

# “Mobile” Leprosy Control in the Eastern Province of Zambia. Parts I and II\*

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## I. Planning and Operation of Treatment Circuits

### INTRODUCTION

The LEPRA Control Project in Malawi started in 1965, and the present scheme in the Eastern Province of Zambia, which is a co-operative one between the Health Department of the Republic of Zambia and the British Leprosy Relief Association (LEPRA), is based very largely on the example and experience of the parent project in Malawi. There is similarity in the terrain chosen in the 2 countries, but the volume and distribution of the respective populations differ greatly. Both campaigns, however, were launched with the same idea—namely, to bring early and regular treatment to as many patients as possible, with reasonable regard to the costs involved, and to include a control system at least 75% effective.

In Malawi the control area is only about one-sixth that of Zambia's Eastern Province, but it contains an estimated population 5 times as great. In Zambia the scattered nature of the population was an important factor in the decision to change from dapsone tablets to 4-weekly depôt injections—a decision which also gave the leprosy teams more time for village case-finding, examination of school-children, periodic review of registered cases, and the accurate presentation of statistical information.

### POPULATION AND TERRAIN

In the Eastern Province of Zambia the total population is approximately half a million, with a density varying from 90 persons per square

mile (35 per sq. km) in the 3 “urban” areas, to 4 per square mile in the widely-spaced enclaves of the Western boundary of the Province in the Luangwa River valley. Villages are generally small, consisting of about 100 persons, with distinct groupings at intervals of 3 to 40 miles. Few of them are on the 2 main transport arteries. Apart from the Luangwa River, which floods considerably between January and April and which does not approach the main population areas, most streams are dry from June to December. Hills mostly present as isolated sharp elevations from the huge plateau and form no hindrance to the movement of vehicles, though many unbridged watercourses become impassable to both vehicle and patient during the rainy season.

### INSTALLATION OF CIRCUITS

For this a map of scale 1 : 250,000 was used, and with available information on population density and village groupings, tentative points were plotted before the ground was covered. Various revisions soon became necessary as the roads, rivers and bridges were checked in detail. Rural health centres, which formerly dispensed treatment to limited numbers of patients within walking distance, remained focal points in the network. In the more thickly populated areas a practical average distance between treatment points was found to be 12 km (7½ miles). Where possible, these points were located at schools, local courts, grinding mills, or village stores, and it was found advantageous to distribute simple time-tables of the unit's 4-weekly calls to each point on the circuit. More

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comprehensive time-tables were posted at each rural health centre included in a specific treatment run, and these showed the entire day's schedule for a year. Medical personnel in charge of these centres are thereby able to advise their former leprosy patients, or potential new patients, at which point they can most conveniently obtain advice.

All circuits were initially launched on fortnightly tablet treatment, the first week's dose being taken with water under direct supervision, the second dose being given to the patient in a container to be taken at home. There was an expected interchange and movement of patients from one treatment point to another as the network expanded. An overall 75% attendance rate has been maintained throughout the first year.

Each team consists of 3 persons: a medical assistant with experience in the diagnosis, treatment, and assessment of leprosy, an auxiliary for clerical work and the preparation and handling of equipment, and a driver. Over-

night stays by members of the teams are necessary when the work is mainly in areas far distant from the main base.

#### LOGISTICAL DETAIL

In an attempt to bring early and regular treatment to as many patients as possible in a scheme of this kind, constant thought must be given to the level of effectiveness, both clinically and economically. In the drama of contacting a few cases of tuberculoid leprosy in a remote area, one can too easily fall below the "level of effectiveness at which a campaign continues to represent a good use of resources". (WHO, 1966.)

The success of the operation depends on many factors, such as: (1) the number of patients per treatment-mile; (2) the daily distance to be covered before the first patient is treated; (3) the number of new cases discovered per month or per year; (4) the quality of drivers and rate of deterioration of vehicles; (5) the regularity of attendance of registered patients; (6) the ratio of total number of cases under

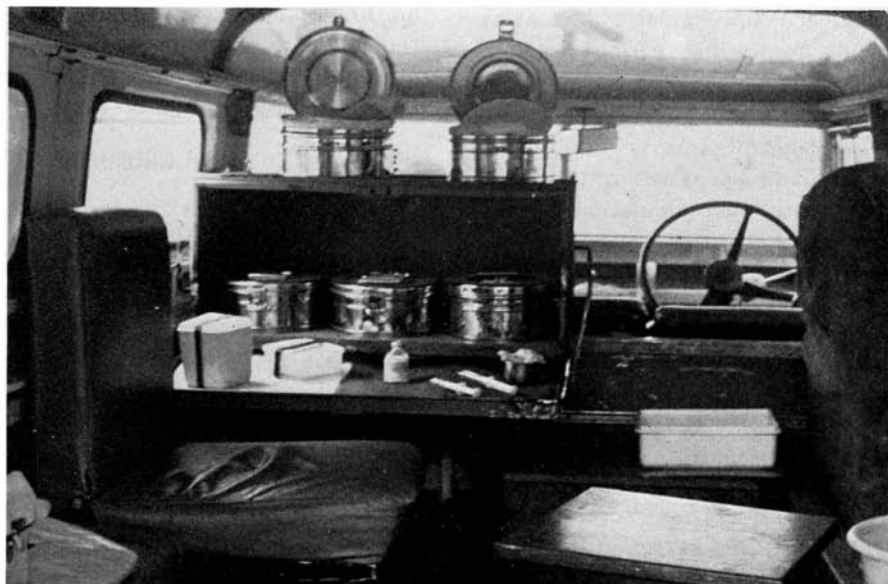


FIG. 1

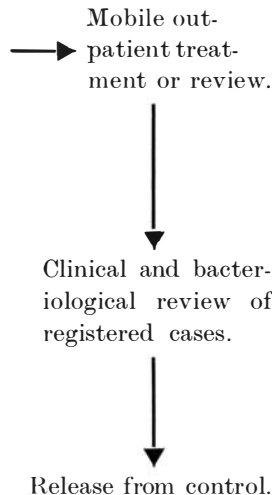
Interior view of vehicle modifications for injection purposes. Glass (not disposable) syringes are normally used. Adequate room is needed inside the cabinet for full opening of the drum lids. (The upper 2 drums are not normally carried, and were photographed for demonstration purposes only.)

treatment in the new project to the numbers and salaries of the staff involved; (7) whether or not it is necessary to finance and staff a base hospital for the small percentage of leprosy patients needing admission; and (8) the “turn-over” of cases introduced to treatment and those released from control.

In work of this type the final step of release from control should be taken slowly and carefully, with very close regard to the possibility of a mistake in clinical assessment and also to the fact that many leprosy patients feel rejected and disappointed if told not to come back again. Our policy throughout has been to release them and to certify this, but to make it very clear that they are always welcome to return to see us at any time.

The processing may thus be outlined:

- (1) Contact and village case-finding
- (2) School examinations.
- (3) Transfers from leprosaria.
- (4) Transfer from rural health centres.
- (5) Voluntary presentations to mobile unit.



Of the 3 units proposed for adequate provincial control, 2 were functioning fully on a 28-day treatment regime by injection at the end of the first year. Each 4-weekly period *per unit* works out as follows, based on a 5-day working week. In fact the central office is also open on Saturdays for administration, docu-

mentation of the current week’s work, and briefing for the next week:

Approximate control cover	6000 sq. miles (15,500 sq. km)
Treatment days	10
Treatment miles	800 (1290 km)
Overall mileage for treatment purposes	1000 (1610 km) (depending on overnight accommodation)
Established treatment points	80
Average no. of patients per treatment point	7

Thus 10 days are allocated for administration at base, vehicle maintenance, preparation of equipment, health education, planning and carrying out of village and school examinations, and clinical assessment of patients under treatment.

#### SUGGESTED PROCEDURE FOR VILLAGE EXAMINATIONS

Two factors may ruin attempts to examine the whole-body surface of villagers, namely complete lack of understanding of what the exercise is about, and lack of reasonable privacy. House-to-house examinations might in some ways be more effective, but in this area it is very unlikely that the time and organization involved would be justified, and good lighting is always a problem. Section II of this paper includes a description of the canvas screen which we have used in setting up a central examination point either in a village or at some treatment point already known and familiar to many people in the area.

At least one advance visit, with full explanation in the local dialect is absolutely essential. As a matter of courtesy the local chief, rural council, and schoolmaster are always informed of our plan. Also of value has been the advance distribution, through the local chief and in the local dialect, of (1) simply-phrased letters to the village headmen and their

people explaining the reason for the visit, how the newly-found patient may receive treatment, and placing great emphasis on out-patient management; and (2) posters outlining the main signs and symptoms of leprosy; across these are written the date and time of the proposed visit. If the first distribution of this information can coincide with a short speech and introduction of the examiners, this is again a great advantage and may help to reassure the timid potential patient.

Figure 2 shows only one screen in use, but it is an easy matter to erect another compartment adjacent to this one and to use it for undressing and dressing if the number of patients is large. A record of all persons examined is made, by age-group and sex.

The year's work has shown that the value of these examinations in case-finding is not impressive, but on the other hand as a means of promoting public confidence and interest their value is considerable, and certainly greater than that of exhortations in press or radio. It is thought that these examinations, conducted in

an informal and friendly way, coupled with the acceptance and handling of leprosy cases at village level, may bring forward even more voluntary presentations as the work proceeds.

#### CASE NOTES AND CARDS

In a tough plastic cover, each patient carries an out-patient card bearing his coding, dosage, and treatment and review dates. A final section is printed on this card for the stage of release from control. The patient's main case-note carries a registration coding compiled from: (1) the area of the day's run; (2) the day on which the run is made; (3) the number of the treatment point for that day; (4) the classification and sex of the patient; (5) the patient's serial number in the register for that day. Thus CN/TUE/6/NLM/23 signifies that the patient is in Chipata North, on Tuesdays, at treatment point 6, is classed as non-lepromatous, male, and number 23 in the register.

Each register is sectioned by classification and sex. For the purposes of field work, all cases are divided into lepromatous and non-lepromatous,



FIG. 2

Canvas examination screen erected and secured to a tree. There is more than enough room inside it for the examiner and one patient; the vehicle's back door is fixed widely open and access to the interior is easy.

and for immediate recognition of the lepromatous case all data on records and registers are in *red*, those for non-lepromatous cases in *black*.

On initial registration an additional coding system may easily be devised to indicate: (1) the completely untreated case starting on low dosage; (2) the previously treated case from a rural health centre; or (3) the case recently transferred from a leprosarium.

#### CENTRAL CONTROL REGISTRY AND OFFICE

This office was established in the Provincial centre at an early stage. A suitable shelved

storage capacity of at least 125 cubic metres is also essential for a scheme of this size involving 3 vehicles and teams. In order to locate and register every known case of leprosy in the Province, all medical records, leprosy registers and drugs were initially withdrawn from rural health centres and other treatment points; these are now filed in the Central Registry. Monthly statistical information both for LEPRO and the Government being issued from this office. The clarification and improvements resulting from this central control are described in the paper by McDougall and Drake (see p. 115).

## II. Landrover Modification for Dapsone Injections and Clinical Examination

#### MODIFICATIONS AND EQUIPMENT FOR INJECTION

For this purpose 3 factors are essential: (1) maximum standard of sterility of equipment in all conditions; (2) rigidity of the equipment on rough roads; and (3) privacy for the patient receiving an intramuscular injection.

For 8 months of the year the air in this Province is heavily dust-laden. Against this constant enemy, equipment must be hermetically sealed, lids must fit perfectly, drums must be carefully anchored on their base, and everything must be as far off the floor as is practicable. Figures 1, 3, 4, 5 and 6 show the basic arrangement.

If the spare wheel *must* be carried within the vehicle, it should be completely covered with lined canvas, and both wheel and canvas must be periodically washed with soap and water. The 3 sterile drums within the metal cabinet are 23 cm in diameter, sit firmly in a wooden base, and can be fully opened within the cabinet. The lid of the cabinet is lowered to form a work-table for the medical assistant; “formica” surfacing of the lid would be an advantage. Used syringes are stowed in a plastic box;

syringe-holding forceps and dressing forceps are immersed in an antiseptic solution in a covered plastic container.

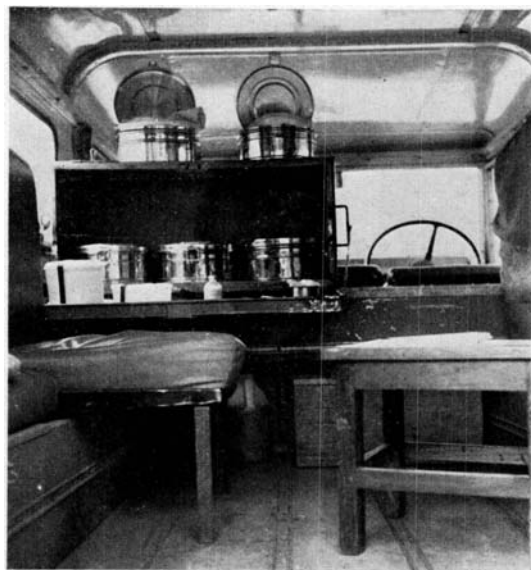


FIG. 3

Interior view of vehicle modifications for injection purposes. Adequate room is needed inside the cabinet for full opening of the drum lids. (The upper 2 drums are not normally carried and were photographed for demonstration purposes only.)

The 3 sterile drums contain respectively: (1) 30 × 5-ml syringes in sterilizing envelopes, and needles, at least 5 per syringe, in one envelope plainly marked; (2) cleansing swabs; and (3) a 23-cm kidney-dish to receive the syringe in use. This should suffice for a minimum

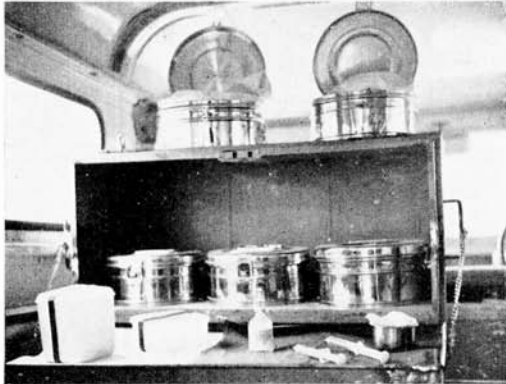


FIG. 4

Interior modifications for injection purposes; the cabinet, with lid lowered to form a working surface. Glass (not disposable) syringes are normally used. Adequate room is needed inside the cabinet for full opening of the drum lids. (The upper 2 drums are not normally carried and were photographed for demonstration purposes only.)

of 125 injections, with a change of syringe after 5 or 6 consecutive injections at the same treatment point.

The depôt sulphone used is "Sulfone UCB" (Brussels) and contains 250 mg per ml, made up with sodium carboxymethyl-cellulose, sodium ethyl-mercuri-thiosalicylate and glycerin. Filler needles of a larger gauge are advised as the solution may be turgid. Thorough cleansing of the rubber sealing is even more important than usual. Four-weekly injections are given intramuscularly into alternate buttocks, the patient sitting on a small stool with his back to the injector and in complete privacy within the vehicle. Sitting is considered an added advantage, since in this position "it is quite impossible to strike the sciatic nerve" (Cochrane, 1964).

Once patients are familiar with the routine after their initial attendance, the time per injection can be reduced to a very few minutes. The auxiliary helper keeps a close watch on the register, supervises the stream of patients, and advises the injector on any recorded change in treatment. The date of the team's next visit is explained to the patients verbally and also recorded for each patient.

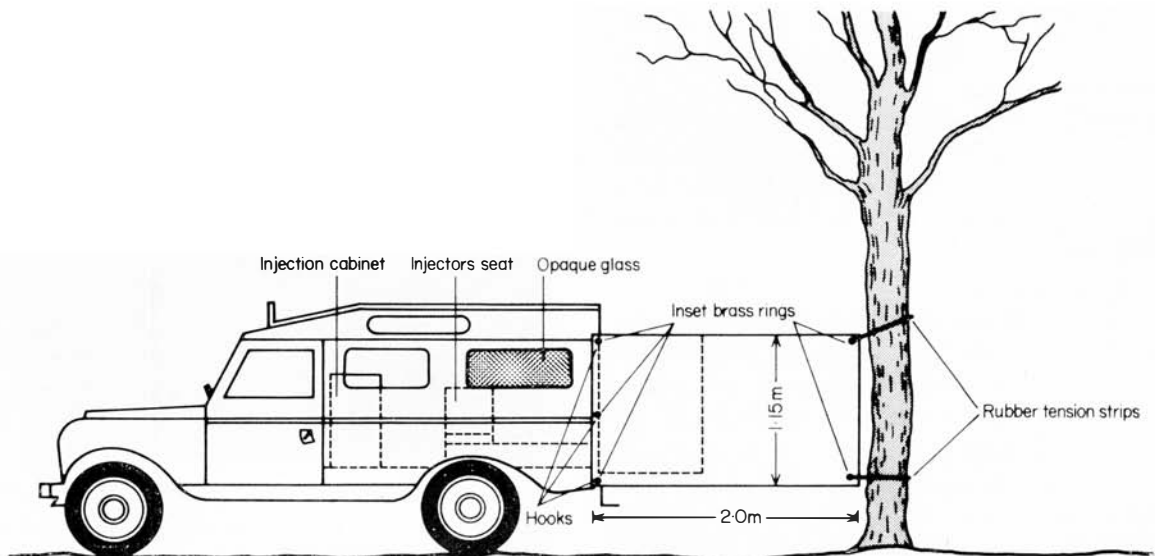


FIG. 5

Side-view diagram of the injection vehicle with canvas screen for clinical examinations erected and secured to a tree.

### PORTABLE SCREEN FOR CLINICAL EXAMINATIONS

Since treatment is only an adjunct to control, the review (re-assessment) of cases (clinically and bacteriologically) is carried out at treatment points with the aid of a portable canvas screen (Fig. 2). These reviews should be carried out by the medical assistant who has dispensed treatment to the patient over the previous 6 or 9 months, and time for them should be allowed in the 28-day time-table of work. The screen is also of value in village and school examinations. The canvas is of medium thick quality, measures approximately 4 by 1.15 metres, and has 2.5 cm brass rings at all corners and at appropriate intervals along its edges. Strips of old motor-car inner-tube are useful for attaching the screen to trees. Bacteriological examinations can be carried out within the privacy of the vehicle, as can also clinical examination of the lower part of the body if the patient feels the privacy of the screen is not enough.

When the examination is being carried out the contacts of infectious patients should, ideally, be seen at the same time, and very much greater emphasis on this method of case-finding is now being given in the Eastern Province.

The current cost of this screen in Zambia is about £11 (11 pounds sterling), but this is considered unreasonably high; elsewhere it might be purchased for about half this price.

### DISCUSSION

Some practical details of this first year of work in the Eastern Province of Zambia are presented (at what may seem a very early stage) because the methods used appear, so far, to be both successful and economical. Discussions are now in progress on extending the work into another province (Luapula), and it may be that the modifications described here could have application in other countries where leprosy prevalence and the terrain are similar.

Vehicle modification as demonstrated in the accompanying figures is already under revision for the use of a third team. However, with the available local resources only, it is difficult to produce the standard of equipment needed for work of this kind. Inside the vehicle, the exact disposition of the equipment in inches and centimetres is important, as is also the sealing of all containers and the provision of efficient devices for opening and closing them dozens of times during a hot and tiring day's work.

To those who believe that out-patient treatment with tablets has its limitations, and with the possibility of DADDS becoming available in the future, safe and efficient techniques for "mobile" injection therapy under rural conditions may become more important. It is hoped that this paper may lead to the development of a perfected built-in assembly based on the prototype described.

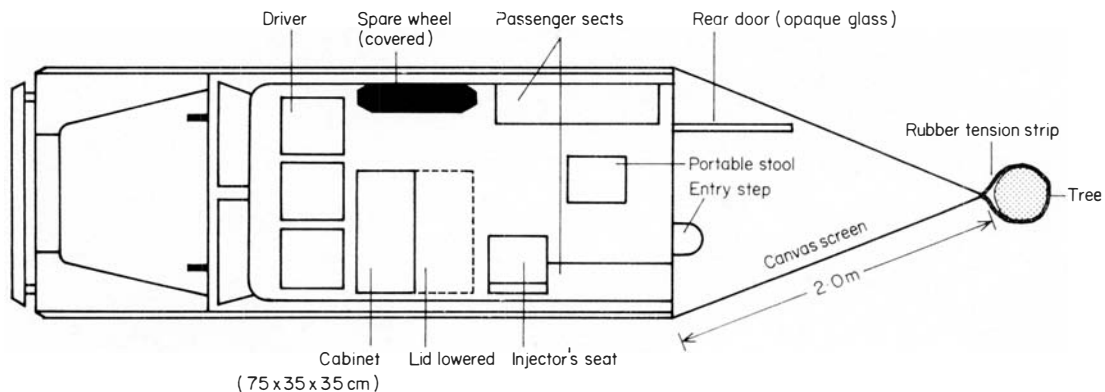


FIG. 6

Plan of the injection vehicle, showing clinical examination screen in place, and position of interior equipment.

## SUMMARY

A procedure for the installation in Landrovers on mobile treatment circuits is described, with reference to population density, terrain, patient yield, attendance rates, and the best economic use of time and personnel.

This scheme in the Eastern Province of Zambia is a joint, co-operative one between the Zambian Department of Health and the British Leprosy Relief Association in London. As the first year of work has developed, modifications to the Landrovers have been necessary for the giving of injections inside the vehicle; these are described in some detail, as is also the use of a canvas screen for carrying out clinical examinations in reasonable privacy.

There is a need for a strong, practical built-in unit for giving drugs by injection, bearing in mind the rural circumstances described. If DADDS comes into general use, this need could be even more important. The hope is

expressed that the prototype used in this scheme may lead to the production of a perfected, built-in unit for "mobile" injection purposes.

## ACKNOWLEDGEMENTS

I would like to thank the Permanent Secretary, Department of Health, Lusaka, and the British Leprosy Relief Association, London, for permission to publish this article.

I wish to record that the organization and methods now in practice in the scheme in Zambia have developed from previous experience with the inauguration of the LEpra Control Scheme in Southern Malawi, 1965-7. Indeed, the whole idea of this modification for mobile control in Zambia derives directly from LEpra's work in Malawi.

## REFERENCES

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