmar at that time was included under India during British rule.[1] In 1891, the Commission estimated the prevalence to be 8·6 per 10,000 population for the whole country. At the same time, the prevalence for Central Myanmar was reported as 14·4 per 10,000. The 1932 census of Myanmar reported 11,127 leprosy cases (prevalence being 7·6 per 10,000 population) in the country, which was probably an under estimate as the enumeration was probably based mainly on obvious and easily recognizable signs of the disease.

Dr Santra in 1935 reported a prevalence of 250 per 10,000 population in the Mandalay area. In 1951, Dr Dharmendra was assigned to Myanmar as a WHO consultant and in his report it was estimated that about 100,000 cases could be present in the country and the prevalence at that time was estimated to be 50 per 10,000 population.[2] This estimate was revised and increased by Dr Lampe (WHO consultant to Myanmar from 1953 to 1955) to 100 per 10,000 population (about 200,000 cases).

A WHO Leprosy Advisory Team in 1963–1964 conducted a survey and revised the estimated prevalence upwards to 250 per 10,000 population for the whole country (about

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590,000 cases).[3] In some areas of Central Myanmar, the prevalence was estimated to be as high as 400 per 10,000. During the time of this survey, the prevalence reported by the leprosy control project teams in Shwebo and Myingyan District was 322 and 443 per 10,000 population, respectively. During 1973, the national authorities conducted a parallel survey which was called National Leprosy Programme Prevalence and Assessment Survey and in its report the prevalence was estimated to be 242 per 10,000 population.

Leprosy control in Myanmar

In consultation with WHO, the Government launched an intensive programme for leprosy control under Health Department Plan No. 9 in 1952. This plan was based on early case-finding and providing domicillary treatment with dapsone to all patients in the country. At that time there were very few primary health centres at the township level serving the rural population. Most of the preventive and curative services were centered around hospitals and dispensaries. In order to address the problem of leprosy from a public health point of view and to attain the necessary coverage within a relatively short period of time special leprosy control project teams were established in each district (each district comprising five to eight townships) to cover the whole country. Case-finding activities included mass (village) surveys, school surveys, contact surveys and special group surveys. Along with the technical support provided by WHO, UNICEF provided the necessary supplies and equipment including free supply of dapsone to the national programme.[4]

The Central Unit under the Disease Control Programme in the Department of Health was responsible for planning, implementation, training, monitoring and assessment of the leprosy control activities in the whole country. The programme was headed by the deputy director for leprosy control. In addition to the special teams, specialized leprosy hospitals in Yangon and Mandalay served as specialist institutions for referral service, training, reconstructive surgery, rehabilitation and research activities.

In the 14 States and Divisions, the government established seven Regional Leprosy Control Teams that were part of the Disease Control Programme under the State and Division Health Departments. In areas where the disease burden was high, one Regional Leprosy Officer was stationed at the state and division level with several leprosy control project teams placed at the district level covering several townships depending on the endemicity. Each leprosy control project team comprised of one medical officer, one to three leprosy inspectors, 20–30 junior leprosy workers and one laboratory technician.

Based on the experience gained from 1952 to 1973 all relevant information and experiences of the past with regard to epidemiology, control strategy, organizational set-up and management matters were reviewed. Based on the results of the review future strategies were developed and implemented by the leprosy control programme. Important operational actions taken during the period were:

1. Increasing the number of mid-level management personnel such as regional leprosy officers, leprosy specialists for Bago, Ayeyawady and Yangon Divisions including support staff for these officers.
2. Participating in the country health planning process to formulate the Peoples' Health Plan (1977–1981), the first ever systematic health planning process applied in the country with the co-operation of WHO and UNICEF.

3. Carrying out research activities to strengthen leprosy control measures:
    - Dapsone resistant prevalence survey in Myingyan Township.
    - Rifampicin trial in Singu Township.
    - Continue BCG trial follow-up studies in Singu area.
4. Revising the policy on criteria for determining inactivity of leprosy patients after a sufficient period of regular treatment with dapsone. Patients who were inactive were then released from control and discharged from the treatment register and this was carried out in a timely manner with the aim to reduce the unnecessary heavy load of registered leprosy patients.
5. Introducing the concept of integration of leprosy control activities into Basic Health Services (BHS) by conducting pilot studies in Yangon, Mandalay amd Magway Divisions and Mon State during the period 1970–1974.

During the period of 1973–1977, the leprosy control programme registered the highest number of cases in the country (262,171 cases) with the prevalence of 86·2 per 10,000 population.[5]

In 1978, based on the primary health care concept promoted by WHO, the Ministry of Health under its First Peoples Health Plan integrated the vertical disease control programmes such as malaria, tuberculosis, leprosy and trachoma with the general health services also known as basic health services (BHS). The first phase of the plan covered 147 townships and leprosy control activities came under 'Primary Health Care and Basic Health Services Programme' of the Department of Health. By the end of the second Peoples' Health Plan in 1986, integration was completed in all the remaining townships of the country. Out of a strength of over 900 specialized staff in the leprosy control programme, more than half of them (mainly paramedical staff) were re-trained and transferred over to the primary health care service of the Township Health Department as multipurpose health workers. The remaining leprosy staffs were assigned as technical support staff to the various divisional, district and township health departments.

Situation during the early 1980s

The leprosy situation during the early part of the 1980s is described below.

A large number of leprosy cases had been detected and brought under regular treatment. It was estimated that 89% of the total estimated lepromatous cases in the country had been already detected and registered for treatment.

Case-finding activities continued to progress well in all project areas, based on routine referrals, self-notifications, contact examination, school children examination and planned mass surveys.

At the end of December 1980, a total of 262,081 leprosy cases were registered for treatment, out of which 231,469 cases were under treatment. The treatment regularity rate was 87·6%. There were 2120 cases treated in leprosy hospitals, homes and colonies during the year 1980.

Among patients undergoing treatment, the lepromatous proportion was 23·1% and the proportion of children was 5·9%.

In all, 4069 non-lepromatous cases were released from control during 1980.

The annual incidence remained throughout these years at 1 to 3 per 1000 population per year.

The lepromatous rate remained the same at 3 per 1000 population. Eighteen percent of lepromatous cases developed negative skin smears after more than 6 years of treatment with dapsone monotherapy, whereas 50% of the borderline cases were smear negative after 6 years of treatment.

Among the lepromatous cases that had been under treatment for more than 10 years with dapsone monotherapy, a fair number of them remained bacteriologically positive. According to the dapsone resistant survey conducted in Myingyan Township during 1980–1983, 38·6% of them were found to be dapsone resistant. The annual incidence of dapsone resistant was 3·4% per year.

As a result of timely case detection and early treatment especially among children, 72% of the tuberculoid cases and 96% of the indeterminate cases were free from deformities.

Children under 15 years of age among the total treated cases declined remarkably from 26% in 1957 to 5·9% in 1980. The impact of sustained efforts of leprosy control was especially observed in schoolchildren, the majority of whom were under 15 years of age. During 1962–1963, out of a total of 350,798 schoolchildren that were screened 9375 new cases (26 per 1000) were detected. However, in 1980 out of 480,282 schoolchildren examined, only 345 new cases (0·71 per 1000) were detected which clearly demonstrated the effect of mass treatment in protecting the children from leprosy.

Challenges faced

DAPSONE RESISTANT

A dapsone resistance survey was carried out in Myingyan District during 1980 and 1983. In 1980, out of 779 lepromatous patients who had been treated with dapsone monotherapy for more than 5 years (90% of them had been treated for more than 10 years), 38·6% were found to be resistant to dapsone treatment.[6] The annual incidence of dapsone resistant during 1981 and 1982 was 40 and 45 per 1000 lepromatous patients, respectively. On average, the annual dapsone resistance rate was 3·4% per year. It was felt at that time that dapsone resistance could have developed around 10 years earlier as it was mentioned in the 1973 WHO Assessment Report that 24–27% of the lepromatous and borderline cases examined in the survey were found to have solid staining bacilli in their skin smears.

HIGH DISEASE BURDEN

The burden of disease in the country was still huge at the time of integration, having over 250,000 cases under treatment and more than 10,000 new cases being detected annually. Additional information on the magnitude of the problem was also obtained from the WHO BCG Trial in Singu Township in Mandalay Division regarding the incidence of the disease. This trial was conducted from 1964 to 1975 and it was observed that the incidence of leprosy was persisting at about 5 per 1000 population per year for the whole project period. It demonstrated that dapsone monotherapy was not effective in controlling the transmission of the disease.

SHIFT IN DONOR INTEREST

UNICEF, which was the major provider of drugs (dapsone) along with other supplies and equipment to the leprosy control programme, shifted its focus in the early 1980s and started to gradually phase out its support for leprosy control. The national programme had to explore and establish new networks with other interested donors to obtain the necessary drugs for the programme.

Finding alternative regimens 1981–1987

Myanmar carried out a study using rifampicin in the same area where the BCG trial was conducted (Singu Township) from 1976 to 1984. In this trial, rifampicin 600 mg was given daily for 30 days in addition to the usual dapsone 100 mg daily to all lepromatous, borderline-lepromatous and borderline cases who were becteriologically positive. Another 1500 mg rifampicin was given as a single dose annually in the following years until the skin smears are negative or skin lesions become inactive. In addition, cases showing suspicious signs of dapsone resistance were given clofazimine 100 mg daily in addition to the above mentioned two drugs until skin lesions became inactive or skin smears became negative. Cases registered in the Shwebo and Wetlet Townships were designated as controls and standard dapsone monotherapy was given to patients in these two areas.[7]

After 2 years following the administration of rifampicin, all cases showed clinical improvement and the bacteriological index fell satisfactorily. Nasal smears were almost without exception negative for acid fast bacilli and solid staining bacilli were very seldom seen. Very few, about 12 patients out of 271 patients during the 5th year showed evidence of re-activation. This was controlled in all cases by re-administering rifampicin 1500 mg annually at the time of full annual assessment. The objective of rendering lepromatous patients non-infectious therefore appears to have been achieved. The annual incidence of leprosy among the population under study was found to decline from 4·9 per 1000 population in 1976–1977 to 0·9 per 1000 population in 1983–1984. In the control (Shwebo-Wetlet) area which was treated with dapsone monotherapy, the annual incidence was 5·1 per 1000 in 1976–77 and 1·7 per 1000 in 1983.

The results from the above two studies (Dapsone Resistant Survey and Rifampicin Trial) encouraged the national programme to use rifampicin in addition to dapsone in its regimen for the treatment of lepromatous cases. This regimen was used between 1982 and 1986 in the high endemic areas, namely Yangon, Bago, Ayeyawady, Magway, Mandalay and Sagaing (Shwebo, Sagaing, and Monywa project areas only) Divisions.

During the preparatory phase (1982–1983) all registered cases were screened and assessed clinically as well as bacteriologically. From 1983 to 1985 all lepromatous cases were given rifampicin 1200 mg once a month for 6 consecutive months in addition to daily dapsone. This was then followed-up with an annual dose of rifampicin 1500 mg while still on dapsone (recommendation at that time was to treat lepromatous cases for life with dapsone monotherapy). In the second year of this initiative, 32,071 cases (55% of the registered lepromatous cases) were given rifampicin 1200 mg once a month for 6 months. In the 3rd year, an additional 33,676 cases were treated with rifampicin and all those cases treated during the 2nd year were given their annual rifampicin dose. This activity was carried out by the existing staff of the leprosy control programme. In addition to providing

the above-mentioned treatment, the specialized staff also treated dapsone resistant cases, managed leprosy reactions and other complications, carried out clinical and bacteriological assessments, training and research activities. Altogether, 67,747 lepromatous cases were brought under this treatment. At the same time in the above mentioned areas, all non-lepromatous cases were treated with dapsone monotherapy by the basic health service staff (BHS).

In the remaining states and divisions, which at that time were categorized as low endemic areas, the BHS continued to provide dapsone monotherapy to both lepromatous and non-lepromatous cases as part of the integrated disease control programme. Rifampicin was not given to patients in these areas due to low endemicity, lack of drugs and inadequate human resources needed to deliver the services. In addition to providing treatment, the BHS staff also carried out case-finding, clinical assessment and health education activities under the supervision of the township medical officer. The low endemic areas included Chin, Kachin, Kayah, Kayin, Rakhine, Shan, Mon States, and Tanintharyi Divisions.

Concomitantly in the six high endemic regions the inactive cases belonging to the non-lepromatous group were screened by the basic health services and then reviewed by the medical officer or leprosy inspectors. Cases that met the criteria were then released from control (discharged). At the end of 1987, 61,587 non-lepromatous cases treated with dapsone mono-therapy were released from control and were discharged from the treatment register.

During the maintenance phase (1985–1986) patients who were given rifampicin were assessed clinically and bacteriologically annually. The number of registered cases at the end of 1987 was 204,282 cases and the registered prevalence rate was 53·4 per 10,000 population.

The plan for using dapsone and rifampicin in 1982–1986 was made during the planning exercise for Country Health Programme in 1980 for the medium term (1982–1986), which was well before WHO MDT was published. It was based on the findings of the rifampicin trial in Singu area to control the increasing problem of dapsone resistant leprosy in the country. It was our own initiative. No one has advised it. The risk was taken after giving serious consideration of our situation, but we were careful to include clofazimine 100 mg daily for the suspected dapsone resistant leprosy cases. So far we have not come across any cases of rifampicin resistant leprosy in the trial area.

Introduction of WHO Multidrug Therapy (MDT) in Myanmar, 1988–1994

WHO MDT[8] was introduced in Myanmar on a small scale during 1986–1987 in some selected areas of the country. However, in 1988 with the support of drugs from WHO the coverage was expanded and it was introduced in the six hyperendemic divisions (Ayeyawady, Bago, Magway, Mandalay, Sagaing and Yangon) covering around 85% of the registered cases in the country. To simplify the operational aspects regarding the delivery of MDT drugs in the field, fixed duration treatment was adopted and multibacillary cases were given 24 monthly doses of MDT. After completion of the recommended fixed doses, both paucibacillary (PB) and multibacillary (MB) cases were discharged, regardless of their skin smear status. In the above-mentioned areas the delivery of MDT drugs at the village level as well as case-holding was placed in the hands of the specialized staff of the leprosy control programme. The introduction of WHO MDT in the above-mentioned six divisions was carried out in a phased manner.

By the end of 1990, 167 townships were covered by MDT. The outcome of this treatment was reflected in the drastic reduction of registered prevalence from 53·4 per 10,000 population (204,282 registered cases) in 1987 to 27·6 per 10,000 population (112,129 registered cases) in 1990. This reduction was due to curing 52,566 cases (cumulative figure) with WHO MDT as well as cleaning of the registers as part of the review process prior to the introduction of this new regimen.

However, at the end of 1990, after evaluating the progress made, the leprosy control programme realized that it was not possible to extend the coverage in the targeted townships any further especially within a short period of time by using only the existing staff of the leprosy control programme. The nature of domiciliary treatment as well as the need to supervise the monthly dose of MDT required the staff to visit each village every month, which made it impossible for them to cover new areas in the township. At the same time, the following favourable conditions encouraged the leprosy control programme to hand over the task of delivering MDT drugs to the patients in their area to the local BHS staff.

- The existing coverage of the basic health infrastructure was adequate and strong except for a few townships in the border areas of the country.
- MDT was found to be simple to administer, had few side-effects, effective and operationally easy for the BHS to handle as part of their routine activities.
- The disease trend was declining and it was found that the township health departments were able to manage the leprosy problem as part of their routine work without burdening them.

In 1991, the task of delivering MDT was handed over to the BHS and the following measures were undertaken to ensure full collaboration from all the agencies involved.

- Necessary administrative measures were taken at the central, state and divisional levels for the handing over of MDT activities.
- Orientation and capacity building measures for staff of the leprosy control programme and BHS were carried out.
- Establishment of clear and simple mechanisms for monitoring and supervision.
- Establishment of referral centres for management of complications and other problem cases,
- Strengthened the support and technical assistant provided by the leprosy control programme to the BHS.

With the above-mentioned measures in place, township medical officers were made programme managers for leprosy control in their respective townships. The staff of the BHS such as, health assistants, lady health visitors and public health supervisors grade 1 were made responsible for field supervision while the midwives and public health supervisors grade 2 were now given the responsibility (as implementers) for case-finding and treatment with MDT.

The vertical leprosy control programme staff were re-assigned as technical advisors, supervisors and co-ordinators, responsible for training, diagnosis for difficult cases, management of leprosy reactions and other complications, and in preparing statistical reports.

Expansion of MDT coverage: 1995 onwards

The 1991 World Health Assembly Resolution (WHA 44.9) to eliminate leprosy as a public health problem by the year 2000 gave substantial impetus to leprosy elimination efforts in Myanmar. With the pledge of a sufficient supply of MDT drugs from WHO in 1994 the national programme was able to extend the MDT coverage to all 320 townships in the country and MDT drugs were made available in all the health facilities (township hospitals, station hospitals, rural health centres and sub-health centres) in the country. The BHS staff provided domicillary treatment to all the registered cases within their jurisdiction. By 1996, all 18,758 cases registered for treatment in the country were given MDT in all 320 townships.

As a result of expansion in MDT coverage, the prevalence declined further from 6·11 per 10,000 population (24,082 cases) in 1994 to 2·5 per 10,000 population (11,906 cases) at the end of 1998 and the number of accumulative cases cured with MDT reached 183,731 cases in the whole country.[9]

Achievements due to integrated MDT services

As a result of integration, the following achievements were made in the country.

1. A marked reduction in registered prevalence from 53·4 per 10,000 population in 1987 to 2·5 per 10,000 in 1998.
2. Significant increases in MDT coverage were attained both in-terms of patients and geographical area. During 1988, only 19·3% of the registered patients were on MDT and in 1996 all registered cases were on MDT (100% coverage). Geographically, in 1988 only 15% of the country was covered with MDT whereas by 1996 it was 100%.
3. New case detection was found to be more effective as more health workers are now involved in case-finding activities. An average of 8000–10,000 new cases were detected annually from 1986 to 1997. The proportion of children among the new cases declined from 17·9% in 1986 (pre MDT period) to 9·5% in 1997. The new proportion of cases with grade 2 disability fell from 27.6% in 1986 to 10.9% in 1996.
4. The capacity of the BHS staff in diagnosis and treatment was improved and the health centres as well as the sub-health centres were able to provide leprosy services at the peripheral level. The integrated approach proved to be very effective and sustainable.
5. Information, education and communication (IEC) activities were intensified with the involvement of basic health service and voluntary health workers.
6. A community based rehabilitation (CBR) programme was initiated for leprosy patients (with the active involvement of the community) in some selected townships.
7. A coordinated system for supervision and monitoring was established. Key information on leprosy was included in the routine reporting system of the BHS.
8. The leprosy control programme was able to participate in WHO multi-centric research studies trying out new drug combinations (using ofloxacin and minocycline in addition to rifampicin) and health systems research.

Conclusion

The introduction of WHO MDT during 1988 in Myanmar dramatically changed the picture of leprosy. Leprosy patients now had something to look forward to in the form of an effective treatment that was universally available totally free of cost. Along with the expansion of MDT services, the community realized that leprosy could be cured within a relatively short period of time and this was one of the main reasons for the reduction of stigma associated with the disease. Information materials for the public could now be presented in a positive way without creating fear. Patients could now be told that they are cured after finishing the recommended course of treatment, unlike the situation in the past when a large proportion of patients faced the risk of relapsing after dapsone monotherapy. Apart from changing the image of leprosy in the community, MDT also restored the credibility of the national health services in general and the leprosy programme in particular. It also renewed enthusiasm among leprosy workers and BHS staff. The public health approach in dealing with the problem of leprosy in Myanmar lives on thanks to MDT.

Finally, Myanmar reached the Leprosy Elimination target of less than 1 per 10,000 population (0·9 per 10,000) at the end of January 2003. The achievement was announced by the Ministry of Health and WHO during the Third Meeting of Global Alliance for Elimination of Leprosy (GAEL) held in Yangon, 6–8 February 2003.

At the end of the year 2003, the prevalence of leprosy in the country was 0·51 per 10,000 population with 2730 registered leprosy patients, all under WHO MDT.

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