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REPORT OF THE AFRICAN CONFERENCE ON SMALLPOX ERADICATION

Brazzaville, Republic of the Congo, 16-19 November 1959

CONTENTS

INTRODUCTION

The African Conference on Smallpox Eradication organized by the Regional Office for Africa of the WHO was held at Brazzaville from 16-19 November 1959.

In addition to WHO staff members, the Conference was attended by 26 participants, from 20 countries in Africa south of the Sahara and from one country of the Eastern Mediterranean Region, as well as by observers from the CCTA, the Pasteur Institute of Brazzaville and the "Institut d'Etudes Supérieures" of Brazzaville. The list of participants is given in Annex I.

The Session was officially opened by Mr R. Troadec, First Counsellor and Personal Representative of the High Commissioner General, representing the President of the Community at Brazzaville, and Dr T. Evans, Deputy Director of the WHO Regional Office for Africa.

The following also attended the opening ceremony: Mr A. Dufour, Diplomatic Counsellor to the High Commissioner General, Médecin-Lt.Col. A. Doll, representing the Government of the Republic of the Congo, Dr C. Dricot, Director General of Medical Services of the Belgian Congo.

The Conference elected Dr D. M. Blair Chairman, and Médecin-Lt.Col. F. Merle Vice-Chairman. Dr D. G. Snell and Médecin-Lt.Col. G. Binson, were appointed as Rapporteurs.

The purpose of the Conference was explained in the opening statement made by the Deputy Regional Director, who pointed out that the objectives of such a meeting were to enable participants to exchange views on the epidemiology of smallpox, to examine the prevailing situation in the different countries of Africa, to compare practical experiences in regard to problems relating to smallpox control, to consider the results and progress achieved, and finally to study and formulate criteria applicable to mass campaigns directed at the eradication of the disease, eminently suited to a large-scale programme. He also drew attention to the fact that although vaccination against smallpox has been known and practised for over 150 years, and is one of the simplest, safest and most effective measures in the field of preventive medicine, the disease is still endemic and outbreaks still happen in some parts of the world,

especially Asia and, to a lesser extent, in Africa South of the Sahara, where 20 000 cases were reported in 1958. But there is general agreement that smallpox can be eradicated from an endemic area if 80 per cent. of the population is vaccinated or revaccinated within a period of four to five years. In the technical aspects of eradication of the disease in Africa, mention was made of a special problem "how to reach that proportion of the people in areas with poor or no communications and with thinly scattered or nomadic populations".

The Conference was organized according to a method of work combining the advantages of both plenary meetings and discussion groups. The work was based on a three-stage pattern:

- Introductory statement
- Discussion groups
- Plenary meetings

and proceeded according to a carefully regulated programme, as indicated in Annex IV.

At the introductory meetings, the working papers were submitted by their authors, who illustrated their statements by concrete examples. After the statements, the two working parties held a two to three hours session, meeting separately, and considering the same agenda items. To facilitate coherence of the two group discussions, a series of questions had been prepared beforehand; they also provided, if needed, material for discussions and guidance on the approach to the subject. The group rapporteurs, assisted by the discussion leaders and the Secretariat, summarized in a report the main conclusions of their group which emerged from the day's discussions. A comparison in Plenary Meeting of each group report formed the basis of a single report which was read and given final consideration in Plenary Session.

The last Plenary Meeting included also a series of short statements made by certain participants on the campaign system in force in their countries.

These statements completed the particulars and statistical data sent by the Administrations of most of the African countries and territories in reply to a questionnaire on smallpox eradication, distributed in 1958. A summary of the replies was published as a document, made available to participants, and reproduced here in Annex V.

FINAL REPORT

1. Epidemiological Considerations Related to Smallpox Eradication

The Conference agreed that susceptibility to the disease is not dependent on race, sex or age, but is related directly to past infection with smallpox or to vaccination. The duration of immunity varies with the individual, but in any given community the majority of persons retain a useful degree of immunity for a period of five years.

1.1 Variola major and minor

From the clinical point of view, there are differences of degree between variola major, variola minor or Alastrim, etc. The differences leading to the drawing of a distinction between variola major and variola minor are quantitative in nature. From the epidemiological and prophylactic viewpoints, it is wise to regard variola major and variola minor as different forms of the same disease.

1.2 Influence of climate

Some participants drew attention to the possible influence of climate; the endemic form of the disease would be found in humid regions, while the epidemic form would occur rather in dry countries. Large population movements, which are considerable in dry regions, determine to a great extent the predominance of the epidemic form, whereas the endemic form is more usual in forest zones and dense savannah areas.

It was also felt that the different epidemiological behaviour of the disease observed in dry and wet regions or dry and wet seasons of the year could be attributed rather to the immobilization of the population in the wet season or regions than to climatic conditions in themselves.

1.3 Criteria for eradication

The criteria of smallpox eradication in Africa cannot be considered on the basis of individual territories, but must involve the whole "African Region". This entails the co-operation of all countries in the Region in their eradication programmes, even though they may consider from the national point of view that the incidence of

smallpox in their territory does not constitute a major health problem. In view of the difficulty of obtaining reliable data of the occurrence of the disease in remote areas, the Conference felt that eradication should not be claimed until there had been three years' freedom from smallpox after a vaccination campaign.

2. Organization of a Smallpox Eradication Service

2.1 Its place in the general structure of the public health service

It is recognized that most African countries cannot hope to be in a financial position to set up independent and strictly specialized smallpox eradication services.

It is recommended that a smallpox eradication programme should be planned and carried out under the overall direction of the head of the National Public Health Service. In order to ensure full co-operation of the many different agencies which contribute to medical and health work in some countries, it is recommended that a National Smallpox Eradication Advisory Committee be set up in such areas, on which will be represented the various central and local government departments, missionary, commercial, educational, community development bodies and voluntary agencies which will be involved in the programme.

Countries already provided with mobile services for major endemic diseases will continue to use their regular inspection teams for vaccination campaigns. The establishment of such bodies may be of assistance to countries which at present are not provided with them.

2.2 Responsibilities for the service

A senior doctor of the central public health administration should be made responsible for all aspects of the eradication programme. Clear lines of command and levels of responsibility should be established from this senior medical officer down to the vaccinator in the field.

The Conference deprecated the tendency in some areas to delegate the responsibility for the direct control in the field of smallpox to non-medical persons.

All aspects of smallpox eradication - vaccination, diagnosis, isolation, treatment international quarantine - must come under the general direction of the senior doctor in charge of the programme.

As the campaign enters its later stages, the accurate diagnosis of individual cases becomes of major importance. Similarly, surveillance, isolation and control measures should be intensified as the eradication campaign progresses.

The smallpox eradication service should cover all these activities.

3. Organization of Eradication Campaigns

3.1 Planning aspects

In planning a smallpox eradication campaign, the fullest possible use should be made of existing information on the topography of the country, population distribution, lines of communication, natural centres for gathering of people, and any previous medical surveys that may have been undertaken.

It is realized that notification is not as good as it should be in most countries of Africa, but this should not hinder the initiation of the campaign. As the campaign progresses, the proper diagnosis of every notified case becomes of first importance.

In planning a vaccination campaign, every effort must be made to ensure that the maximum possible number of primary vaccinations are done.

So-called door-to-door vaccination does not seem to be easily arranged in some territories, except in special cases such as in towns or non-attendance for religious or social reasons, etc.

The Conference stressed the necessity of covering only 80 per cent. of the census population, but of successfully immunizing at least 80 per cent. of the actual population.

The aim of the eradication campaign should be the vaccination of the entire population within three years.

3.2 Costing

As accurate as possible a financial estimate of the cost of the campaign should be established. Cost of vaccine, personnel and transport would be the major items. The estimate of these costs can be adjusted in the light of the experience gained in the initial period of the campaign.

3.3 Transport

It was felt that transport facilities and communications varied so much in Africa that it was not possible to decide any definite scale of provision for this item. When organizing the campaign, however, the speediest form of transport of personnel, vaccine and equipment should be carefully considered according to the conditions of the different countries.

In those countries provided with mobile health units, the transport problem has already been largely solved.

3.4 Personnel

The whole staff of the public health services of the country concerned may be called upon to participate in the eradication campaign.

The core of each vaccination team should consist of the permanent skilled staff, who can be reinforced in particular areas by persons locally recruited who enjoy the confidence of the people and can speak their language.

In some areas in Africa it is necessary to consider the employment of female vaccinators, in order to overcome prejudices and religious objections.

3.5 Population movements

In Africa, large groups of the population may move great distances away from their homes and countries. Some of these migrants are moved by the desire to seek temporary employment in mines and large industrial concerns. It is recommended in these cases that vaccination be carried out at recruitment points, and should, if possible, be given to families as well. In some areas there are movements of nomadic people with their stock and, in such cases, it is necessary to arrange for vaccinating points along their route of travel or to provide mobile vaccination teams.

Vaccination certificates should be provided when considered necessary or advisable.

3.6 Co-ordination with other campaigns

It was recommended that smallpox eradication campaigns may be co-ordinated with campaigns against other major endemic diseases prevalent in the country, e.g. leprosy, trypanosomiasis and treponematoses.

3.7 Evaluation of campaigns

To assist in the continent-wide eradication campaign, it is important that the work done in each country be recorded by similar methods in as simple a manner as possible. The work done by each individual vaccinator should be recorded separately, in order to evaluate the results of his work and, in the case of failure, to decide whether it was due to the loss of potency of the vaccine or the inefficiency of the vaccinator.

Important items of information to be collected are: number of people vaccinated in each area, number of primary vaccinations and revaccinations, age distribution in terms of infants, children and adults.

In order to evaluate the quality of the vaccine and the efficiency of the vaccinator's work, a percentage of the primary vaccinations should be checked by an independent inspector.

All the data obtained during the vaccination campaign should be channelled to a central office for proper classification and analysis.

The figure for primary vaccinations of infants is an important index of the requirements for annual vaccination of this group in the years following the campaign.

3.8 Consolidation stage

On completion of a successful campaign, i.e. when 80 per cent. of the population has been successfully vaccinated, the results achieved should be consolidated by maintaining a high level of immunity in the population through the vaccination of infants and the vaccination and revaccination of children reaching school age, those entering employment and immigrants. A particularly careful check should be made of unvaccinated migrants.

4. Recruitment and Training of Personnel

Countries with an adequately staffed health organization will gain by seconding personnel for implementing the eradication campaign from available local staff. Other countries will have to rely on the assistance of persons from outside the health service, who will have to be trained in the basic principles underlying the various operations in which they may be involved - vaccination and inspection, preservation of vaccine, preparation of reports, etc. - in order to enhance their efficiency.

Apart from intelligence and an adequate education, the essential qualities to be looked for in the selection of personnel are good character and integrity.

4.1 Medical

In recruiting medical personnel for assignment in a smallpox eradication campaign, it is important that they should have experience of smallpox control or a flair for mass campaign work.

4.2 Inspectors

In addition to the employment of health inspectors and other trained persons in the health service, use may be made of the more senior and responsible vaccinators to undertake the important work of checking the results and arranging the supplies for the vaccinators. Ex-members of police and military forces are particularly suitable material for recruitment for this type of work.

4.3 Vaccinators

Vaccinators must be able to grasp accurately the prescribed vaccination technique and know the contra-indications. The training of such persons, although intensive, should not exceed a period of two to three weeks. This, of course, applies only to persons recruited specially as vaccinators.

4.4 Others

During vaccination campaigns, it may be possible to make use of such groups as school-teachers, high school and university students and others to augment the vaccination teams for short periods in each area.

5. Vaccines and Vaccination Techniques

5.1 Types of vaccine: advantages of dried vaccine

In practice, two types of vaccine, glycerinated vaccine lymph and dried vaccine, are used. Glycerinated vaccine has been widely employed in the past because of its low cost as compared with dried vaccine, but this does not offset the advantage of the better keeping qualities of the latter. Dried vaccine enables campaigns to ignore considerations of climate and distance and should be employed in rural areas. Glycerinated vaccine has a particularly useful role in eradication campaigns in towns and other close concentrations of people which have good communications.

The present cost of dried vaccine is four to six times higher than that of glycerinated vaccine, a fact which for certain countries may be decisive in the question of choice. The lymph, therefore, may certainly be used whenever there is a possibility of easy, low-temperature transport of the product to the user and of preserving it under the same conditions until applied.

However, it is quite likely that an appreciable reduction in the price of dried vaccine may result from increased production by the laboratories, and it would be advisable to study this possibility and perhaps to consider assistance to such laboratories in order to improve their output.

Moreover, it was further pointed out that estimates and price comparisons between different vaccines are usually based on the cost of the individual dose and indicate glycerinated vaccine as being by far the cheapest. Consideration should be given to other criteria that would be less theoretical, taking into account not only the quantitative but the qualitative factor in vaccination. Practical standards could then be proposed which would enable the final cost per person protected to be calculated, bearing in mind the real purpose of the campaign, which is the effective protection of the population.

A vaccine giving a high percentage of "takes" will result in a saving of time, effort and money in the campaign.

5.2 Storage and transport of vaccine

Glycerinated lymph must be stored at centres at less than -10°C and while being transported to the field must not be exposed to temperatures over +4°C. Dried vaccine should be stored in cool conditions, but may be transported in the field without any special precautions with regard to temperature. Neither vaccine should be exposed to direct sunlight. When dried vaccine is reconstituted it should be used immediately and any residue discarded.

5.3 Control of vaccine potency

Only vaccines of high potency which comply with the requirements recommended by the Study Group on Recommended Requirements for Smallpox Vaccine (WHO/BS/IR/70 - 27 November 1958) should be accepted for use in the eradication campaigns. The

potency of the vaccine in the field must be checked frequently during the campaign by the observation of a certain number of primary vaccinations. It will be useful to check from time to time the potency of the vaccine kept in stock.

5.4 Vaccination technique

Two vaccination techniques are in use, the "scratch" and the "multiple pressure". In the hands of those who used them, both have given good results.

Each country organizing a smallpox eradication campaign should endeavour to establish a uniform method of undertaking the vaccinations. When practising vaccination by either method, it is important to keep in mind the following details:

(a) It should be done on the area of the deltoid insertion on the left arm.

(b) Alcohol should not be used for cleaning the skin. If any cleaning agent is used, soap and water are recommended, but the skin must be perfectly dry when applying the vaccine. It should be borne in mind that the considerable aseptic precautions taken in the laboratories during the preparation of the vaccine must be continued up to the moment of use.

(c) Whatever instrument is used for vaccination, vaccinostyle or needle, it should be carefully cleaned and sterilized by heat before use.

(d) Whichever technique is used, only one insertion is recommended. No blood should be drawn in either case.

(e) After vaccination, the individuals should be kept in the shade for a short period, about 10 minutes, to ensure that the vaccine is dried.

(f) No dressing whatever should be applied to the site of the vaccination.

5.5 Complications

The most frequent complication is secondary infection. It is reported by those who employ the "multiple pressure" technique that secondary infection is rarely observed.

The other and more serious complication, encephalitis, is rarely observed in Africa. Prevention lies essentially in the vaccination of children during their first year of life.

6. Social Aspects and Health Education

6.1 Attitude of the population; taboos and prejudices

It is of prime importance to attempt to determine the attitude of the population towards both smallpox and vaccination. In some areas, the attitude of populations in respect of vaccination is one of apathy or passive acquiescence. This attitude changes immediately when an outbreak of variola major occurs.

Active resistance to vaccination has been observed in some groups due to prejudices and religious beliefs. When proper health education of the public has been effected, it has been possible to overcome the difficulties.

Rather than making a frontal attack on taboos and prejudices, they should be taken into consideration when planning the content, methods and media of health education in each particular group of the population.

6.2 Community participation

Although, broadly speaking, the principles of public health education have been established and are generally known and accepted, nevertheless, the task of their application in smallpox eradication campaigns remains to be done.

Governments and in particular finance administrators, must be convinced of the value of health education and of the long-term economies to be achieved in these campaigns by allocating part of their budgets to this item.

On the other hand, the inhabitants of the villages will have to be encouraged to set up local hygiene and health education committees inside their own communities. This work should be entrusted to local health educators. In this connexion, one participant pointed out that at Brazzaville a course for health educators had just been instituted, which, taking students holding the State Nursing Diploma, would within two years qualify them as health educators.

The employment of local persons in the campaign aids this community participation.

These considerations are valid for all aspects of health education, which in respect of the smallpox campaign should be integrated in a general programme.

7. Legislation

7.1 Advisability of special legislation

The promulgation of special legislative provisions is regarded as an essential factor in the implementation of an eradication programme.

7.2 Voluntary or compulsory vaccination

A combined effort of education and propaganda adapted to local conditions should facilitate the voluntary participation of the population in a vaccination campaign.

It would, however, be unwise to contemplate the complete abolition of compulsion, because any appreciable degree of absenteeism would seriously prejudice the progress already achieved.

The retention of compulsory smallpox vaccination is therefore strongly recommended.

8. International Aspects

8.1 Importance of international and regional co-ordination and co-operation

The political divisions in Africa generally ignore natural and ethnic frontiers. This makes the problem of vaccination and control of smallpox particularly difficult in contiguous frontier zones. When eradication campaigns are organized in such zones, the countries should agree to take common action to ensure full success.

The problem of smallpox control is not limited by national frontiers and can only be solved successfully with the full co-operation of all national health administrations. Countries bordering on areas where smallpox has already been eliminated should arrange that their campaign be organized to increase this area on their side of the boundary at the earliest possible date.

Vaccine production, particularly of the dried type, should be undertaken only by a few well organized institutions. This will make it necessary for them to produce the vaccine required by other countries without such laboratories. It is recommended that vaccine production laboratories in the Region keep all authorities concerned informed of available stocks, particularly of glycerinated lymph.

8.2 International assistance

It is recognized that, for most of the African countries, international assistance will be required in order to develop successful smallpox eradication campaigns. This assistance may take the form of receiving technical information and advice from WHO, or material assistance from this and other organizations. The provision of equipment for dried vaccine production and the supply of vaccine and/or transport are examples of this type of assistance.