



INTER-REGIONAL SEMINAR ON SURVEILLANCE
AND ASSESSMENT IN SMALLPOX ERADICATION

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THE SMALLPOX ERADICATION PROGRAMME IN SIERRA LEONE

by

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1. Introduction

"In 1967, Sierra Leone reported 70.1 cases of smallpox per 100 000 population, the highest smallpox rate in the world. (In comparison India's smallpox rate in 1967 was 15.6 per 100 000 population). In 1968 when Sierra Leone initiated its programme of smallpox eradication, outbreak control activities were heavily emphasized. Fifteen months after the programme started and with less than 50% of the population vaccinated by the present campaign smallpox reports had decreased to very low levels."

The above excerpt from the Center for Disease Control's publication, 'Smallpox Eradication Program', gives in a nutshell the result of what has been referred to as the "Eradication Escalation Activities" in Sierra Leone. This paper will attempt to analyze some of the factors which contributed to the success of the programme, highlighting particularly the surveillance aspect.

2. Background

Sierra Leone, a sovereign country of 2.4 million people and 27 000 square miles (Capital: Freetown) is similar in size to Punjab State in India and is situated on the west coast of Africa. It is roughly circular in shape and has a sea coast 210 miles in length. It extends for about 180 miles inland and, except for its Atlantic seaboard, is completely surrounded by the Republics of Guinea and Liberia.

The equatorial climate is characterized by heavy rainfall from April to September,

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and a period of low rainfall extending from October to March. The economy is based mainly on diamonds and iron ore exports but most of the inhabitants are farmers; 75% of the inhabitants live in villages of less than 1 000 persons. Two significant features of the rural life are close social contact as a result of tribal organizations and the mobility of the population.

3. Smallpox in Sierra Leone

Smallpox has traditionally been one of the devastating diseases in the country. Over the past quarter of a century, major epidemics have occurred at roughly ten year intervals with epidemic peaks in 1933, 1946, 1957 and 1967. A total of 4 946 cases were reported during the 1957 epidemic, the highest incidence ever recorded. In 1967 and 1968, Sierra Leone had the highest reported smallpox incidence in the world; 1 698 cases were reported in 1967 and 1 143 cases in 1968. The reported case fatality ratio was 11.1%.

The 1967 to 1969 epidemic began in late 1966. There were 170 cases reported in October, November and December of that year compared to 121 cases during the first nine months. During 1967 and 1968 the largest number of cases occurred at the end of the dry season in April, May and June and a large number of cases continued to occur through most of the rainy season.

Smallpox is predominantly a rural disease in Sierra Leone. Data on 1 052 of 1 274 cases reported in 1968 and 1969 show that 995 cases or 95% occurred in 143 villages of less than a thousand inhabitants while only 57 cases occurred in 14 towns of over a thousand population. The relative inaccessibility of, and intimate living in the smaller villages, are major factors in the high intensity of smallpox transmission within the rural areas.

Preparation and burial of infected corpses provided a particularly favourable milieu for smallpox transmission. Among 15 index patients investigated, a higher number of secondary cases resulted from dead index patients (average 16.0) than from index patients who recovered (average 4.7).

4. Smallpox Eradication Campaign

It is against this background that the combined United States Agency for International Development (USAID) and Sierra Leone Government Smallpox Eradication Programme was launched on 26 January 1968. The programme was to be executed in two phases. The attack phase was planned to last about two years during which the country's immunity level would be rapidly raised by mass vaccination. This attack phase would be followed by a maintenance phase during which newborns, migrants and other unvaccinated persons would be vaccinated, surveillance of suspected cases of smallpox improved and the attack phase work consolidated.

Personnel for the attack phase consisted of five teams for mass vaccination and one epidemic control 'fire fighting' team to respond to smallpox outbreaks in unvaccinated areas. Each team consisted of a team leader, two vaccinators, one recorder, and one driver. Vaccinations were administered with the ped-o-jet injectors. The five mobile teams, each carried three ped-o-jets and using freeze-dried vaccine, averaged 932 smallpox vaccinations per team day. Because of the many

small villages in the country a collecting point strategy, which endeavoured to get within 3 miles of every village, was employed. The mass vaccination teams were used to build up rapidly the population immunity level rather than to attempt to reach virtually all of the population at a slower pace. Vaccination coverage of over 80% was considered acceptable.

By the end of July 1968, 689 670 smallpox vaccinations had been administered in four of the thirteen administrative areas comprising 30% of the national population. At this time, the intensified investigation and control efforts - code name "Eradication Escalation" - were begun in an attempt to eradicate smallpox even before the mass vaccination phase could completely cover the country. This idea was based on the expected coincidence of the usual seasonal decline in smallpox from August to November, and the already significant decline in smallpox incidence presumed to be a result of vaccinations thus far carried out. This extra effort was considered justified because the vaccination teams had already mass vaccinated most of the two areas of highest endemicity and highest turnover. Additionally, all of the Guinea side of the border continuous with these areas had by then been vaccinated.

The intensified investigation and control programme began with a special issue of The Eradicator (Annexe 1). The Eradicator is a mimeographed monthly newsletter on a single sheet (both sides) and consists of five sections. The 'Headquarters Notes' section contained news about programmes, ceremonies, meetings, strategy changes etc. A small map showing vaccinated areas and location of recent outbreaks and cumulative tally of persons vaccinated, followed in a 'Progress' section. A 'From the Field' section paid tribute to the team of the month and to local chiefs etc. who were especially helpful to vaccination teams. Under an 'Epidemiology' section, recent outbreaks were sketched and instructive points noted. Nation-wide trends were presented graphically. Areas to be vaccinated in the following month were listed in the concluding 'Schedule' section. The newsletter was also used to encourage smallpox surveillance and was sent to all Dispensers, Health Inspectors, Medical Officers, District Administrative Officers, Paramount Chiefs and Peace Corps Volunteers. The special issue launching the "Eradication Escalation Programme" explained the rationale of the effort and appealed to all concerned to be especially alert for smallpox in their areas. This issue was followed up by personal visits by headquarters staff to District Administrative officers and District Medical Officers in key districts and the District Administrative Officers in turn sent circular letters direct to paramount chiefs under their control. Radio and newspaper appeals were also made. Copies of the August 1968, December 1968 and May 1969 issue of The Eradicator representing the start, the half way mark and the final outcome of the programme respectively are annexed to this paper (Annexes 1, 2 and 3).

5. Assessment

Beginning in May 1968, when transportation became available, coverage and take rates were routinely assessed by probability sampling of about 5% of the inhabitants in each chiefdom, six to eight days after vaccination. The samples were deliberately biased to include a higher proportion of persons from villages beyond vaccination centres. This approach allowed the identification of pockets of low coverage for mop-up activities. Using the information from assessment and the tally sheet records, the extent of coverage, take rates, and individual team performances were monitored and evaluated.

6. Surveillance

The surveillance activities were based on the pre-existing infectious diseases notification system which required a weekly telegram from each of the 172 fixed health facilities in the country.

The four man 'fire fighting' team undertook to investigate and control an average of three outbreaks per month. Investigation was mainly limited to determining the source of the outbreak and the geographical extent of the exposed population. The source of approximately three-fourths of the investigated outbreaks was ascertained. Determination of the source of an outbreak often led to other previously unknown outbreaks during the first several months of the intensified campaign, but towards the end, most new outbreaks were traced to previously discovered infected areas.

Emphasis was placed on the control of each discovered outbreak. This was achieved mainly by vaccination of the entire village and exposed surrounding villages and by isolation of victims. A salient feature was the visit on at least two occasions to each infected village preferably in later afternoon, evening or very early morning, in order to ensure effective coverage of the population. In one district, control of a very extensive outbreak was achieved only after arrangements had been made for a vaccinator to sleep in the infected village, thereby being available to vaccinate farmers returning from work or before they went out again. Also important was the occasional separation of the 'fire fighting' team members into two or even one man units in controlling widespread outbreaks.

One example of an actual outbreak investigated may serve to illustrate the approach used:

Outbreak of Smallpox, Tongo Field, Kenema District

Tongo Field is a diamond mining area of about 60 square miles in northern Kenema District leased to the Sierra Leone Selection Trust (S.L.S.T.). The town of Tongo is in the middle of the leased area and is inhabited almost entirely by diamond miners and their families. Smallpox teams vaccinated this area in April 1968.

A patient presented himself at the S.L.S.T. Mining Hospital at Tongo during the prodromal phase on about 5 June 1968. He was suspected of having smallpox and was sent home to be observed. Thus, he was isolated soon after the rash appeared. The local Health Overseer was alerted by the Medical Officer and he immediately vaccinated the patient's 15 immediate contacts and 148 other persons in the town.

The patient, a 24 year old male, had visited relatives and friends in another Chiefdom, which had not yet been mass vaccinated, about two weeks before he became ill. In this Chiefdom he came in contact with a woman who had smallpox. The patient returned to Tongo and developed the rash on 6 June. He was isolated and had an uneventful recovery but suffered severe scarring. He had never been vaccinated. When SMP teams were in Tongo, he "was too busy digging" to get vaccinated.

Fortunately, his family was well vaccinated (21 of 22 other housemates, 95%) at the time of his illness, and there were no subsequent cases. A scar survey of

102 persons in the surrounding section of town revealed that 92% had been vaccinated.

The prompt recognition and isolation of this case by the Tongo Field medical authorities, combined with ring vaccination efforts helped to prevent secondary transmission. Equally important was the fact that 21 of the 22 other persons in his household at that time had already been vaccinated, and that the town generally was also highly immune. Most of the survey population had been vaccinated by SMP teams but there was also evidence of recent "maintenance" vaccinations of newborns at the nearby mining hospital.

This case is an excellent example of the effectiveness of mass vaccination and immediate case detection and control measures in stopping smallpox transmission.

The attached "Outbreak Investigation Report" reveals that over 51 such investigations were carried out, of which 26 proved to be smallpox and two were suspected to be smallpox.

7. Programme Progress to Date

From the inception of the programme on 26 January 1968 to the completion of the attack phase on 27 January 1970, 2 095 513 smallpox vaccinations were performed.

Assessment data indicated an average coverage of 72% of the population but team tally data indicated a higher overall immunization level approaching 86%.

At this time, only 69% of the country's total population had been mass vaccinated.

On 5 April 1969, the last case of smallpox in Sierra Leone became ill. Ironically this case occurred in an unvaccinated woman in the heart of the capital city of Freetown and the source of this case was never satisfactorily determined. This last case occurred only 15 months after the start of the Eradication Programme.

8. Summary

The salient features of the USAID/Sierra Leone Government Smallpox Eradication Programme have been presented. It has been shown that a mass vaccination programme beginning in areas of highest endemicity and combined with an intensified outbreak investigation and control programme can most efficiently and rapidly interrupt smallpox transmission.

Acknowledgements

I wish to thank Mr James N. Thornton, Operations Officer of the Smallpox Eradication/Measles Control Programme in Sierra Leone for preparing the 'Outbreak Investigation Report' and Dr Donald R. Hopkins, previous Medical Epidemiologist in the same programme, for the report on the epidemiological investigation of the outbreak in Tongo Field.

References

1. Plan of Operations: Smallpox Eradication/Measles Control Programme, Sierra Leone. Fiscal Year 1971.
2. Hopkins, D. R., Lane, J. M., Cummings, E.C. et al: Smallpox in Sierra Leone, I. Epidemiology.
3. Hopkins, D. R., Lane, J. M., Cummings, E. C. et al: Smallpox in Sierra Leone, II. Two Funeral Associated Outbreaks.
4. Hopkins, D. R., Thornton, J. N., Lane, J. M. et al: Smallpox in Sierra Leone, III. The 1968-69 Eradication Programme.
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TABLE 1. SIERRA LEONE SMALLPOX/MEASLES ERADICATION PROGRAMME
Outbreak Investigation Report

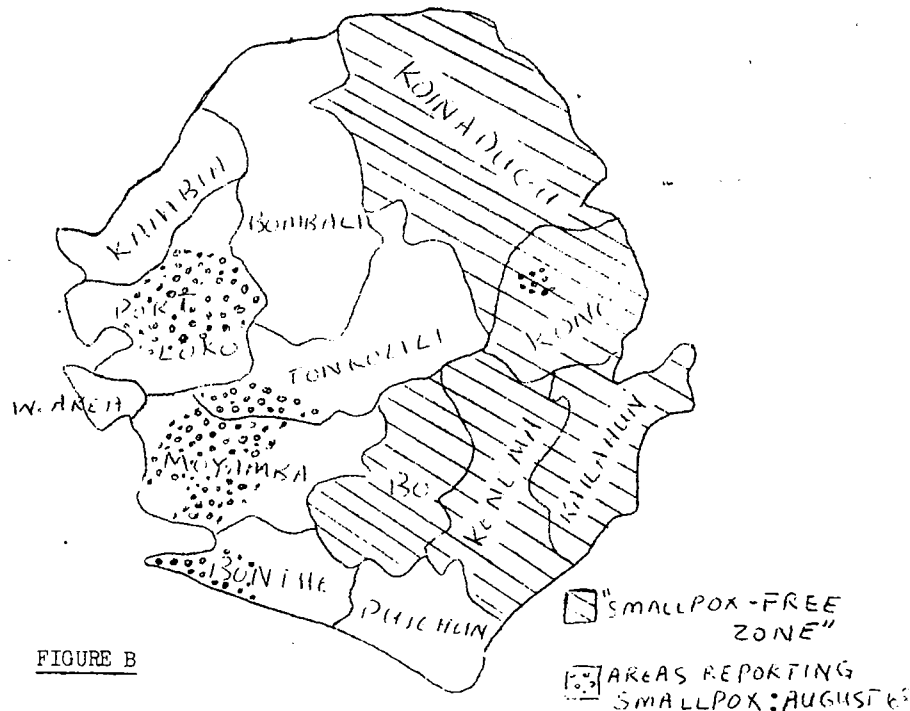
Date	Outbreak No.	District or Area	Reported by:		No. of cases	Final diagnosis
			Regular Survey System	Other		
June-May 1968	Unnumbered	Koinadugu			96	Smallpox
February	1	Koinadugu	x		100+	Smallpox
February	2	Kailahun		x	72	Smallpox
January-March	3	Kono	x		51	Smallpox
April-July	4	Kono	x		290	Smallpox
May	5	Kailahun	x		11	Smallpox
July	6	Bo	x		1	Possible spx
July	7	Western	x		11	Smallpox
July	8	Kenema	x		1	Smallpox
July	9	Moyamba	x		128	Smallpox
August	10	Port Loko	x		186	Smallpox
August	11	Bonthe	x		23	Smallpox
August	12	Kono	x		2	Smallpox(?)
September	13	Koinadugu	x		3	Chickenpox
September	14	Tonkolili			18	Smallpox
September	15	Kambia		x	38	Smallpox
September	16	Western	x		2	Smallpox
October	17	Bombali	x		8	Smallpox
November	18	Bo	x		3	Smallpox
December	19	Bo	x		7	Smallpox
January 1969	20	Moyamba	x		8	Smallpox
January	21	Moyamba	x		6	Smallpox
January	22	Moyamba		x	3	Smallpox
January	23	Pujeha	x		3	Not spx
January	24	Port Loko		x	25	Smallpox
February	25	Western	x		11	Smallpox
February	26	Bonthe	x		12	Smallpox
February	27	Bonthe		x	19	Smallpox
March	28	Pujeha	x		18	Smallpox
April 5	29	Western			1 (last case)	Smallpox
April	30	Kambia	x		2	Not spx
June	31	Pujeha	x		6	Chickenpox
July	32	Masanga Leprosarium			1	Chickenpox
August	33	Bo	x		1	Not spx
September	34	Port Loko	x		1	Scabies
September	35	Port Loko	x		2	Chickenpox
November	36	Koinadugu	x		2	Chickenpox
February	37	Western	x		1	Chickenpox & Herpes

Note: on the basis of unofficial reports, 14 other cases were investigated, all of which were clearly not smallpox.

Annexe 1.

THE ERADICATOR SPECIAL ISSUE

August 1968
Monthly Newsletter of the Sierra Leone Smallpox/Measles Program.



We are now presented with a unique opportunity to eradicate smallpox in Sierra Leone over the next 2-3 months, long before the mass vaccination phase is complete. This Special Issue of the Eradicator is to present the evidence, and ask your help.

Figure A shows the dramatic reduction in the number of smallpox cases reported in Central and West Africa during the first quarter of 1968, as compared to 1967, and as compared to the 1960-67 average number of cases. In the 1st quarter 1968, only 2,338 cases were reported, a decline of 29.2% from 1967 (3,851 cases). Since January 1, 1967, more than 46 million persons in this area - 40% of the estimated 1968 population of the region - have been vaccinated against smallpox. Measles cases in the region have declined by 48.6% this year.

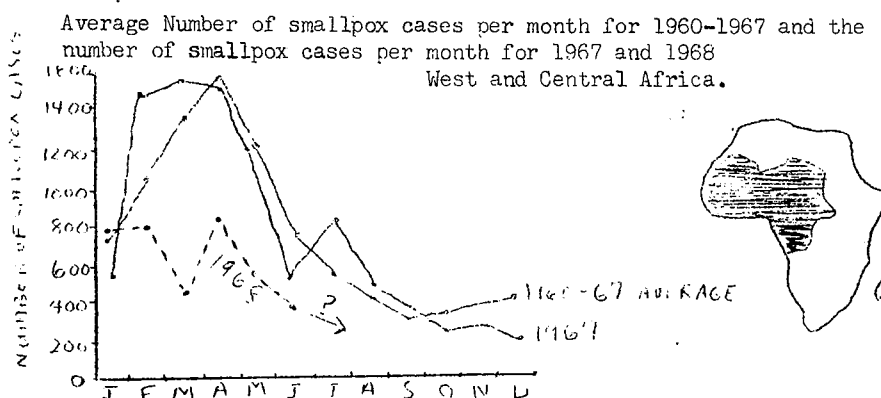
In the remainder of Africa (East and South) smallpox incidence has shown a substantial increase in 1968 .

In Sierra Leone, only 900 cases have been reported from January to August, 1968, compared to 1,234 cases during the same period last year - a decline of 27%. Approximately 30% of the population has been vaccinated since January, 1968, including Kono and Koinadugu Districts, which produced 75% of last year's cases.

The areas which smallpox outbreaks in July-August, 1968 are shown in Figure B, which also shows vaccinated areas. We have investigated all of these infected areas, and vigorous control measures have begun. (Only 11 of 148 chiefdoms reported smallpox.)

In Figure A, the regular seasonal decline of smallpox cases in September and October is also apparent. This year, we expect that the effect of this seasonal decline and the decline which has resulted from mass vaccination efforts will combine to result in especially low levels of smallpox in September and October, 1968. At this time, smallpox will be

FIGURE A



restricted to a few persons in a few villages. If we can promptly recognize and control these few cases in September and October, we will eliminate the disease in Sierra Leone before the dry season, when increased movement of villagers will otherwise result in more epidemics in unvaccinated areas.

To rapidly eliminate smallpox in these crucial next two months, only two things are required:

FIRST, we need to know who and where those last few cases are. This means intensified surveillance: Health and other personnel must actively look for, and report smallpox cases immediately. Even a day's delay can result in more spread of the disease and more deaths.

SECONDLY, we need to prevent the discovered cases from spreading. This means vaccination of the INFECTED Villages, and isolation of the cases in a separate camp is possible, or in their own house: The mass vaccination phase will vaccinate in all other villages later, what we need now is stop further spread of the disease BY CONCENTRATING ON DETECTING AND VACCINATING INFECTED VILLAGES.

If you are a Health Inspector, Dispenser, Public Health Assistant, EDCU Assistant, Health Overseer, Paramount Chief, Section Chief, Village Chief, Peace Corps Volunteer, Teacher, Social Development Worker or Chiefdom Policeman, - in short everybody - we are asking you to be alert, ask about, and look for smallpox IN YOUR AREA, and report cases to the District Medical Officer, District Officer, or Mission Hospital, AS SOON AS POSSIBLE.

Persons gathered at out-patients' clinics (and at markets) generally have come from a large geographic area, and much can be learned by simply asking before clinic starts, if any of them know of smallpox in the area. One man could easily do this in less than an hour each day.

We are asking every District Medical Officer, District Officer, and Medical Officers in charge of non-government hospitals to BEGIN LOCAL CONTROL MEASURES, AND TELEGRAPH OR CALL THESE REPORTS TO MEDICAL STATISTICS IN FREETOWN, OR SMP HEADQUARTERS, FREETOWN (2199) IMMEDIATELY. We (SMP headquarters) can now assist in all control efforts, whenever necessary, and expect to investigate all reported cases.

Guinea and Liberia are also intensifying their efforts. THIS IS AN UNUSUAL OPPORTUNITY WHICH WE CANNOT AFFORD TO MISS!

THE

Annexe 2.

ERADICATOR

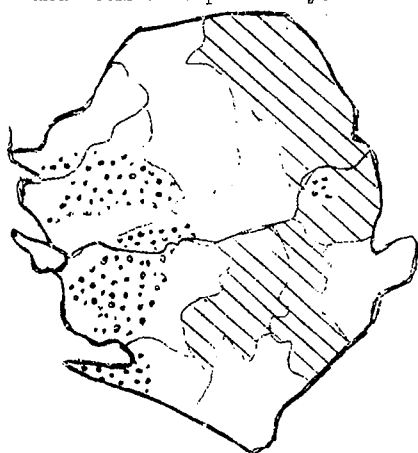
December, 1968

Monthly Newsletter of the Sierra Leone Smallpox/Measles Programme

HEADQUARTERS NOTES

At the end of December, 1968, the only known active cases smallpox in all of Sierra Leone were eight cases in Banta Mokelle Chiefdom, Moyamba District. That the intensive "Eradication Escalation" efforts begun last August have very significantly reduced the threat of smallpox is unquestioned. But "almost eradication" is not enough. As long as one case of smallpox remains, every unvaccinated person is threatened. Even though the eradication of smallpox in Sierra Leone has not been neatly timed to occur before the end of 1968, smallpox eradication is only postponed to early 1969, and not prevented. The intensive case finding and case containment will continue. SMP Headquarters and the fire-fighting team stand ready to act on any reported smallpox. WE APPEAL TO EVERYONE TO LOOK FOR AND REPORT SMALLPOX IN YOUR AREA IMMEDIATELY. Any smallpox case discovered now may be the last case in Sierra Leone if it is reported right away or the first case in another large outbreak, if it is not.

We congratulate Mr. V.A. Dauda and Mr. A.M.K. Yarjah, on their recent promotion to Health Superintendents. They were both outstanding as Team Leaders and made an invaluable contribution to the campaign effort. Mr. S.K.O. Fullah and Mr. J.G. Momodu have been named as Team Leaders for Team 2 and Team 5 respectively.



AUGUST 1968



OCTOBER 1968



DECEMBER 1968



MASS VACCINATED AREAS



AREAS WITH ACTIVE SMALLP

PROGRESS

At the end of December, 965,578 smallpox vaccinations and 146,764 measles vaccinations had been given since the beginning of the mass vaccination phase in January. Thus 40% of the population was vaccinated in 1968. It is expected that vaccination of the remainder of the population will be accomplished even faster.

FROM THE FIELD

Field operations continued at high speed during December. However, we have been a little disappointed by the attendance in some of the chiefdoms in Port Loko District where coverage fell below the goal of 90%. We would like to thank the officials and staff of Delco Mines for their assistance while we worked in that area.

Once again, Team Four (A.D. Bangura, Team Leader, S.A. Fode, M.M. Komneh and A.K. Bangurah) has been cited as the Best Team of the month. Mr. A. Kargbo-Reffell, Field Supervisor, had the highest praise for their continued excellence of operations.

We also want to bring special attention to the outstanding job being done by Mr. S.M. Kamara and the assessment team - Messrs S.M. Conteh, P.M. Tarrwally, and D.H.S. Rogers.

Finally, Mr. T.S. Bangura, Team Leader of Team I, has been named to fill the position of Deputy Field Supervisor for the next two months. Mr. Kargbo-Reffell gave his special thanks to Mr. M.S. Ibrahim Team Leader of Team 3, for exceptional and efficient service in the position for the past two months. Mr. A.M.B. Massaquoi will serve as Team Leader of Team 1 while Mr. Bangura is DFS.

EPIDEMIOLOGY

A smallpox outbreak involving seven persons was discovered in Bumpe Chiefdom, Bo District, in early December. The first case was a woman trader who was infected at Gbap, in Bonthe District before she returned home. Gbap and the exposed areas of Bumpe Chiefdom were vaccinated by the SMP fire-fighting team and by Mr. J.A.K. Muana, Health Inspector at Mattru.

For the first time since January 1967, no cases of smallpox were officially reported during a full report week. This occurred first for the report week ending December 14 and again for the report week ending December 21.

SCHEDULE

The teams will complete Port Loko District in January and proceed to Bombali District in February. Freetown and Western Area will be vaccinated in March.

THE

Annexe 3.

ERADICATOR

Monthly Newsletter of the Sierra Leone Smallpox/Measles Programme
May 1969

NO SMALLPOX IN MAY!!!

HEADQUARTERS NOTES

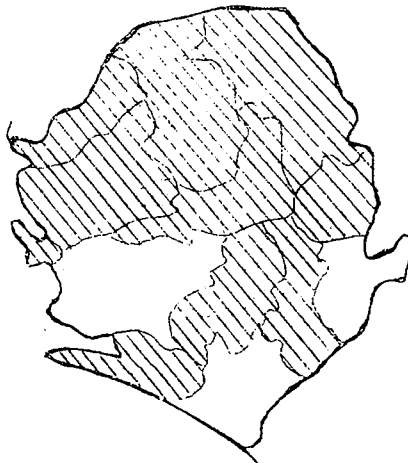
Nocases of smallpox were reported in any part of Sierra Leone during the month of May, which was the first month the country has been totally smallpox-free since this programme began. It will be recalled that only one case occurred in the entire country in April.

Also in May, a delegation from Sierra Leone including Dr. Evelyn Cummings, DCMO, Dr. Donald Hopkins, USAID, and Mr. James Thornton, USAID, attended the Annual Regional Meeting of Smallpox Eradication/Measles Control personnel from the 19 participating West and Central African countries, held in Lagos, Nigeria. The meeting was jointly sponsored by USAID and the World Health Organization.

The Sierra Leone delegation reported on the dramatic success of the Smallpox Eradication Programme in Sierra Leone. At the meeting, it was revealed that only 2 of the 19 countries represented still had known cases of smallpox. Since that time, we have learned that only 8 cases of smallpox - 2 in Nigeria, and 6 in Togo - were reported from the entire region during the month of May, 1969. In May, 1968, over 600 cases of smallpox were reported from 6 of the 19 countries, and in May, 1967, more than 1200 cases were reported in the region!

TO MAINTAIN THIS SMALLPOX-FREE STATUS, SUSPECTED SMALLPOX MUST BE REPORTED IMMEDIATELY!

PROGRESS



■ MASS VACCINATED
AREAS

At the end of May, a total of 1,700,691 persons, or approximately 71% of Sierra Leone's total population had been vaccinated against smallpox by this programme since late January, 1968. A cumulative total of 295,768 measles vaccinations have been given over the same period.

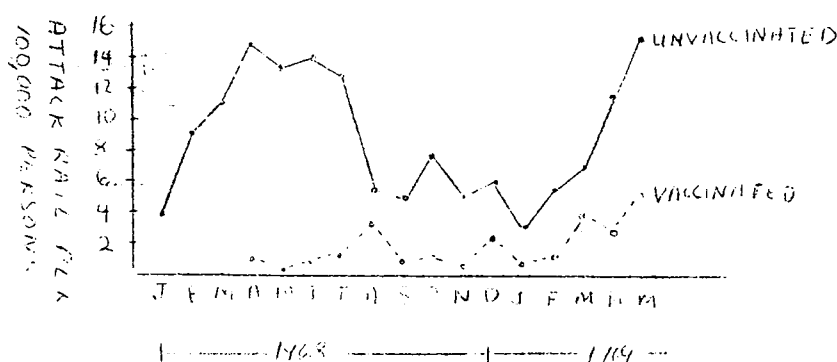
FROM THE FIELD

The teams completed Bonthe District by covering the mainland part of that district in May. However, the teams were somewhat disappointed to find that many persons in this area were so afraid of vaccination that they went into hiding or ran away to avoid vaccination. On the other hand, a few chiefdoms were exceptionally responsive. We would especially like to thank the D.O., Mr. A.B.Momoh, the D.M.O., Dr. S.S.Dumbuya, the Cooperative Society Chairman for Diamani site Mr. J.S.Macauley, and the Health Inspector at Mattru Mr. J.A.K. Muana for their cooperation and support.

Team 4 was named Team of the Month for their outstanding morale and performance. This team consists of Mr. A.D. Bangura, Team Leader, and Mr. J.B. Kellah, Mr. J.P.C. Allie, and Mr. S.A. Wade.

Finally, thanks and a salute to Mr. N.S. Ibrahim, for his superb performance as Deputy Field Supervisor during the month.

Measles Incidence in Vaccinated and Unvaccinated Districts of Sierra Leone
(figure 2)



EPIDEMIOLOGY

Figure 2 illustrates the difference between reported measles incidence in vaccinated and unvaccinated areas. In unvaccinated areas, the annual rise in measles incidence during the dry season months of January, February, March, and April is seen in 1968, and again in 1969. In the vaccinated areas, an average decrease of some 70% in reported measles cases is observed. However, in August, December, March April, and May, measles outbreaks in poorly vaccinated villages in Koinadugu and Port Loko Districts resulted in a fairly high measles incidence in "vaccinated" districts. Most of those cases were in children who did not attend the vaccination center in their area. In Bo, Kenema, and Kono Districts, where over 85% coverage was achieved in the 0-4 year age group, only 37 cases of measles have been reported since those areas were mass-vaccinated more than a year ago. To achieve good measles control, we have to reach all or almost all of the children under 4 years.

In addition to better SNP measles coverage, there is a great need for improved measles reporting by everyone. Not only the number of measles cases seen each week, but also information regarding the approximate age (in months) of all cases seen should be recorded and reported. Recording "child/male" and "child/female" is inadequate. If the child's age is not known, it should be estimated. Equally important, is whether or not the child received a measles vaccination. This information would allow us to monitor the effectiveness of the campaign more accurately, and identify target areas and population groups for mop-up vaccination more quickly.

SCHEDULE

In June and July, the teams will vaccinate Moyamba District. DURING THE MONTH OF AUGUST, THEY WILL RETURN TO BO TOWN, KENEMA TOWN, MAGBURAKA, AND KOIDU-YENGEMA-BOLENDU URBAN AREAS TO PROVIDE MEASLES VACCINATION AND SMALLPOX VACCINATION TO ALL CHILDREN AND ADULTS WHO WERE NOT VACCINATED LAST YEAR.