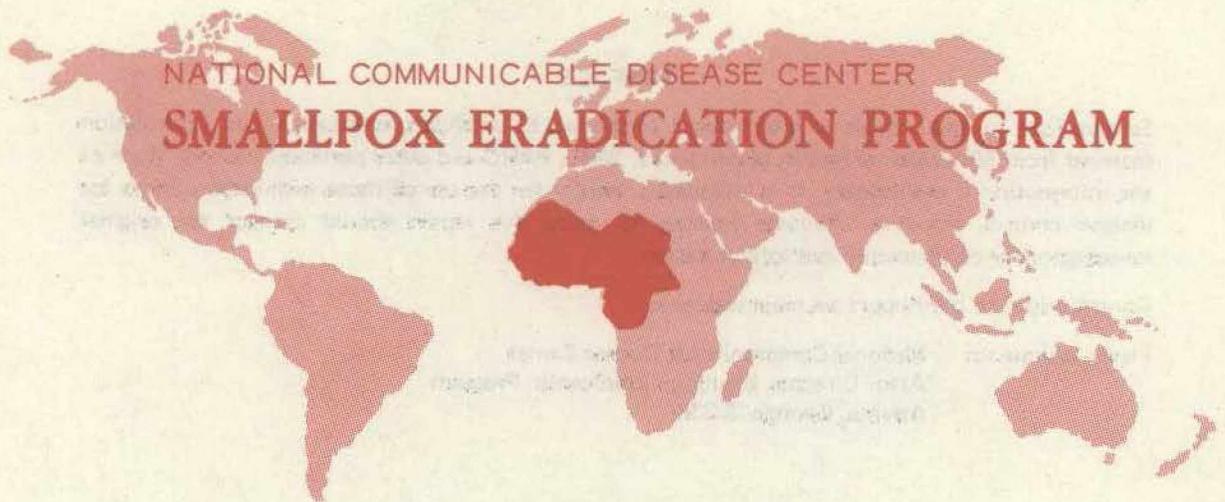


June 1970



- I. CURRENT SMALLPOX MORBIDITY STATUS
- II. KWARA STATE SMALLPOX OUTBREAK  
(Preliminary report)

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

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PUBLIC HEALTH SERVICE

**PREFACE**

Summarized in this report is information pertaining to smallpox eradication and information received from Ministries of Health investigators, WHO, PAHO and other pertinent sources. Much of the information is preliminary. It is intended primarily for the use of those with responsibility for disease control activities. Anyone desiring to quote this report should contact the original investigator for confirmation and interpretation.

Contributions to the Report are most welcome.

Please address to: National Communicable Disease Center  
Attn: Director, Smallpox Eradication Program  
Atlanta, Georgia 30333

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STATE OF GEORGIA  
DEPARTMENT OF HEALTH  
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SMALLPOX ERADICATION PROGRAM  
ATLANTA, GEORGIA 30333

National Communicable Disease Center ..... David J. Sencer, M.D., Director  
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DR. MILLAR ASSUMES NEW POSITION

On May 25, Dr. J. D. Millar assumed the responsibilities of Director of the Community and State Services Division, Communicable Disease Center. This Division includes three major public health activities of the Center, namely, the Immunizations Branch, the Venereal Diseases Branch and the Tuberculosis Branch.

Dr. Millar graduated from the University of Richmond in 1956, received his M.D. Degree from the Medical College of Virginia in 1959 and the DTPH from the London School of Hygiene and Tropical Medicine in 1966. He has served as a member of the World Health Organization Expert Committee on Smallpox Eradication, and participated in international meetings covering the topical area of smallpox sponsored by the World Health Organization and the Pan American Health Organization.

The smallpox eradicators of the world will miss the full time contribution of Dr. Millar's intellect and leadership, but anticipate continuing and significant assistance from him. These qualities will be the gain of the Community and State Services Division.

We use this means to wish to Dr. Millar the very best of continued success.

## I. CURRENT SMALLPOX MORBIDITY STATUS

The number of reported cases of smallpox for the 20 country West and Central African Area during 1968, 1969 and 1970 is presented in Table 1. The decline in smallpox is even more dramatic when compared to the annual average for the period of 1960-1967. During this time an average of 10,149 smallpox cases were reported each year. In view of the current disease activity in Kwara State, Nigeria, the data presented for 1969 and 1970 will be altered.

Table 1. Reported Cases of Smallpox by Month, West and Central Africa 1968-1970

Month	1968	1969	1970*
January	729	124	0
February	939	117	0
March	619	41	0
April	683	83	
May	688	30	
June	411	22	
July	282	39	
August	197	15	
September	212	9	
October	319	2	
November	131	1	
December	120	0	
TOTAL	5,330	483	

Source: WHO WER, #8, February 21, 1969; #9, February 27, 1970.

\* The Ilorin outbreak, being preliminary data, is not relected in the official WHO data.

## II. KWARA STATE SMALLPOX OUTBREAK (Preliminary Report)

### A. Introduction

An outbreak of smallpox was reported from the immediate area of Ilorin town, the capital city of Kwara State, Nigeria, in March 1970. The first reported case was a 14-year-old unvaccinated female admitted to the Kaduna Infectious Diseases Hospital on March 21. She acquired her illness from her older brother in Amayo village, 7 miles southwest of Ilorin town. An investigation and control team began work on March 23.

## B. The Outbreak

The epidemic curve is shown in Figure 1. A total of 59 cases, including suspect cases with pending laboratory confirmation, have been reported. None of the cases had been previously vaccinated. Of the 59 cases, 47 occurred within Amayo town (Figure 2) while 12 occurred in hamlets or villages within a mile radius of Amayo. The dates of onsets reveal that 58 of the 59 cases occurred prior to the initiation of control activities. To date, only a single case has occurred in Amayo town with onset (April 4) after control measures were initiated. This case was vaccinated on March 27 and exhibited a primary take to vaccination.

Figure 1. Cases of Smallpox by Date of Onset of Prodrome for 2 Day Intervals Amayo Village and Surrounding Hamlets, October 1969 - April 1970

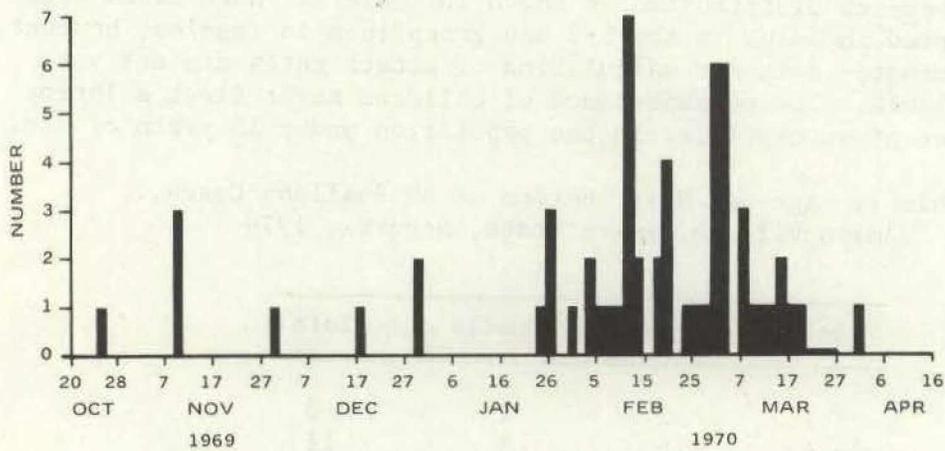
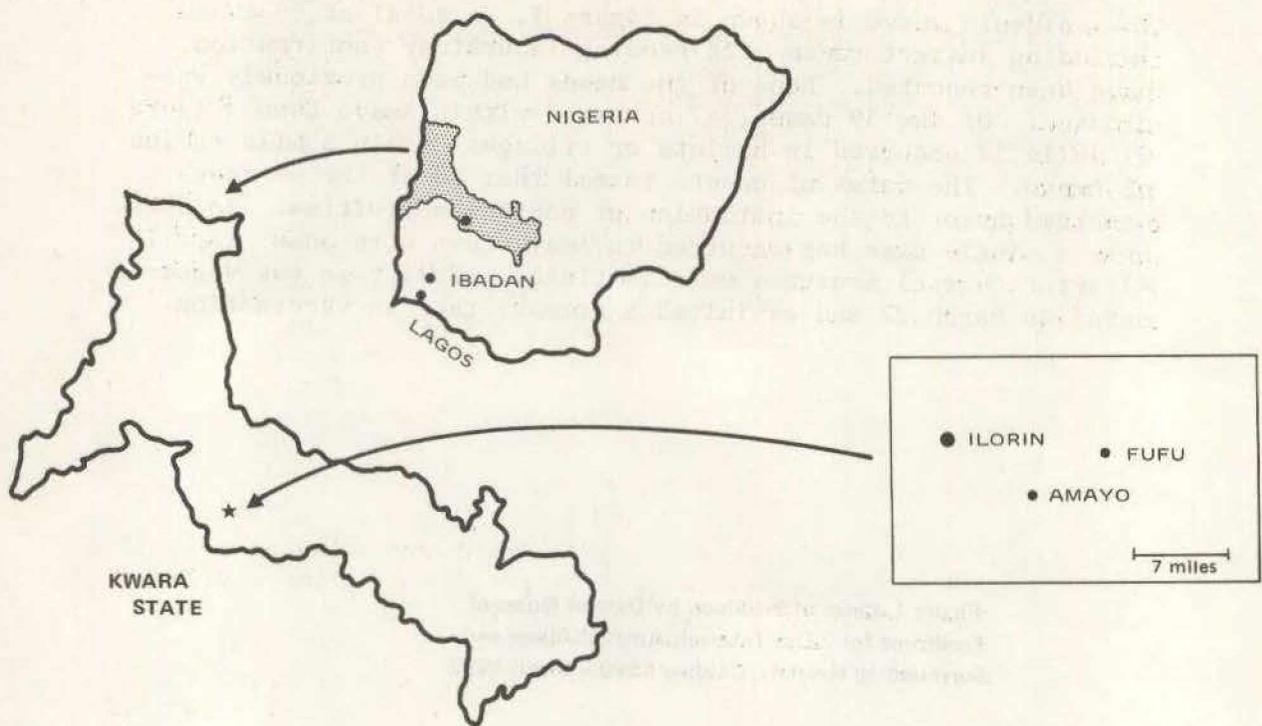


FIGURE 2. Map of Area where outbreak occurred, October 1969 – April 1970



The age-sex distribution is shown in Table 1. More cases were reported in males in the 5-9 age group than in females, however, denominator data for calculation of attack rates are not yet available. The preponderance of children may reflect a larger number of susceptibles in the population under 15 years of age.

Table 1. Age-Sex Distribution of 59 Smallpox Cases, Amayo Village, Kwara State, Nigeria, 1970

Age	Male	Female	Total
< 1	2	1	3
1- 4	6	5	11
5- 9	16	9	25
10-14	6	7	13
15-19	2	0	2
20-24	1	2	3
25+	2	0	2
TOTAL	35	24	59

Three of the patients were known to have traveled during their incubation period. In addition to the girl hospitalized in Kaduna, a 15-year-old male became ill in Lagos but returned to Amayo village during the first day of rash. The third, a 1-year-old male, traveled to Ibadan with his mother but returned to Amayo prior to development of rash. The travel history of the remaining patients has not yet been obtained.

The initial source of the index case has not yet been determined. However, the investigation revealed that a sister of several of the cases involving nomadic Fulani peoples had smallpox in October of 1969. In spite of this, no direct relationship between the index case and the Fulani woman could be determined. An intensive search revealed one other smallpox case occurring during the late dry season (March-April, 1969) in the immediate area.

A reconstruction of the epidemic is as follows:

- (1) In late October 1969, a 6-year-old unvaccinated male from Fufu village traveled eight miles to Amayo village and subsequently developed smallpox.
- (2) This case gave rise to three cases, none of which were vaccinated. They were a 10-year-old male, a 13-year-old female (both living in the same compound), and a 13-year-old male (residing in an adjacent compound). Their dates of onset were mid-October.
- (3) A 6-year-old unvaccinated playmate with onset in early December, is the only 3rd generation case discovered to date.
- (4) The transmission of the disease remains unclear with a case occurring around December 20 with no known contact with any of the previously mentioned patients. Knowledge of the "chain of transmission" through January remains incomplete.

Health officials were immediately concerned with the possibility of importation to Ilorin town, 7 miles from the epidemic area with a heavily traveled road connecting the two towns. An active surveillance-case finding campaign was initiated in Ilorin which led to the discovery of one person with a history of smallpox in October of 1969. An immunity survey showed a 77 percent immunity level in Ilorin town.

An additional five smallpox cases (not reflected in Figure 1) is now being investigated in Ilorin town. To date no connection with the Amayo outbreak has been established. On April 14, 1970, two cases of smallpox were admitted to the Ilorin Infectious Diseases Hospital. One, a 1-year-old female, had onset on March 31; the other, a 3-week-old infant from the same compound, developed illness on April 12. The dates of onset and age-sex data are not yet available for the other three cases.

#### C. Epidemic Control Measures

In the Amayo village and surrounding area a mass vaccination site was established on March 24, using the Ped-O-Jet. Five days after the Ped-O-Jet vaccination site was established, a mop-up activity using bifurcated needles and multiple puncture technique was employed. A total of 1000 people was vaccinated. Because of resistance of the population to participate in vaccination campaigns an active surveillance program will be maintained through July 1970. Five teams of 6-7 persons each will search house-to-house for the disease during this time.

In Ilorin a similar approach is being used. Every compound will be visited and susceptibles vaccinated over the next two month period. This approach is deemed necessary because of the failure of two mass campaigns to achieve a sufficiently high level of immunity.

#### D. Discussion

The assessment survey data following mass campaigns conducted from December 1968 through July 1969, showed poor coverage; 60 percent in Ilorin town and 70 percent in the rural area. The data for the rural area is deceptive in that vaccination sites were set up in villages ranging in population from 500 to 1000 which resulted in the small hamlets being virtually unvaccinated. Some of the larger villages also had very poor coverage. For example, in Amayo village the vaccination tally data showed that 500 smallpox vaccinations were administered. The census data for that village lists a total of 1400 population.

The outbreak has re-emphasized the usefulness of tally data and assessment data in identifying areas remaining susceptible after a mass campaign. Subsequent to the mass campaigns, the maintenance program activities were instituted in December of 1969, with Ilorin town being revaccinated. Over 97,000 vaccinations were administered in Ilorin town, however, an assessment could not be conducted and information on the susceptible population was unavailable.

E. Summary and Conclusion

A total of 59 cases of smallpox has been reported from the town of Amayo and its immediate vicinity in Kwara state, Nigeria, since October 26, 1969. An additional five cases have been reported from Ilorin. Because of the high susceptibility rates to smallpox which existed after the mass campaigns, it seems likely that smallpox disease has persisted in this area since the last known outbreak was recorded during the latter part of the dry season in 1969. At this time there were over 70 reported cases.

(Reported by Dr. E. A. Smith, Ministry of Health, Nigeria.)



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