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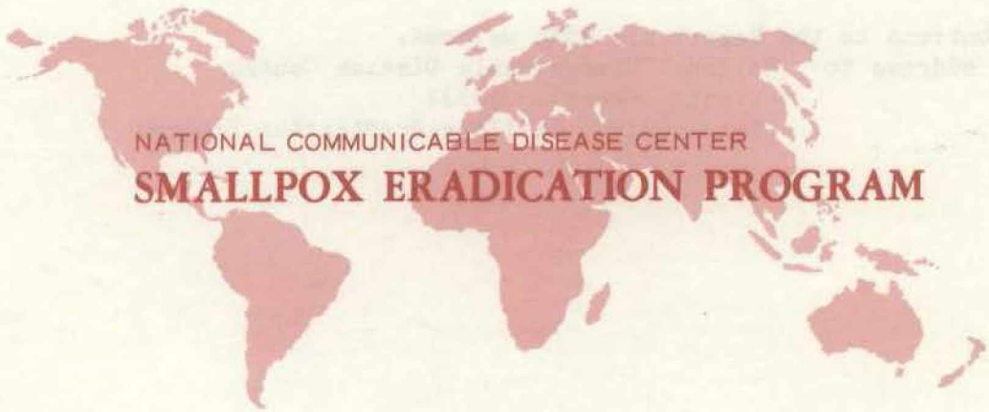

NATIONAL COMMUNICABLE DISEASE CENTER

SMALLPOX ERADICATION PROGRAM

THE SEP REPORT

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

PUBLIC HEALTH SERVICE

PREFACE

Summarized in this report is information pertaining to the SEP and information received from health officials, university investigators 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
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I. INTRODUCTION

In May 1965, President Johnson said "This government is ready to work with other interested countries to see to it that smallpox is a thing of the past by 1975." To begin to implement this pledge, the U.S. Public Health Service and the U.S. Agency for International Development in coordination with the World Health Organization formulated plans for a 19-country program of smallpox eradication (and measles control) in West and Central Africa. In January of 1966, the Smallpox Eradication Program (SEP) was organized at NCDC from the old Smallpox Unit, Epidemiology Branch, to direct the 19-country West African Program as well as to continue NCDC's responsibilities for preventing the re-establishment of smallpox in the USA. Concurrent with the development of the West African Program, seven intermittent reports under the title "West African Smallpox Eradication/Measles Control Program Surveillance Report" have been issued since July 1966 providing demographic and morbidity and mortality data for the countries in the program. In addition, beginning in December 1966, four "Status Reports" were issued summarizing technical and logistical information for those immediately concerned with the West African Program.

With this issue, SEP inaugurates several changes including a new cover, a new name, and most important, a new scope. While primary emphasis will continue to be on the surveillance of smallpox (and measles in West Africa), the Report will not be limited to surveillance information. An attempt will be made to include comments on the methodology and problems of smallpox eradication as reported from workers in the field in Africa and elsewhere. From time to time, information on anti-smallpox activities in the U.S. and other non-endemic countries will be included as will data on the occurrence of complications of vaccination. The Chief, Smallpox Eradication Program welcomes all comments, critical or otherwise, of the SEP Report and warmly invites submission of any information which may be of interest to those committed to smallpox eradication.

II. SMALLPOX SURVEILLANCE

A. Smallpox Surveillance in the United States - First Annual Review, 1966

Although the last confirmed cases of smallpox in the USA occurred in 1949[1], NCDC maintains a continuing national vigilance for introduced smallpox. In 1966, NCDC provided clinical, epidemiological, and laboratory assistance to the States in the diagnosis of 46 cases of suspicious vesicular disease.

In 14 instances (involving 16 patients*) the Smallpox Eradication Program conducted an epidemiological appraisal; in 11 instances (involving 13 patients) NCDC medical epidemiologists were sent to perform detailed field investigations of the incident.

Of the 16 patients, 8 had recently traveled overseas and 5 of these had been in smallpox epidemic or endemic regions during the 2-weeks prior to their arrival in the United States. In one instance contact had taken place in the United States between the patient and a visitor from Kenya. Smallpox Health Alert Notices had been issued by the Foreign Quarantine Program to each of the 5 at the port of entry; these were instrumental in stimulating all 5 to seek medical aid when their illnesses began.

In the remaining 30 cases, laboratory specimens from a variety of sources in the States were referred to the Vesicular Disease Virus Laboratory for diagnosis.

The 46 cases studied were reported from 21 States and Puerto Rico (Figure 1). The seasonal distribution of suspect smallpox cases is seen in Figure 2 which presents the number of specimens received by month for laboratory diagnosis.

Specimens were subjected to one or more of the following tests depending upon the information available at the time the specimen was received: culture in embryonated eggs; tissue culture (RU 1 human embryonic lung fibroblast and HEP-2 cell lines); agar gel diffusion; electron microscopy; and occasionally the complement fixation test for antigen. Sera submitted for study were subjected to either CF or HAI antibody testing.

Of the 46 cases, smallpox was considered by the reporting authority as the primary clinical diagnosis in 17. In two other cases, smallpox was included in the differential diagnosis. In no instance was the diagnosis of smallpox confirmed. (Negative culture results on the chorioallantoic membrane in each of three successive passages coupled with negative electron microscopic and agar gel diffusion tests were accepted as sufficient to rule out the presence of variola or vaccinia virus). In 7 of the 17 cases, a virus other than variola was identified as the etiologic agent.

Of all the 46 cases studied an etiologic agent was identified in 18 (39.1 percent). In only five did the agent identified confirm the original clinical diagnosis. In an additional 13 cases, agents were recovered confirming a diagnosis other than the primary clinical diagnosis; in 28 cases, no etiologic agent was identified (see Table 1).

* Three patients in one family

[1] Irons, J.V., et al: "Outbreak of Smallpox in the Lower Rio Grande Valley of Texas in 1949," Amer. J. Pub. Hlth., 43:25-29, Jan.-July 1953.

FIGURE 1

GEOGRAPHIC DISTRIBUTION OF VESICULAR DISEASE CASE SPECIMENS SUBMITTED TO THE VESICULAR DISEASE LABORATORY, NCDC, UNITED STATES, 1966

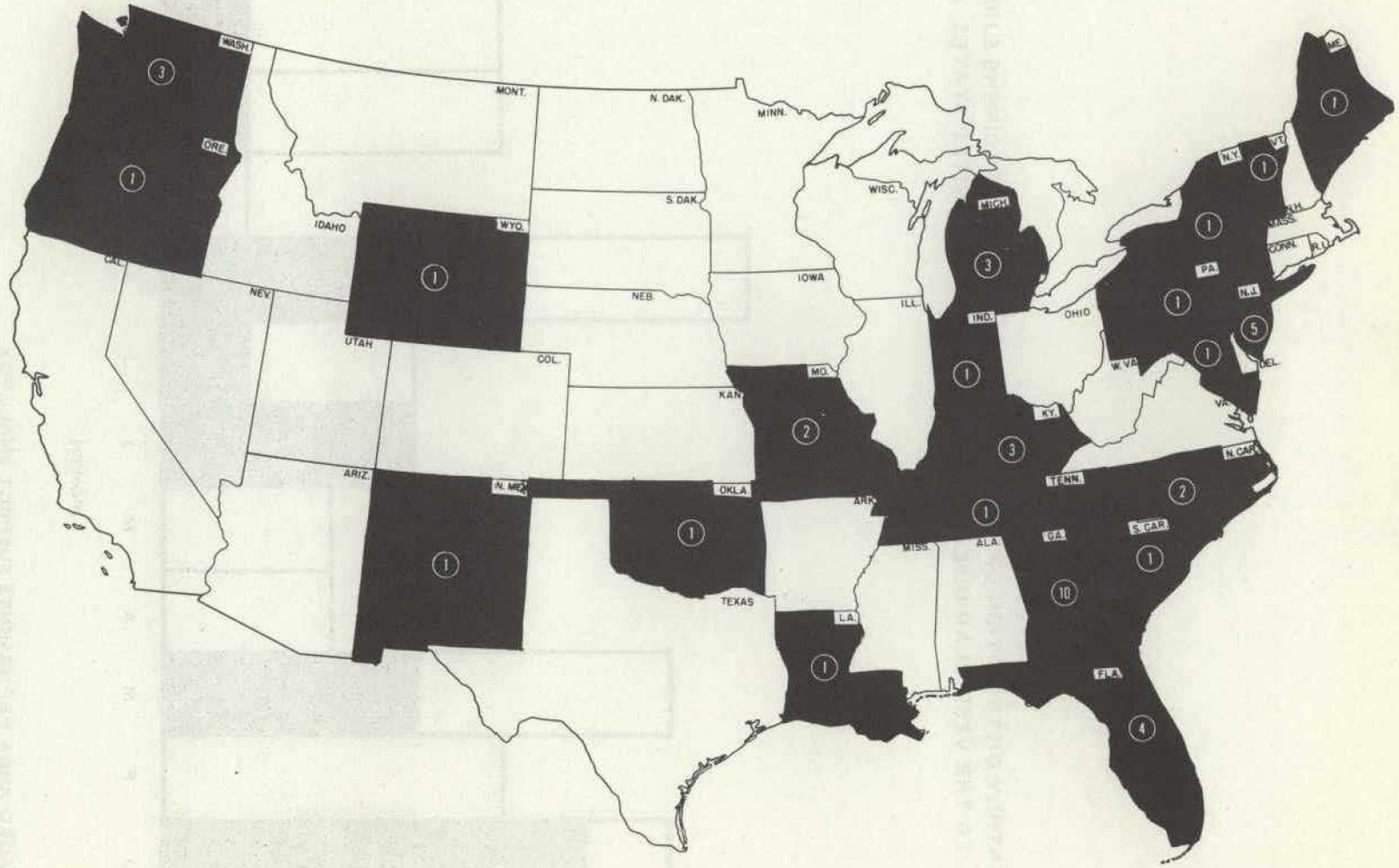
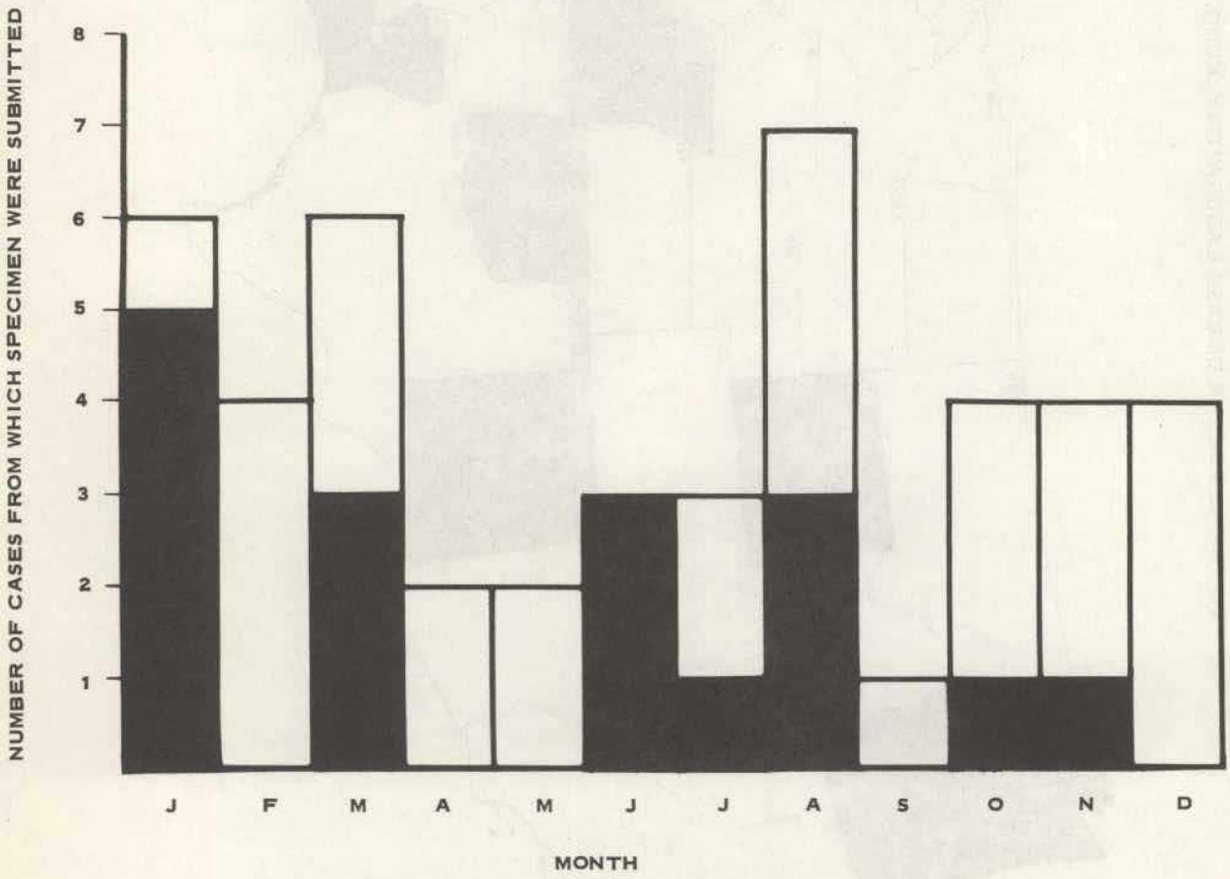


FIGURE 2

MONTHLY DISTRIBUTION OF VESICULAR DISEASE* CASE SPECIMENS SUBMITTED TO THE VESICULAR DISEASE LABORATORY, NCDC, UNITED STATES, 1966



*SHADED AREA REPRESENTS SUSPECT SMALLPOX

The 18 agents detected were identified by means of 5 different laboratory tests. Table 2 presents findings by agent and result of the various tests performed. Vaccinia virus where present was identified by all of the available diagnostic procedures; in contrast chickenpox was identified only by electron microscopy and serologic means.

In 13 cases, the referring clinical diagnosis was "vaccinia" or "vaccination reaction." Available clinical, epidemiological and laboratory data for these cases is summarized in Table 3. Eleven of the patients had a history of exposure to vaccinia either by vaccination or by contact with a vaccinated sibling within three weeks preceding onset of illness. Etiologic agents were identified in the specimens from only 4 of these 13 patients: two suffered from vaccinial infections, in both cases exzema vaccinatum; varicella and herpes simplex were serologically identified in two additional patients. No agents were identified in the remaining 9, a surprising finding particularly in patients with rash disease following vaccination.

Table 1. Laboratory Diagnosis in Cases of Vesicular Disease for which NCDC Assistance was Sought, 1966

Primary Clinical Diagnosis	Laboratory Diagnosis Made			Laboratory Dx Not Made	Total
	Confirmed Clinical Dx	Confirmed Other Dx	Total		
Smallpox, RO SP	0	7	7	10	17
Vaccinia, RO Vacc.	1	2	3	9	12
Varicella, RO Var.	2	1	3	5	8
Herpes, RO herpes	2	1	3	2	5
Other*	0	2**	2	2	4
TOTAL	5(10.9%)	13(28.3%)	18(39.1%)	28(60.9%)	46(100%)

* Hepatitis -1; Impetigo-1; Kaposis-1; Encephalitis-1
** Coxsackie A-16-1 (Serology); Enterovirus-1 (Electron Microscopy)

Table 2. Distribution of Laboratory Diagnosis by Agent and Test Result, 1966

Agent	Identifications	Number Positive by Test Performed				
	Number	CAM	T.C.	Agar Gel	EM	Serology
Vaccinia	4	4/4	4/4	2/2	1/1	1/1
Varicella	7	0/3	0/4	0/2	2/5	6/7
Herpes	5	2/3	2/4	N.D.	1/2	3/3
Coxsackie A_{16}	1	0	0	N.D.	N.D.	1
"Enterovirus"	1	N.D.	0	N.D.	1	0
TOTAL	18					

N.D. = Not done

Table 3. Results of Laboratory Studies in Cases with a Clinical Diagnosis of "Vaccinia"or "Vaccination Reaction," 1966

Identification Number	Age	Sex	Clinical Diagnosis	Vaccination History	Specimen	Lab Tests Done	Test Results
(6-0049)	6	M	PVE	10 d. post vacc.	Sera	Serology	Negative
(6-0250)	15	M	?vaccinia rash	No vaccination Hx	VF, slide	FA	Negative
(6-0321*)	15	F	PVE	Died 18 d. post vacc.	Brain	CAM, TC	Negative
(6-0374)	12	M	?vaccinia - HS	No history vacc.	Pust. Fld.	CAM, TC, FA	Negative
(6-0414)	6mos.	F	?vaccinia rash	Post vaccination	Sera	Serology	Pos. for varicella
(6-0742)	4	M	Herpes-?vaccinia	Without vaccination	Slides	Serology, TC	Both Pos. herpes simplex
(6-0824)	43	M	Vaccinia rash	10 d. post vacc.	VF	TC, CAM, Serol.	Negative
(6-1237)	5mos.	M	Ecz. Vaccinia	17 d. post sibling vacc.	CAM for Confirm.	CAM, TC, Serol.	All positive vaccinia
(6-62)	4	M	General vaccinia	7 d. post vacc.	VF, sera, scab, slide	CAM, TC, Gel, Serol.	Negative
(6-63)	7	M	General vaccinia	7 d. post vacc.	VF, sera, scab, slide	CAM, TC, Gel, Serol.	Negative
(6-68)	5	M	Vaccinia inoculate	7 d. post sibling vacc.	Sera	Serol.	Negative
(6-94)	9	M	?vaccinia inoculate	Lesion 9 d. post vacc.	Smear	CAM, TC	Negative
(6-95)	2	M	Ecz. vaccinatum	Sibling vacc. 3 wks. before	Smear, culture	CAM, TC	Both pos. for vaccinia

* Fatal case

COMMENTS: 1) 11/13 had history of prior vaccination.
2) Vaccinia isolated by culture on CAM and TC twice; varicella was identified only by serology.
3) Serologic testing was negative for vaccinia Ab titers in the five patients from whom sera were submitted.
4) Both vaccinia isolates came from patients with exzema vaccinatum.

The period of study in the laboratory from receipt of specimen to issue of final report averaged 5.3 weeks with a range of 3 to 20 weeks. Preliminary reports were issued at 6 hours and 72 hours on all cases suspected of being smallpox.

Encephalitis Cases

Of the 46 cases there were 7 described clinically as encephalitis, from which specimens were referred for laboratory diagnosis; these are listed in Table 4. Laboratory studies were generally inconclusive. The one vaccinia isolate (#6-2783) was sent for confirmation from a state laboratory; serologic testing was suggestive of herpes simplex infection in one case (#6-2671).

Table 4. Encephalitis Cases Submitted to the Vesicular Disease Virus Laboratory for Study, 1966

Identification Number	Age	Sex	Clinical Diagnosis	Duration of Illness	Fatal	Laboratory Results
6-0049	6	M	Post vaccinal encephalitis	2 weeks	No	All negative
6-1562	7	M	"Relapsing Varicella Encephalitis" two weeks after rash	3 weeks	No	All negative
6-2031	5	F	Varicella encephalitis	Unknown	Yes	?Enterovirus by EM
6-2783	10wks.	M	?Herpes encephalitis	3-4 days	Yes	Vaccinia from brain
6-2869	5	F	Varicella encephalitis	Unknown	Yes	All negative
6-2671	50	M	Viral encephalitis pathologically diagnoses as herpes simplex	Unknown	Yes	Herpes simplex by serology
6-0321	15	F	Post vaccinal encephalitis, no rash, onset 11 days after vaccination	18 days	Yes	All negative

Of the 7, 5 cases ended fatally. The frequency of mention of varicella or herpes in the clinical diagnoses of patients with CNS disease in this series suggests that these agents may be more frequently associated with severe CNS disease than is commonly appreciated.

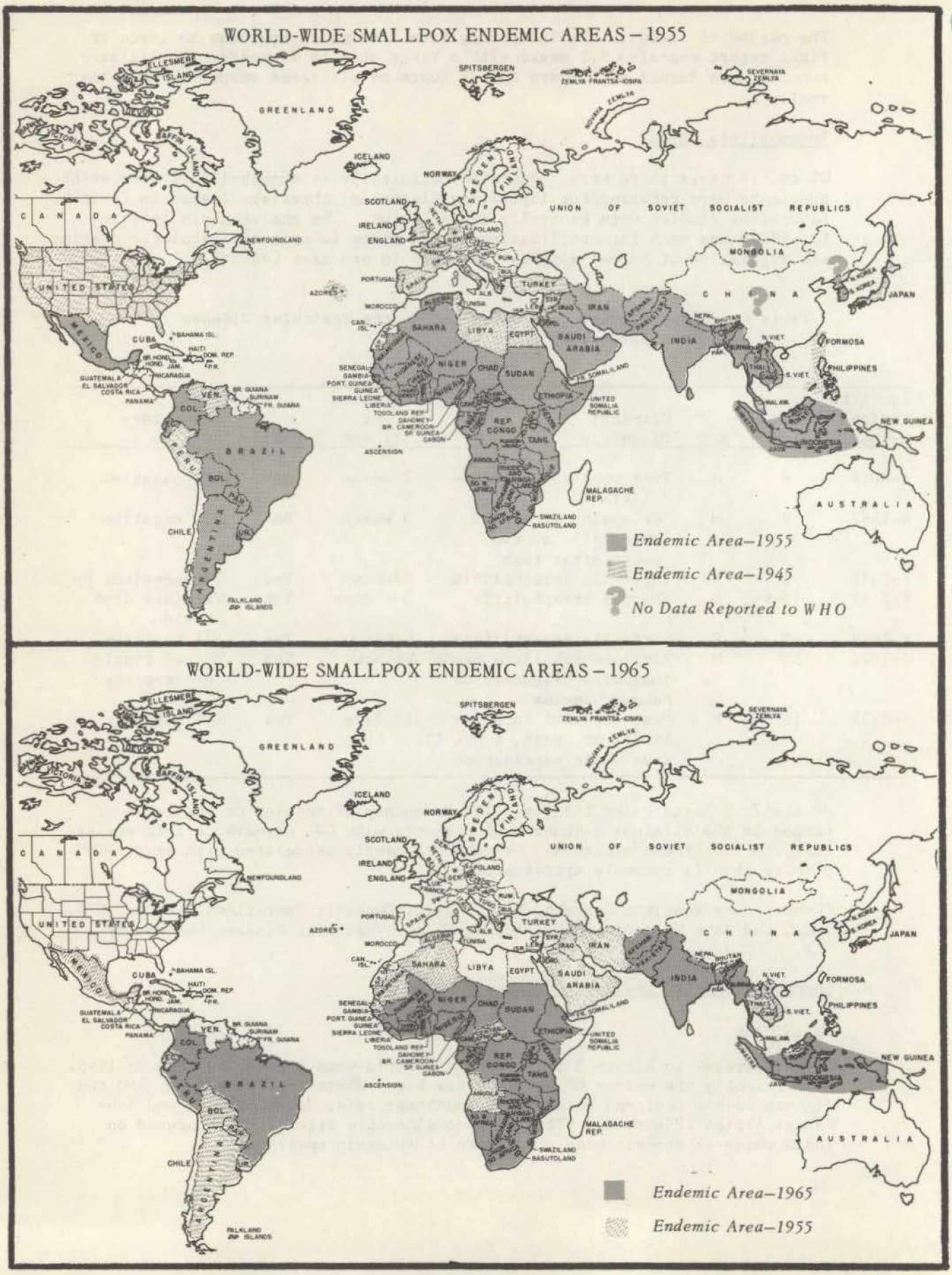
(Reported by Ronald R. Roberto, M.D., Chief, Domestic Operations Section, SEP, NCDC and John M. Noble, M.D., Acting Chief, Vesicular Disease Laboratory, LP, NCDC.)

B. Current Trends of Smallpox Occurrence

World-Wide

As illustrated in Figure 3 smallpox was a world-wide problem as late as 1945. More recently the extent of smallpox has been substantially reduced, and the disease is now confined to parts of Southeast Asia, South America and Sub-Sahara Africa (Figure 3). This year considerable attention is focused on India which is experiencing a surgence of epidemic smallpox.

FIGURE 3


WORLD-WIDE SMALLPOX ENDEMIC AREAS – 1955
Endemic Area–1955
Endemic Area–1945
No Data Reported to WHO
WORLD-WIDE SMALLPOX ENDEMIC AREAS – 1965
Endemic Area–1965
Endemic Area–1955

The past twenty years' world-wide experience of smallpox is shown in Figure 4. Major epidemics occurred in 1951 with 482,218 reported cases and 1958 with 302,477 reported cases. From 1959 through 1966 between 50,000 and 100,000 cases per year were reported. Even though in the early part of 1967 much of India has experienced epidemic smallpox it appears likely that the total number of smallpox cases reported in the world this year will remain in the range of 50,000 to 100,000.

Reports received by the World Health Organization through May 18, 1967, show a total of 31,478 compared with 24,478 for the corresponding time period of 1966. This represents an increase of 28.6 percent. The number of reported smallpox cases by continent is shown in Table 5. For comparable time periods, a decrease of 18.4 percent is noted for Africa, the Americas are experiencing a slight decrease and Asia has an increase of 47.1 percent.

Table 5. Distribution of Reported Smallpox Cases by Continent for Comparable Time Periods, 1966 and 1967*

Continent	1966	1967
Africa	6819	5563
Americas	98	102
Asia	17545	25810
Europe	16**	3***
Oceania	0	0
TOTAL	24478	31478

* Compiled from WHO reports, January 1 - May 18, 1967
** All United Kingdom Cases
*** Imported cases: 2 Germany; 1 Czechoslovakia

Asia

The distribution by country of smallpox in Asia during comparable time periods for 1966 and 1967 is shown in Table 6. India accounts for 87.8 percent of the total number of cases occurring in Asia this year. During the similar period of time in 1966, India accounted for 86.7 percent of the cases.

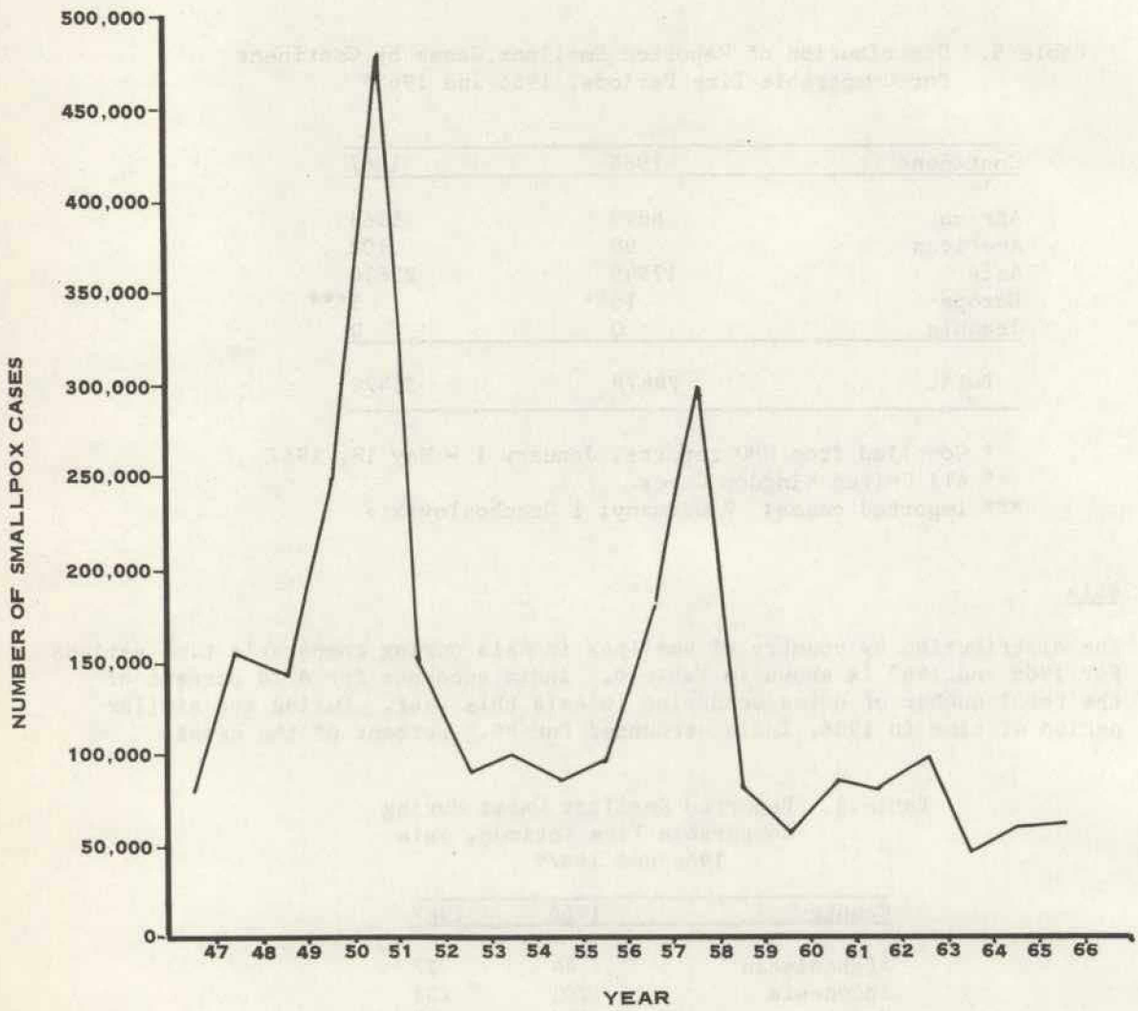
Table 6. Reported Smallpox Cases during Comparable Time Periods, Asia, 1966 and 1967*

Country	1966	1967
Afghanistan	44	27
Indonesia	201	231
Nepal	312	73
Pakistan	1782	2758
India	15204	22669
Other	2	52
TOTAL	17545	25810

*Compiled from WHO Reports, Jan. 1 - May 18, 1967

FIGURE 4

WORLD-WIDE REPORTED SMALLPOX CASES, 1947 – 1966



SOURCE: 1947–1950: Epid. & Vital Stat. Report 4 (11-12):1951.
1951–1958: Epid. & Vital Stat. Report 17 (10): 1964.
1959–1966: WHO Regional Office for the Eastern Mediterranean Publication - "Smallpox Eradication Program" to be reported at the 20th World Health Assembly.

India

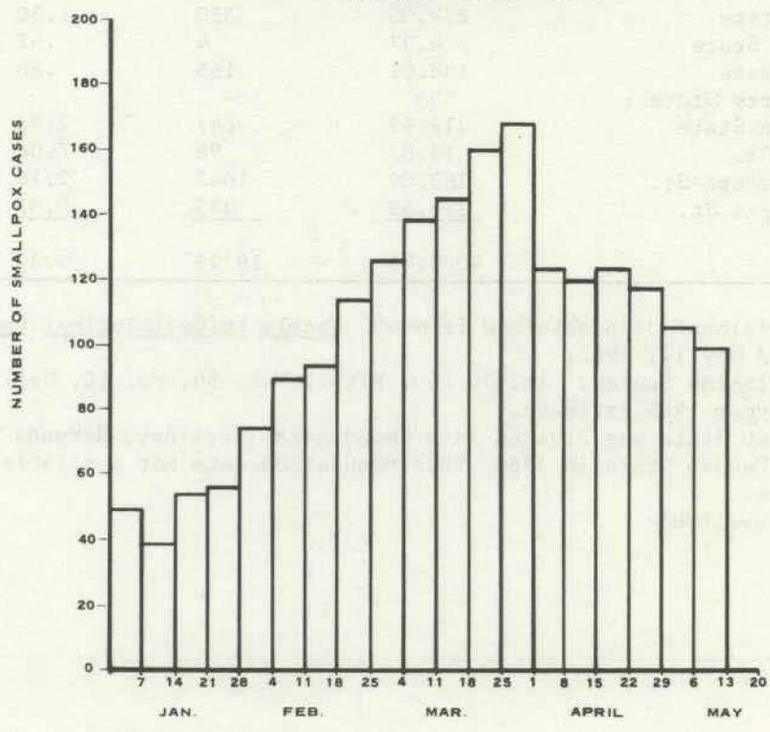
Recently, data were published by the World Health Organization (Vol. 42, #19) showing the distribution of smallpox cases by state and territory for the first quarter of 1967 for India. During this quarter a total of 19,728 cases were reported, an increase of 108 percent over the 9,471 cases reported during the comparable period of 1966. The case fatality ratios are 23.4 and 24.9 for the first quarters of 1967 and 1966, respectively.

The attack rates per 100,000 population by state and territory are given in Table 7. The attack rate for Maharashtra State, 24.15, is almost 6 times that of the nation as a whole (4.20). However, the attack rate of 28.21 for Bombay (Maharashtra State) does not differ from the overall State rate. The mid-year 1965 population estimates show Maharashtra State with 9.1 percent of the total population, yet 54.2 percent of the smallpox cases this year have been reported from this State. Bihar State, with an attack rate of 6.13 has had 15.5 percent of this year's reported cases; its population represents 10.6 percent.

Figure 5 illustrates the weekly distribution of smallpox cases for Bombay through May 13. The peak of the epidemic occurred during the week of March 26; however, the decline since the week of April 2 has been very gradual.

FIGURE 5

REPORTED SMALLPOX CASES, BOMBAY, INDIA
JANUARY 1 - MAY 13, 1967



SOURCE: WHO

EDITORIAL NOTE:

Readers will note that data shown for Asia for the first quarter of 1967 in Surveillance Report #7 are discrepant from data in this report; however, both represent official data released by WHO. Discrepancies are being queried and will be corrected as information is developed.

Table 7. Reported Smallpox Cases*, India
First Quarter, 1967

State of Union Territory	Population** (in 100,000's)	Number of Cases	Attack Rate (per 100,000)
Andhra Pradesh State	380.93	485	1.27
Andaman & Nicobar Terr.	0.78	-	-
Assam State	131.91	126	0.96
Bihar State	497.80	3054	6.13
Chandigarh Terr.)			
Haryana State)	221.14	1010	4.57***
Punjab State)			
Delhi Terr.	30.55	175	5.73
Goa, Damon & Diu Terr.	NA	9	-
Gujarat State	225.28	364	1.62
Himachal Pradesh St.	14.56	38	2.61
Jammu & Kashmir St.	36.94	-	-
Kerala State	183.57	142	0.77
Madhya Pradesh St.	351.03	647	1.84
Madras State	352.33	108	0.31
Maharashtra St.	428.26	10344	24.15
Manipur State	8.70	-	-
Mysore State	254.00	330	1.30
Nagaland State	4.37	4	.92
Orissa State	188.01	165	.88
Pondicherry State	NA	-	-
Rajasthan State	219.69	647	2.95
Tripura St.	13.89	98	7.06
Uttar Pradesh St.	763.09	1647	2.16
West Bengal St.	386.63	335	0.87
TOTAL	4693.46	19728	4.20

* Provisional data obtained from WHO Weekly Epidemiological Record No. 19, dated May 12, 1967.

** Population Source: Am. J. Pub. Hlth., Vol. 56, No. 10, Oct. 1966. Mid-year 1965 estimate.

*** Punjab State was divided into Chandigarh Territory, Haryana State and Punjab State in 1966, thus population data not available for the three.

NA Not available

Africa

Despite smallpox outbreaks in Ghana, Guinea, Nigeria and Sierra Leone, Africa as a whole has experienced a decrease of 18.4 percent in the total reported cases of smallpox cases as compared with last year.

West and Central Africa

Notifications received through the World Health Organization of smallpox cases occurring within the Smallpox Eradication/Measles Control Program countries through May 3, total 3,788 cases for this year. An increase of 26.6 percent over the 2,993 cases reported during the same time period of 1966 is observed. This increase is due in part to the epidemic situations occurring in the countries mentioned above. With the development of the Smallpox Eradication Program for these 19 countries, intensified efforts toward better reporting, increased surveillance activities and a public awareness of overall program efforts through health education activities have almost certainly given rise to increased reporting of smallpox cases.

The distribution by country of this year's cases as compared with last year is shown in Table 8. Nigeria accounts for 59.6 percent of the reported cases in 1967 compared with 65.4 percent of the 1966 cases.

Table 8. Reported Smallpox Cases in the West Africa Smallpox Eradication/Measles Control Program Countries, Comparable Reporting Periods, 1966 and 1967

Country	Comparable Reporting Date in 1966 and 1967	Cumulative Number of Cases 1966	1967
Cameroon	January 31	1	1
C.A.R.	*	-	-
Chad	April 9	0	4(i)
Congo (B)	*	-	-
Dahomey	April 18	162	321
Gabon	*	-	-
Gambia	*	-	-
Ghana	April 25	1	8
Guinea	February 25	3	27
Ivory Coast	March 26	0	2
Liberia	February 28	0	3
Mali	April 13	146	89
Mauritania	*	-	-
Niger	April 21	631	847
Nigeria	April 1	1959	2257
Senegal	*	-	-
Sierra Leone	April 1	64(i)	163(i)
Togo	April 9	18	57
Upper Volta	January 28	8	9
TOTAL		2993	3788

* No cases reported to WHO through May 3, 1967
(i) Includes imported cases

Smallpox Surveillance - Nigeria

The Federal Government of Nigeria in April initiated publication of a "Nigerian Smallpox-Measles Program Surveillance Report" series. Included in the first issue were numbers of very pertinent comments on surveillance and reporting problems and the importance of these in epidemic control. We are pleased to reproduce parts of the Report (Vol. 1, No. 1) below:

Recognition of Smallpox Cases:

"Recent surveys in three separate areas of the Federation indicate that most people recognize the clinical disease of smallpox. It carries many names and its cause is often attributed to supernatural causes, but it is generally identified and feared. Certain mild and modified cases, especially when they coexist with chickenpox are difficult to diagnos. A diagnostic laboratory is being established in Lagos to assist in the diagnosis of difficult cases.

Reporting of Smallpox Cases:

"Although many recognized cases of smallpox are reported, some are deliberately hidden. In a recent survey of 600 non-reported cases by health authorities in Kano (Northern Region), results showed that most people felt nothing could be gained by reporting their afflictions. Education is needed to convince the people that reporting does lead to action which can protect the village from further cases of smallpox.

Action on Smallpox Cases:

"Action in the form of case isolation, case treatment and vaccination of contacts of smallpox cases must follow reporting if epidemics are to be prevented. The local dispenser who recognizes an introduced case of smallpox into his village and institutes appropriate action not only is preventing much suffering and disability in his village, but is also doing his part in the eradication of smallpox from Nigeria. Prompt action is the best stimulus towards improvement in reporting."

(Reported by E. O. Smith, M.D., Director, Smallpox-Measles Unit, Federal Ministry of Health, Nigeria.)

III. ERADICATION NOTES

A. Provisional Vaccination Data - West Africa SE/MC Program

Provisional data compiled for the month of April show at least 1,528,721 smallpox and 352,904 measles vaccinations were administered in the 19 country area. This brings the total number of vaccinations administered during January through April of this year to at least 4,178,788 doses of smallpox and 806,558 doses of measles. Table 9 shows these data by country.

Table 9. Smallpox and Measles Vaccinations (provisional data) Administered by Country, January-April, 1967

Country	Smallpox Vaccinations			Measles Vaccinations		
	Jan-March	April	Jan-April	Jan-March	April	Jan-April
Cameroon	200,000	250,000	450,000	30,000	58,021	88,021
C.A.R.	80,046	30,513	110,559	18,348	9,124	27,472
Chad	87,185	NR	87,185+	14,665	NR	14,665+
Congo (B)	NR	NR	NR	NR	NR	NR
Dahomey	0	108,311	108,311	0	27,968	27,968
Gagon	50,000	NR	50,000+	8,000	NR	8,000+
Gambia	0	0	0	0	0	0
Ghana	114,000	8,760	122,760	9,500	1,877	11,377
Guinea	NR	NR	NR	NR	NR	NR
Ivory Coast	330,005	173,853	503,858	68,635	22,400	91,035
Liberia	NR	NR	NR	NR	NR	NR
Mali	314,353	163,593	477,946	71,749	55,531	127,280
Mauritania	0	0	0	0	0	0
Niger	374,000	260,000	634,000	57,000	40,000	97,000
Nigeria	439,000	325,500	764,500	25,000	35,000	60,000
Senegal	0	0	0	0	0	0
Sierra Leone	NR	NR	NR	NR	NR	NR
Togo	161,478	65,691	227,169	57,017	23,867	80,884
Upper Volta	500,000	142,500	642,500	93,740	79,116	172,856
TOTAL	2,650,067	1,528,721	4,178,788+	453,654	352,904	806,558+

NR = No report

B. Nigeria - Pilot Projects

In mid-April the National Meeting of the Nigerian Smallpox Eradication-Measles Control Program personnel was held in Lagos, at which Nigerian pilot projects were discussed. These have been carried out in each of the Regions and in Lagos.

The "coverage" (proportion of the population vaccinated) was determined by post campaign assessment surveys. "Take rates" (proportion of those inoculated who developed "takes") were estimated in preschool children. Table 10 presents coverage and "take rate" data for pilot programs in each of the regions.

Table 10. Pilot Project Assessment Data, Nigeria, 1967

Site (Region)	Coverage(%)	Take Rate*(%)
Abakaliki, Urban (Eastern)	74.8	100.0
Abakaliki Rural (Eastern)	90.0	**
Igbo Ora & Eruwa (Western)	77.0	99.8
Iyekovia District (Mid-Western)	85.7	95.4
Kano, Kudu Ward (Northern)	72.0	-
Maroko (Lagos)	88.2	100.0
Zaria City (Northern)	96.8	-

* In preschool children.

In Table 11 the average number of vaccinations per team day is given for seven pilot projects. The total number of hours involved during the vaccinating is not available, thus, the hourly rate is not shown. The range of vaccinations per team day was 853 to 4056 with an overall average of 1425.

Table 11. Pilot Project Vaccination Data, Nigeria, 1967

Site (Region)	Number of Team Days	Doses of Vaccine Given			Vaccinations per Team/Day
		Measles	Smallpox	Total	
Abakaliki Urban (Eastern)	22	3123	43392	46515	2114
Abakaliki Rural (Eastern)	60	*	55750	55750	929
Igbo Ora & Eruwa (Western)	16	3389	24306	27695	1731
Iyekovia District (Midwestern)	26	3233	18956	22189	853
Kano (Kudu Ward)(Northern)	12	7996	40678	48674	4056
Maroko (Lagos)	8	1205	10704	11909	1489
Zaria City (Northern)	30	4175	30987	35162	1172
TOTAL	174	23121	224773	247894	1425

* Data not available.

In general the following comments are applicable to each of these pilot projects: vaccinating was unusually heavy soon after the "clinic" opened, tapered off at noon, and picked up again during the late afternoon; a vaccination team's performance is much dependent on the initiative of the team leader, whose enthusiasm is vital; some team members were unable to perform all of the minor repairs on the jet injectors; for flexibility, vaccinators and recorders should be trained to perform both jobs.

(Reported by E. O. Smith, M.D., Director Smallpox-Measles Unit, Federal Ministry of Health, Nigeria)

IV. FEATURES FOR NEXT ISSUE

A preview of the July issue is offered for the reader's interest. It will feature presentations of laboratory data on smallpox in several South American countries and a detailed report of the assessment of a mass urban-rural vaccination campaign by survey techniques will be presented.

Key to all disease surveillance activities are those in each State who serve the function as State epidemiologists. Responsible for the collection, interpretation and transmission of data and epidemiological information from their individual States, the State epidemiologists perform a most vital role. Their major contributions to the evolution of this report are gratefully acknowledged.

STATE	NAME
Alabama	Dr. W. H. Y. Smith
Alaska	Dr. Thomas R. McGowan
Arizona	Dr. Melvin H. Goodwin
Arkansas	Dr. Wm. L. Bunch, Jr.
California	Dr. Philip K. Condit
Colorado	Dr. C. S. Mollohan
Connecticut	Dr. James C. Hart
Delaware	Dr. Floyd I. Hudson
D.C.	Dr. William E. Long
Florida	Dr. E. Charlton Prather
Georgia	Dr. W. J. Murphy
Hawaii	Dr. Ralph B. Berry
Idaho	Dr. John A. Mather
Illinois	Dr. Norman J. Rose
Indiana	Dr. A. L. Marshall, Jr.
Iowa	Dr. Ralph H. Heeren
Kansas	Dr. Don E. Wilcox
Kentucky	Dr. Calixto Hernandez
Louisiana	Dr. John A. Trautman
Maine	Dr. Dean Fisher
Maryland	Dr. John H. Janney
Massachusetts	Dr. Nicholas J. Fiumara
Michigan	Dr. George H. Agate
Minnesota	Dr. D. S. Fleming
Mississippi	Dr. Durward L. Blakey
Missouri	Dr. E. A. Belden
Montana	Dr. Mary E. Soules
Nebraska	Dr. E. A. Rogers
Nevada	Dr. Mark Herman
New Hampshire	Dr. William Prince
New Jersey	Dr. W. J. Dougherty
New Mexico	Dr. Kathleen Hawkins (Acting)
New York State	Dr. Julia L. Freitag
New York City	Dr. Harold T. Fuerst
North Carolina	Dr. Martin P. Hines
North Dakota	Mr. Kenneth Mosser
Ohio	Dr. Calvin B. Spencer
Oklahoma	Dr. Robert Leroy Carpenter
Oregon	Dr. Edward L. Goldblatt
Pennsylvania	Dr. W. D. Schrack, Jr.
Puerto Rico	Dr. Rafael A. Timothee
Rhode Island	Dr. William Schaffner, II (Acting)
South Carolina	Dr. G. E. McDaniel
South Dakota	Dr. G. J. Van Heuvelen
Tennessee	Dr. C. B. Tucker
Texas	Dr. Van C. Tipton
Utah	Dr. Robert Sherwood
Vermont	Dr. Linus J. Leavens
Virginia	Dr. Paul C. White
Washington	Dr. John A. Beare
West Virginia	
Wisconsin	Dr. Josef Preizler
Wyoming	Dr. Robert Alberts