CLASSIFICATION

PROJECT EVALUATION SUMMARY (PES) — PART I

Report Control Symbol U-447

1. PROJECT TITLE	2. PROJECT NUMBER	3. MISSION/AID/W OFFICE
Expanded Program for Immunization	698-0410.29	OAR/Rwanda 002462

4. EVALUATION NUMBER (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) RWA-EVA-83-1

Final

[X] REGULAR EVALUATION [ ] SPECIAL EVALUATION

5. KEY PROJECT IMPLEMENTATION DATES	6. ESTIMATED PROJECT FUNDING ($000)	7. PERIOD COVERED BY EVALUATION
A. First PRO-AG or Equivalent FY 80	A. Total $ 1,174	From (month/yr.) 8/79
B. Final Obligation Expected FY 84	B. U.S. $ 450	To (month/yr.) 6/83
C. Final Input Delivery FY 84		Date of Evaluation Review 6/18/83

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
See attached Executive Summary and translation of evaluation report		

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS

- [ ] Project Paper
- [ ] Financial Plan
- [ ] Logical Framework
- [ ] Project Agreement
- [ ] Implementation Plan e.g., CPI Network
- [ ] PIO/T
- [ ] PIO/C
- [ ] PIO/P
- [ ] Other (Specify) _____
- [ ] Other (Specify) _____

10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT

A. [ ] Continue Project Without Change

B. [X] Change Project Design and/or [ ] Change Implementation Plan — PACD Extended to 2/28/84

C. [ ] Discontinue Project

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

Alan V. Getson
Health Development Officer

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12. Mission/AID/W Office Director Approval

Signature: Norman L. Olsen

Typed Name: Norman L. Olsen

Date: 9/19/83

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Executive Summary

Evaluation of the Expanded Program for Immunization - (698-0410.29)

I. What constraints does this project attempt to overcome?

Rwanda, like most developing countries, has high rates of preventable childhood diseases such as polio, tetanus, measles, whooping cough, tuberculosis and diphtheria. Some of these diseases (measles, whooping cough and tuberculosis) are still among the ten leading causes of morbidity in this country. The primary constraint addressed by this project was the lack of an effectively organized national immunization program including a lack of trained personnel, an insufficient cold chain and a weak to non-existent system for the distribution of vaccines. This situation resulted in very low levels of immunization coverage throughout the country.

II. What technology did the project promote to relieve this constraint?

Through joint financing (AID, GOR, WHO, UNICEF), this project provided a combination of technical assistance in the development and management of a national immunization program, training of health personnel at all levels, commodity inputs - vehicles, cold chain equipment, vaccines and operational support for fuel and vehicle maintenance/repair and spare parts.

III. What technology did the project attempt to replace?

Prior to the development of this project, GOR efforts at developing a national immunization program could be characterized as disorganized and ineffective due to the lack of elements discussed in item II above. Early GOR vaccination efforts suffered due to insufficient personnel, equipment and vaccines and other types of logistical problems. In addition, there were frequent problems with vaccine distribution and spoilage.

IV. Why did the project planners believe the intended beneficiaries would adopt the proposed technology?

Project planners had sufficient experience both in Rwanda and other developing countries to believe that the proposed technology (basic immunization services) would be readily adopted once a well-organized system of vaccination services was developed. The encouraging results of this project have confirmed this belief.

V. What characteristics did the intended beneficiaries exhibit that had relevance to their adopting the proposed technology?

High morbidity rates due to target childhood diseases provided sufficient motivation to parents to bring their children to vaccination centers for immunization.

VI. What adoption rate has this project achieved in transferring the proposed technology?

The project hoped to achieve a total immunization coverage of 30% by the fifth project year (1983). The evaluation team estimated that a total coverage of 21% had been achieved. However, the team also noted that coverage rates for specific immunizations such as measles and BCG greatly exceeded the original objectives. For example, the vaccination objective for measles was 30% but the evaluators noted that approximately 53% coverage had been achieved. Similarly for BCG, 30% coverage was expected but 49% had been achieved.

VII. Has the project set forces in motion that will induce further exploration of the constraint and improvements to the technical package proposed to overcome?

With assistance from this project, the GOR has established a greatly improved national immunization program including manpower, training, equipment and drugs necessary to continue and expand the services available. In view of the positive results of this project, there is strong evidence to indicate that the project can be expanded to achieve greater coverage. However, it is also clear from the evaluation that the GOR will be unable to maintain or expand this project without continued donor assistance.

VIII. Do private input suppliers have an incentive to examine the constraint addressed by this project and to come up with solutions?

A major part of the health system in Rwanda is organized, managed and financially supported by private missionary groups. These groups are already included in the national immunization program. Since immunization services are regarded as primarily public health services, there is a feeling among both the public and private health care providers that such services are the responsibility of the GOR. In view of this, there would not be much incentive for the private sector to become more actively involved.

IX. What delivery system did the project employ to transfer technology to intended beneficiaries?

The immunization program in Rwanda uses a delivery system which is a combination of vaccinations given in fixed health facilities and outreach services. Vaccinations are given in more than 150 fixed health facilities. In addition approximately 70 vaccinators are employed and assigned to various facilities. These vaccinators also provide outreach services to distant communes.

X. What training techniques did the project use to develop the delivery system?

The project utilized a combination of formal training and in-service education to develop the immunization program delivery system. The formal training followed standard WHO, EPI training curricula. 27 physicians received advanced EPI management and administration training, 25 nurses attended the EPI intermediate training program and more than 350 health center personnel including vaccinators attended 1-2 day in-service training programs held in every prefecture.

XI. What effect did the transferred technology have upon those impacted by it?

Rwanda is beginning to experience significant reductions in the number of reported cases of childhood diseases, particularly measles and whooping cough. The evaluation team was confident that these changes were due to the national immunization program. However, the team was cautious in noting that increased immunization coverage and a more detailed study would be required to provide a

definitive confirmation of the observed decreases noted in the incidence of selected childhood diseases in Rwanda.

UNOFFICIAL TRANSLATION

EVALUATION REPORT

OF THE

EXPANDED PROGRAM OF IMMUNIZATION IN RWANDA

May 30th to June 18th, 1983

by:

the Government of Rwanda

WHO

UNICEF

USAID (CDC)

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1. INTRODUCTION

At the request of the Government of Rwanda, a joint committee of representatives from the Government, WHO, UNICEF and USAID evaluated the Expanded Program of Immunization in Rwanda from May 30th to June 18th, 1983.

The committee consisted of seven members, three of whom were from Rwanda, two from the WHO, one from UNICEF and one from USAID.

The evaluation took place five years after the establishment of the EPI in Rwanda.
The study methodology consisted of:
1.1. The study of reports and documents on EPI and other services of the Ministry of Public Health.
1.2. Discussions with officials involved with the EPI.
1.3. Study of the immunization coverage using the method of preselected sample groups as recommended by the WHO.
1.4. Visits to a certain number of EPI units at the local level.
1.5. Study of EPI impact on the morbidity and mortality of the six target diseases.

2. BACKGROUND INFORMATION

2.1. General Information on the Country

2.1.1. Geographical Situation

Rwanda is a country with an area of 26,338 Km^2 located in central Africa. It lies 1,200 km from the Indian Ocean and 200 km from the Atlantic Ocean (as the crow flies). In the north it borders on Uganda, in the south on Burundi, in the east on Tanzania, and in the west on Zaire.

2.1.2. Population

The country has 5,562,744 (1982) inhabitants, or 204 per Km^2.
Of this population:
- 5.27% are children aged 0 - 11 months,
- 13.90% are children aged 1 - 4 years,
- 26.38% are children aged 5 - 14 years.

The infant mortality rate is 143 . The birth rate is 51.1 and the growth rate is 3.57%.

2.1.3. Economy

The economy is primarily agricultural and divided into two subsections:
a) Food production, dominated by the cultivation of bananas, beans, sweet potatoes, manioc and potatoes.
b) exportation: essentially involving coffee, tea, and cinchona.
Aside from agriculture, the raising of livestock and mineral exploitation (cassiterite, tungsten) are developing.

2.1.4. Transportation and Communication

Transportation and communication are, for the most part, carried out over land. There is a total of 8,000 km of roads, of which 400 km are paved.

Despite this network, the majority of the population remains virtually impossible to reach. This is because of:

- dispersed habitats
- uneven land relief
- numerous very badly broken portions of the road, especially during the rainy season.

Buses, mini-buses and small trucks, both public and private, are used as means of transportation.

2.1.5. Politico-Administrative Organization

Politically, Rwandans belong to the National Revolutionnary Movement for Development, in which membership is a right.

Administratively, the country is divided into ten Prefectures, which are subdivided into Communes (143), which are further subdivided into Sectors. The smallest administrative unit is the Cell, a component of the Sector, which consists of an average of 50 households.

2.1.6. Health Infrastructure

	Public	Private	Total
Hospitals	13	16	29
Health Centers	57	70	127
Dispensaries	75	24	99

The total number of beds is: 4,440 for hospitals
3,185 for the remaining health units.

2.1.7. Medical and Paramedical Personnel

	Rwandan	Expatriates	Total
Doctors	132	62	194
Medical Assistants	276	2	278
A2 Nurses	333	92	425
A3 Nurses	334	14	348
Male Nurses	74	4	78
Assistant Midwives	185	1	186
Assistant nurses	199	8	207
Immunization Technicians	73	1	74
Dentists	-	2	2
A1 Nurses	49	27	76
Pharmacists	6	1	7

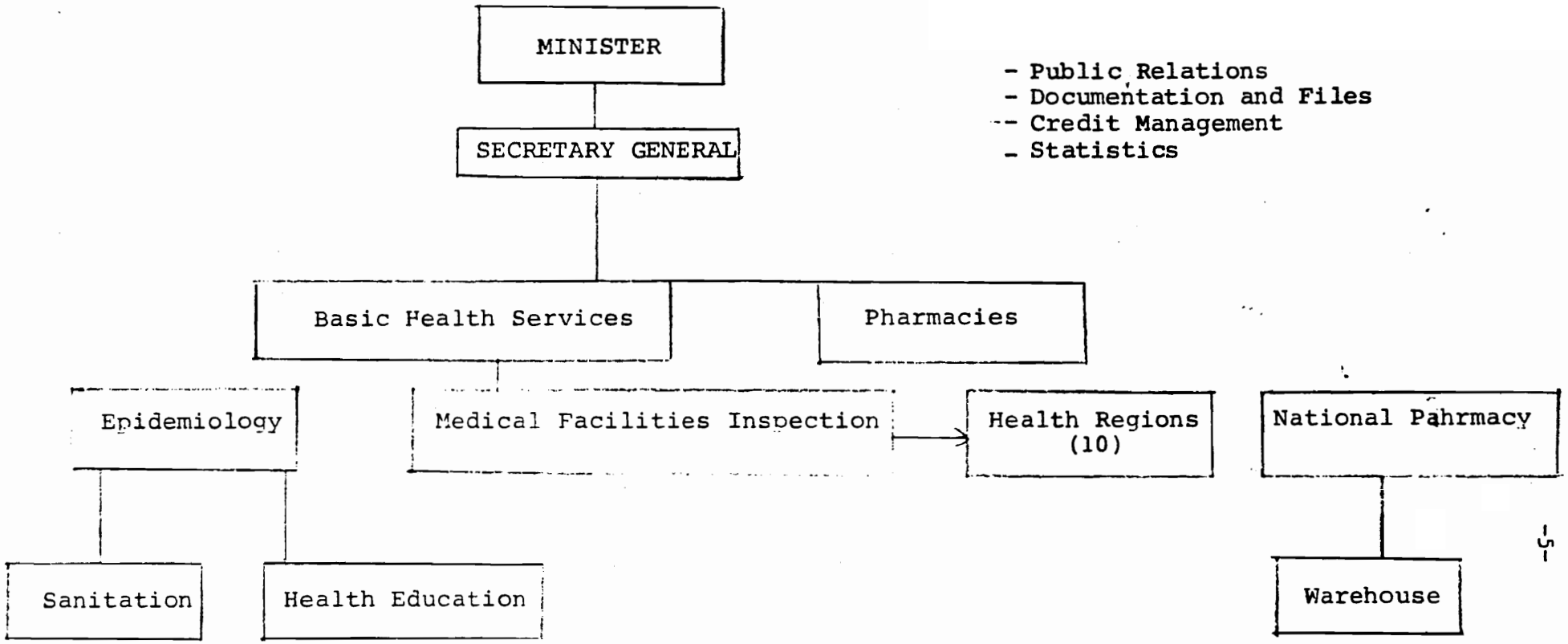
2.1.8. The ten principal causes of morbidity for 1982

Diseases	Number of Cases
Malaria	190,863
Diarrheal Diseases	87,359
Influenza	68,513
Pneumonia	46,092
Measles	36,792
Gonorrhea	23,046
Chicken Pox	14,199
Whooping Cough	11,857
Tuberculosis	6,573
Recurrent Fever	5,260

2.1.9. Evolution of the Budget of the Ministry of Public Health/National Budget

Budget Year	Ministry of Public Health	National	%
1978	533,107,212	6,643,412,000	8
1979	580,037,192	9,214,319,000	6.4
1980	718,386,236	11,976,056,673	6.1
1981	836,708,364	14,459,400,000	6
1982	829,977,086	16,240,100,000	5.1

2.1.10 Organizational Chart of The Ministry of Public Health



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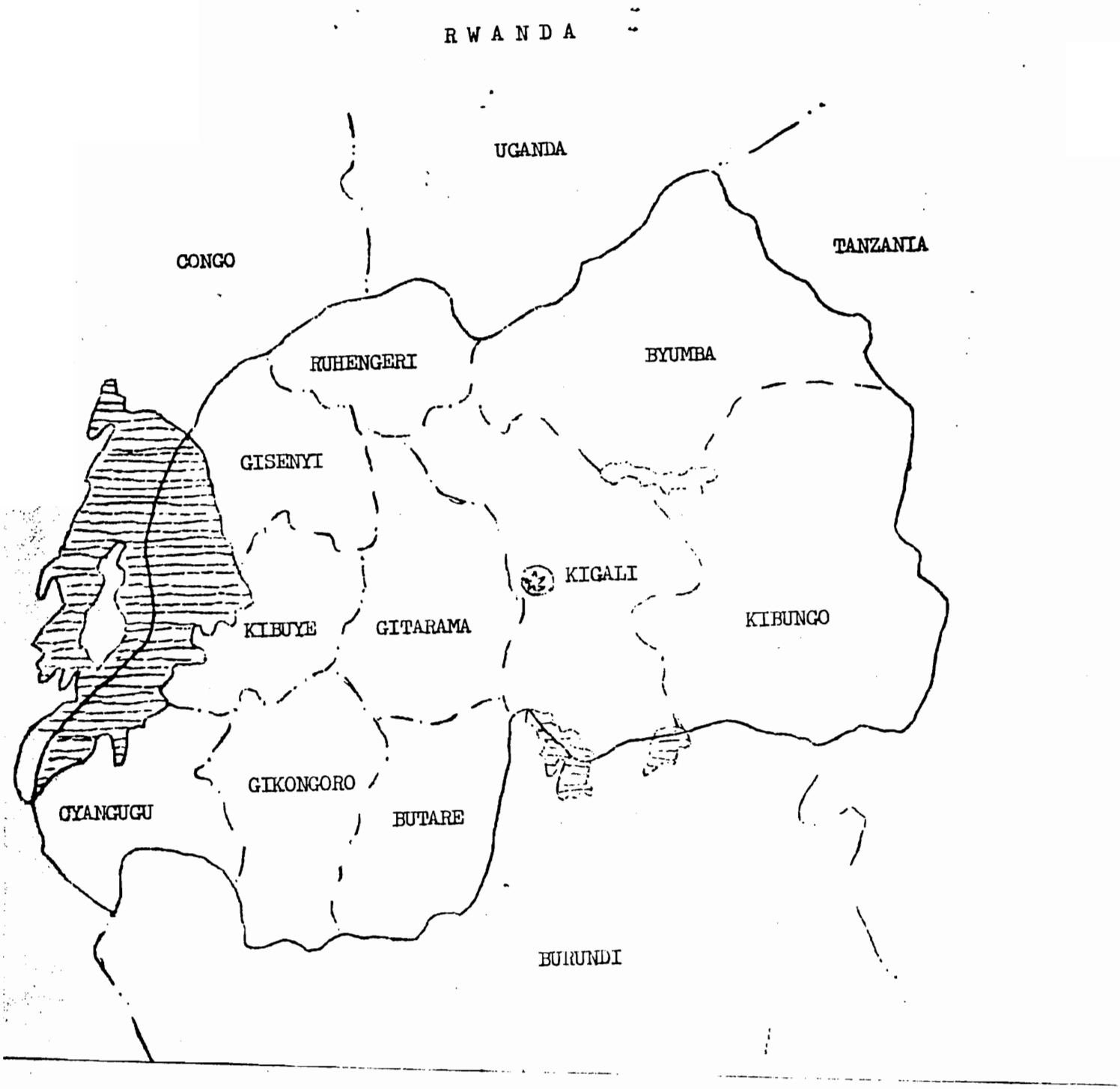

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2.2 PRESENTATION OF THE EXPANDED PROGRAM OF IMMUNIZATION

2.2.1. History

The EPI in Rwanda evolved considerably before arriving at its present form. The following should be noted:

- the great impact left on the country by the campaign to erradicate small pox, as well as the following dates:

- 1968 - 1969: numerous efforts to vaccinate against polio, whooping cough, tetanus and diphtheria which suffered from logistical problems and problems related to the conservation of the vaccine.

- 1974 - 1975: experimental vaccination against measles, the results of which were disappointing: children who had been vaccinated caught the disease (faulty conservation of the vaccine).

- 1977: the Rwandan government requested the agreement of WHO and UNICEF for the establishment of a program targeting polio, tetanus, measles, whooping cough, tuberculosis and diphtheria for children aged 0 to 6, as well as tetanus for pregnant women.

- 1978: The training of personnel and the setting up of a centralized organization on the national level. The EPI becomes operational.

2.2.2. Objectives

The EPI is planned to achieve the following for total vaccination coverage:

1st	year	of	the	program:	1978	rate	of	coverage	= 5%
2nd	"	"	"	" :	1979	"	"	"	= 10%
3rd	"	"	"	" :	1980	"	"	"	= 15%
4th	"	"	"	" :	1981	"	"	"	= 20%
5yh	"	"	"	" :	1982	"	"	"	= 30%
6th	"	"	"	" :	1983	"	"	"	= 40%
7th	"	"	"	" :	1984	"	"	"	= 50%
8th	"	"	"	" :	1985	"	"	"	= 60%
9th	"	"	"	" :	1986	"	"	"	= 70%
10th	"	"	"	" :	1987	"	"	"	= 80%

2.2.3. Program Resources

a) Personnel: - 2 doctors having completed the advanced EPI course (management and administration)
- 10 medical male nurses (intermediate EPI course)
- 1 principal male nurse (intermediate EPI course)
- 1 A2 nurse
- 74 vaccinators
- 12 drivers

b) Finance: - the EPI project is financed jointly by the Rwandan Government, WHO and UNICEF. Since June 1981, the project has been supported by USAID.

- effective budget:

1982:	1983:
3,962,120 FRW	4,087,340 FRW

c) Equipment:

c.1. Transportation: the EPI has available:

- 40 Honda motorcycles in stock
- 9 Toyota Stouts (3 built in 1980 and 6 in 1982)
- 1 1979 Land Rover, long wheel-base
- 1 1981 Suzuki Jeep
- 1 1982 Toyota Corolla
- 230 bicycles

c.2. Cold Chain

- Kerosene refrigerator RAK 36	= 140
- Kerosine refrigerator RAK 66	= 91
- electric refrigerator	= 12
- freezer	= 6
- portable ice-chest, large	= 37
- portable ice-chest, small	= 177

c.3. Other

- surgical cases	- 210
- megaphones	- 140
- typewriters	- 5

2.2.4. Activities and Results

a) Immunization Coverage

The immunization activities of the EPI from 1980 to 1982 are presented in Table 1.

b) Training and Recycling

The EPI has trained:

- 18 doctors and 5 EPI supervisors (advanced EPI course on management and planning) in December, 1982,
- 25 vaccinators and EPI supervisors (intermediate EPI course on management and planning) in March, 1982.

The vaccinators and those in charge of medical training were trained.

CHART FOLLOWS (Table 1)

ORGANIZATIONAL CHART FOLLOWS

3. EVALUATION OBJECTIVES

The objectives assigned to the Evaluation Committee were the following:

- to evaluate the administrative and financial management,
- to evaluate the cold chain and the management of vaccines,
- to recommend improvements in the EPI in Rwanda.

Table n° 1 Vaccinations carried out over the past 3 years

Vaccin / Year	BCG	POLIO				D.T.COQ				Measles	Tetanus for pregnant women	
		1st dose	2nd dose	3rd dose	Booster	1 dose	2 dose	3 dose			1st dose	2nd dose
1900	251.536	113.856	65.900	45.159	62	124.738	70.070	40.391	544	169.404	28.818	13.265
1901	302.507	259.899	175.902	129.956	5.294	254.347	175.337	126.826	6.499	237.957	50.500	20.170
1902	379.662	295.253	190.934	144.918	29.636	317.005	227.336	171.173	34.276	287.964	77.651	36.820
Total	1013.705	669.008	440.736	320.033	34.992	696.090	472.743	346.390	41.319	695.405	157.049	70.263

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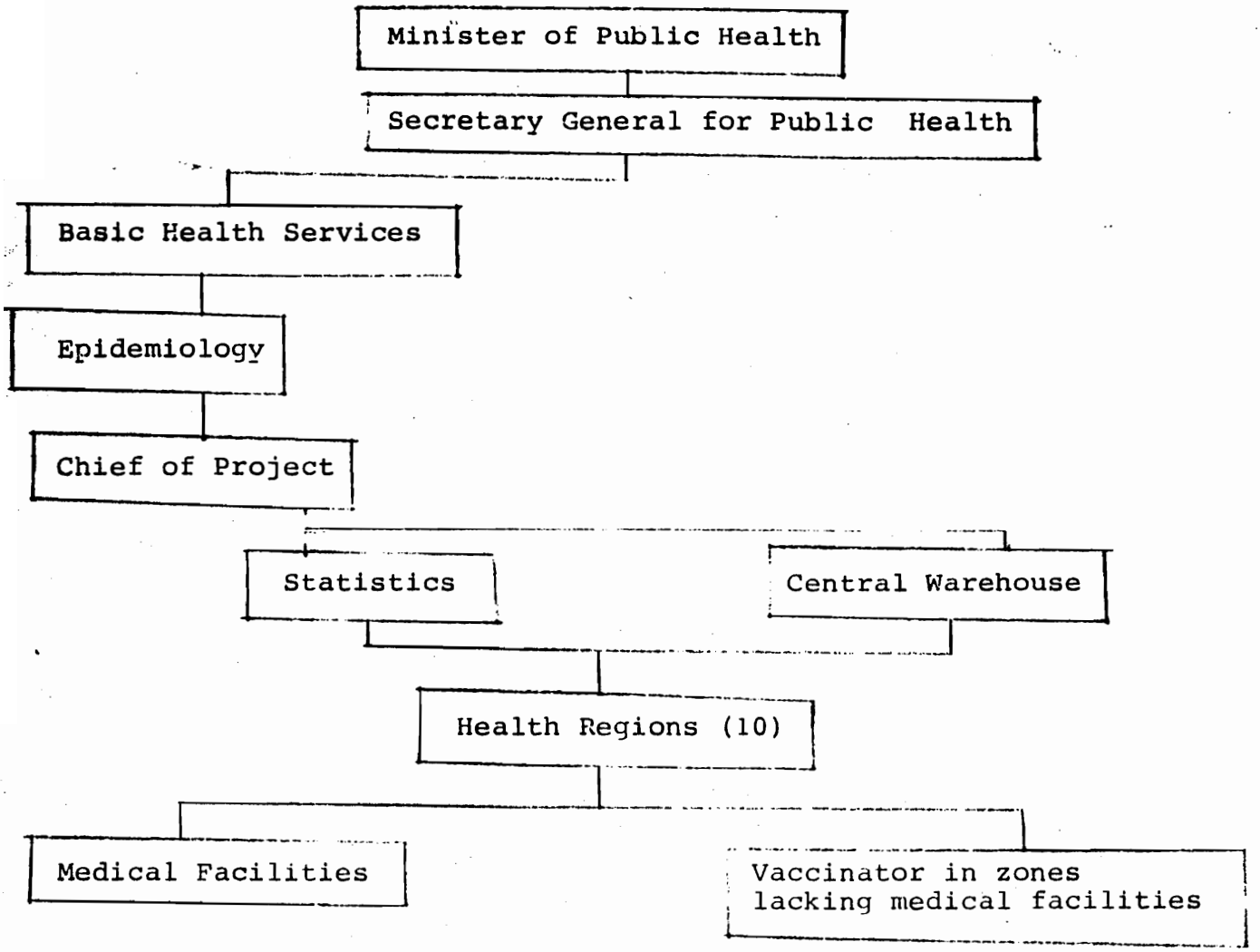
2.2.5. Organizational Chart of the E.P.I.

This project is integrated with the Department of Epidemiology and is directed by a government doctor.



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4. EVALUATION METHODS

Two independent approaches were adopted:

1) To interview participants in the program at all levels. At the same time, an inspection of program materials was carried out. A questionnaire (Annex 2) was developed to gather of a certain amount of evaluation information.

2) An evaluation of the immunization coverage was carried out by committee members, using the WHO preselected sample group method. Due to the difficult terrain in the country, the sample may have been slightly biased. However, the methodology used is the same one the country used during the preceding evaluation. Simultaneously, a number of questions concerning the program were asked of mothers of children included in the preselected sample group.

5. EVALUATION RESULTS

5.1. Administration and Management

Central Level

At present the EPI in Rwanda is feeling the lack of a core staff which should, in the long run, assure continuity under the direction of the National Director for Epidemiology. Right now the EPI does not have a doctor who could take care of the program on a fulltime basis. The EPI also lacks a manager/accountant and a suitable secretary. The EPI is also working without suitable office space.

PERIPHERAL/INTERMEDIATE LEVEL

Recently a number of supervisors seem to have been promoted or transferred to other regions. A certain stability seems indispensable for the correct running of activities.

SUPERVISION OF THE HEALTH UNITS/VACCINATORS

The committee members noted that the gasoline ration was generally insufficient to allow the EPI supervisor to regularly visit the health units for which he is responsible. One of the causes of this situation is that the type transportation available is inefficient (vehicles are too large). For example, Gisenyi has 400 l of gasoline available per quarter, or a range of 20 Km a day.

WORK/SUPERVISION PLAN

The supervisors of the EPI have not always worked out a systematic surveillance plan from which it would be possible to work out a budget. The lack of supervision results in the under use of a number of centers and/or vaccinators. A maximalization of existing resources should allow an increase in the immunization coverage.

We noted that a regional supervisor in training outside the country had not been replaced temporarily during his absence..

The committee heard complaints concerning the slow reimbursement of authorized supervisory staff daily expenses. It is obvious that a certain time period is needed for this reimbursement, since the Ministry of Public Health and the Ministry of Finance are involved. However, delays of four months, six months and one year, not to mention four years seem unacceptable and do not contribute to the motivation of a supervisor. In the same way, vaccinators do not always receive prompt reimbursement of their expenses which also causes motivation problems.

5.2. Program Operations

5.2.1. Cold Chain

a) Central Level

The chief of stock is responsible for the control of refrigerated material. Kigali's central depot is temporarily located in a wide room of about 100 m^2, and in two small rooms of approximately 50 m^2. The area is sufficient for stocking vaccines, equipment and detached pieces. The program will have to be moved to another temporary location before being set up at its permanent location at the OPHAR (National Pharmacy of Rwanda) in the three years.

The vaccines are stored in five Philips freezers, which have a net storage capacity of 2.3m, and in four Philips/Electrolux refrigerators having a total capacity of about 1,500 liters at $+4^{o}C$ and 150 liters at $-20^{o}C$. Meales and polio vaccines are kept in the freezers at temperatures varying from -15° to -24.5^{o}. The surrounding temperature is $+28^{o}$.

Tuberculosis, tetanus, dipheteria and whooping cough vaccines are stored at correct temperatures, that is above $0^{o}C$ and below $+8^{o}C$. However, the temperatures noted in the refrigerators were not uniform (between $+0,5^{o}C$ and $+6.6^{o}C$).

Each refrigerator and freezer has attached a sheet indicating the temperatures noted twice a day. The annotation of these sheets is up to date.

At this time the repairs of broken-down refrigerators are undertaken by the private sector. The position of the refrigerators and freezers is constistent with the specifications of the EPI (a minimum of 15 cm between the appliance and the wall, and 30 cm from one appliance to another). The placement of the boxes of vaccines within the refrigerators and freezers also meets EPI requirements. It was noted that five freezers and freezer compartiments in refrigerators have a variable amount of cold packs necessary for the transportation of vaccines from the central to the regional depots.

b) Regional Level

b.1. Personnel

The EPI supervisor of a health region is in charge of supervising the conservation of vaccines. In eight cases out of ten, this person has an assistant available.

b.2. Equipment

With the exception of two, all the centers are equipped with electric Philips/Electrolux refrigerator/freezers. The electricity was found to be stable. Measures to be taken in the event of extended electricity failure are adequate. Only one center does not have an independent refrigerator, and one center has a refrigerator running solely on kerosene. The equipment is not systematically locked up. It is defrosted regularly.

The cold packs are stocked in the freezers to be exchanged for new ones when the vaccinator comes to change the vaccines.

Each appliance has a thermometer. The temperature is taken twice a day, but is not recorded on a graph, which has in the past prevented the documentation of accidents.

No refrigerator had a organized temperature stabilizing system. This system, which consists of a cold pack, permits the absorbtion of temperature changes which are too rapid, toward the top as well as toward the bottom, especially since the daytime/nightime changes are very important in certain areas.

c) Peripheral Level

c.1. Personnel

Generally one person is designated to maintain the refrigerator but this is done rarely. An assistant is assigned to this task, especially in the certified centers, where special problems come up when the person in charge goes on vacation.

c.2. Equipment

In the peripheral areas the refrigerators used are generally Electrolux RAK 36 or 66, running on kerosene. Usually the kerosene is furnished by the Regional Office. Average consumption goes from 12 to 20 litres per month. On the whole, the majority of the refrigerators had a properly burning flame.

c.3. Observed Temperatures

At the time of the visit, the temperatures noted were from $-1^{o}C$ to $+ 14^{o}C$. 10 out of 16 refrigerators had adequate temperatures ($+4^{o}V$ to $+ 8^{o}C$). Two refrigerators were out of order at the time of the visit.

c.4. Thermometers and Graphs of Temperatures

23 out of 31 centers had a temperature gauge available. Certain thermometers were not properly calibrated. Only three centers had data available on observed temperatures in their refrigerators over the past months. One of them noted descending temperatures to -4°C without the vaccines being frozen at that time.

c.5. Location of Refrigerator

Generally the refrigerators are well-placed. The most frequent problem is the lack of a correct level.

c.6. Placement of Vaccines

In 22 out of 28 cases, the vaccines were arranged according to standards. In two dispensaries the diphtheria-whooping cough vaccines were in contact with the frost of the freezer. In 5 out of 27 dispensaries the vaccines were not placed in order of their arrival. We found products other than vaccines in 4 out of 29 refrigerators. Despite their correct location, certain refrigerators did not have adequate temperatures.

c.7. Vaccines Carriers

Each center has one vaccine carrier available and at least four cold packs. The most frequently encountered model is the "Philipines" type, of which the water-tightness left something to be desired. The other centers had King Sealy's. Some centers are still working with classic thermos bottles. Only two centers did not have the physical means to freeze their cold packs.

c.8. It was observed several times during immunization sessions that the opened vaccine bottle was placed on a cold pack. This is an extremely inefficient system.

c.9. At least two refrigerators were broken at the base of their frames. This occurence seems to lead to an abnormally frequent breakage of glass.

c.10. Only one out of the 31 centers visited had these problems directly related to the quality of its kerosene. In this case, the flame had gone out on its own.

5.2.2. Immunization Sessions

All of the 31 health centers visited have a fixed immunization program, 10 of which are coordinated with general medical consultations, and 23 with special consultations and MCH. Units which can precisely determine their target population are rare. 17 of the 31 Health Centers visited have a mobile immunization program. Overall, 24 out of 31 units coordinate immunization services with other services.

In general, the majority of centers which have integrated immunization services have a set schedule, but the number of immunization hours per week is far from being uniform. Health personnel advise mothers of the place and date of immunization through sector and cell chiefs, and through religious authorities.

Immunization sessions start with health education in small groups for 15 to 20 minutes. The immunization sessions are carried out in the shade, with the mothers either sitting down or josting one another around the vaccination table.

The vaccines are protected from the light, and vaccinations are carried out with syringes. Sterilization of equipment is done for the most part by boiling and sometimes using a sterilizing solution such as alchohol.

The age of the child to be vaccinated is determined by either the statement of the mother, or by the presentation of an ID card, or by an examination of the child's teeth, his weight or his psychomotor development, or by referring to the seasons and the agricultural activities in the area. The vaccinations carried out are recorded on a daily vaccination list. A vaccination slip is given to the mother, but certain centers keep the slip until the complete immunization has been accomplished. Some vaccinated children are numbered and registered, but others are not recorded in any way. At the close of the vaccination sessions, the vaccines opened during the day are destroyed in 65% of the centers visited.

In general, personnel use the following immunization schedule:

- BGG at birth
- polio and diphtheria-whooping cough at 3 months, with a minimum interval of 4 weeks
- measles at 8 months, but some groups vaccinate at 6 months and revaccinate at 9 months

Type of Vaccine and Immunization Technique Used

1)	BGG	GLAXO	005ml: 0 - 1 month
2)	Polio	Institute of Immunology Virology Belgrade, Yugoslavia	intradermic 0.1, 1 yr 2 drops per 05
3)	Measles	Rimerax Rit	0.5cc deep subcutaneous
4)	Diphtheria and Tetanus	Institut Serotherapie Vaccinal Berne	0.5cc IM

5.2.3. Health Education

There are health education sessions all the EPI health centers visited. It is carried out before nutrition and health consultations, and vaccinations. The sessions take place in an informal discussion led by health center personnel, and last 30 to 60 minutes.

The following subjects are treated:

- vaccinations: advantages and possible complications,
- the necessity of completing the total series of primary vaccinations to protect the child,
- dispelling rumors such as one which is that vaccinations will sterilize mothers and children,

- the seriousness of the six diseases preventable by immunization,

The personnel use posters in the national language and WHO posters for educational support; slides provided for EPI course have never been used.

Besides health education in these health centers, there is also the sensitizing of the population by administrative and political authorities during sector and cell meetings, and by religious authorities during services.

Sometimes personnel use negative sanctions, such as having mothers who have not had their children vaccinated pay more for medical consultations when these children are stricken with one of the EPI target disease or by having a mother who does not show up for an appointment be summoned by the cell chief.

5.2.4. Training of Personnel

- Table no. 2 synthesizes the training and in-service education results of Rwandan personnel in EPI management and planning.

- The investigation carried out in the field shows that 58% of the personnel in charge of immunizations had access to in-service education.

- After several transfers, a regional EPI supervisor was unable to follow the intermediate EPI management and planning course.

- At the health center level, a good portion of the personnel in charge of immunizations is poorly trained in the management of cold chain equipment, in the correct organization of immunization sessions, and in the correct management of vaccination materials.

- health center personnel are not very informed on EPI directives and on disease surveillance.

CHART FOLLOWS (Table No. 2)

5.2.5. Evaluation of the Immunization Coverage

5.2.5.1. Methods

The study of the evaluation of the immunization coverage was carried out using three analyses:

- an evaluation of the immunization coverage by the committee in the field,

- the study of the results of the immunization coverage by the person in charge of the April, 1983 Rwandan project,

Table no. 2 Training and Recycling of Rwandan Health Personnel

Type of Training	Date and Place	Length of Time	Number of Rwandan Participar
1. Advanced EPI management and planning course	Alger 1978	2 weeks	2
	Brazzaville 1980	2 weeks	1
	Rwanda - Dec. 1980	2 weeks	23
2. Intermediate EPI management and planning course	Rwanda - Mar. 1982	2 weeks	25
3. Operational training and medical training, including vaccinators	Kibungo 1980	2 days	22
	Butare 1980	1 day	25
	Cyangugu 1980	2 days	35
	Kibungo 1980	1 day	18
	Gisenyi 1981	2 days	30
	Kibuye 1981	1 day	21
	Butare 1982	2 days	35
	Gitarama 1982	3 days	28
	Byumba	1 day	29
	Gokongoro 1982	1 day	23
	Kigali 1983	1 day	44
	Kigali 1981 - 1982	2 days	± 60 people from certified medical centers

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- the analysis of the theoretical immunization coverage (0 - 11 months) in 1982.

The evaluation of the immunization coverage by the committee was done on a sample of 30 groups randomly chosen from a cumulative population in all the sectors of Rwanda.

The sample of the population studied consists of children aged 12 to 23 months at the time of the investigation, therefore apt to have received a complete series of primary vaccinations.

Each group included at least seven target children. The immunization status of each child was recorded from vaccination certificates and the BGG vaccination scar.

The seven committee members were split into three teams; each team was to study 10 groups.

The results of the immunization coverage in Rwanda in April, 1983 have been analyzed in documents on the methodology used in the choosing of study groups and households and in the recording of data; on the quality of the investigators, on the means by which data was treated, and on its interpretation.

The study of the theoretical immunization coverage was accomplished by dividing the number of subjects vaccinated from 0 - 11 months for each type of vaccine by the population in this age bracket.

This study was carried out solely for 1982, since we do not have vaccinated subjects divided by age-bracket for other years.

We completed our study of the immunization coverage with a very thourough study of four cells of Busoro in the Butare prefecture (200 families).

5.2.5.2. Results

a) Immunization Coverage

Household Visited: The total number of households visited was 854, which represents 28 households per group; there were between 10 and 27 households per group. Most of the teams remained in the field for an average of three hours to complete the selection of a group.

Number of Children Vaccinated: A total of 212 children having reached the age of 12 to 23 months was recorded; 28 groups out of 30 (93%) included 7 children, and in 2 groups (7%) 8 children were recorded. 150 children (71%) were provided with vaccination certificates.

BGG Vaccination: The vaccinations in 127 children were confirmed by a vaccination certificate, that is 60% of the recorded children or 85% of the total number of children with vaccination certificates. The vaccination scar was present in 104 children, or 49% or the total number of children recorded.

Vaccination against Diphtheria, Tetanus (non neo-natal), and Whooping Cough: The required conditions for validity were:

- the first dose given after the age of 3 months
- at least a four-week interval between doses

All the vaccinations were confirmed by a vaccination certificate. The first diphtheria-whooping cough dose was given to 134 children, or 63% of the total number of children recorded, or 89% of the total number of children having vaccination certificates. The second dose of the vaccine was given to 98 children, or 46% of children having received the first dose.

The third dose was given to 75 children, or 36% of the total number of children having received the first dose, that is 78% of children having received the second.

Polio Vaccination: The same conditions of validity were required. All the vaccinations were confirmed by a vaccination certificate. The first oral dose of polio vaccine was given to 121 children, or 57% of the total number of children recorded, or 81% of the total number of children having vaccination certificates. The second dose was given to 82 children, that is 39% of the children having received the first dose. The third dose of the vaccine was given to 54 children, or 25% of the total number of children recorded, or 45% of children having received the first dose, that is 66% of the children having received the second.

Measles Vaccination: The required conditions for validity were one injection after the age of 8 months. 113 children received a dose of measles vaccine, that is 53% of all recorded children, or 75% of children with vaccination certificates.

Complete primary vaccination - The following is required in order to have a completed primary vaccination series:

- One BCG dose
- 3 doses of diphtheria-whooping cough, with 4 weeks' interval between doses
- 3 doses of polio vaccine after 3 months, with 4 weeks' interval between doses
- one dose of measles vaccine after 8 months.

45 children, or 21% of all recorded children, or 30% of all children with vaccination certificates were completely vaccinated.

Vaccinations Carried Out	BCG	Diph/WhpnCgh			Polio			Measles	Completely vaccinate
Confirmed with a:		Dose I	Dose II	Dose III	Dose I	Dose II	Dose III		
Vaccination Certificate	127 (60%)	134 (63%)	98 (46%)	76 (36%)	121 (57%)	82 (39%)	54 (25%)	113 (53%)	45 (21%)
BCG vaccination scar	104 (49%)	-	-	-	-	-	-	-	-

Note: All the above mentioned required conditions are standard for the vaccination schedule functioning in this country.

b) Participation of the public

150 mothers were willing to answer questions posed to determine the reasons for their incomplete or non-participation at the immunization sessions.

- 39 mothers (26%) knew the dates of the immunization sessions
- 24 mothers (16%) found that the vaccination centers were too far away
- 18 mothers (12%) were absent with their children on the day of the vaccinations
- 16 mothers (11%) did not know or had not been informed that they had to have their children vaccinated several times
- 28-mothers (19%) indicated that their child had been ill on the day of the vaccinations
- 22 mothers (15%) stopped the vaccination series because the preceding vaccinations caused reactions (fever, abcess, edema) were cancelled either because vaccines were out of stock or because of the absence of the vaccinator
- 6 mothers (4%) indicated transportation difficulties.

Other reasons given by the mother were:

- mother was ill (9 cases= 6%)
- "I'm waiting for the next appointment"
- too much work, too much waiting, no motivation
- no program of immunization (7 cases = 5%)

c) Location of Vaccination Session

31 Health Centers were visited while the group selections were being carried out. It was noted that:

- 13 Health Centers (41%) had a fixed location
- 19 Health Centers (59%) had fixed and mobile location

To the question: "How far (minutes' walking) is the nearest dispensary from you?, 198 mothers (83%) answered the following:

- 6 mothers (34%) are less than a 30 minute walk from the dispensary
- 56 mothers (28%) are between a 30 and a 60 minute walk (5Km)
- 15 mothers (8%) say they are between a 60 and a 90 minute walk away (10 Km)
- 60 mothers (30%) are supposedly over 90 minutes away (over 10 Km)
- In total, 75 mothers (38%) are apparently over one hour away from the vaccination center, that is over 5 lm.

5.3. Discussion

The discussion will deal with the program vaccination objectives, specifically the results of the immunization coverage determined by the EPI committee, and of the thorough immunization coverage of one health center, and finally of the theoretical immunization coverage of children 0 - 11 months old in 1982.

a) The immunization coverage determined by the committee and the program objectives.

The object is to see whether, according to our results, the EPI in Rwanda has reached its objective concerning the immunization coverage for its fourth year.

Table No. 4. Evaluation of the Program's Coverage (committee)

Dose	Coverage Objective shown in %	Immunization Coverage Accomplished, shown in %.	Difference
BCG	30	49 (scar)	+ 19
P1	30	57	+ 27
P2	30	39	+ 9
P3	30	25	- 5
D1	30	63	+ 33
D2	30	46	+ 16
D3	30	36	+ 6
Measles	30	53	+ 23
Completely Vaccinated	30	21	- 9

This table shows that the EPI has gone beyond its objectives in immunization coverage for 1982. This is for all vaccine doses except for the 3rd administration of the polio vaccine, due to a supply disruption because of bad planning (November 1982). If, however, the total number of children completely vaccinated is considered, it can be noted that the EPI in Rwanda has almost reached its objective; indeed, the objective indicated is 30% for all vaccines, and the actual objective is 21%, or a difference of 9%.

b) Immunization coverage of the EPI in Rwanda and the program objectives.

The purpose of the chart is to judge the EPI in Rwanda with regard to the results of the immunization coverage in April, 1983.

Table N° 5 - Evaluation of the Immunization Coverage - April 1983

Doses	Coverage Objective Shown in %	Accomplished Immunization coverage in %	Difference
BCG	30	74 (certificate and scar)	+44
P1	30	60	+30
P2	30	49	+19
P3	30	41	+11
D1	30	66	+36
D2	30	52	+12
D3	30	45	+15
Measles	30	61	+31
Completely Vaccinated	30	34	+ 4

The results of the evaluation of the immunization coverage for April 1983 also indicate that the EPI in Rwanda has gone beyond its objective for each type of vaccine and even for total immunization.

c) "Comparison" of the two Immunization Coverages

The results of the immunization coverage of the EPI in Rwanda are superior to those of the committee, with regard to second and third doses of polio, and to the diphtheria-whooping cough and measles.

This difference can be explained by the number of important polio vaccinations which were cancelled because of a supply disruption of polio vaccine due to poor planning.

Indeed, there was a scarcity of polio vaccine from November to December, 1982, and the ration of polio vaccines planned for most of January 1983 was not delivered until May, 1983.

Table n° 6 "Comparison" of Immunization Coverages

Type of Immunization coverage	Number of Children Vaccinated	Vaccination Certificates		BCG	Polio			Diphtheria Whooping Cough			Measles	Completely Vaccinated
		No. with	No. without	%	P1	P2	P3	D1	D2	D3		
EPI April 1983	212	73	27	74 Scar Certificate	60	69	41	66	52	45	61	34
Committee June 1983	212	71	29	49	57	39	25	63	46	36	53	21
Difference		+2	-2		+3	+10	+16	+3	+6	+9	+8	+13

d) Theoretical Immunization Coverage (1982)

Table n° 7

Vaccinated Subjects	BCG	Polio			Diphtheria-Whooping Cough			Measles
Age		I	II	III	I	II	III	
0 - 11 Months	154,573 53%	138,491 47%	96,594 33%	70,783 24%	152,613 52%	109,919 37%	81,962 28%	118,032 40%

In 1982 program objectives had already been passed for the 0 - 11 month age-group.

e) Thorough Coverage of the surrounding zone of a Health Center

This table shows that with a planned immunization program with a thorough census of the target population, a coverage varying from 85 to 90% can be obtained for all vaccines.

Immunization Coverage of 4 Cells of the Busoro - Butare Sector - 1983 - by thorough Census (200 families)

Table n° 8

Age	Vaccinated Child	Incomplete	Non-Vaccinated	Total	% Vaccinated
0 - 11 months	70	1	35	106	66%
1 year	88	4	5	97	91%
2 years	111	15	5	131	85%
3 years	77	2	12	91	85%
4 years	83	3	13	99	84%
5 years	92	9	10	111	83%
6 years	42	14	22	78	54%
1 - 6 years	493	47	67	607	81%

5.2.6. Epidemiological Surveillance

5.2.6.1. Method

The data concerning the Expanded Program of Immunization is compiled weekly using two standard forms for each health unit. These are collected by 23 peripheral epidemiological notification centers which forward them to the statistical service in Kigali via their regions. Only tuberculosis is reported monthly. Neonatal tetanus is not reported. During 1982, 96% of centers returned their forms each week or each month. Each week a bulletin is issued by the Statistical Service. On June 15th, 1983, the last available report was dated from the 10th to the 16th of April, 1983. The first data available dates from 1973. Data from three health-training levels was collected. Statistics from the pediatrics service of Kigali hospital concerning hospitalizations for neonatal tetanus were also obtained. Also requested was the opinion of health workers who had a long experience in the field.

5.2.6.2. Results

Table n°9 restates the rough data for whooping cough, measles and chicken pox, and uses it as an indicator to evaluate a possible change in the reporting of cases at the central level. The numbers given are from 1973 to 1982 in order to evaluate the annual differences.

The available data of certain centers is also presented.

TABLE N° 9. Number of Cases of 3 Diseases - Rwanda - 1973 - 1982

REGION	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983 6 mois
Measles											
Country	70.493	48.246	44.721	77.844	73.272	96.203	61.094	80.402	58.163	36.696	-
Dispensary 1	278	485	754	978	698	1.231	880	721	84	17	-
Dispensary 2	-	-	-	-	379	693	1.270	478	612	167	14
Dispensary 3								128 (8 months)	222	23	22
Whooping Cough											
Country	20.915	27.719	20.813	21.355	26.502	16.615	16.223	16.189	16.171	11.654	-
Dispensary 1	16	72	119	136	68	22	56	15	0	3	-
Chicken Pox											
Country	6.046	8.607	6.369	8.187	8.275	11.115	13.440	13.270	11.344	14.083	-
Dispensary 1	21	22	26	41	27	24	64	27	39	12	-

Source : Statistical Service, Ministry of Public Health; Mushishiro Dispensary - Gitarama; Kansi Dispensary - Butare; Cyanika Dispensary - Gikongoro.

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The difference in the reduction percentage of the number of cases for each year is shown in table10. The national incidence of disease is shown in table11. From 1978 to 1982, 5, 4, 7, 14 and 12 cases respectively of neonatal tetanus were hospitalized at Kigali hospital. It appears that neonatal tetanus is a rare disease in this country.

A nurse who had been working in Rwanda for 25 years in a rural dispensary and who had patients coming in frequently had never seen a case of neonatal tetanus, and only rarely seen a few cases of umbilical cord infections. The custom seems to be to use a new or boiled razor blade to cut the umbilical cord. In certain regions a poultice of leaves is applied to the umbilical cord, in others nothing at all is used.

5.2.6.3. Discussion

a) Measles - Whooping Cough

It is clear that the number of reported cases of measles and whooping cough has dropped at the national level as well as at the three control centers visited. The numbers obtained in 1982 are the lowest recorded since 1973. It is improbable that the change is due solely to the annual differences. The statistics coming from the three centers known for having a very active immunization program show an even greater drop. In the coming years we will be able to consolidate our opinion on this subject provided that the immunization coverage maintains its present level or improves.

For measles, since coverage is not uniform--going from well-covered regions (up to 90% of the children aged less than 1 year completely vaccinated) to others where the coverage is low-- little by little a critical density of susceptible children will form and the development of an epidemic spread will become apparent. The coverage resisting this spread will thin out, and the average age of the cases will probably rise at the same time.

The optimal effectiveness of the measles vaccine is 95%. In the field the vaccine is often given before the age of 9 months, which diminishes the conversion percentage during epidemics. We should therefore expect the appearance of a more or less large number of children who will have measles. Health officials should be prepared to explain this occurrence to the population to avoid their doubting the benefits of the vaccine.

b) Neonatal Tetanus

Only an investigation of a sample group could definitively confirm the impression that neonatal tetanus is not a major problem in Rwanda. It would be interesting to simultaneously evaluate the percentage of women having given birth at home, as well as the type care given to umbilical cord.

c) Distribution and Interpretation of Statistical Data.

Regional EPI officials are not automatically informed of epidemiological statistics for their areas. Nevertheless, a weekly summary of EPI diseases at least is possible at this level in the event of an abnormal high incidence of

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Table n°10. Number of Cases of Measles, Whooping Cough and the Percentage of Reduction of Reports Since the Introduction of the Immunization Program in the Country and for 3 Dispensaries

		1980	% Reduction	1981	% Reduction with preceding year	1982	% Reduction with preceding year
Measles	Country	80.402	-	58.163	27.7	36.696	42.1
	Dispensary 1	721	-	84	88.3	17	79.7
	Dispensary 2	478	-	612	-	167	72.7
	Dispensary 3	-	-	222	-	23	89.6
Whooping Cough	Country	16.189	0	16.171	0	11.654	27.9
	Dispensary 1	15	73	0	100	3	-

Source : Annual Reports from the Ministry of Public Health 1980 - 1981 - 1982

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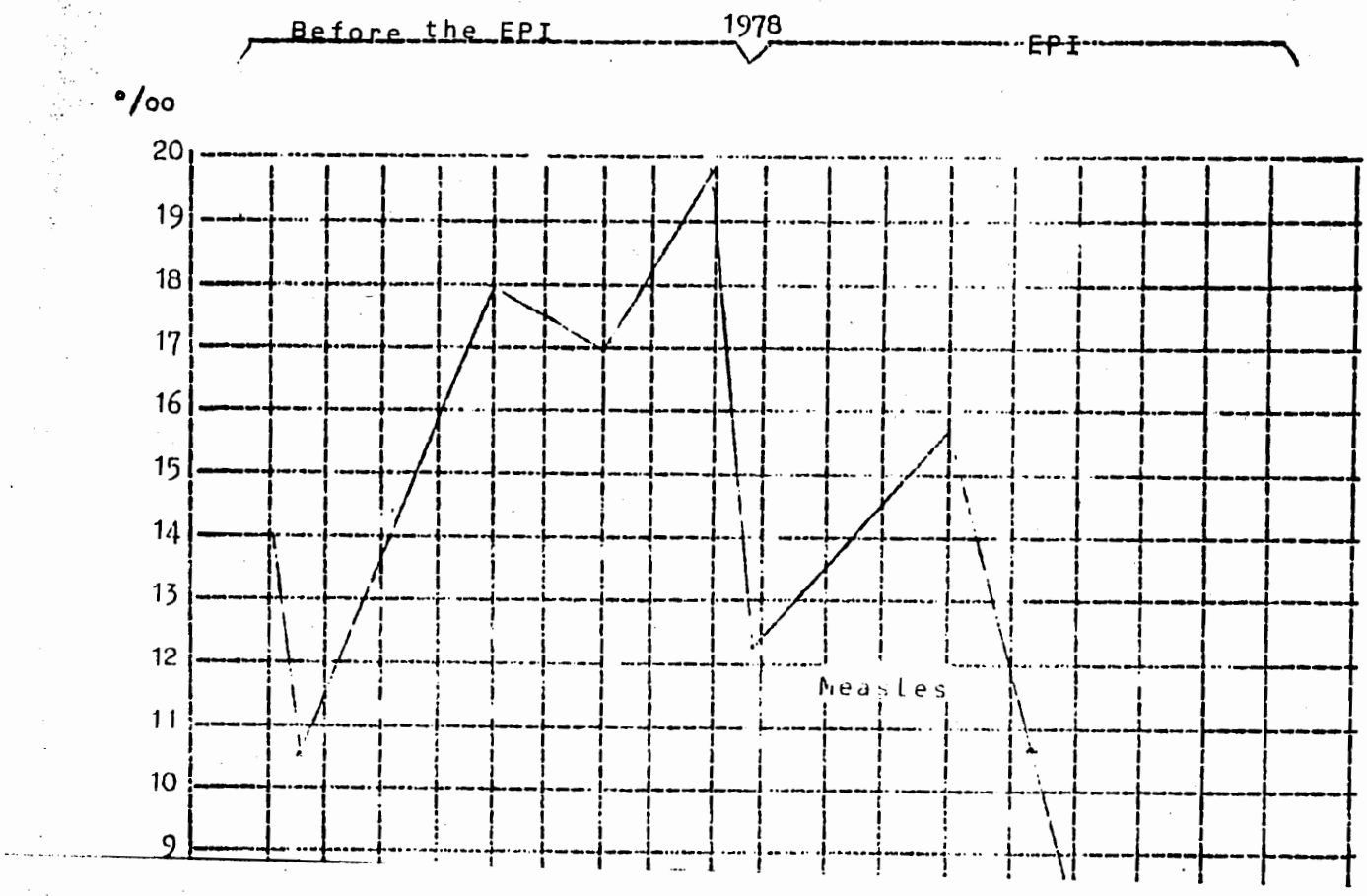
TABLE 11

OBSERVED INCIDENCE RATE (1974-1982)



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these diseases. The peripheral level is notified after the detection at the central level, which produces a delay in establishing of appropriate control methods.

A comparison of disease incidence by region and the immunization coverage by district could be very enlightening.

At this time there is no difference in the notification of vaccinated and non-vaccinated cases of a disease. 84% of health center officials already require the vaccination status of a child who comes down with measles, but only 48% will notify the EPI supervisor if there is an abnormal number of cases of measles in adequately vaccinated subjects.

In their written reports, certain centers have adopted the practice of distinguishing beween vaccinated and non-vaccinated cases of a disease. The further development of this practice would help the earlier discovery of a vaccine whose efficiency was diminishing.

It should be noted from now on that with the expansion of coverage, the ratio of vaccinated cases of measles to the total number of cases will go toward 1. A vaccination-efficiency indicator will therefore act as a close observation of this ratio, as well as of the difference in the number of cases among the population. Only an epidemiological investigation in the field could correctly evaluate the situation.

6. RECOMMENDATIONS

6.1. Général Recommendations

6.1.1. Administration and Management

- Immediately appoint an epidemiologist MD who would be in charge of all aspects of the EPI and who would answer to the National Director for

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Epidemiology and who would work in close collaboration with the WHO epidemiologist.

- Develop a team for this person consisting of a manager/accountant, a secretary and a driver.

- Make available to this team adequate and centralized working quarters.

The committee believes unanimously that these three recommendations are extremely urgent and that they are the essential conditions for the efficient solution to problems in the short and long run.

- Assure a certain job stability for the intermediate staff and replace key personnel sent abroad for training.

- Require each sector supervisor to prepare a rational supervision plan allowing the realistic surveillance of field work.

Example : checking in the register to verify the child's vaccination certificate.

- Obtain from supervisors a budget proposal for this supervision.

- Make available a more economical means of transportation as soon as possible (motorcycles).

- Study for the future, region by region, the ideal type of vehicule meeting 80% of their needs.

- Make available to the central supervision a 4 x 4 vehicule, short wheel-base, Land Rover type.

- Help the vaccinator establish a realistic work schedule at least three months in advance.

- Increase the necessary resources for obtaining good supervision by adopting a system of declaration of expenses for personnel in the field. This system would be based on a regular programming of payments on the pay list, replacing the usual declaration forms.

6.1.2. Cold Chain

a) Central Level

- An assistant should be appointed for supervising the cold chain should the principal supervisor be absent.

- Equip the cold storage room as soon as possible with all accessories an agreed upon in the contract with the supplier.

- Place the cold packs for the vaccine carriers in a seperate freezer from the vaccines.

- Install temperature stabilizing system (cold packs) in the diphtheria-tetanus refrigerators until those vaccines can be transfered to the cold storage room.

- Provide two mercury thermometers going -30° to +20° to calibrate the other thermometers.

- Assign an order number to each appliance of the cold chain.

- Train a technician capable of repairing the most frequent break-downs. Since this would not be a full-time position, this person could assist in the distribution of vaccines.

- In the future, place vaccines to be distributed daily in a refrigerator with double doors, thus avoiding opening the cold storage room several times a day.

b) Regional Level

- An assistant should be appointed for the supervision of the cold chain during the absence of the supervisor.

- Maintain appliances which are locked.

- Install a temperature stabilizing system (cold packs) in the two lower shelves of the refrigerator.

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- Provide one mercury thermometer per health region.
- Provide shelving material for the district of Gikongoro.

c) Local Level

- Appoint an assistant at every level of training for the maintenance of the refrigerator.

This recommendation is particularly indicated for the certified centers for reasons mentioned above.

- Install a temperature stabilizing system (cold packs) in each refrigerator.
- Install a thermometer and temperature/maintenance sheets on each refrigerator. (Sheets from preceding months will be kept in the files).
- Provide a second vaccine-carrier to centers which have activities similar to those of the vaccinator.
- Preferably provide King Sealy Vaccine-carriers in the future.
- Permanently regulate the faulty placement of vaccines, by level as well as by order of arrival (new on the right, old on the left), as well as the usage of the refrigerator for all other products.
- Never place diphtheria-whooping cough-tetanus vaccines over the freezer compartment.
- Mark in a distinctive manner (date or other sign) vaccines going to the field. Throw out vaccines which have been taken from the refrigerator more than three times. Priority usage is to go to vaccines which are left over from the preceding session.
- During the course of their utilization in the field, place vaccine bottles in a bowl of ice-cubes. Wrap bottles in use in aluminium foil.
- Destroy all opened bottles at the end of each session.

d) At all levels

- Avoid storing flammable materials in the same room as a kerosene refrigerator.

- For each appliance in the cold chain, evaluate the local conditions of utilization (exterior temperature) and the length of time vaccines may remain in a particular appliance before being placed in another facility.

6.1.3. Immunization Sessions

- Give each health unit providing vaccination services to a particular zone assistance in precisely determining its target population as well as its fixed and semi-mobile zones, and encourage some centers to increase their number of immunization hours per week.

- Further educate mothers in knowing the birth date of their children.

- Vaccinate in the shade and protect vaccines from heat and light.

- Drop the requirement for a maximum of two months between each polio and diphtheria-whooping cough vaccination.

- Clean and sterilize vaccination equipment the day before the vaccination session.

- Organize vaccination sessions in such a way that jostling is avoided.

6.1.4. Training of Personnel

- Intensify training of local vaccination personnel and widely diffuse information on the management of cold chain equipment and the organization of vaccination sessions.

- Continue the publication of the journal EPI-RWA and expand the "mail" section, which promotes communication with the local level.

- Distribute recent documentation on disease surveillance in all health centers, as well as appropriate materials for health education.

- Coordinate with the Ministry of Education the introduction of EPI methodology in programs for medical schools, medical assistants and nurses.

6.1.5. Immunization Coverage - Health Education

In light of the different immunization coverage results, we recommend:

- A more ambitious definition of the immunization coverage objectives for the coming years.

- An evaluation of the immunization coverage in June 1984 by Rwandan nationals.

- The determination of a certain number of sectors to receive a vaccinator.

- A communal or regional evaluation of the immunization coverage for one year, to determine the degree reached by the program in the community or region, and to discover the sectors which have not yet been reached by this program.

- The improvement and reinforcement of the semi-mobile system by health personnel in charge of sectors which are far from fixed immunization centers.

- An intensification of health education activities for health personnel and others, using audio-visual aides as much as possible (billboards, posters, slides, etc.).

- Use of the politico-administrative and religious structures as well as the mass media as much as possible to educate parents.

RECOMMENDATIONS TO INTERNATIONAL ORGANISATIONS

Taking into consideration the positive results obtained by the EPI in Rwanda in the accomplishment of the first part of the objectives;

Taking into consideration that the objectives still to be reached have rather important financial implications;

Taking into consideration that in the present conditions, the financial means of the Rwanda Government do not allow it to take complete charge of the EPI;

The evaluation committee of the EPI-Rwanda recommends that the present partners of EPI-Rwanda: WHO, UNICEF and USAID continue to financially and technically support this program.

The committee recommends to the Rwanda Government and to all these organizations that the next international EPI-Rwanda evaluation be scheduled for June 1986.

ANNEXES

PEV - FORMULAIRE D'EVALUATION DES UNITES DE SANTE

1 Identification de l'unité de santé

1.1 Unité de santé de ..... 1.2 gov/agréée

1.3 Préfecture de..... 1.4 Commune de .....

1.5 Distance en heures de la préfecture (en voiture);;;..... min.

1.6 Personnel en charge des soins externes (nombre) ....

médecin.... infirmiére A1 ....
assistant médical..... " A2
laborantin(e)..... " A3 ::::.

1.7 Nombre de personnes en charge des vaccinations .....

Qualification..... heures/semaine.....

1.8 Nombre de personnes en charge de la chaîne de froid .....

Sont-elles les mêmes que sous 1.7? oui/non

2 Activités développées par l'unité de santé

2.1 Population couverte par le centre .....

2.2 Nombre d'enfants de moins de un an .....

2.3 Nombre de consultations PAI au mois d'avril 1983 .....

2.4 Nombre de consult. prénatales " " .....

2.5 Programme de vaccination fixe oui/non
mobile oui/non
pendant consultation curative oui/non
pendant consultation spéciale oui/non

2.6 Quel est votre programme de vaccinations pour les mois à venir?

2.7 Avez-vous rencontrés des complications vaccinales? oui/non

2.8 Quand vous voyez un cas de rougeole vérifiez-vous si l'enfant a été vacciné, et comment?

2.9 Supposons que dans la même semaine vous voyez vingt cas de rougeole chez des enfants que vous avez vaccinés correctement il y a cinq mois, que feriez-vous?

3 Documentation administrative des vaccinations

3.1

	Nombre de doses reçues en 1982	administrées en 1982	Taux d'util.%
BCG			
DPT			
TT			
Polio			
Rougeole			

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4 Inspection du matériel

4.1 Réfrigérateur: Marque:..... Type: kérosène/électricité
état de porte..... serrure à clé: oui/non

4.2 Température intérieure.....°C Température extérieure....°C

4.3 Thermomètre de contrôle: . oui/non

4.4 Diagramme de température: oui/non explication?.....

4.5 Congélateur fonctionne: oui/non

4.6 Localisation 4.6.1 15 cm: oui/non 4.6.3 courant d'air: oui/non
4.6.2 soleil: oui/non 4.6.4 niveau: oui/non
4.6.5 aération: oui/non

4.7 Disposition des vaccins 4.7.1 en général: .....
4.7.2 par arrivage: .....
4.7.3 aliments: oui/non

4.8 Nombre de doses de DTCoq en stock..... théorique.....
" " rougeole " ..... " .....

4.9 Y a-t-il des vaccins périmés dans le réfrigérateur? oui/non

4.10 Y a-t-il des flacons entamés dans le réfrigérateur? oui/non

4.11 Carburant: 4.11.1 Réserve.....litres
4.11.2 Fréquence de remplissage ....fois par mois
4.11.3 Consommation mensuelle ..... litres
4.11.4 Origine d'approvisionnement.....

4.12 Fréquence de ramonage de la cheminée: .....fois par mois

4.13 Pièces détachées disponibles: ...verres, ...mèches

4.14 Couche de givre inférieure à 1 cm: oui/non

4.15 Fréquence de dégivrage: ...fois par mois

4.16 Nature de la flamme: bleue / jaune / noirâtre

4.17 Avez-vous un stock suffisant de seringues oui/non
aiguilles oui/non
coton oui/non
savon oui/non

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5 Personne habituellement en charge des vaccinations (interview)

5.1 Formation: 5.1.1 médicale
5.1.2 PEV: cours moyen / recyclage

5.2 Est_ce que vous demandez la carte de vaccination à chaque consultation? 5.2.1 en général oui/non
5.2.2 PMI oui/non

5.3 Quel est l'age minimum dans votre calendrier de vaccination?

5.3.1 DTCoq.....mois

5.3.2 Polio.....mois

5.3.3 Rougeole mois

5.3.4 BCG.....mois

5.4 Intervalle entre chaque vaccination: DTCoq..... semaines
Polio..... semaines

5.5 Comment organisez-vous votre séance de vaccination (convocation, publicité, arrangement des personnes; préparation du vaccin)?

5.6 Que faites-vous avec les vaccins entamés pendant la journée?

5.7 Combien de temps avant la vaccination stérilisez-vous votre matériel?

5.8 Comment?

5.9 Que feriez-vous en cas d'arrêt prolongé de votre réfrigérateur?

5.10 Avez-vous eu une panne de réfrigérateur dans les 12 derniers mois? nombre.....

durée..... jours

motif.....

5.11 Comment sensibilisez-vous les parents pour une 2ème ou 3ème vaccination?

5.12 Quand avez-vous eu une visite du superviseur du PEV pour la dernière fois?

date.....

durée de la visite.....heures

5.15 Quelle recommandation a été faite?

verbalement: OUI/NON

par écrit: oui/non

5.14 Comment estimez-vous l'age d'un enfant?

5.15 Combien de séances de vaccination ont été annulées le mois passé?.....

Pourquoi?.....

5.16 Co-ordonnez-vous vos activités vaccinales avec les autres services? oui/non

5.17 Que faites-vous comme éducation sanitaire en matière de vaccination?

Quand?

Quoi?

Avec quel matériel de support?

5.18 A votre connaissance, y a-t-il des tabous concernant la vaccination? oui/non. Si oui, lesquels?

5.19 Recevez-vous un support de la communité? oui/non

ou du bourgmestre? oui/non

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Annexe 9 : ENQUETE SUR LA COUVERTURE VACCINALE.

Les données géographiques particulières au Rwanda font que la méthodologie classique de la sélection des foyers est difficile.

Par contre, l'organisation sociale est-elle qu'il est possible de poursuivre la sélection d'unité de taille très petite, c'est-à-dire de 50 à 100 familles, et ce de façon simple par numérotation de ces unités et tirage au sort.

Par la suite avec l'aide du responsable de cellule, il sera possible de faire un recensement exhaustif de l'état vaccinal des enfants de 12 à 23 mois révolus. Cette approche devrait prendre moins de temps que la visite de maison en maison.

Si une [illegible] ne comptait pa[illegible], il faudrait tirer une autre cellule au hasard.

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ANNEXE 10 : LISTE DES MEMBRES DE LA COMMISSION.-

1. **Bureau :**

1. Coordonnateur
   Mr G.A. CHRISTODOULOU — OMS NAIROBI

2. Rapporteur :
   Dr Alain J.M. MOISIN — CDC / AID
   Monroe County Health
   Departement
   Westfail Road Rochester
   N.Y. USA 14691

2. Membres :

3. Dr RUTIJANWA Médard — Directeur de l'Hôpital
   Mwanza
   B.P. 6 RUHENGERI

4. Dr NGABONZIZA Martin — Médecin Directeur de la
   Région Sanitaire de Kibuye
   B.P. 44 KIBUYE

5. Dr IMBOUA-BOGUI Guy — Consultant OMS, Médecin
   Epidémiologiste
   Institut National de Santé
   Publique
   B.P. 17 ABIDJAN -
   COTE D'IVOIRE

6. Mr HORNIKX Rutger — Secrétaire Exécutif du
   BIMER
   B.P. 442 KIGALI

7. Mr IMMER Monfred — Service des Achats, UNICEF
   Palais des Nations
   CH-1211 GENEVE 10

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Annexe 5 : LES SOINS DU REFRIGERATEUR DU PEV DU RWANDA.

ACTIVITES	DATE DU MOIS DE 198																														
JOURNALIERE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1. Début (temp)																															
2. fin (temp)																															
3. la flamme correcte																															
4. pas de fumées																															
5. Donne fermeture porte																															
6. verre bon état																															
7. pas de panne																															
8. Durée, jour/panne																															
CHAQUE SEMAINE																															
1. Nettoyage brûler																															
2. Remplir pétrole (deux fois/semaine)																															
3. Vérifier mèche																															
4. Nettoyage radiateur																															
5. Dégivrer si nécessaire																															
MENSUEL - 1 mois																															
1. Stock du pétrole pour stock																															
2. A-t-il un verre																															
3. A-t-il 1 mèche (sock)																															
4. Combien de jours de pétrole(cons.moyenne)																															
5. Faire rapport																															

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PROGRAMME ELARGI DE VACCINATION — Annexe : 1

PROJET RWA-EPI-001

Enquête sur la couverture vaccinale

(1) Groupe n° .....

(2) Groupe d'âge évalué de 12 à 24 mois

(3) Date de l'interrogatoire

(4) Ecart entre les dates de naissance du groupe d'âge à évaluer 06.81 à 06.82

(5) Région .....

(6) Secteur .....

(7) Enquêteur(trice) 1.....

2.....

Ile du sujet	(8) N° du foyer	(9) Nom de l'enfant dans les limites du groupe d'âge	(10) Date de naissance	(11) Carte de vaccination	B.C.G. Cicat. +	B.C.G. Cicat. -	B.C.G. Date	(12) Vaccinations effectuées (inscrivez la date de vaccination) Polio 1 (P1)	Polio 2 (P2)	Polio 3 (P3)	Rappel	DTCOQ 1	DTCOQ 2	DTCOQ 3	Rappel	Rougeole	(13) Complètement vaccinés
1.																	
2.																	
3.																	
4.																	
5.																	
6.																	
7.																	
8.																	
9.																	
10.																	

Durée de l'enquête : ..... heures ..... minutes

Début : ..... Fin .....

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Annexe 1.1.

Programme élargi de vaccination - Enquête

Raison pour la participation incomplète et la non participation des mères à la vaccination.

Raisons données par les mères	La case qui correspond à la réponse donnée par la père doit porter le n° du sujet indiqué sur la première page.								
Connaissez-vous les dates des séances de vaccination ?									
Le centre de vaccination est trop loin ?									
Mère et enfants sont absents le jour de vaccination ?									
Ne savait pas ou n'était pas informé qu'il fallait être vaccinés plusieurs fois ?									
Enfant malade le jour de vaccination ?									
Les vaccinations précédentes ont provoqué des réactions graves ?									
Les séances de vaccination ont été annulées: rupture de vaccins, manque de personnel ?									
A eu une mauvaise expérience avec le personnel et les dispensaires ?									
Difficultés de transport									
Autres raisons									
	1	2	3	4	5	6	7	8	9

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Annexe : 1.2.

Autres questions

Questions	Numéro d'enfant							
	1	2	3	4	5	6	7	8
1. Avez-vous été à la consultation prénatale?								
2. Avez-vous reçu du tétanos ?								
. Comment connaissez-vous la prochaine date de vaccination de votre enfant ?								
3. - Carte de vaccination								
4. - visite de routine PMI								
5. - rappel par autre personne								
6. - autre								
7. Avez-vous une bouteille de Coca/Fanta ?								
8. Avez-vous une bouteille de primus ?								
9. Avez-vous une cuillère à soupe ?								
10. Avez-vous une cuillère à café ?								
11. Avez-vous du sel fin ?								
12. Avez-vous du sucre ?								
13. Est-ce que vous pensez que la diarrhée peut tuer votre enfant ?								
14. A quelle distance se trouve le dispensaire le plus proche ?								

C = Oui 1 - 13 question, répondez oui ou non

N = Non 14 question, répondez combien de minutes

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LISTE DES SECTEURS D'ENQUETE SUR LA COUVERTURE VACCINALE ET LES UNITES DE SANTE VISITEES.

PREFECTURE	SECTEURS	UNITE DE SANTE VISITEE
CYANGUGU	CYIBUMBA	Dispensaire KAMEMBE
	KIRAMBO	Dispensaire MWEZI
GIKONGORO	CYANIKA	Centre de Santé CYANIKA
	NGARA	Centre de Santé NGARA
	TARE II	Centre de Santé KARANBI
BUTARE	NYAMIYAGA	Centre de Santé BUSORO
	CYARWA-CYIMANA	Centre de Santé KIBILIZI
	MBASA	Centre de Santé KARAMA
	BUVUMO	Centre de Santé KANSI
GISENYI	GISHWATI	Centre de Santé BIRUYI
	RUTEMBO	Centre de Santé MWIYANIKE
	GISA	Centre de Santé MURARA
RUHENGERI	KIBINGO	Centre de Santé BUTARO
	RUTOVU	Centre de Santé KINYABIRA
	GASHAKI	Centre de Santé RWAZA
BYUMBA	NGANGI	Centre de Santé RUTARE
	RWANKUBA	Hôpital KIZIGURO
	BISIGA	Hôpital BYUMBA
KIBUNGO	RUBONA	Hôpital KIBUNGO
	SHOLI	Centre de Santé RUKOMA
KIGALI	MWOGO	Centre de Santé NYAMATA
	KAGUGU	Centre de Santé KABUYE
	BUTBA	Centre de Santé TARE
	MUHIMA	Centre de Santé MUHIMA
KIBUYE	GASOVU	Centre de Santé MURUNDA
	BUTEMBO	Centre de Santé KIBLIGO
	KAGABIRO	Centre de Santé MUBUGA
GITARAMA	RUKARAGATA	Centre de Santé NYABIHEMBE
	NYARUBUYE	Centre de Santé KINAZI
	KIBULI	Centre de Santé GATAGARA

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Annexe 3 : Questionnaire pour les Centres des Régions Sanitaires.

1. Quels sont vos stocks actuels en BCG, TT, DTCOQ, Polio, Rougeole ?

2. Ils représentent normalement combien de mois d'approvisionnement des Hôpitaux et Centres Sanitaires ?

3. Quel est votre système de réapprovisionnement par dépôt central ?

4. Comment estimez-vous vos besoins ?

5. Comment commandez-vous les vaccins et autre matériel comme mèches, seringues etc... ?

6. Qui surveille votre travail, combien de fois par an ?

7. En cas de panne prolongée que faites-vous ?
   a) Avez-vous un refrigérateur d'appui ?
   b) Avez-vous un groupe électrogène d'appui ?
   c) pouvez-vous passer vos stocks de vaccins [illegible] entreprise privée ?
   d) préférez-vous les retourner à Kigali ?

8. Est-ce que vous avez un système pour assurer que les vaccins reçus les premiers sortent les premiers ? Lequel ?

9. Est-ce qu'il vous arrive de recevoir du vaccin qui est près de sa date limite d'utilisation ?

10. Qui paie pour les frais de déplacement pour le PEV ?

11. Comment se fait-il la distribution de vaccins aux Centres de Santé ?

12. Comment commandez-vous les pièces détachées pour les frigos ?

13. Quels sont les formulaires que vous recevez des hôpitaux et Centres de Santé ? A quel interval ?

14. Que faites-vous pour que ces formulaires soient correctement remplis et reçus en temps utile ?

15. A votre avis, qu'est-ce qui pourrait être amélioré dans la distribution de vaccins par le dépôt de Kigali ?

16. Si vous aviez assez d'argent, qu'achèteriez-vous pour le PEV dans votre Centre ?

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Annexe 4 : EVALUATION DU MATERIEL DU PEV DU RWANDA (Chaine du froid).

1. Objectif :

Connaître le matériel, son fonctionnement et son efficacité dans les conditions diverses de son utilisation.

2. Méthode :

1. Etudier les instructions de fonctionnement,
2. Vérifier le matériel s'il est au complet et son état de fonctionnement,
3. Installer et mettre en marche,
4. Durée.

4.1. Pour les refrigérateurs et congélateurs.

Il est recommandé de suivre le fonctionnement du matériel [illegible] et enregistrer les températures [illegible] de.

4.2. Pour les glacières [illegible] jours.

- Pour 10 jours plus ou moins.

4.3. Pour les glacières d'une journée (porte vaccins)

- Pour 2 jours.

Pour tous les matériels, il est recommandé d'établir le nombre de fois à ouvrir dans l'utilisation sur le terrain et noter chaque fois, par exemple :

au niveau des unités sanitaires / nombre de fois à ouvrir.

i) Refrigérateurs :

- deux fois pour la vérification et l'enregistrement de la température,
- deux fois pour prendre et remettre les vaccins.

ii) Pour les porte-vaccins

Il est recommandé d'éliminer l'ouvrage inutile, uniquement pour les vaccins, peut-être 5 fois pour une séance.

5. Veuillez faire de commentaires.

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A .....

Le .....

Annexe 4.1. EVALUATION DU MATERIEL DU PEV DU RWANDA (Chaine du froid).

Date	REFRIGERATEURS				CONGELATEURS		GLACIERES		TEMPER.
	A PETROLE		A ELECTRICITE		A PET.	A ELECT.	PLUSIEURS JOURS	D'UNE JOURNEE	EXT.
	cc	cc	cc	cc	cc	cc			

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Annexe 6 : ENQUETE D'EFFICACITE VACCINALE POUR LA ROUGEOLE - MARCHE A SUIVRE.

1. Individualiser un zone présentant une poussée épidémique

2. Conformer le diagnostic

3. Sélectionner les cellules comptant le plus de cas

4. Compter à la fin de l'épidémie par cellule le nombre d'enfants susceptibles, c'est-à-dire n'ayant pas fait la rougeole et ce de façon exhaustive.

5. Diviser ce groupe en 4 sous groupes :

	Malade	Sain
Vacciné	A	B
Non vacciné	C	D

6. Calculer l'efficacité vaccinale en employant la formule

$$1 - \frac{\frac{A}{A+B}}{\frac{C}{C+D}}$$

7. Calculer le KI2 test pour la table 2 x 2 citée en 5.

8. Si l'échantillon est assez grand, il pourra être intéressant de calculer l'efficacité suivant l'âge de vaccination
- 6 mois à 6 mois, 9 à 12 ou 13 à 12 et plus 1,5).
Ensuite opérer comme en 6 et 7.

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REPUBLIQUE RWANDAISE
MINISTERE DE LA SANTE PUBLIQUE
Projet RWA/EPI/001
B.P. 397 KIGALI

ANNEXE 7

RELEVE MENSUEL DES VACCINATIONS REVISE

- Unité Sanitaire :
- Préfecture :

Groupe d'âge	B C G	POLIO			RAPPEL	DTCOQ			RAPPEL	ROU-GEOLE	Complètement vaccinés	TETANOS (femmes enceintes)		Sujets complètement vaccin.
		1e dose	2e dose	3e dose		1e dose	2e dose	3e dose				1e dose	2e dose	
0-11 mois														
12-23 lois														
2 ans et plus														
TOTAL														

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Type de vaccin	Quantité au 1er jour du mois (en dose)	Quantité reçue (en dose)	Quantité utilisée (en dose)	Quantité au dernier jour du mois (en dose)	Dose administrée	% utilisation
- B C G						
- D T P E R						
- POLIO						
- ROUGEOLE						
- ANTITETANIQUE						

Remarques ou suggestions du mois.

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#70

Executive Summary

Evaluation of the Expanded Program for Immunization - (698-0410.29)

I. What constraints does this project attempt to overcome?

Rwanda, like most developing countries, has high rates of preventable childhood diseases such as polio, tetanus, measles, whooping cough, tuberculosis and diphtheria. Some of these diseases (measles, whooping cough and tuberculosis) are still among the ten leading causes of morbidity in this country. The primary constraint addressed by this project was the lack of an effectively organized national immunization program including a lack of trained personnel, an insufficient cold chain and a weak to non-existent system for the distribution of vaccines. This situation resulted in very low levels of immunization coverage throughout the country.

II. What technology did the project promote to relieve this constraint?

Through joint financing (AID, GOR, WHO, UNICEF), this project provided a combination of technical assistance in the development and management of a national immunization program, training of health personnel at all levels, commodity inputs - vehicles, cold chain equipment, vaccines and operational support for fuel and vehicle maintenance/repair and spare parts.

III. What technology did the project attempt to replace?

Prior to the development of this project, GOR efforts at developing a national immunization program could be characterized as disorganized and ineffective due to the lack of elements discussed in item II above. Early GOR vaccination efforts suffered due to insufficient personnel, equipment and vaccines and other types of logistical problems. In addition, there were frequent problems with vaccine distribution and spoilage.

IV. Why did the project planners believe the intended beneficiaries would adopt the proposed technology?

Project planners had sufficient experience both in Rwanda and other developing countries to believe that the proposed technology (basic immunization services) would be readily adopted once a well-organized system of vaccination services was developed. The encouraging results of this project have confirmed this belief.

V. What characteristics did the intended beneficiaries exhibit that had relevance to their adopting the proposed technology?

High morbidity rates due to target childhood diseases provided sufficient motivation to parents to bring their children to vaccination centers for immunization.

VI. What adoption rate has this project achieved in transferring the proposed technology?

The project hoped to achieve a total immunization coverage of 30% by the fifth project year (1983). The evaluation team estimated that a total coverage of 21% had been achieved. However, the team also noted that coverage rates for specific immunizations such as measles and BCG greatly exceeded the original objectives. For example, the vaccination objective for measles was 30% but the evaluators noted that approximately 53% coverage had been achieved. Similarly for BCG, 30% coverage was expected but 49% had been achieved.

VII. Has the project set forces in motion that will induce further exploration of the constraint and improvements to the technical package proposed to overcome?

With assistance from this project, the GOR has established a greatly improved national immunization program including manpower, training, equipment and drugs necessary to continue and expand the services available. In view of the positive results of this project, there is strong evidence to indicate that the project can be expanded to achieve greater coverage. However, it is also clear from the evaluation that the GOR will be unable to maintain or expand this project without continued donor assistance.

VIII. Do private input suppliers have an incentive to examine the constraint addressed by this project and to come up with solutions?

A major part of the health system in Rwanda is organized, managed and financially supported by private missionary groups. These groups are already included in the national immunization program. Since immunization services are regarded as primarily public health services, there is a feeling among both the public and private health care providers that such services are the responsibility of the GOR. In view of this, there would not be much incentive for the private sector to become more actively involved.

IX. What delivery system did the project employ to transfer technology to intended beneficiaries?

The immunization program in Rwanda uses a delivery system which is a combination of vaccinations given in fixed health facilities and outreach services. Vaccinations are given in more than 150 fixed health facilities. In addition approximately 70 vaccinators are employed and assigned to various facilities. These vaccinators also provide outreach services to distant communes.

X. What training techniques did the project use to develop the delivery system?

The project utilized a combination of formal training and in-service education to develop the immunization program delivery system. The formal training followed standard WHO, EPI training curricula. 27 physicians received advanced EPI management and administration training, 25 nurses attended the EPI intermediate training program and more than 350 health center personnel including vaccinators attended 1-2 day in-service training programs held in every prefecture.

XI. What effect did the transferred technology have upon those impacted by it?

Rwanda is beginning to experience significant reductions in the number of reported cases of childhood diseases, particularly measles and whooping cough. The evaluation team was confident that these changes were due to the national immunization program. However, the team was cautious in noting that increased immunization coverage and a more detailed study would be required to provide a

definitive confirmation of the observed decreases noted in the incidence of selected childhood diseases in Rwanda.