

FD-910  
 698041025/15  
 Unclassified

CLASSIFICATION  
**PROJECT EVALUATION SUMMARY (PES) - PART I**

Report Symbol U-447

<b>1. PROJECT TITLE</b>			<b>2. PROJECT NUMBER</b> 698-0410.25	<b>3. MISSION/AID/W OFFICE</b> USAID/Ghana
AIP Yaws/Yellow Fever (Ghana)			<b>4. EVALUATION NUMBER</b> (Enter the number maintained by the reporting unit e.g., Country or AID/W Administrative Code, Fiscal Year, Serial No. beginning with No. 1 each FY)	
			<input checked="" type="checkbox"/> <b>REGULAR EVALUATION</b> <input type="checkbox"/> <b>SPECIAL EVALUATION</b>	
<b>5. KEY PROJECT IMPLEMENTATION DATES</b>			<b>6. ESTIMATED PROJECT FUNDING</b>	<b>7. PERIOD COVERED BY EVALUATION</b>
A. First PRO-AG or Equivalent FY _____	B. Final Obligation Expected FY _____	C. Final Input Delivery FY _____	A. Total \$ <u>2,363,000</u>	From (month/yr.) <u>11/80</u>
			B. U.S. \$ <u>580,000</u>	To (month/yr.) <u>12/82</u>
			Date of Evaluation Review _____	

**8. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR**

A. List decisions and/or unresolved issues, cite those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., airgram, SPAR, PIO, which will present detailed request.)	B. NAME OF OFFICER RESPONSIBLE FOR ACTION	C. DATE ACTION TO BE COMPLETED
1. The GOG Project Completion Date should be extended 18-24 months	MOH	1/83
2. The USAID PACD should be extended 6-8 months	USAID	1/83
3. As MFU Teams complete each Health District, resident members of the Team should remain at the Health Center to carry out a Y/YF surveillance program and be provided with a motorcycle or bicycle and Pencillin to maintain yaws control.	MOH	4/83
4. Random serum specimens/surveys should periodically be conducted to ensure no reintroduction of yaws in treated areas.	MOH/CDC	9/83
5. Village health workers should do surveillance to identify new yaws cases and report cases to MFU teams.	MOH	6/83
6. Unearmarked USAID funds remaining in the AIP should be utilized for additional program activities as stated in the report.	USAID	1/83
7. Evaluation of project activities based on the PACD extension.	USAID/CDC	12/83

**9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS**

<input type="checkbox"/> Project Paper	<input type="checkbox"/> Implementation Plan e.g., CPI Network	<input checked="" type="checkbox"/> Other (Specify)
<input type="checkbox"/> Financial Plan	<input type="checkbox"/> PIO/T	Revising Program by using a PIL
<input type="checkbox"/> Logical Framework	<input type="checkbox"/> PIO/C	
<input checked="" type="checkbox"/> Project Agreement	<input type="checkbox"/> PIO/P	<input type="checkbox"/> Other (Specify)

**10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT**

A.  Continue Project Without Change

B.  Change Project Design and/or  Change Implementation Plan

C.  Discontinue Project

**11. PROJECT OFFICER AND HOST COUNTRY OR OTHER RANKING PARTICIPANTS AS APPROPRIATE (Names and Titles)**

Lawrence R. Eicher, Chief, HPN Division, USAID/G  
 James R. Washington, Acting Evaluation Officer, USAID/G  
 Dr. Victor Agadzi, Chief, MOH Epidemiology Division  
 Dr. Yaw Aboagye-Atta, Acting DMS, MOH  
 Dr. Peter Perine & Mr. John Nelson, CDC

**12. Mission/AID/W Office Director Approval**

Signature: *Gerald G. Graf*  
 Typed Name: Gerald G. Graf, Acting Director  
 Date: December 17, 1982

### Project Evaluation Summary

Summary: The Yaws/Yellow Fever Project is a cooperative effort involving the Government of Ghana, Agency for International Development, European Economic Community, United Nations Children's Fund and the World Health Organization. The project was designed as a two year program to contain yellow fever epidemics and to interrupt the precipitous increase of yaws in Ghana. By the end of the program, a total of 3,382,906 rural people were to be treated for yaws with penicillin, as of September, 1982, 821,943 (24.3%) of these people had been treated (Table 18). A total of 3,472,143 children between 1 to 10 years were to be given yellow fever vaccine; by September, 1982, 421,983 (12.2%) had been vaccinated (Table 16). The major causes for failure to meet the design objectives in decreasing order of magnitude are: (1) lack of petrol at the field team level (2) lack of spare parts for the 20 project vehicles (3) constraints placed upon the project by the deteriorating socio-economic problems of Ghana. There is no possibility of achieving the goals of the YYF project within the time frame initially established (January, 1983). Prospects for completing the program as originally designed within the next 18 to 24 months, without a dramatic improvement in the economic situation in Ghana together with additional external inputs, are nil.

### Evaluation Methodology

A team comprised of Mr. John Nelson and Dr. Peter Perine conducted this assessment between December 2 and 17, 1982. The assessment process included:

- 1) Review of all quarterly reports submitted by YF Regional field teams.
- 2) Review of pertinent records and statistics at the Headquarters of the Division of Epidemiology, MOH, which was charged with directing the YF program.
- 3) Consultation with other participating donor agencies, MOH Officials, and Medical Field Unit personnel.
- 4) A serologic assessment to:
  - a. Measure the yellow fever immunity level of vaccinated and non-vaccinated school children in the Ashanti Region.
  - b. Measure the efficacy of measles, yellow fever vaccination and yaws treatment before and after vaccination and treatment in a group of children living in a rural area of the Greater Accra Region.
- 5) Visits to various storage facilities for vaccines, YF supplies and equipment appropriate to the program.
- 6) Studies in collaboration with the National Reference Laboratory at Korle Bu, which attempted to measure the penicillin sensitivity of common bacterial pathogens, such as Neisseria gonorrhoeae, which might be adversely effected by the massive amounts of penicillin given to the Ghanaian population during the course of YF campaign.

### External Factors

The economy of Ghana has deteriorated substantially since 1980. Most commodities are in critical shortage, especially in the more remote rural areas where the YF teams have concentrated their activities according to the project design. For example, the YF teams were able to reach only 17.2% of the projected eligible population, excluding BCG tuberculosis vaccine, from January 1981 to September 1982; this represents 1,509,284 immunizations and penicillin treatments.

Tables 14-18). The Ministry of Health has, however, given the highest priority to the YF program as reflected by its use of extremely limited discretionary funds to maintain YF field activities. The EEC, UNICEF and WHO have also given substantial additional funds to the project beyond their initial commitment. To a very great extent, the YF project has been one of the major primary health care activities in rural Ghana. If the present level of support from the GOG and participating donors continues and if the economic situation in Ghana stabilizes, the objectives of the YF program set for January, 1983, could be completed within 18 to 24 months.

### Inputs

The categories of inputs, their availability or need is as follows:

- (1) Petrol - sufficient quantities have been allocated by the MOH specifically for YF activities. However, distribution of petrol from central stores to Regional depots cannot be assured.

- (2) Vehicles and spare parts - Three of the 20 trucks donated to the project by the EEC have suffered extensive damage from accidents and require major overhaul. The remaining 17 vehicles are short of spare parts (shock absorbers, tires, fan belts, filters, etc.) but this problem is improving as a result of additional donor contributions. The anticipated distribution of 30 new motorcycles to the field teams will greatly enhance the overall operations of the program.
  
- (3) Cold Chain - The quantities of vaccines, penicillin, syringes, etc. are adequate for the short term. Refrigerators, freezers and other cold storage facilities are marginal in number and condition. It will be necessary to ensure that each health district in Ghana has the capacity to store perishable vaccines for a minimum of one month.
  
- (4) Manpower - A sufficient number of Medical Field Unit (MFU) personnel are available to complete the YF project. The morale of the MFU teams is deteriorating owing to the economic conditions of Ghana and the hardships they experience in the field. Over the last year, an increasing amount of YF personnel and resources have been temporarily diverted to cholera control by MOH Officials.

Outputs

The progress of the YF Project to date is given in Tables 3 - 19. As of September, 1982, 1,247,416 people have been examined for yaws (Table 7) of which 327,948 have received penicillin treatment. An Assessment

carried out in October, 1981, established that 80.8% of the eligible population residing in villages visited by YF teams were treated for yaws. Yellow fever vaccination was provided to 82.3% of the target population (Table 5).

Although not an integral component of the YF program, 78,390 children between the ages 9-24 months were given measles vaccine; 135,985 children received BCG vaccination for tuberculosis; and 186,968 women of child-bearing age received tetanus toxoid in hope of preventing neonatal tetanus (Table 13).

The extent to which each of the Regional MFU teams were able to meet their projected eligible populations is given in Table 14. Most of the YF resources and activities have been directed to the control of yaws and yellow fever in the hyperendemic areas for these diseases, i.e. Central, Eastern and Ashanti Regions. The outputs of the YF program were redirected in January, 1982, to concentrate more resources in these hyperendemic Regions (Table 7).

#### Purpose

The YF Project had the following objectives:

1. To reduce the prevalence of active yaws in Ghana to less than 100 cases per 100,000 population by 1983.
2. To contain epidemics of yellow fever in Ghana by 1983.

The prevalence of active yaws has been appreciably reduced by the YF project. In the populations examined by YF teams, the active yaws prevalence rate was 703 per 100,000 before treatment; resurveys 3 to 8 months

later indicated that this rate had fallen to 53 per 100,000, a decline of 92%. Moreover, District level clinics have been trained to conduct yaws surveillance on an ongoing basis and have been provided with sufficient penicillin to treat any new or missed cases of active yaws and their contacts to ensure control.

From 1977 to 1979, a total of 848 cases of yellow fever comprising at least 4 major epidemics were reported in Ghana. Although sporadic cases of yellow fever have occurred since the inception of the YF program in 1981, no epidemics of yellow fever have been reported. (Figure 2).

The assessment of yellow fever vaccine efficacy described under Evaluation Methodology will be repeated at intervals during 1983.

There has been no incongruity between the proposed inputs into the YF program and the expected outputs. The YF methodologies have proven to be highly effective where implemented. The expected outputs of the program remain valid and will only be affected by the socio-economic factors prevailing in Ghana.

#### Goals and Subgoals

In addition to the primary goals of the YF program listed in the preceding section, a number of other goals were incorporated into the program:

1. YYF Project teams would reach 95% of the villages scheduled for visit.
  - a. Teams would be provided with reliable transport and petrol to reach scheduled villages.
  - b. Team schedules would be developed to ensure that all villages could be visited in a systematic and timely manner.
  
2. Project Teams would maintain at least an 80% coverage of the yaws target population
  - a. Each village would receive the appropriate advanced notification of the YYF team visit.
  - b. Resurveys to assess and improve yaws coverage would be conducted 6 weeks after the initial team visit.
  
3. All levels of the Project Operation would provide for the Proper handling and administration of vaccines.
  - a. Cold chain equipment would perform to acceptable standards.
  - b. Vaccine handling would conform to acceptable standards.
  
4. The three Regions (Ashanti, Eastern, Central) at high risk to yaws would maintain coordinated programs of phased expansion.
  - a. Scheduling would be coordinated to provide for a maximal level of Regional cooperation.
  - b. National headquarters would function as the focal point for receiving and disseminating Regional information.

5. Adequate treatment would be provided to 95% of the infectious yaws cases diagnosed by health authorities.
  - a. Penicillin would be made available to all health sites for the treatment of infectious yaws cases and contacts.
  - b. Recommended treatment schedules for yaws would be made available to health personnel.
  
6. YYF teams would continue to provide measles vaccination to all children 9 to 24 months of age; BCG vaccination for tuberculosis to all children from birth to 1 year of age; and tetanus toxoid to women of childbearing age for prevention of neonatal tetanus.

The level of attainment of these goals is listed in Table 4.

Where MFU teams were able to carry out their assigned duties, they achieved or surpassed objectives. Again, goals not achieved were in large part due to external factors beyond the control of the MFU's and the MOH.

#### Beneficiaries

The rural people of Ghana and their children in particular have greatly benefited from the YYF program where it has been conducted. Yaws is a disabling disease with a significant economic impact. Active lesions of the soles and hands are incapacitating and often appear at a time when crops must be planted or harvested. Yaws also causes mutilating lesions much like leprosy. Both of these complications occur in about 10% of those infected. If children are not treated early they may suffer disability later in life that could be so easily cured by a single shot of penicillin.

The YF program should also have an impact on the incidence of neonatal tetanus, but this will be impossible to measure with any degree of accuracy. The combination of measles and BCG vaccinations, although given to only a small cohort of susceptible children, will provide protection to several thousand Ghanaian children against these diseases. This alone would justify the cost per patient seen and treated which is estimated to be \$1.49 (Table 6).

The political impact of the YF program among the rural populations of Ghana is impressive. The MFU teams are often the only government health personnel that rural Ghanaians have seen in more than a decade. This may explain the interest and commitment of the Ministry of Health to the YF program.

Yellow fever has had a 24% mortality rate over the past ten years. The vector mosquito is found in all parts of urban and rural Ghana. The potential for an explosive epidemic is a constant threat and any thing done to lessen this threat is justified - especially when one vaccination provides lifetime immunity.

#### Unplanned Effects

Not pertinent at this time. However, mass treatment with long acting penicillin which is excreted in the urine for as long as 28 days after a single injection may select or promote the spread of certain pathogenic bacteria among the Ghanaian population. Of particular concern is gonorrhoea. Strains of gonorrhoea completely resistant to penicillin were first detected in Ghana and have since spread to other parts of

West Africa and the world. In an attempt to measure any adverse impact of penicillin treatment for yaws, the National Reference Medical Laboratory in Accra is monitoring the antibiotic sensitivity of Neisseria gonorrhoeae in Accra and Kumasi.

Although rare patients treated with penicillin have experienced some minor early and late reactions to the drug, no anaphylactic reactions have occurred.

#### Lessons Learned

Many of the difficulties encountered by the YYP Project in Ghana are likely to be experienced in other African countries facing the same economic and health problems. The YYP has achieved remarkable results considering the conditions under which the field teams have labored. The medical, political and social impact of this program cannot be overstated. Much of the success of YYP has been due to the willingness of a variety of donor agencies to combine their resources toward the achievement of a common goal. The results of the YYP effort have continuously assured these donors that their assistance would have a direct and immediate impact on the health and welfare of the Ghanaian people.

#### Recommendations

- I. The GOG Project Completion Date should be extended 18-24 months.
- II. The YYP USAID Project Assistance Completion Date should be extended to 6 to 8 months.

- III. As MFU Teams complete each health district in a Region, the resident members of YYF teams should remain behind at the district health center to carry out a surveillance program for yaws and yellow fever as well as other activities of the District Health Teams. These individuals should be provided with either a motorcycle or a bicycle and sufficient penicillin to maintain yaws control within his geographic area of responsibility.
- IV. Random serum specimens and serologic surveys should be periodically conducted within pertinent age groups to ensure that yaws has not been reintroduced into previously treated areas. These serum specimens could be tested at the district level by training the local surveillance team to perform the simple rapid Plasma Reagin (RPR) test for yaws antibodies.
- V. Surveillance for active yaws cases should make use of village level health workers as sentinals to report new cases to the district level MFU team. Also, each Region should have a mobile team available for yaws and yellow fever epidemic control.
- VI. The unearmarked USAID funds allocated to the YYF Project should be utilized as follows:
- a. The distribution of the remaining funds should be coordinated with other participating donor agencies.
  - b. Purchase the required refrigeration spare parts to bring them to an acceptable functioning level.

- c. Purchase bicycles and/or motorcycles for district health level surveillance staff.
- d. Fund a comprehensive assessment of the YF Project prior to its completion. This assessment should involve a randomly selected sample of the treated population in several regions with emphasis on the Ashanti, Eastern and Central which form the hyperendemic focus for disease.

YAWS/YELLOW FEVER PROJECT  
INFECTIOUS YAWS REPORTS  
GHANA 1969-1982

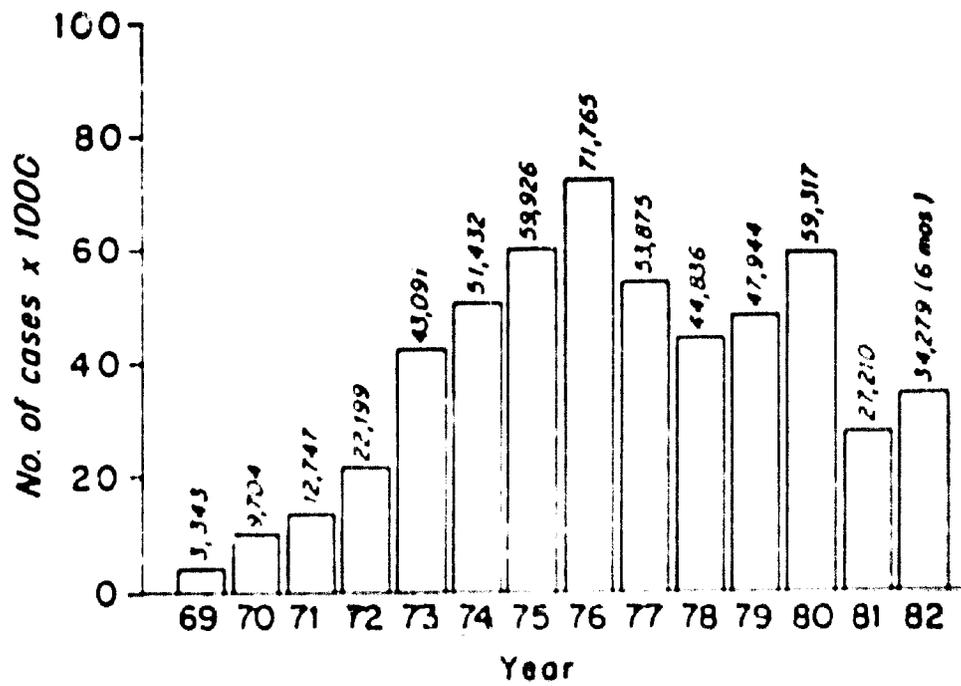


FIGURE 1

YAWS/YELLOW FEVER PROJECT  
YELLOW FEVER CASE REPORTS  
GHANA 1970-1982

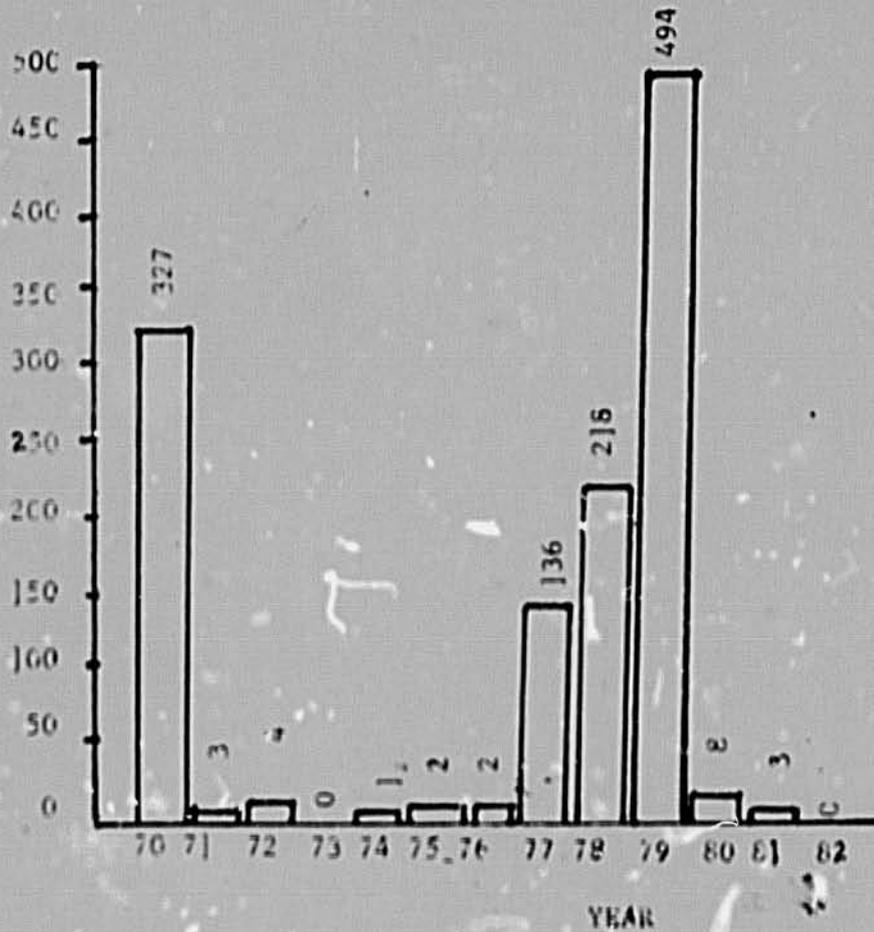
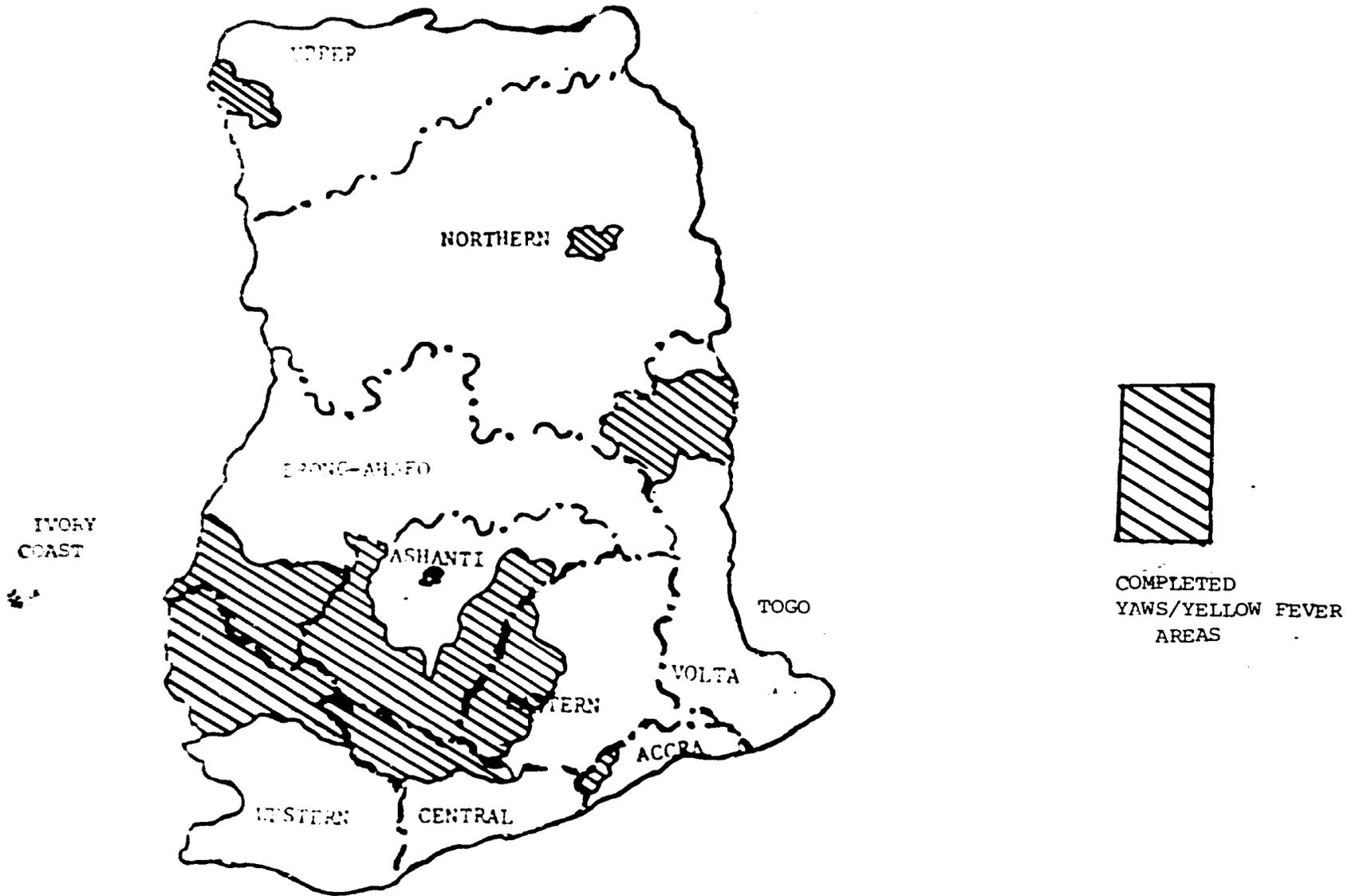


FIGURE 2

YAWS/YELLOW FEVER PROJECT  
AREAS COMPLETED BY MOBILE TEAMS  
GHANA SEPTEMBER, 1982



FIGURE

YAWS/YELLOW FEVER PROJECT  
PERCENTAGE OF GOAL ATTAINMENT<sup>1/</sup>

GOAL REFERENCE AND DESCRIPTION	EXPECTED ACHIEVEMENT	ACTUAL ACHIEVEMENT	PERCENTAGE OF GOAL ATTAINMENT
Number of days Project Teams carried out assigned Field Activities.	4890	1799	36.8%
Percent of Yellow Fever target Population residing in villages visited by YF Teams and Receiving the Vaccine.	80.0%	82.3%	102.9%
Percent of Yaws Target Population Residing in villages visited by YF teams and receiving penicillin Treatment.	80.0%	80.8%	101.0%
Vaccine Efficacy (Pending Assessment)	90.0%	Pending	Pending
Number of Yaws Examinations Performed by Project Teams.	3,912,000	1,247,415	31.9%
Percent of infections Yaws cases demonstrating clinical resolution of lesions within 2 weeks of Penicillin treatment.	95.0%	96.2%	101.3%
Number of Persons Receiving Preventive Treatment for Yaws.	2,085,200	770,757	37.0%

PERCENTAGE OF GOAL ATTAINMENT (CON'T)

GOAL REFERENCE AND DESCRIPTION	EXPECTED ACHIEVEMENT	ACTUAL ACHIEVEMENT	PERCENTAGE OF GOAL ATTAINMENT
Number of Persons Receiving Curative Treatment for Yaws.	78,450	56,191	71.6%
Number of Persons Receiving Yellow Fever Vaccine	1,345,000	421,983	31.4%

1/  $\frac{\text{Actual Achievement}}{\text{Expected Achievement}} = \text{Percent of Goal Attainment}$

YAWS/YELLOW FEVER PROJECT  
ASSESSMENT OF COVERAGE IN SELECTED AREAS <sup>1/</sup>

TYPE OF PROCEDURE	<u>TARGET POPULATION COVERAGE</u>				TOTAL ADJUSTED COVERAGE <sup>3/</sup>
	1-4 YEARS	5-9 YEARS	10-14 YEARS	FEMALES 15-44 YEARS	
YAWS TREATMENT <sup>2/</sup>	77.9%	86.9%	75.4%	X	80.8%
YELLOW FEVER IMMUNIZATION	76.8%	87.2%	X	X	82.3%
TETANUS TOXOID IMMUNIZATION	X	X	X	63.3%	63.3%

X - Not targeted for procedure

<sup>1/</sup> Random Sample Villages in Three Regions at Highest Risk to Yaws disease conducted in October, 1982.

<sup>2/</sup> Includes persons treated as cases, contacts and under the JMT guidelines.

<sup>3/</sup> Results adjusted by the proportion each age group represents of the total target population.

YAWS/YELLOW FEVER PROJECT  
 COSTS BY TYPE OF PROGRAM INPUT  
 JANUARY 1981 - SEPTEMBER 1982  
 (U.S. DOLLARS)

COST DESCRIPTION	TYPE OF INPUT					TOTAL COST
	TRANSPORTATION	PENICILLIN - VACCINE	SALARIES - TRAINING	COLD CHAIN - COMMODITIES	OTHER <sup>2/</sup>	
OVERALL PROJECT COST	\$270,000	\$ 315,000	\$ 945,000	\$ 265,000	\$ 60,000	\$ 1,855,000
PERCENT OF TOTAL COST	14.6	17.0	50.9	14.3	3.2	100.0
COST PER PATIENT <sup>1/</sup> SEEN	.22	.25	.76	.21	.05	\$1.49

1/ Profile of an average patient would be a one time visit to a 3-4 year old child living in an area at high risk of yaws disease. This patient would receive an immunization against tuberculosis (BCG), yellow fever and an injection of penicillin. Costs are calculated on the basis of the number of examinations performed.

2/ Includes Workshops, Assessment Activities and Regional Level Support.

YAWS/YELLOW FEVER PROJECT  
EXAMINATIONS AND PROCEDURES PERFORMED  
BY REGION  
JANUARY, 1981 - SEPTEMBER, 1982

REGION	NUMBER OF EXAMINATIONS PERFORMED FOR YAWS DISEASE	NUMBER OF PROCEDURES <sup>1/</sup> PERFORMED PER 1,000 PERSONS EXAMINED
ASHANTI	385,901	1,351
BRONG-AHAFO <sup>2/</sup>	101,508	1,364
CENTRAL	139,494	1,473
EASTERN	340,006	1,397
GREATER ACCRA <sup>2/</sup>	37,954	941
NORTHERN <sup>2/</sup>	18,165	1,239
UPPER <sup>2/</sup>	14,172	741
VOLTA	70,225	1,609
WESTERN <sup>2/</sup>	139,991	1,212
TOTAL	1,247,416	1,355

1/ Procedures include immunizations against yellow fever, measles, tuberculosis (BCG), tetanus and a penicillin injection for yaws prevention or treatment. Populations eligible for each procedure are determined by one or more of the following CRITERIA: Clinical signs, age, sex and geographic location.

• Approximate expected rate - 1150/1,000 Examinations

2/ Respective Regions not included in YYF Campaign during 1982.

YAWS/YELLOW FEVER PROJECT  
 REPORTED COMPARED TO PLANNED TEAM PERFORMANCE  
 BY REGION  
 JANUARY 1981 - SEPTEMBER 1982

REGION	PERCENTAGE OF TIME TEAMS WERE ABLE TO CARRY OUT SCHEDULED TEAM ACTIVITIES <sup>1/</sup>	PERCENTAGE OF PLANNED YAWS EXAMINATIONS THAT TEAMS WERE REPORTED AS PERFORMING
ASHANTI	43.6	35.0
BRONG-AHAFO	33.6	38.5
CENTRAL	37.2	30.6
EASTERN	38.9	49.7
GREATER ACCRA	33.4	16.6
NORTHERN	6.1	13.8
UPPER	12.7	10.7
VOLTA	22.6	15.4
WESTERN	34.2	30.7
TOTAL	36.8	31.9

<sup>1/</sup> Reported Number of Days Regional Teams Carried out Field Activities  
 15 Days X 19 months\* X number of assigned Regional Teams

- Exception: Brong-Ahafo, Northern and Upper are multiplied by only 11 work months as they did not participate in 1982 Yaws/Yellow Fever Campaign.

YAWS/YELLOW FEVER PROJECT  
 CHARACTERISTICS<sup>1/</sup> OF POPULATION EXAMINED FOR YAWS  
 BY REGION  
 JANUARY 1981 - SEPTEMBER 1982

REGION	OF ALL PERSONS EXAMINED FOR YAWS:		
	PERCENT FEMALE	PERCENT FEMALE AGED 15-44 YEARS	PERCENT AGED 9-24 MONTHS
ASHANTI	46.6	15.6	6.5
BRONG-AHAFO	50.5	12.8	8.5
CENTRAL	52.4	16.2	6.8
EASTERN	51.7	15.2	6.2
GREATER ACCRA	53.9	22.3	7.2
NORTHERN	56.5	16.1	17.3
UPPER	52.3	20.6	15.6
VOLTA	53.0	19.5	9.9
WESTERN	48.7	16.9	5.2
TOTAL	40.0	15.9	7.0

1/ Estimated distribution within the general Ghanaian population:  
 Females - 49.8%; Females 15-44 years of age - 20.0%; children  
 9 months - 24 months of Age 4.5%.

YAWS/YELLOW FEVER PROJECT  
 PENICILLIN TREATMENT FOR YAWS  
 BY REGION  
 JANUARY 1981 - SEPTEMBER 1982

REGION	PENICILLIN TREATMENT RATE FOR YAWS DISEASE PER 1,000 EXAMINATIONS <sup>1/</sup>	TOTAL NUMBER OF PERSONS RECEIVING TREATMENT FOR YAWS DISEASE <sup>2/</sup>
ASHANTI	755.9	291,717
BRONG-AHAFO	730.2	74,117
CENTRAL	696.9	97,208
EASTERN	658.1	223,752
GREATER ACCRA	125.8	4,775
NORTHERN	49.7	903
UPPER	23.1	327
VOLTA	673.3	47,282
WESTERN	627.7	87,867
TOTAL	663.7	827,948

1/ Rates are 85.4/1,000 Exams in the three Selected Mass Treatment Regions (Accra, Northern and Upper) and 698.3/1000 Exams in the other six Regions that adhere to the Juvenile Mass Treatment (JMT) strategy.

2/ Includes persons treated as cases, contacts or under the JMT strategy.

YAWS/YELLOW FEVER PROJECT  
 INFECTIOUS YAWS CASEFINDING  
 BY REGION  
 JANUARY 1981 - SEPTEMBER 1982

REGION	INFECTIOUS YAWS CASES:		
	RATE PER 100,000 EXAMINATIONS	PERCENT UNDER 15 YEARS OF AGE	NUMBER OF CONTACTS PER CASE REPORT
ASHANTI	682.0	95.6	14.2
BRONG-AHAFO	562.5	96.5	7.9
CENTRAL	717.1	97.6	2.5
EASTERN	793.2	95.3	5.9
GREATER ACCRA	442.6	96.4	3.8
NORTHERN	418.4	93.4	8.5
UPPER	21.7	66.7	10.7
VOLTA	373.1	93.5	13.1
WESTERN	1122.9	98.3	1.8
TOTAL	693.6	96.9	5.0

YAWS/YELLOW FEVER PROJECT  
YAWS CASE REPORTS  
BY REGION  
JANUARY 1981 - SEPTEMBER 1982

REGION	NON-INFECTIOUS CASES:		TOTAL YAWS <sup>1/</sup>
	RATE PER 100,000 EXAMINATIONS	PERCENT UNDER 15 YEARS OF AGE	CASE RATE PER 100,000 EXAMINATIONS
ASHANTI	481.5	21.7	1,163.5
BRONG-AHAFO	381.3	37.2	943.8
CENTRAL	3,255.3	66.1	3,257.5
EASTERN	4,156.4	44.4	4,949.6
GREATER ACCRA	1,405.1	59.9	14,499.9
NORTHERN	990.9	22.8	1,409.3
UPPER	1,785.2	28.9	1,806.4
VOLTA	13,194.7	59.1	13,567.8
WESTERN	2,289.4	33.4	3,412.3
TOTAL	3,107.6	50.5	3,747.7

1/ Includes all cases (Infectious and Non-Infectious) reported by Field Teams and diagnosed on the basis of primary lesions.

YAWS/YELLOW FEVER PROJECT  
 IMMUNIZATIONS ADMINISTERED  
 BY REGION  
 JANUARY 1981 - SEPTEMBER 1982

REGION	YELLOW FEVER	TYPE OF VACCINE ADMINISTERED:			TETANUS TOXOID
		MEASLES	BCG		
ASHANTI	135,612	17,454	27,317	49,095	
BRONG-AHAFO	28,989	7,667	15,201	12,479	
CENTRAL	54,643	9,869	21,199	22,476	
EASTERN	105,185	21,188	32,617	52,129	
GREATER ACCRA	15,745	2,734	3,932	8,503	
NORTHERN	9,388	3,152	6,066	3,004	
UPPER	3,758	2,087	2,227	2,103	
VOLTA	31,797	6,950	13,403	13,506	
WESTERN	36,866	7,289	14,023	23,623	
TOTAL	421,983	78,390	135,985	186,968	

YAWS/YELLOW FEVER PROJECT  
 TOTAL PROGRAMME COVERAGE  
 OF POPULATIONS ELIGIBLE <sup>1/</sup>  
 BY REGION  
 JANUARY, 1981 - SEPTEMBER, 1982

REGION	MEASLES	YELLOW FEVER	TETANUS TOXOID	PENICILLIN FOR YAWS	TOTAL ADJUSTED COVERAGE <sup>2/</sup>
ASHANTI	18.7%	21.8%	11.8%	28.1%	22.8%
BORG-AKAPU	16.3%	9.2%	6.0%	14.2%	11.2%
CENTRAL	19.8%	16.4%	10.1%	17.5%	15.9%
EASTERN	30.9%	23.0%	17.1%	30.6%	25.8%
GREATER-ACCRA	3.9%	3.4%	2.8%	*	3.2%
NORTHERN	6.7%	3.0%	1.4%	*	2.8%
Upper	4.5%	1.2%	1.0%	*	1.5%
VOLTA	12.7%	8.7%	5.6%	7.8%	7.8%
WESTERN	16.3%	12.3%	11.9%	17.7%	15.0%
TOTAL	15.1%	12.2%	8.1%	24.3%	17.2%

<sup>1/</sup> Includes Measles: 9mths - 24mths; Yellow Fever 1-10yrs; Tetanus Toxoid: Females 15-44 yrs; Infectious Yaws: birth - 14 years.

<sup>2/</sup> Adjusted by the proportion each age group represents of the total at risk population.

\* Excludes Selected Mass Treatment Regions.

YAWS/YELLOW FEVER PROJECT  
 MEASLES IMMUNIZATION  
 COVERAGE OF ELIGIBLE POPULATION <sup>1/</sup> BY REGION  
 JANUARY, 1981 - SEPTEMBER, 1982

REGION	NUMBER OF PERSONS IMMUNIZED	NUMBER OF PERSONS ELIGIBLE <sup>2/</sup>	PERCENT POPULATION COVERAGE
Ashanti	17,454	93,385	18.7%
BRONG-AHAFO	7,667	47,077	16.3%
CENTRAL	9,569	49,952	19.8%
EASTERN	21,188	68,648	30.9%
GREATER-ACCRA	2,734	69,260	3.9%
NORTHERN	3,152	46,864	6.7%
UPPER	2,087	46,236	4.5%
VOLTA	6,950	54,618	12.7%
WESTERN	7,289	44,781	16.3%
<b>TOTAL</b>	<b>78,390</b>	<b>520,821</b>	<b>15.1%</b>

1/ Persons between the age of 9 - 24 mths.

2/ Calculated as 4.5% of the total population.

YAWS/YELLOW FEVER PROJECT  
YELLOW FEVER IMMUNIZATION  
 COVERAGE OF ELIGIBLE POPULATION <sup>1/</sup>  
 BY REGION  
 JANUARY, 1982 - SEPTEMBER, 1982

REGION	NUMBER OF PERSONS IMMUNIZED	NUMBER OF PERSONS ELIGIBLE	PERCENT POPULATION COVERAGE
ASHANTI	135,612	622,565	21.8%
BRONG-AHAFO	28,989	313,847	9.2%
CENTRAL	54,643	333,018	16.4%
EASTERN	105,185	457,651	23.0%
GREATER-ACCRA	15,745	461,734	3.4%
NORTHERN	9,388	312,429	3.0%
UPPER	3,758	308,237	1.2%
VOLTA	31,797	364,119	8.7%
WESTERN	36,866	298,543	12.3%
<b>TOTAL</b>	<b>421,983</b>	<b>3,472,143</b>	<b>12.2%</b>

1/ Persons between the age of 1-10 years,  
 calculated as 30.0% of the total population.

YAWS/YELLOW FEVER PROJECT  
TETANUS TOXOID IMMUNIZATION  
 COVERAGE OF ELIGIBLE POPULATION <sup>1/</sup>  
 BY REGION  
 JANUARY, 1981 - SEPTEMBER, 1982

REGION	NUMBER OF PERSONS IMMUNIZED	NUMBER OF PERSONS ELIGIBLE	PERCENT POPULATION COVERAGE
ASHANTI	49,095	415,043	11.8%
BRONG-AHAFO	12,479	209,231	6.0%
CENTRAL	22,476	222,012	10.1%
EASTERN	52,129	305,100	17.1%
GREATER-ACCRA	8,503	307,822	2.8%
NORTHERN	3,004	208,286	1.4%
UPPER	2,103	205,491	1.0%
VOLTA	13,506	242,746	5.6%
WESTERN	23,623	199,028	11.9%
TOTAL	186,968	2,314,759	8.1%

1/ Women between the age of 15-44 years,  
 calculated as 20.0% of the total population.

YAWS/YELLOW FEVER PROJECT 1/  
PENICILLIN TREATMENT COVERAGE OF POPULATION  
 BY SELECTED REGION  
 JANUARY, 1981 - SEPTEMBER, 1982

REGION	NUMBER OF PERSONS TREATED	NUMBER OF PERSONS ELIGIBLE	PERCENT POPULATION COVERAGE
ASHANTI	291,717	1,037,608	28.1%
BRONG-AHAFO	74,117	523,079	14.2%
CENTRAL	97,208	555,030	17.5%
EASTERN	223,752	762,751	30.6%
VOLTA	47,292	606,866	7.8%
WESTERN	87,867	497,572	17.7%
<b>TOTAL</b>	<b>821,943</b>	<b>382,906</b>	<b>24.3%</b>

1/ Persons between birth and 15 years of age (Juvenile Mass Treatment). Excludes regions of Greater-Accra, Northern and Upper as these regions treated only Yaws cases and contacts. (Selected Mass Treatment)

Calculated as 50.0% of the total population.

VACCINE AND PENICILLIN UTILIZATION  
 JANUARY, 1981 - SEPTEMBER, 1982

1/

DISPOSITION OF VACCINE/PENICILLIN	YELLOW FEVER VACCINE	MEASLES VACCINE	BCG	TETANUS TOXOID	PENICILLIN 2/
Number of Doses Supplied	682,750	279,020	435,710	562,700	3,185,200
Number of Injections Performed	461,983	78,390	135,985	186,968	827,948
Number of Injections per 100 Doses Supplied	68/100	28/100	31/100	33/100	26/100

1/ Based on Regional project reports.

2/ Penicillin doses average 1.25cc's per injection. This includes yaws infectious and non-infectious cases, contacts and persons treated under the Juvenile Mass Treatment guidelines.

## ANNEX

This evaluation of the Yaws/Yellow Fever project occurred between December 2-17, 1982 and involved two CDC evaluation team members in Accra on TDY, with technical and support staff of USAID/Ghana and the Ministry of Health, Epidemiology Division. Below is a summary of person days devoted to this effort:

CDC Evaluation Team (2)	10 person days each
USAID Health Officer (1)	5 person days
USAID Evaluation Officer (1)	2 person days
USAID Acting Director/Program (1)	2 person days
USAID Clerical Support Staff (4)	3 person days each
MOH driver and vehicle/petrol	10 person days
MOH Technical Staff (2)	5 person days each
CDC Team travel from U.S. to Accra and return:	\$1900 x 2
CDC Per Diem in Ghana	\$176 per day x 17 days