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SMALLPOX ERADICATION PROGRAMME IN GHANA

by

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Introduction

A great deal of attention is being paid, in recent times, to the need for a global attack on smallpox. The dislocation of the economic and social life of an infected district as well as the inconvenience caused to individuals as a result of the control measures that are instituted during outbreaks of smallpox provide sufficient reasons for mounting an eradication programme.

Recent experience has also underscored the fact that, in this modern age, the reintroduction of a disease from an endemic area to another country which has been free from it for many years is a real danger.

It should be a duty of each country to ensure that it does not constitute a threat to the health programmes of other countries. This responsibility is accepted by Ghana.

No ad hoc smallpox eradication campaign has been planned in Ghana, because of the low incidence of the disease in the country as compared with the neighbouring territories. The plans aim at an intensification of smallpox vaccination as part of the general disease intelligence and control activities or in conjunction with other campaigns. The essential objective is that there should be a total coverage of the population in an unspecified period, but well within five years. As a contribution to the WHO eradication campaign, the programme should satisfy all WHO requirements.

The current Ministry of Health plans aim at developing the general public health infrastructure which will provide total coverage, improve disease intelligence and make it possible to maintain the achievements of current eradication campaigns.

Geographical and Social Features

Ghana lies on the west coast of tropical Africa. It has an area of 91,863 square miles. The 1960 population census gives the population as approximately 7 million. It is bordered on the east by the Republic of Togo, on the west by the Republic of Ivory Coast, in the north by Upper Volta and in the south by 350 miles of coastline.

The country is broadly divided into three vegetation belts. There is a short coastal belt in the south, a central forest belt, and the northern Savannah belt. Numerous rivers flow from the north to the south. The most important of these is the Volta River.

There are two seasons. The wet season extends from March to October with a short dry spell in August. The dry season extends from November to the beginning of April. The climate is usually hot and humid in the Southern half. It is hot and dry in the north.

The country has undergone a rapid process of development during the past decade. There is a school in every sizeable village. Communications are generally good. Most villages are linked to the main trunk roads by feeder roads.

Great strides have been made towards improving the health services. There are 75 hospitals and 46 health centres. These are strategically located in the different regions. There is one doctor to every 17,000 people. The present aim is to develop a comprehensive service and provide a total coverage.

The Smallpox Situation

Smallpox is endemic in Ghana and her neighbouring territories. The number of reported cases of smallpox in Ghana and in the neighbouring territories during 1959-61 is presented in the table below.

Smallpox Notifications in Ghana and Neighbouring Territories

TABLE I

Country	Cases			
	1959	1960	1961	1962
Ghana	99	139	70	135
Ivory Coast	788	1634	4656	1900
Togo	64	347	281	572
Upper Volta	382	126	2360	1335
Grand Totals	1333	2246	7367	4942

Table II shows the distribution of the annual notifications of smallpox according to the regions in Ghana.

TABLE II Smallpox Notifications according to Regions 1960-62

Regions	1960	1961	1962
Accra District	17	5	17
Eastern Region	5	4	11
Central Region	46	8	4
Western Region	16	4	3
Ashanti Region	19	33	25
Brong Ahafo Region	4	6	1
Northern Region	4	2	38
Upper Region	1	-	-
Volta Region	27	8	43

The striking feature is the persistence of a high number of reported cases in Ashanti. Next come Accra and the Volta Region. A map of the distribution shows that most of the cases in Ashanti occur in the city of Kumasi. The number of cases reported in Kumasi was 23 out of a total of 25 for the Ashanti Region in 1962.

The arterial roads coverage on Kumasi in the heart of the cocoa district. Most of these roads are the ones that link Ghana to her neighbouring territories.

A table of the quarterly notification of smallpox in Kumasi reinforces the connection of the disease with immigration from the north.

Travelling is very restricted in the north during the wet season due to the swelling of the numerous rivers. South bound traffic across the northern border of Ghana increases during the dry season from November to March.

TABLE III Quarterly Notification of Smallpox in Kumasi

Quarter	1960	1961	1962
1st Quarter, January - March	6	3	18
2nd Quarter, April - June	-	6	3
3rd Quarter, July - September	1	5	-
4th Quarter, October - December	-	16	2
Total	7	30	23

The reports about smallpox patients frequently omit the age and tribal origin. The custom of the northern people to tag the name of their tribes to their own names makes it often possible to detect the tribal origin. An inspection of smallpox notifications in Kumasi shows a preponderance of Wangaras and Moshies. These are the major tribes in the Upper Volta.

Age and Sex Distribution

The annual cases of smallpox reported in Ghana show no difference in the sex distribution. Unfortunately the age is frequently omitted. Reports of secondary cases frequently indicate family relationships. The reported family outbreaks indicate that the children are very susceptible but have a low mortality rate.

Trends

The major epidemics of smallpox were in 1941-42, 1946-48 and 1951 when the figures ranged from 840 to 1650 annually. The annual incidence has fallen from an average of 900 cases during 1950-54 to an annual average of 120 in the period of 1955-59.

Past Efforts at Control

Before 1951 vaccinations against smallpox were limited to the principal towns and similar centres of high population such as markets and entrance posts. Mass vaccinations were only undertaken during outbreaks of smallpox. The rural areas were generally neglected as a rule. Since 1951 the Medical Field Units have carried out mass vaccinations in conjunction with polyvalent surveys in the areas where the units had been established. This mainly covered Northern Ghana, as such, despite the fact that over half a million vaccinations were done annually many parts of the country were not touched.

Smallpox Eradication Plan

The objective of the new smallpox eradication programme is to vaccinate the total population within a period of five years. This programme will be carried out as part of the routine duties of the established public health service. No ad hoc vaccination campaign is envisaged. This programme is now possible for the following reasons:

(a) Each administrative region has a Principal Medical Officer, who is responsible for the direction and co-ordination of all health activities in the region.

(b) Each region has a regional Medical Officer of Health and a supporting team of public health officers.

(c) Each region has a Medical Field Unit

(d) Community Health Nurses are now being turned out in increasing numbers. This group of workers will assist with the maternity and child welfare services. They will conduct health education within the community and assist with disease intelligence.

The Organization

It was the intention to use school teachers in the original plans for a vaccination campaign. In the intensified vaccination programme it is planned to rely solely on the public health service.

The Medical Officers of Health and their supporting teams of Health Superintendents, Health Inspectors and Health Overseers will be responsible for the diagnosis, isolation care, quarantine or surveillance of contacts, and the reporting of smallpox cases. These officers are based in the health offices and health centres.

The vaccination will be carried out in the urban areas, markets and customs posts by health inspectors and public vaccinators. The Medical Field Units will be responsible for vaccinations in the rural areas.

The Medical Field Units are an organization of medical auxiliaries with considerable experience in working among the rural communities. The members have established a long tradition of good public relations with the people.

Each region now has a unit consisting of a medical officer, a regional field supervisor, one or two field superintendents and a team of twenty-five or more technicians. Altogether there are 250 technicians in the organization. Each regional unit has a laboratory, a store and a transport maintenance service. There are four or more vehicles to each unit. Some of the vehicles have been supplied by UNICEF for use in the Yaws Campaign. The staff are supplied with bicycles. In recent times many of them have acquired auto-cycles. The staff are versed in various procedures such as injection, vaccination, microscopy, mapping, the preparation of returns and simple store-keeping.

Plan of Operation

The vaccination is carried out by (a) the static services and (b) the mobile teams. The static services consist of health inspectors, public vaccinators and public health nurses. These operate in the market places, health and customs posts, institutions, schools, factories and welfare clinics.

The mobile teams of the Medical Field Units operate in the rural areas. The medical officer determines the method of operation according to the social and cultural circumstances of the locality or the nature of an associated programme. House to house visits may be necessary in sparsely populated areas with widely-scattered hamlets. Working at collecting points is the practice during mass yaws treatment. It has been decided to carry out smallpox vaccination in conjunction with yaws treatment in the Central, Eastern, and the Western regions where the yaws Campaign is currently in progress.

In the other regions, where the first phase of the Yaws Campaign is over, it is already a practice to carry out vaccinations in conjunction with the polyvalent surveys.

Each region is divided into administrative districts and the districts are sub-divided into convenient survey areas. The list in the appendix gives the survey areas and the estimated population. Map II shows the survey areas. The procedure is to complete one survey area after another.

The technique of vaccination employed is scarification. Freeze-dried vaccine is preferred in the rural areas.

It is not convenient to carry out a full follow-up of all vaccinations. Instead, a representative sample of the population is followed-up to assess the percentage of "takes". Complications are reported by the static health services.

Materials and Equipment

It is estimated that 8 million doses of vaccine or 400,000 vials, each containing 20 doses of dried vaccine would be required for the period of five years of the intensified vaccination programme.

Problems of the Eradication Programme

The main difficulty in executing the vaccination programme will be the supply of vaccine. The rate of progress will depend on the regular availability of vaccine. In the form of an intensified vaccination by the established staff, it is considered that the requirements of equipment will not place undue strain on the resources of the Ministry of Health. Most health centres possess refrigerators.

Apart from the high population centres which lie at the intersections of the lines of communication, smallpox in Ghana tends to occur along the international borders. Previous experience has shown that the most effective way of dealing with such a situation is a joint vaccination effort by the two neighbouring territories. An example of such a joint action was undertaken by Ghana and Togo in 1948. It can be done again.

Summary

The annual incidence of smallpox in Ghana is low when compared with the neighbouring territories. The only guarantee against reintroduction after eradication is continuous vigilance and the maintenance of a high level of herd immunity through regular vaccination of the public. This requires a sustained effort. The policy of the Ministry of Health is to integrate vaccination into the general public health services.

As a contribution to the WHO global smallpox eradication campaign, Ghana plans to achieve a total coverage of vaccinations in less than five years. The programme does not envisage an ad hoc vaccination campaign. The aim is to intensify vaccination by the public health services in a manner that will satisfy all WHO requirements. The main difficulty in the way of success is expected to be the supply of vaccine.