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YAWS CONTROL — AN OPPORTUNITY FOR PROMOTING RURAL HEALTH-SERVICES

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General Observations

The goal towards which every health worker must strive, regardless of the importunities of his daily work, is the raising of the level of health of the people. This must be his philosophy, his creed, and his purpose. Because the pursuit of more limited objectives tends to restrict the breadth of his vision, it becomes necessary to examine a disease-control programme not as an end in itself but rather as a means towards something broader.

One of the most effective means for advancing towards better health for everybody is the establishment and maintenance of some form of adequate local health-service. There is little question as to the desirability of a population's having such services available, as is shown by the remarkable progress made in the prevention of disease and promotion of health in many places where such services exist.

A concentration on one disease to the exclusion of others may be compared with the over-extension of a single military salient into the enemy's territory. Without the advance of its lateral support, the salient may find itself in difficulty. So, too, must a public-health spearhead, such as a yaws-control programme, proceed only in relation to the supporting elements of public health. That it may be a spearhead is our thesis here, but it cannot become the whole campaign.

One might raise the question whether the overwhelming problems associated with a single disease, such as yaws, should not lead one to concentrate upon its eradication rather than to spend one's substance on a more diffuse effort such as the promotion of general public-health. Experience has shown that unilateral efforts have often failed in all but

the most transitory objectives. So far as we know, there is no record of an extinct disease. We must therefore always expect a reservoir of cases, even in populations which have been subjected to " eradication " measures. It is this small focus which represents the real danger as soon as the pressure of an intensive campaign is reduced. Only the constant search for, and suppression of, this residue of cases can properly be said to be a permanent control-measure.

A disease-control team can stay in a locality until the last infectious case has been found and treated, but in practice the law of diminishing returns militates against this. Furthermore, it is a public-health axiom that no one person is completely safe from the hazards of disease until all are safe. The same applies to communities since the control of a disease in one community is no assurance of protection unless neighbouring communities are also under control. To protect all communities in an area where a disease is highly prevalent would require more teams of specialists than are likely to be available. The campaign must be pursued among the neighbouring communities while the remaining reservoir of infection in the treated community is kept under the surveillance of an adequate local health-department.

This is not to advocate the neglect of a serious disease-problem until the time is ripe for establishing a modern health-centre with complete equipment and staff in every locality of a country or province. It is clear that under certain circumstances a single piece of health work, such as the drainage of a swamp or the application of DDT to dwellings, can bring much benefit to the people. The warning we wish to sound here is that a particular aspect of health work must not be permitted to be a goal in itself but must be merely a step towards realizing the goal.

General health-services are desirable, not only from the point of view of the measurable advances which follow their establishment, but also because they represent a form of progress which goes hand in hand with other stages of a society's evolution. The health factors inherent in economic development are by now well known, and the interrelationship between social and health causes and effects is axiomatic. The promotion of general health-services as an objective means that the efforts expended have far greater potentialities than those connected with any lesser goal.

The advent of public-health services has generally been the result of continued demands by an articulate population motivated by the presence of a major health problem, or by educational and promotional activities, or by both. In those places where yaws is highly prevalent, no better stimulus for popular opinion can be imagined. Its social and economic implications are so apparent that the work of health education is already well under way almost spontaneously. The prospects for success in reaching the goal through the medium of well conceived and carefully planned yaws-control campaigns are indeed bright.

A yaws-control campaign is a good method for stimulating general health-services for at least three reasons : the epidemiological characteristics of the disease facilitate its control ; it is relatively easy to diagnose ; and its treatment expectations are good. Yaws is chiefly a disease of the tropics, occurring in rural, underdeveloped localities, and affecting large numbers of children. Since the suffering of children arouses great popular concern, and since the incapacity of young adults results in manpower losses, yaws-control activities have subjective and objective, social and economic, significance. In addition, the disease tends to be most prevalent in those localities where general health-services are insufficient. From all indications, therefore, yaws-control campaigns may serve admirably as forerunners of programmes which are desperately needed. Thus, the spearhead meets little resistance.

The fact that yaws lesions are generally external makes people more aware that they have the disease in their midst—this visual evidence facilitates public understanding of the problem. In this respect, moulding public opinion through yaws control has many advantages over projects directed against diseases which are not as patently apparent to persons in rural, underdeveloped regions of the world. As the personnel working in health programmes are, at least in the early stages, " foreigners ", their function in building sound public-health is likely to be better understood if their first task has to do with a disease in which the signs are so clearly evident.

The present-day therapeutic agents by which yaws may be conquered almost with a single stroke offer a golden opportunity to demonstrate the value of modern public-health and medical services and to gain public support. There is hardly any other disease-problem which can be so readily attacked and in which the expectations from treatment are so great. The development of an effective, non-toxic, easily-given therapeutic agent is the aim in many diseases ; we have achieved that aim in the case of yaws. If the old admonition to " put your best foot forward " may apply in public health, then a yaws-control programme, when conceived as a means rather than as an end, serves admirably. The spearhead brings the rest of the forces close behind it.

Planning

It is clear that an important goal for any population-group is the establishment and maintenance of adequate general health-services. It is likewise obvious that a yaws-control programme provides an opportunity to bring this benefit to a community. The problem which faces public-health administrators is the reconciliation of these two concepts into an answer to the question " How ? " The key to the attainment of the objective is planning.

For example, in the case of a yaws-control team beginning a two-year programme in a community, it is possible to outline the personnel and equipment needed as follows. Among the persons on the team might be a physician and an auxiliary worker, both drawn from the local population. The latter could be trained so that he could make home visits with special reference to yaws, later expanding his interests to other communicable diseases, and then finally to other health matters. In this way the seeds of a public-health nursing programme can be sown. Similarly, the local physician attached to the team can attend to general medical problems, gradually expanding his scope. On the withdrawal of the team, therefore, the nucleus of a local health-unit can be left behind to cope with the reservoir of yaws cases and to work towards a modern and more adequate health-service. All this should be correlated with programmes of education and training of professional health-workers at all levels.

This is but a sketchy illustration of one of the most important processes in public-health work—planning. This process of planning should begin early in any programme. After assessing the problem, in this case yaws prevalence, and establishing the long-range goals, namely the provision of adequate local public-health services, planning should outline the methods whereby the campaign may proceed from the solution of the one to the achievement of the other. This would include the estimate of resources, both human and material, which could be made available at each period of the campaign. The qualitative and quantitative considerations must be calculated as well as the steps necessary to obtain or produce them. The anticipated accomplishment of each unit, both human and material, should also form part of such an outline, again with the time factor carefully considered. Thus, a step-by-step building-up of a plan would serve as the blueprint for the programme.

The responsibility for the general planning in public health must rest with the agency charged with the implementation of the programme, and this means the national or local government. The idea that only an international agency, such as WHO, should do the planning is erroneous. Its role should largely be limited to providing advisers who can discover and evaluate the facts which have a bearing upon the plans and who can give their technical aid in the actual formulation stage. Only the health authorities of a nation can estimate : (*a*) the human and material resources which will be available from time to time ; (*b*) the economic, social, religious, and other factors which may augur well for a plan or may doom it to failure from the start; (*c*) the readiness of the public for health services —of what kind and to what extent. Thus, one may lay down the precept that planning should begin early, with the full participation from the start of the agencies which will implement the plan, and should attempt to indicate what, by whom, when, and how much.

Among the characteristics of a good plan are the following :

(1) A good plan outlines a series of limited objectives consistent with, and leading up to, a stated general purpose, and indicates the gradual course of action.

Those who formulate plans for establishing local health-services through the inauguration of a yaws-control programme should indicate the subsidiary year-to-year goals. There is reason to believe that some general medical services should be available from the very beginning of a specific disease-control project. Persons working in the field have reported that patients sometimes have difficulty in understanding why their medical or surgical conditions do not come under the jurisdiction of a service unit that the whole community praises for its wonderful work. The inclusion of more comprehensive services from the start permits the planner to consider the team as an embryonic health department. Subsequent plans may concentrate chiefly on balancing out the services of this young department, increasing some, decreasing or modifying others. The problems of education and training of personnel must necessarily be determining factors in planning the speed of progress by way of the short-term objectives towards the main aim.

(2) A good plan should be thoroughly understood at all levels, and those who participate in the programme should share in its preparation.

Participation in planning may be stimulated through universal agreement on the needs and on the objectives. In places where yaws is prevalent, the early co-operation of the health authorities, as well as of the community leaders, and even of the general population, should not be difficult to attain. This is the first step in assuring co-operation throughout the subsequent stages of planning and implementation.

(3) A good plan is realistic and provides for maximum use of facilities, both existing and envisaged.

The prevalence of yaws in areas of poor economic resources emphasizes the frugality with which the public-health administrator must conduct his work. He must make the best possible use of his personnel, often entrusting involved technical procedures to partially trained workers, while training them and others to do more, and to do it better. The plans for general local health services under such conditions must be rigorously well-grounded.

(4) A good plan is flexible and capable of revision.

Although the development of events which may influence a plan cannot always be anticipated, a programme of work should be under constant surveillance so that plans may be modified whenever necessary. The establishment of repository penicillin as an effective agent in the treatment of treponemal diseases, for instance, forced the modification of plans in the continuation of existing programmes. Only those plans of operation

which are flexible and capable of revision would be able to adapt the new scientific knowledge into its administrative structure.

Expected Results from Well-Planned Campaigns

From the experience gained in mass campaigns against treponemal diseases in general and against yaws in particular, it is already possible to state definitely that, when mass therapy is carefully planned and systematically carried out, the immediate effect is a significant reduction in the number of infectious cases. Thus, in a pilot area, the village of Nong Kratom, in Rajburi Province, Thailand, with a population of 2,891, there were 675 cases of yaws, or 23.3% of the total population. Treatment was given in a single injection to all cases, but the schedules varied ; 300,000 units of PAM were given to children two years old or under, 600,000 units to those between three and ten years of age, and 1,200,000 units to all those over ten.

The results one and three months after treatment were as follows :

Type of lesion	*After one month*		*After three months*	
	healed (%)	*improved* (%)	*healed* (%)	*improved* (%)
Early infectious	85.2	100	100	100
Open ulcerative	55.5	100	88.8	100
Hyperkeratosis	4.3	64.8	29.4	94.9

At these two follow-up examinations, the entire population was re-examined. At the first, no new cases were discovered ; at the second, only two new cases appeared.

A similar pattern is apparent in many other projects for treponemal-disease control. The earliest of the mass-treatment programmes, and the one with the most completely delineated base-lines, is the campaign still being conducted against endemic syphilis in Bosnia. This disease is communicated non-venereally, chiefly among children, in much the same manner as yaws. The results of the campaign in Bosnia, the lessons learned, and the epidemiological observations, have been summarized by Grin.[2]

From this well-organized and methodically conducted campaign, it has been reported (in a personal communication from I. Pintaric) that, on the average, during the first control examination in an area where a large reservoir of manifest syphilis existed, it was found that the number of cases of secondary syphilis (relapses, reinfections, and new cases) was reduced to about 10% of the number discovered at the beginning of the campaign. With further systematic control examinations, that number was progressively reduced to a few sporadic cases, or to the point where the disease disappeared completely. Complete disappearance of infectious cases was noted in some isolated villages at the first control examination.

Discussion

Experiences such as these, repeatedly confirmed in other WHO/UNICEF field-programmes, lend support to the contention, put forward elsewhere,[6] that if treponemal-disease-control programmes are carefully planned and meticulously carried out, there is a reasonable prospect that these diseases ultimately can be eliminated as major public-health problems.[5]

One occasionally meets the argument [5] that no communicable disease has ever been eliminated by the sole process of treating infected persons. If such a statement suggests the inference that complete control of yaws is unlikely from the use of limited numbers of stationary clinics, one would, of course, agree, for such has indeed been the experience of the past. Nevertheless, as Harding [3] has clearly demonstrated, when mass treatment is accompanied by active case-finding covering a large proportion of the population, persistent efforts to reduce the level of infectiousness will be well rewarded. In this connexion it is interesting to note that never before has there been available to those carrying out control work against any disease a weapon comparable to repository penicillin in the treatment of yaws.

It is a well-established epidemiological principle [1] that, for the control and eventual elimination of certain communicable diseases, it is necessary only that the incidence of new infections be held consistently below the level at which the number of infectious cases are rendered non-infectious. Therefore, by constantly keeping one step ahead of the spread of *Treponema pertenue*, yaws can ultimately be controlled. A reassuring corollary of this epidemiological fact is that, for certain communicable diseases, when diminishing ratios are obtained over successive periods of time, the rate of declining incidence tends to accelerate as the disease comes under increasingly effective control.

It is well recognized that no single mass sweep through an area will effectively control any of the treponemal diseases. It is believed possible, however, that with repeated mass surveys the incidence of the infectious cases can be reduced to the point where permanent public-health facilities will be able to stamp out residual foci before the disease can spread widely, particularly if active case-finding measures are continued.

There is a real danger in telescoping into a relatively brief period the beneficial results of decades unless at the same time there are plans to consolidate the gains by increasing permanent rural public-health facilities. Lambert [4] cites an example of what happened in one instance in which treatment facilities were prematurely abandoned and active case-finding work was discontinued. As a result of an intensive campaign in Western Samoa during the years 1923-6, in which 25,000 persons out of a total population of 40,000 received treatment with arsenicals and bismuth, infectious yaws was practically eliminated from the island. However,

because of political disturbances the campaign was abandoned, and within four years, cases of early yaws " began to sprout like mushrooms in all directions ".[4]

The soundest method of avoiding such a catastrophe is to build into and around the yaws-control programme progressively better general rural health-services. At some point, the yaws-control activities carried out with the assistance of international organizations must be integrated into the permanent rural public-health structure of the country. As the need for intensive yaws-control activities diminishes, general public-health measures of gradually increasing scope should be introduced.

In certain districts of Bosnia, where the endemic-syphilis control campaign has been carried out with excellent results, the emphasis is being shifted to the next most prevalent condition, ringworm of the scalp. Meanwhile, rural health-centres are being built as more and more trained personnel to work in them are becoming available. The transition must be carefully planned, with the ultimate objective of adequate rural health services suitable to the local situation.

With good planning and conscientious implementation at each successive step, the end result will be not only the control of yaws, but health services that are consistent with the broad objective of providing for people in what are now underdeveloped rural areas the highest attainable standard of health, which in the words of the WHO Constitution " is one of the fundamental rights of every human being ".

SUMMARY

One of the most effective ways of securing better health for all is to provide adequate local health-services.

Experience has shown that even when all efforts are concentrated on eradicating a single disease, a dangerous reservoir of cases always remains. The search for, and suppression of, this reservoir must be carried out by public-health services as part of a permanent control-programme. Thus, a particular aspect of health work must be seen as a means towards an end rather than as an end in itself.

In areas where yaws is prevalent, control campaigns against this disease are a good means of stimulating the development of general public-health services for three reasons : the epidemiological character-

RÉSUMÉ

L'une des façons les plus efficaces d'améliorer l'état de santé de la population est d'organiser des services sanitaires locaux bien conçus.

L'expérience a montré que, même en mobilisant tous les efforts en vue d'éliminer une certaine maladie, on laisse toujours subsister un dangereux foyer d'infection. Il incombe par conséquent aux services de santé publique de s'attacher sans relâche à dépister ce réservoir de morbidité puis à le supprimer. C'est pourquoi il faut voir, dans une activité sanitaire déterminée, un moyen en vue d'une fin plutôt qu'une fin en soi.

Les campagnes menées contre le pian dans les régions où sévit cette maladie sont un moyen efficace d'accélérer l'établissement de services généraux de santé publique. Cela pour trois raisons : l'épi-

istics of the disease facilitate its control; it is relatively easy to diagnose; and its treatment expectations are very good. Occurring chiefly in rural, underdeveloped, tropical areas, yaws affects large numbers of children and young adults and thus arouses considerable popular concern. For that reason little resistance is offered to control programmes, and public opinion may, through them, be moulded in favour of fuller public-health services. Moreover, there has never been available for control work against any other disease a weapon comparable to repository penicillin in the treatment of yaws.

The authors consider how yaws-control programmes may be developed into adequate general health-services. Taking a two-year programme as an example, they suggest that there should be on the control team a physician and an auxiliary worker drawn from among the local population. The physician should also attend to general health problems, and the auxiliary worker should be trained to make home visits dealing particularly with yaws, and later with different communicable diseases and other health problems. On the withdrawal of the team, a nucleus would thus remain to cope with the reservoir of yaws cases and to work towards modern and adequate health-services.

They next discuss the problem of planning, the responsibility for which must rest with the local or national government, and give the four main characteristics of a good plan : it should outline a series of limited objectives consistent with, and leading to, a stated general purpose; it should be understood at all levels, and all who participate in the programme should share in its preparation; it should provide for a maximum use of facilities; and it should be flexible and capable of revision.

démiologie spécifique du pian rend la lutte relativement aisée, le diagnostic de la maladie est facile et son traitement offre de grandes chances de succès. Cette affection, qui est surtout répandue dans les zones rurales des régions tropicales peu évoluées, frappe en grand nombre les enfants et les jeunes adultes, de telle sorte que la population voit en elle un redoutable fléau. C'est pourquoi les campagnes contre le pian ne sont pas accueillies avec défaveur par les habitants et sont aptes à préparer les esprits à l'extension des services de santé publique. En outre, la pénicilline-retard offre pour le traitement du pian une arme plus efficace qu'aucune de celles dont on ait jamais disposé contre les autres maladies.

Les auteurs de l'article examinent comment les activités entreprises contre le pian pourraient servir de point de départ à l'établissement de services complets de santé publique. Envisageant, à titre d'exemple, un programme biennal de lutte contre cette maladie, ils suggèrent que l'équipe chargée des opérations comprenne un médecin et un auxiliaire choisi parmi la population locale. Le médecin s'occuperait aussi de problèmes sanitaires d'une portée générale. Quant à l'auxiliaire, après s'être bien familiarisé avec la lutte contre le pian, puis contre différentes autres maladies transmissibles au moyen de visites à domicile, il serait amené à étendre son action à d'autres secteurs. L'équipe une fois partie, un noyau demeurerait sur place pour s'attaquer aux cas de pian qui subsisteraient encore et pour travailler à la création de services de santé publique modernes et adéquats.

Le soin d'établir un programme d'action et de veiller à son exécution incombe aux autorités locales ou au gouvernement central. Pour qu'un plan d'opérations soit efficace, il est essentiel : 1) qu'il fixe une série d'objectifs limités visant un but général clairement défini; 2) qu'il soit bien compris à tous les échelons et que tous ceux qui participent à son exécution aient collaboré à sa mise sur pied; 3) qu'il soit conçu de façon à permettre le meilleur emploi possible des moyens mis en œuvre; 4) qu'il ait une certaine souplesse et puisse être modifié ou adapté.

From the experience gained in mass campaigns against various treponemal diseases, the authors find that, when mass therapy is carefully planned and systematically carried out, a significant reduction in the number of infectious cases results. In one control area in Thailand, for instance, all early infectious cases of yaws were healed three months after treatment. In Bosnia, where a campaign is being waged against endemic syphilis, it was found at the first follow-up examinations that the number of cases of infectious syphilis was reduced to about 10% of the original number. In certain isolated villages, infectious cases had completely disappeared. Thus, it seems that, with repeated mass surveys, the incidence of infectious cases of treponemal diseases can be reduced to the point where permanent public-health facilities will be able to stamp out the residual foci.

However, there is very considerable danger in abandoning treatment facilities and case-finding prematurely. In Western Samoa, for instance, infectious yaws had almost been eliminated in 1926 when an intensive campaign had to be abandoned; within four years, cases of early yaws reappeared in large numbers. At some point, the yaws-control activities must be integrated into the permanent rural public-health structure of the country. As the need for intensive control of yaws decreases, general public-health measures of gradually increasing scope must be introduced.

On a constaté que, si elles sont organisées avec soin et menées méthodiquement, les campagnes de grande envergure contre les diverses tréponématoses permettent de réduire sensiblement le nombre des cas infectieux. C'est ainsi que, dans une région de la Thaïlande, tous les sujets atteints de pian infectieux récent ont été guéris après trois mois de traitement. En Bosnie, où une campagne contre la syphilis endémique est actuellement en cours, les premiers examens post-thérapeutiques ont fait apparaître que le nombre des cas de syphilis infectieuse avait été ramené à environ 10% du chiffre initial, et même à un chiffre voisin de zéro dans certains villages isolés. Il semble donc que, en recourant à une série de vastes enquêtes, on parviendra à ramener la fréquence des cas infectieux de tréponématoses à un niveau suffisamment bas pour que les services permanents de santé publique réussissent à éteindre les foyers qui pourraient subsister.

Il serait cependant imprudent d'interrompre prématurément les campagnes de traitement et de dépistage. Le cas du Samoa occidental est significatif à cet égard. Grâce à une campagne intensive, le pian infectieux avait été presque totalement éliminé de cette région en 1926, époque à laquelle il fallut interrompre les opérations; quatre années plus tard, on assistait à une forte recrudescence de pian récent. Il faut que l'action entreprise contre le pian fasse, d'une manière ou d'une autre, partie intégrante des services permanents de santé publique en milieu rural. Et au fur et à mesure que la nécessité d'une lutte intensive contre cette maladie se fait moins impérieuse, il importe d'introduire graduellement dans divers domaines les mesures permettant d'améliorer la santé publique.

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