

PD-ANN-495  
 YE-ANN-495A  
 62-0937-115

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

Report Symbol U-447

1. PROJECT TITLE  <b>EXPANDED PROGRAM OF IMMUNIZATION</b>			2. PROJECT NUMBER  <b>625-0937</b>	3. MISSION/AID/W OFFICE  <b>USAID/MAURITANIA</b>
5. KEY PROJECT IMPLEMENTATION DATES			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) <b>83-2</b>	
A. First PRO-AG or Equivalent FY <u>80</u>	B. Final Obligation Expected FY <u>80</u>	C. Final Input Delivery FY <u>83</u>	6. ESTIMATED PROJECT FUNDING A. Total \$ <u>1,100,000</u> B. U.S. \$ <u>400,000</u>	
			7. PERIOD COVERED BY EVALUATION From (month/yr.) <u>JULY 1981</u> To (month/yr.) <u>JULY 1983</u> Date of Evaluation Review <u>8/83</u>	

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. Establish a long-term training program for EPI personnel.	USAID/MOH	1/84
2. Provide short-term TA to evaluate and establish reliable reporting system.	USAID/MOH	3/84
3. Recruit and train personnel for EPI, particularly warehouse manager and central level administrative and supervisory personnel.	MOH	1/84
4. Provide adequate per diem to EPI personnel on mobile teams and other staff when performing supervisory visits.	MOH	6/84
5. Convene first meeting of EPI donors (USAID, WHO, UNICEF and MOH).	USAID/WHO/ UNICEF/MOH	1/84
6. Develop agenda to address EPI and MOH coordination problems to be discussed at next meeting of Council for Primary Health Care and Health Education.	USAID/MOH	1/84
7. Establish agenda to address Health Education program to be discussed at next meeting of Primary Health Care Council.	USAID/MOH	1/84

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	INTEGRATE ACTIVITIES INTO PROJECT 682-0230
<input type="checkbox"/> Logical Framework	<input type="checkbox"/> PIO/C	
<input type="checkbox"/> Project Agreement	<input type="checkbox"/> PIO/P	<input type="checkbox"/> Other (Specify)

10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT

A.  Continue Project Under 682-0230

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)

- Ms. Betsy Brown, Project Manager, USAID.
- Dr. Youssouf Kane, Director of Preventive Medicine and Expanded Program of Immunization, Ministry of Health.
- Dr. Mohamed Mahommed O/Hacen, Former Director of EPI.
- Mr. Antoine Ayoub, WHO Technical Advisor to EPI.

12. Mission/AID/W Office Director Approval

Signature: *Peter Benedict*

Typed Name: **Peter Benedict, USAID Director**

Date: **September 19, 1983**

PROJECT EVALUATION SUMMARY - PART 1: EXPANDED PROGRAM OF IMMUNIZATION

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8. DECISIONS (Continued)

<u>Item</u>	<u>Action</u>	<u>Date Action to be Completed</u>
8. Schedule observation visits to Kolda, Senegal and possibly Niamey, Niger to observe PHC and EPI activities and possible application of approach and reporting system to Mauritanian EPI.	USAID/ UNICEF/MOH	3/84
9. Reestablish regular reporting system which existed prior to January 1983.	MOH	10/83
10. Institute a system of cold chain autonomy for mobile teams.	MOH/USAID	3/84
11. Reassess method for determining vaccine needs on a yearly basis.	UNICEF/ MOH/USAID	10/83

13. SUMMARY

The Project has made progress towards its stated purpose of reducing the incidence of immunizable diseases among children 0-5. Poor disease surveillance and high rate of vaccination card loss by mothers prevent statistically valid quantification of the program's epidemiological impact.

Since 1981, some progress has been made in resolving problems identified by the mid-term evaluation. However, operational problems have developed which will need attention as EPI is integrated into the national Primary Health Care program.

A detailed evaluation report is appended to this PES.

14. EVALUATION METHODOLOGY

See attached report.

PROJECT EVALUATION SUMMARY - PART 1: EXPANDED PROGRAM OF IMMUNIZATION

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15. EXTERNAL FACTORS

Prolonged drought conditions in Mauritania and an increased dependence on donor-provided food supplies have had an unexpected effect on program implementation. Many villages have moved or are dispersed during the dry season, as people search for pasture for herds, making them difficult for the mobile teams to cover. Coverage seems to be best where CRS food distribution programs for children 0-5 are located, since immunization cards are a pre-requisite for receiving foodstuffs. Both these factors have been considered in the attached report and should be considered in the ongoing program.

16. INPUTS

Inputs have been provided on schedule. Procurement recommended by the mid-term evaluation has all been accomplished, and all project funds have been expended and accounted for.

17. OUTPUTS

The GIRM has established an EPI nationwide. Eleven mobile teams serve in ten administrative regions, excluding the northern extremities of the country which are largely unpopulated. 26 of 30 MCH Centers now conduct vaccination activities. A new central vaccine warehouse in Nouakchott supported by fully automatic generators has been established in Nouakchott. Supplies and equipment have been provided to these fixed centers and EPI activities will be initiated in five newly established centers.

18. PURPOSE

As described in the project paper, the purpose of the EPI is to reduce "..... the incidence of six communicable diseases (tuberculosis, measles, diphtheria, whooping cough, tetanus and polio) in children 0-5 years ....."

Indications from both the 1981 and this evaluation are that there has, in fact, been a reduction. However, given the uncertainty of data and unreliability of the reporting system, it is not possible to quantify this statement. Nonetheless, the results of this evaluation compare favorably with that of 1981 tending to confirm that if reductions have not taken place, neither have increases occurred. The 1981 evaluation noted that

PROJECT EVALUATION SUMMARY - PART 1: EXPANDED PROGRAM OF IMMUNIZATION

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the incidence of measles fell significantly after a vigorous measles campaign. Epidemiologically, this was to be expected. Since that time, EPI activities have been promising, since no significant change in the rates of the EPI target diseases has been observed.

19. GOAL

"To improve the health status of Mauritanian children aged 0-5 years." The Project contributed to the vaccination of more than 57,500 children against tuberculosis (BCG), 41,200 children against measles, 117,300 children against diphtheria, tetanus and whooping cough and more than 113,200 children against polio.

20. BENEFICIARIES

The direct beneficiaries of the Project are Mauritanian children 0-5 years and their mothers. In terms of Section 102(d) criteria, this Project has contributed to a reduction in infant mortality. Depending on the vaccine considered, 46 percent of the target population can be documented as having been reached by this Project.

21. UNPLANNED EFFECTS

As the population has become increasingly concentrated around major towns, the role of the urban Maternal and Child Health Centers has become increasingly important. In order to maximize the effectiveness of these facilities which currently have low vaccination rates for the dense population surrounding them, a strategy for outreach activities should be developed.

The rapid growth of mobile EPI activities has strained central level management, as the MOH did not consider increasing numbers of top and middle level administrators in its long-term planning.

22. LESSONS LEARNED

The Project has demonstrated the feasibility of establishing integrated immunization services and the continued need for mid-level personnel training.

**PROJECT EVALUATION SUMMARY - PART 1: EXPANDED PROGRAM OF IMMUNIZATION**

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The following lessons may be learned:

1. Fixed centers in large urban centers could expand their vaccination schedules to 6 days per week, combining vaccination with other infant/child health services;
2. Fixed centers in Nouakchott and major towns can be improved to deliver a major portion of vaccination services over the next five years. This responsibility may include development of an outreach strategy demanding further resources than presently envisioned either by the GIRM or by USAID;
3. Mobile teams are capable of providing technical backstopping to the fixed centers;
4. Mauritanian EPI top level personnel may have relied too heavily on WHO EPI technical personnel resulting in the setting of unrealistic and overly ambitious goals not adapted to host country realities (e.g. 80% of target group to be vaccinated; excessive vaccine orders);
5. Coordination cannot occur in a vacuum. The GIRM has established a National Council on Primary Health Care and Health Education which will have as its major task the coordination of EPI activities to address and resolve problems in EPI;
6. Regular coverage surveys are a tool of good management. In the future, such surveys should be carried out frequently and their findings used in program planning and management. The expertise to carry out these surveys exists within the Ministry of Health and EPI. Surveys can be performed without outside technical assistance.

**23. SPECIAL COMMENTS OR REMARKS**

Vaccination programs in Mauritania cannot be carried out solely by either fixed centers or mobile teams. An integrated immunization strategy is key to the success of the program. Mobile teams cannot be phased out in the next five years because for the foreseeable future, Mauritania's population will continue to be too decentralized to permit adequate coverage out of fixed facilities alone. Mobile teams are also performing a key function in supervising and supporting fixed vaccination center activities.

As coverage rates are still relatively low, it would not be advisable to lower the program's target age cohort at this time. Such a step should only be taken when coverage rates have clearly reached satisfactory levels.

**EXECUTIVE SUMMARY (PER STATE 1982 - 81077)**

**September 12, 1983**

**PROJECT: Expanded Program of Immunization**

**COUNTRY: Mauritania**

**I. What constraints does this project attempt to overcome and who does it constrain?**

The project addresses reducing the rates of morbidity and mortality of immunizable diseases in children under six, thereby attempting to overcome a major health constraint to development.

Additionally, the project addresses the administrative, logistical and managerial aspects at all levels of project implementation which constrain achieving increased immunization rates.

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

- First : Use of scientifically proven antigens.**
- Second: Monitoring techniques of vaccination.**
- Third : Maintenance of an effective cold chain.**
- Fourth: Performance of periodic epidemiological assessments of activities.**
- Fifth : Tested training programs for EPI personnel.**
- Sixth : Strengthening logistical support at all levels of the Program.**

**III. What technology does the project attempt to replace?**

- 1. Recycling of disposable needles and syringes.**
- 2. Unreliable methods for maintaining the cold chain.**
- 3. Duplicative, uncertain and unreliable surveillance system.**
- 4. Uncertain logistics system.**
- 5. Lack of adequate epidemiological data to monitor program activity.**
- 6. Inappropriate supervision at all levels.**
- 7. Inadequate and irrelevant training at all levels.**
- 8. Uncertain concepts of management and administration at all levels.**

**IV. Why do project planners believe that the intended beneficiaries will adopt the proposed technologies?**

The continued Expansion of Maternal and Child Health Centers in Mauritania, as requested by the population involved, implies to planners that mothers will continue to bring their children for vaccinations. Additionally, unless absent at the time of a visit by the mobile teams to remote villages, mothers willingly bring their children for vaccinations.

V. What characteristics do the intended beneficiaries exhibit that have relevance to their adopting the new technology?

Mothers of children in the target group recognize that sickness or death can be averted by having their children vaccinated. Mothers are willing to walk several kilometers to make sure their children are vaccinated. This characteristic has perhaps the most relevance to their adopting this technology.

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

There are two ways of analyzing the adoption rate of this technology. First, more than 57,500 children have been vaccinated against tuberculosis (BCG), 41,200 children against measles, 117,300 against diphtheria, tetanus and whooping cough and 113,200 against polio. Second, this evaluation documented an adoption rate of 13-46% depending on antigen. It is suspected, however, that the real rate of adoption may be 20-25% higher than the documented rate.

VII. Will the project set in motion forces that will induce further exploration of the constraints and improvements to the technological package proposed to overcome it?

With the creation of a Council on Primary Health Care and Health Education, a major force has already been set in motion to induce further exploration of the technological package proposed. The establishment of this Council was in part a result of this project.

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

Private suppliers have been involved in addressing cold chain, vaccine and logistics constraints. Project success depends heavily upon private suppliers to offer appropriate solutions to project constraints.

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

Vaccinations are provided through trained nursing personnel in two ways. First, mobile teams follow a pre-arranged program to systematically visit remote villages and vaccinate target age children. Second, in the more settled areas, such as towns and large cities, fixed centers hold regular vaccination sessions for intended beneficiaries.

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

A variety of approaches are used, including:

1. In-country seminars;
2. Short-term training in third countries;
3. Introduction of technology into nursing school curriculum;
4. Participation at international seminars or conferences;
5. Observation visits to other EPI projects;
6. Periodic supervisory visits by central level personnel to regional levels; and
7. Technical advisors participating in project evaluations.

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**EVALUATION**

**Expanded Program of Immunization**

**(625-0937)**

**For the Period: July, 1981 - July, 1983**

**USAID/Mauritania**

**Report prepared by:**

**John P. McEnaney, Health Development Officer**

**Dr. Andrew Vernon, Medical Epidemiologist**

**September, 1983**

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## FOREWORD

The following report is the reflection of many hours of thought and many days of work on the part of a number of dedicated people. Although all the participants in this evaluation are listed in the ANNEX as well as their respective responsibilities, recognition should be given to Doctor Youssouf KANE, Director of the Preventive Medicine Service in the Ministry of Health and Social Affairs for shouldering the major part of this joint evaluation effort. For his patience and ebullient devotion to duty, Mr. Djibril SENGHOTT has played a singularly distinctive role in assuring the continued success of EPI in Mauritania.

Organizing and mobilizing USAID resources and providing invaluable technical assistance as well as being generally informative and helpful were Ms. Erna Kerst, USAID EPI Project Manager and Ms. Betsy Brown, USAID Health Advisor.

To these people in particular and to all who participated in this evaluation special thanks is due, since without their combined efforts this report would not have been possible.

John P. McEnaney  
Health Development Officer

Dr. Andrew Vernon  
Medical Epidemiologist

August 18, 1983  
Nouakchott, Mauritania

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1. Mauritania

## INTRODUCTION

This report is an end-of-project evaluation for the USAID supported Expanded Program of Immunization (EPI) Accelerated Impact Program Project, 625-0937.05. The Project Activity Completion Date was extended an additional year to August 31, 1983. The Project activities will be continued through the new Rural Health Services Project (682-0230). This is the second and final of two scheduled Project evaluations.

This evaluation was carried out from July 10 to August 8, 1983 as a combined evaluation of the Government of the Islamic Republic of Mauritania, acting through its Ministry of Health and Social Affairs (MOH), The World Health Organization (WHO), The United Nation's International Children's Fund (UNICEF), and the U.S. Agency for International Development (USAID). Representatives from each organization participated in varying degrees during each phase of the evaluation. (See Annexes 1, 2 and 3 for List of Participants and Committees). The evaluation was conducted in three phases:

- I Methodology and Protocol Determination
- II In-Country Field Visits and Coverage Survey
- III Review of Findings and Recommendations

From July 11 to 22, Phase I consisted of Plenary sessions and recommendations from the two subcommittees to (a) develop a survey methodology which would obtain reliable immunization coverage data and (b) develop a protocol to assess EPI field operations. From July 23 to July 30, four teams travelled a combined distance of over 6,500 kilometers and conducted an in-depth coverage survey of the Gorgol Region as well as visited the Regional Centers of Hodh El Gharbi, Assaba, Brakna, Trarza and the capital city of Nouakchott, to assess the operational effectiveness of five EPI mobile teams and thirteen Maternal and Child Health Centers.

From August 1 to 7, evaluation participants met in Plenary session to review findings and propose consequent recommendations. These recommendations are made in Section 7 of this report.

## 1.0 BACKGROUND

### 1.1 DEMOGRAPHY

Mauritania is situated on the northwest coast of the African continent, and is part of the Sahel region. The last census, performed in 1977, enumerated 1,338,000 inhabitants distributed over an area of 1,085,000 square km, giving Mauritania one of the lowest population densities in the world (1.2 persons per square km). The crude birth rate in 1977 was estimated as 43 per 1,000, and the crude population growth rate has since been estimated as 2.5% annually. Infant mortality is estimated at 170 per 1,000 live births, and childhood mortality (1-5 years) at 100 per 1,000 children aged 1 year. In 1977 infants 0-11 months represented 4-5% of the population, and children aged 1-4 years another 12-15%. Major causes of infant and childhood mortality are believed to be malnutrition, diarrheal disease, respiratory disease, as well as measles. Parasitic disease is widely but unevenly present, including malaria, urinary schistosomiasis, intestinal parasitism, and dracunculiasis (Guinea worm). Whooping cough and neonatal tetanus are known to be importantly present. The magnitude of poliomyelitis and childhood tuberculosis is not clearly defined, although adult tuberculosis is a major public health problem.

Economic and demographic factors impact heavily on health in Mauritania. Mauritania is listed as a middle-income country in the African continent (annual per capita income listed as \$480). Major industries are mining (iron ore and copper) and fishing. The traditional activities of agriculture and animal husbandry have suffered from a decade of Sahelian drought. Food production is insufficient, and a majority of foodstuffs are imported.

At least five major ethnic groups are present, including Moor, Peul, Toucouleur, Wolof, and Soninke. These are distributed into urban, rural sedentary, and nomadic populations. The decade of drought has resulted in increased sedentarization of the population; a striking feature of this change has been an important migration of rural population to urban centers. For example, while overall population growth between 1977 and the present has been estimated at 2.5% per year, the capital of Nouakchott has experienced an annual population growth of 23%. Its present population is estimated to number nearly 400,000. Urban migration in the interior is believed to be important but smaller, roughly 7% per year.

The country is divided into 12 administrative regions plus the district of Nouakchott. Each region is divided into departments, respectively headed by a governor and prefect. During the past 18 months, a new political organization, the Structure for Mass Education (SME), has been established and imposed nationally. This entity has systematically enumerated households throughout the country. Each department has been divided into zones, which in turn are composed of 10 quarters. Quarters are divided into 10 cells, each having 10 families. The SME thus presents a potentially useful tool for future assessment of health needs and delivery of health services. The SME

information provided demographic data for the coverage survey in Gorgol. The utility of the SME in the future depends, however, upon establishment of an effective means to periodically update the structure.

## 1.2 The Health Delivery System

Health services are delivered almost exclusively through governmental sources.

Curative medical services rely upon a system which includes the National Hospital in Nouakchott, 12 regional hospitals, and 3 levels\* of dispensaries distributed across the country in or near relatively populated areas. The National School of Public Health in Nouakchott trains nurses and midwives. Physicians remain in short supply. Currently only one third of the country's 96 physicians are Mauritanian. Mauritanian physicians are trained out-of-country. French, Chinese, Russian and Egyptian physicians account for the majority of remaining doctors in Mauritania.

Preventive health services (currently funded almost entirely by foreign aid, with the exception of personnel) are provided through the 11 EPI Mobile Vaccination Teams and 30 Maternal and Child Health Centers (MCH). Annual GIRM contribution to mobile EPI is valued at \$130,000 for personnel (2.8% of the MOH personnel budget). Calculation of personnel costs for fixed center vaccination services is difficult, as MCH personnel tend to rotate in and out of vaccination clinics. The GIRM also provides mobile EPI with central office and warehouse space, regional bases (combined office/storage buildings) and housing for mobile team leaders which the MOH estimates has an annual value of \$103,000.

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\* There are three levels of health facilities in Mauritania; First level or Category A: Total 9. This is a health center encompassing a full range of health services: curative, maternity, and preventive with two beds for general medical needs. The health staff includes: 1 State Nurse; 1-4 Brevete Nurses; 5 nurses aides; 6 orderlies and 2 mid-wives. These are generally located in the Regional Capitals.

Second level or Category B: Total 60. This is a dispensary with the clinical services for adults and children provided by a State Nurse, two Brevete Nurses and one assistant mid-wife. These are generally located at the Department capitals.

Third level or Category C: Total 75. Is the smallest unit which is intended to serve small villages and encampments. It offers first aid and is generally staffed by a brevete nurse and a nurse's aid.

The MCH Service represents an important element of the public health infrastructure, with 30 centers nationwide, 5 of which in the capital. The MCH Service continues to expand in the more densely populated centers of Mauritania. Although there are now 30 MCH centers, only 26 carry out immunization activities and these, irregularly. Improvement of present immunization activities and extension of these activities to additional MCH centers are envisioned in the new USAID Rural Health Services Project 682-0230. Other activities include providing prenatal consultations, nutritional education and growth monitoring.

While the MCH Centers tend to address the urban and sedentary population, the efforts of the Mobile Teams are focussed on the dispersed, often nomadic rural population. They provide immunization services primarily, however some teams include tuberculosis and leprosy control and attempt limited curative efforts. The Ministry of Health is presently studying the feasibility of including diarrheal disease control activities, health education and village health worker supervision among the team's future activities. An organigram of the Ministry of Health is shown on the following page.

### 1.3 History of EPI in Mauritania

Initial EPI efforts began in 1977 with project conception, acquisition of ancillary logistical and financial support, and the designation of Trarza Region as an EPI pilot zone. Progress was interrupted in 1978 by political developments resulting in the loss of donor funding. New support was arranged in early 1979. By late 1979 a planned expansion of the program was underway, with placement of mobile teams as follows:

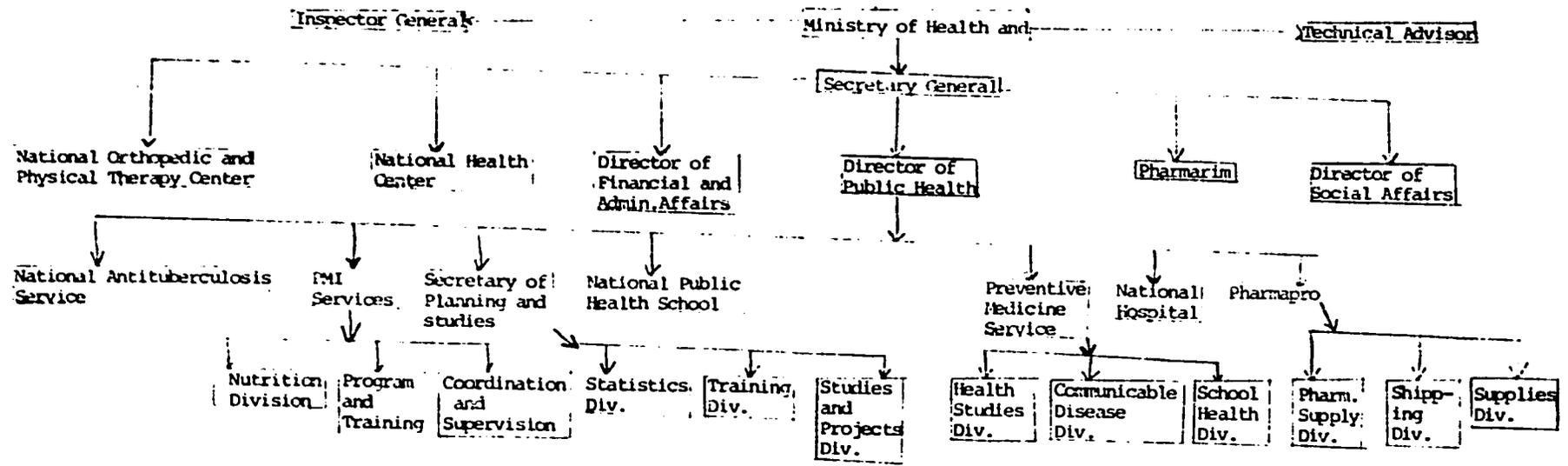
November 1979	Trarza Assaba Brakna
March 1980	District of Nouakchott Guidimaka Gorgol
October 1980	Hodh el-Gharbi
January-May 1980	Hodh ech-Charki Tagant Adrar

Simultaneously personnel of the MCH Centers were trained in national and regional seminars in order to allow the expansion of previously limited urban vaccination activities.

As initially stated, project goals included:

1. Complete immunization of 80% of children aged 0-5 years by the year 1985, against each of 6 diseases (tuberculosis, diphtheria, whooping cough, poliomyelitis, tetanus, and measles).

ORGANIGRAM OF THE MINISTRY OF HEALTH AND SOCIAL AFFAIRS



2. Reduction by 30% of morbidity and mortality due to these diseases.

To achieve these goals, the following vaccination schedule was adopted:

- BCG: 1 dose intradermally between birth and age 5 years
- DPT/Polio: 3 doses subcutaneously/orally between age 3 months and 5 years, with a minimum interval between doses of 1 month, and a maximum of 6 months.
- Measles: 1 dose subcutaneously between 9 months and 5 years.
- Tetanus toxoid: 2 doses given subcutaneously or intramuscularly to pregnant women; service provided by PMI's primarily, during prenatal consultations.

Mobile teams adopted a rhythm to permit coverage of their area three times annually. The scheduling of vaccination activities was decentralized allowing each MCH Center to adapt to local conditions. However, vaccination sites were standardized as follows:

BCG -- left forearm

DPT -- scapular fossa

Polio -- oral

Measles -- right upper arm

Organizationally, EPI is located in the Ministry of Health and Social Affairs, as a function within the Preventive Medicine Service. To date, EPI has not figured into the budget of the Preventive Medicine Service as a line item, since it is almost totally donor funded. Only personnel are Ministry supported. The Chief of Preventive Medicine has overall responsibility for EPI activities. He is supported by two (2) State Nurses who supervise EPI activities from Nouakchott. Additionally, there is one (1) brevete nurse who functions as central warehouse and vaccine storage manager. At the Regional level, the Regional Medical Officer is responsible for EPI activities.

However, the Regional Medical Officer is responsible to the Chief of the Regional Health Units, and incidentally answers to the Chief of the Preventive Medicine Service. To further complicate matters, EPI as a concept implies immunization activities carried out in the MCH Centers. Here too the Regional Medical Chief has overall responsibilities, however the Supervisory Midwife answers to the Chief of the Maternal and Child Health Service.

Each of the 12 mobile team is provided with a refrigerator and a freezer. Four wheel drive, long base Land Rover pick-up trucks (some with tarpaulins) are also included. The team consists of a Team

Leader (a 3 yr. trained State Nurse), an assistant (a 2 yr. trained brevete nurse), a nurse's aide (6 or 9 months training) and a health assistant (3 months of training) in addition to a driver (not a driver/mechanic).

However, identification of EPI personnel in the MCH Centers has not been clearly focused. Midwife supervisors use their discretion as to who will vaccinate and who will maintain records and who will do triage. Refrigerators were only provided to these Fixed Centers overtime after the start-up of the project. At the Regional level all vaccine is ordered, received and stored by the Chief of the Mobile Team. He in turn stocks the MCH Centers in his region and often, but not always, includes this distribution in his monthly reports to the Central level. Until January 1983, Mobile Teams were required to submit monthly reports to the EPI headquarters in Nouakchott. This report included: (a) a listing of all localities visited, (b) kilometers traveled from locality to locality, (c) the number of vaccinations administered by antigen in each locality, (d) an inventory of vaccine stocks remaining at the end of the month, (e) the temperature of the refrigerator and freezer taken twice daily, and (f) expenditures. Additionally, information concerning problems encountered or situations resolved would be included at will. MCH Centers submitted monthly reports which reflected the number of vaccinations administered by antigen and daily temperature control sheets. Some times the Mobile Team report would also include this data. With the introduction of a new disease surveillance reporting system in January 1983, many teams ceased to submit the supplementary reports to EPI headquarters. This has caused disruption of central level planning and control.

With respect to supervision, the mobile team was to have been visited by one of the central supervisors three or four times during the year. At one time, it was envisaged that supervising could eventually be decentralized. However, this never materialized and would have been difficult, given the MOH's hierarchical structure. No specific time was arranged in advance for supervision visits, often they resulted from crisis situations. With such visits generally come additional vaccine and requested spare parts or other equipment. MCH Centers were also visited at this time by the Central level supervisor. No formal records of what occurred during these visits were kept, though some supervisors/supervisees noted suggestions made in vaccine registration books.

In late 1982, the EPI goals were revised in an effort to reflect the attainable rather than remain ever striving for the ideal. A coverage target of 80% for infants 0-11 months and 60% for children 0-5 years in total was adopted.

## 2.0 PREVIOUS EVALUATIONS

In 1981 the Ministry of Health conducted its first vaccination coverage survey with international assistance. The second was conducted in January 1983 during a meeting of international epidemiologists in Nouakchott. The most recent was carried out in July 1983 as a joint MOH, WHO, UNICEF, and USAID effort. (Table 1). Each survey employed the W.H.O. cluster survey method.

### 2.1 Nouakchott

Nouakchott was first surveyed to determine vaccine coverage rates in 1981. Demographic data were based on government-provided statistics from the 1977 census which included estimated population figures for 1982. Additionally, the MOH had data on the division of the Nouakchott population by housing lots. Cluster samples were selected using the official government population figures and housing lot divisions.

The second survey done in 1983 used the population data newly established by the Structure for Mass Education (SME) to randomly select cells (q.v. p. 3) and subsequently randomly select a household as a starting point for collection of clusters.

### 2.2 Regional

Although the Nouakchott surveys encountered few difficulties in cluster selection, population availability and implementation, regional surveys on the other hand experienced significant problems in each of these areas. Bearing this in mind, one must interpret these early results with caution. First, both regional surveys in 1981 (Assaba and Gorgol) only considered the rural sedentary population so as to evaluate mobile team coverage. Urban centers and nomadic camps were deliberately excluded from the survey universe. Second factor which must be considered is that only 2 of 5 departments were surveyed in Assaba and only 2 of 4 departments were surveyed in Gorgol. Finally, it was discovered that the 1977 village population lists were significantly inaccurate due in major part to substantial migratory patterns following many years of drought. In an effort to correct these inaccuracies, an attempt was made to up-date the lists using information provided locally by regional officials and the mobile teams. Population estimates were based upon local estimates and in some instances derived from mobile team records of the number of children vaccinated in a given village.

This effort introduced a bias in favor of the already known and more heavily vaccinated villages. At the time however, there was probably no better method for cluster selection available.

Table 1

History of EPI Coverage Surveys, 1981-1983

Date	6/81	6/81	6/81	1/83	7/83	
Location	Nouakchott	Assaba	Gorgol	Nouakchott	Gorgol	
Demographic Base	1977 Census	a) 1977 census b) Mobile team data	a) 1977 census b) Mobile team data	Structure for Mass Education	Structure for Mass Education	
AGE GROUP	12-47 months	12-47 months	12-47 months	12-24 months	12-47 months	
<u>RESULTS (Per Cent)</u>					TEYARETT	SEBKHA
BCG	70	64	85	52	75	75
Measles	42	53	76	21	39	50
DTC 1	65	61	87	27	54	70
2	54	40	61	18	46	44
3	49	17	35	15	42	25
Polio 1	56	67	86	27	54	68
2	48	40	59	18	46	43
3	45	16	34	15	42	24
Complete Vaccinations	27	14	29	13	32	20
With Cards	69	33	70	-	-	46

### 3.0 THE EVALUATION PROTOCOL

In July 1983, it was decided to carry out an evaluation survey which would include a coverage survey in the Gorgol Region as well as an operational assessment of EPI. The July survey brought the total number of surveys conducted since the beginning of the USAID supported Expanded Program of Immunization in Mauritania to five (see Table 1 on the following page).

#### 3.1 Survey Determination

After serious consideration of the various alternatives, the valuation team elected to carry out a vaccination coverage survey and operational assessment survey. The coverage survey would be done in the Gorgol Region. A national survey was ruled out due to time constraints, limited manpower, logistical considerations and a variable demographic base. It was agreed that the operational assessment would include Gorgol, Assaba, Hodh el Gharbi, Brakia and Trarza Regions.

Another concern of the evaluation team was the desire to make a cautioned comparison with the 1981 survey results. Gorgol offered this possibility. Therefore, the same age group used in 1981 would again be used, that is 12-47 months or 1-3 years.

#### 3.2 Cluster Technique

The Structure for Mass Education (SME) was the basis for cluster selection. (A cluster equals seven children age 1-3 yrs). SME registers for each of the four Departments in Gorgol (Kaedi, M'bout, Maghama and Monguel) were used to compile a sequential and cumulative list of families in the Region. Using the standard W.H.O. cluster technique of random selection, thirty households were chosen. The evaluation team was divided into four smaller teams and the 30 households were divided among them by Department.

The SME permitted each team to have the name of the quarter, the name of the chief of the cell and the name of the head of the household. These three items of information were to play a critical role in maintaining consistency of selection throughout the survey. Using the name of the head of a household as a starting point, and going from door to door, seven children aged 1-3 years were to be located. In the event a head of household could not be identified, the method permitted random selection of a replacement head of household. Thus randomness was assured, as was not the case with the 1981 survey.

#### 3.3 Practical Considerations

Several practical decisions were made which impact on survey results. First, children who had resided in the region less than 6 months were excluded since it was felt that such children would have had little opportunity to receive locally available services. Second, absent children were to be excluded unless a documentation of birth date was provided (vaccination card or birth certificate) and either the child's mother or a vaccination card were present. Third, results

were tabulated separately to show results for children with cards and results for children where maternal history served as an indicator of child's vaccination. History of vaccination was accepted if the mother could indicate the site (on the body) at which the child had been vaccinated. The teams found that some children had cards, some had none, and some had bits of paper on which one or two vaccinations had been recorded. For tabulation purposes, the last group of children were counted as having cards, even if some of the vaccination history on such children relied on histories.

Another note of caution should also be considered at this juncture. Some teams noted, especially among the Moors, that mothers would frequently claim that a child had never been vaccinated, irrespective of the fact that a BCG scar had been observed on the child. One team reported that of 59 children seen, not a single mother indicated that a measles injection had been given, although several of these same children had cards which indicated a measles vaccination had in fact been given. Additionally, although the evaluation attempted to include only children that had been resident six months or longer, among nomads the reliability of this variable is questionable. This problem is due to the fact that the SME had just been introduced, and it may have been in the respondent's interest to indicate residence longer than six months.

Another consideration that the evaluation team found curious, was that some camps claimed the mobile team had not visited in over a year, sometimes two, yet some children with cards in these camps were vaccinated within that period. Furthermore, the parents indicated that the same children had not left home. These incongruities may help explain to some extent the low coverage rates among Moors as shown in Table 5.

**4.0 COVERAGE SURVEY**

Results of the present survey are presented in Table 2. As expected, coverage is significantly lower if results from children with cards only are used, instead of results from children with cards or acceptable histories. For example, complete vaccination coverage was 13% if consideration is only given to children with cards, and 20% if one considers children with cards and acceptable histories.

**Table 2**

**VACCINATION COVERAGE  
GORGOL REGION  
July 1983**

Vaccine	<u>Cards Only</u>		<u>Cards &amp; History</u>		<u>1981 Results</u>
	<u>#</u>	<u>(%)</u>	<u>#</u>	<u>(%)</u>	<u>(%)</u>
BCG	86	40	161	75	85
Scar	88	41	158	74	80
Measles	70	33	106	50	76
DPT 1	90	42	149	70	87
2	55	26	94	44	61
3	36	17	54	25	35
Polio 1	94	44	146	68	86
2	53	25	92	43	59
3	36	17	52	24	34
Complete vaccination	28	13	43	20	29
Total with cards	99	46	-	-	70
Total Children Seen	214		214		218

Table 3

VACCINATION COVERAGE GORGOL REGION  
By Age - July 1983

<u>Age</u>	<u>Total</u>	<u>Completely Vaccinated With Cards</u>	<u>Completely Vaccinated Card and History</u>
1 yr	61 (28%)	6 (21%)	7 (16%)
2 yrs	76 (36%)	12 (43%)	15 (35%)
3 yrs	<u>77</u> (36%)	<u>10</u> (36%)	<u>43</u> (49%)
TOTAL	214 ===	218 (13%) ===	43 (20%) ==

Table 4

DISTRIBUTION OF VACCINATED CHILDREN GORGOL JULY 1983  
By Ethnic Group

<u>Group</u>	<u>Total</u>	<u>Completely Vaccinated Card and History</u>	<u>Per Cent of Totally Vaccinated Children</u>
Moors	127 (59%)	16 (37%)	13
Peul	70 (33%)	21 (49%)	30
Soninke	<u>17</u> (8%)	<u>6</u> (14%)	<u>35</u>
TOTAL	214 ===	43 ==	20 ==

Comparison with 1981 results must take into account the fact that the 1981 survey accepted cards or histories, and did not present results separately. In general, given the statistical limits of the survey method (+ 10%) the results of the present survey are similar to or slightly below those of the 1981 survey in Gorgol. However, the present survey found a fewer children with cards than was the case in 1981 (46% vs. 70%).

The present survey compiled some additional information of interest. First, the distribution of children by age. It was found that approximately equal numbers of 1, 2 and 3 year olds were surveyed, and that completion rates tended to be slightly higher in older children (Table 3). However, given the small numbers seen, statistical significance cannot be assigned. Second, the distribution of children by ethnic group of the mother (Table 4). It was found that Moors represented 59% of the survey population, but included only 37% of the children completely vaccinated. The complete vaccination rate for Moor children was 1/3 that of non-Moor children, and was significantly (square X = 9.81; p<0.01) different. Third, mothers of unvaccinated or incompletely vaccinated children were asked why the child was not completely vaccinated.

Some of the difficulties encountered among the Moor group were mentioned earlier and help to explain why there was a significant difference in vaccination rates. Other factors that should be considered are that they are simply hard to find, since they tend to be nomadic. It is also possible that they are the least informed as to the importance of vaccinations and therefore do not seek health services as quickly as other ethnic groups. At any rate, this problem merits further study since the finding poses significant cultural problems that need to be overcome.

The most frequent reasons cited were:

- fear of fever or other reaction
- ignorance that child was not completely vaccinated
- absence of family when mobile team visited
- ignorance of value of vaccination
- negligence

## 5.0 THE OPERATIONAL SURVEY

Following the coverage survey, each sub-team was assigned one or two regions, and was asked to visit the Regional Director of Medical Services, the mobile team, and MCH Centers in the region currently conducting vaccination activities. Each mobile team and MCH center was to be observed during a vaccination session. The following units were visited:

Gorgol	Medical Officer	Mobile Team	PMI (3)
Hodh Gharbi	---	Mobile Team	PMI (1)
Assaba	---	Mobile Team	PMI (1)
Brakna	---	Mobile Team	PMI (3)
Trarza	Medical Officer	Mobile Team	PMI (2)
NKTT	---	---	PMI (3)

Thus, a total of 5 mobile teams and 13 MCH Centers were surveyed. The full complement of units to be observed was not achieved for a variety of reasons: several medical officers were in Nouakchott at the time of the field visits and some mobile teams and centers were unable to hold vaccination sessions at the time of the field visits. Nonetheless, the field visits were felt to be of major importance in the overall evaluation.

At each health unit visited, a detailed questionnaire was to be completed. A sample questionnaire is included as Annex 4. The purpose of the questionnaire was to direct the team's attention to each of 9 important areas of operation in sufficient detail to allow meaningful evaluation. Precise quantification of responses was often not possible. However, it was the team's overall judgment that each health unit was examined in sufficient detail to permit a number of observations. The following nine categories were looked at:

5.1 Personnel - Mobile teams: one mobile team's leader was absent at the time of the field visit. Only 2 of the 5 teams visited had the full complement of personnel.

MCH Centers: most centers seemed to have adequate numbers of personnel, but many were absent at the time of the evaluation, and it was difficult to assess whether personnel needs were routinely being met. (See Annex 3 - Categories of Personnel).

5.2 Vaccine stock - Mobile teams: adequate vaccine stocks of all antigens were found in each regional depot. In some instances, the amounts of vaccine present exceeded the amount used in the entire past year. Only 2 of 5 teams had a current inventory. Vaccine deliveries occurred variably every 1-4 months. Vaccine orders were placed on the basis of amounts used in prior periods, rather than on the basis of projected target populations.

MCH Centers vaccine stocks were irregular. Centers without functioning refrigerators relied on mobile teams to deliver vaccines when needed. None maintained an inventory of stocks. No projections of targets were made.

5.3 Cold chain - Mobile teams: all 5 teams had a functioning refrigerator and freezer, either using electricity or kerosene. Daily temperature checks were performed by 4 of 5, however, no team appeared to have a systematic and reliable method for assuring temperature checks while they were in the field. Four of 5 refrigerators had temperatures within the range of +4-+8°C; one had a temperature of +20°C at the time of the visit. All 5 refrigerators had thermometers. Ice was present in all freezer compartments, but most were in need of defrosting. Exterior and interior compartments were found to be in good condition. Four of 5 had spare parts available. All 5 had an acceptable emergency plan for removal and storage of vaccine in the event of a major break down.

MCH Centers: Four of the 13 visited had no functioning refrigerator, and relied on the mobile teams for vaccines. Only 3 out of 12 indicated they did daily temperature checks. Half had temperatures beyond an accepted range. Only 3 out of 12 had a thermometer. Exterior and interior compartments were generally in good condition. Due to significant ice in one freezer compartment, maintenance of the cold chain was highly suspect. Spare parts were generally available. All had an acceptable emergency plan.

5.4 Vaccination equipment - Mobile teams: Insufficient quantities of syringes, needles, and vaccination cards were observed.

MCH Centers: Insufficient quantities of syringes, needles, and cards were reported by several Centers.

5.5 Vehicles - Mobile teams: All 5 teams had a functioning vehicle (Land Rover), all over 3 years old. The quantity of gasoline provided was considered inadequate by all 5 teams. The major reason cited was that the funds provided had not been changed in 3 years despite variations in the cost of gasoline. (Table 5).

MCH Centers: No center had a working vehicle. Those in Nouakchott borrow a vehicle from the central office in order to conduct outreach clinics.

5.6 Surveillance - The vast majority of surveillance data are provided by the curative services (hospitals and dispensaries). Mobile teams and MCH Centers are asked to provide such data as they have. Roughly half report diseases by age group or vaccination status. Age grouping and vaccination status data are not requested by the central level statistics section. Without exception health units stated that they received no feedback from the central level.

5.7 Observation of Vaccination Sessions - Less than half the intended vaccination sessions were observed. Multiple issues arose from those that were seen. For instance, single usage materials were often reused due to shortage of materials. Vaccination schedules and sites of injections were generally correctly followed; nevertheless some units deviated from these standards (e.g. use of right arm for BCG, use of arm for DTP). Needles were occasionally used for multiple persons. Syringes were frequently used for multiple persons. The Omega syringe was frequently encountered, but the needle was not

sterilized (flamed) between persons in any of the sessions observed. BCG was rarely administered with correct intradermal technique. Sessions were generally disorganized exacerbating already difficult working conditions. Registration of children appeared to be appropriate, though lengthy. In at least one session, children were registered but a count of vaccinations delivered was not kept, despite a requirement for such counts in the monthly report. Several MCH Centers indicated use of a schedule involving administration of BCG on 1 day, of measles vaccine on a second day, and of DPT/polio vaccine on a third; the difficulties in obtaining full vaccination of children under such a schedule are obvious.

Table 5

Average Cost of Gasoline (Super)  
in Mauritania  
October 1980 -- July 1983

<u>Time Period</u>	<u>Average Cost/litre</u>	<u>% Change</u>
Oct. 1980 - Sept. 1981	.63	-
Oct. 1981 - Sept. 1982	.72	+ 12
Oct. 1982 - July 1983	.68	- 5

1. A 5% DECREASE in average cost in 1983 from 1982.
2. A 7% INCREASE in average cost over a 22 month period from Sept. 1981 to July 1983

SOURCE: U.S.A.I.D. General Services Office, August 1983

5.8 Health Education - No organized effort at health education was observed at any session. A series of questions asked of 3-6 mothers at each session indicated the following:

<u>Question</u>	<u>Number Answering Yes</u>	<u>Sample Size</u>
1. Understood goals of vaccination	34	51
2. Understood normal reaction to vaccine	34	49
3. Understood time to return	34	52
4. Felt well-received by personnel	50	55
5. Had a radio at home	37	55

5.9 I. Reference Material - only 1 of 13 Centers visited reported having useful reference material available (in a few instances, however, the individual interviewed was not the usual chief of the unit).

#### 5.10 Brief Summary

Although a variety of technical problems were perceived by the evaluation team at the MCH Centers, the evaluation team was impressed with the dedication and overall quality of the personnel responsible for EPI at the Regional levels. Both team leaders and midwives as a whole constitute the base upon which the continued success of EPI will depend. The evaluation team is in agreement that this cadre of personnel in particular merits particular attention in the immediate future. Technical support and supervision is presently inadequate and if not significantly reinforced, poses a serious impediment to further EPI progress. Some of the major problems identified by the evaluation team with respect to the mobile teams are:

1. Inadequate per diem support;
2. Insufficient quantities of gasoline;
3. Difficulties in maintaining adequate cold chain over time under severe field conditions; and
4. Insufficient numbers of personnel to adequately constitute a complete team.

Similar problems exist among the MCH Centers, notably among them:

1. Inadequate stock of vaccines and equipment;
2. Inadequately trained personnel;
3. Insufficient numbers of personnel; and
4. Little or no health education activities for mothers.

## 6.0 EVALUATION AT CENTRAL LEVEL

### 6.1 Administration

The headquarters for EPI is in Nouakchott and is a function of the Service of Preventive Medicine. There is no separate EPI or vaccination activity. EPI is the responsibility of the Chief of Preventive Medicine and has a chief of service, with 2 central level supervisors, 2 warehouse managers and 1 vehicle. WHO provides technical assistance through an in-country technical advisor and epidemiologist. A significant part of the epidemiologist's time is devoted to teaching at the National School for Public Health. The numbers of personnel are essentially the same since the EPI program began, despite the ambitious expansion of the program from 3 to 11 regions. As a consequence, central personnel have been seriously overburdened. A dearth of program monitoring, planning, and supervision has resulted.

Coordination between EPI and the Maternal and the Child Health Service remains vague and uncertain. Ambiguity and the lack of formally defined lines of responsibility impede effective technical backstopping of EPI activities.

### 6.2 Warehouse Management

Vaccine management at the central level appeared reasonable. The central warehouse has an available inventory of vaccine cold chain equipment. Several problems were evident: First, cold chain security at the central level is not yet absolutely complete. Second, the managers are both trained nurses, and both are now learning cold chain management and inventory control. Third, there is no EPI trained cold chain technician. Fourth, available vaccine inventory lists were found to have important inaccuracies. Fifth, observed vaccine stocks were judged to be excessive.

### 6.3 Reporting

Confusion has recently arisen with respect to information required to be reported regularly by the EPI units. From 1980 to Dec. 1982 regular reports were required of EPI Units which provided information on numbers of cases of EPI target diseases, number of antigens administered, number of antigens received and stock remaining at end of reporting period. A review of these reports indicated that they were sporadic and incomplete at the level of the EPI supervisor. However, a more complete record was maintained by the Division of statistics within the MOH, thus permitting a more complete analysis.

Since January 1983 no regional level reports on EPI activities have been received at the central level, except requests for funds and gasoline. Nonetheless, the following tables provide a glimpse of vaccine stocks, shipments and utilization by the EPI program. With respect to EPI target diseases, Graph 1 shows the trend of measles cases by month in Mauritania during 1982, while Graphs 2 and 3 respectively reflect measles cases over the period 1971-1982 and whooping cough cases over the period 1971-1982.

Table 6

1982 Vaccine Shipments from  
Central Warehouse (Doses)

	<u>BCG</u>	<u>Measles</u>	<u>DPT</u>	<u>Polio</u>
Expired	7650	-	9140	-
Shipped from Warehouse	96.500	77-87.000	131.000	137.5-165500

Table 7

Vaccine Administered by Mobile Teams 1980-1982 Inclusive

<u>Vaccine</u>		<u>BCG</u>	<u>Measles</u>	<u>DPT</u>			<u>Polio</u>		
				1	2	3	1	2	3
11/79-12/80	*1	66.689	54.843	58.400	27.762	11.275	56.316	23.502	11.275
1/81-12/81	2	47.695	40.826	43.353	37.868	24.213	43.717	35.887	21.333
1/82-12/82	3	41.609	32.767	43.119	22.163	18.694	41.886	21.968	16.558

\* Adjuste: Nr. Rapporte x  $\frac{12}{14}$  = Nr. Estime pour 12 mois

Table 8

Vaccine Administered by MCH Centers 1980-1982 Inclusive

<u>Vaccine</u>		<u>BCG</u>	<u>Measles</u>	<u>DPT</u>			<u>Polio</u>		
				1	2	3	1	2	3
11/79-12/80	*1	12.180	9.008	15.982	10.681	5.919	15.805	10.576	5957
1/81-12/81	2	12.774	10.427	16.198	11.257	9.966	14.944	9.989	11.383
1/82-12/82	3	15.897	8.488	14.601	9.964	8.803	14.766	10.077	7.993

Source: 1 1981 EPI Evaluation  
2 1981 EPI Annual Report  
3 MOH, Division of Statistics and Documentation

Table 9  
1982 Total Vaccine Administered and  
Utilization Rates

<b>Doses Administered</b>	<b><u>BCG</u></b>	<b><u>Measles</u></b>	<b><u>DPT</u></b>	<b><u>Polio</u></b>
<b>Mobile Teams</b>	<b>41.609</b>	<b>32767</b>	<b>83976</b>	<b>80412</b>
<b>MCH Centers</b>	<b>15.897</b>	<b>8488</b>	<b>33368</b>	<b>32836</b>
<b>Total</b>	<b>57.506</b>	<b>41.255</b>	<b>117.344</b>	<b>113.248</b>
<b>Utilization Rates</b>	<b>60%</b>	<b>47-54%</b>	<b>90%</b>	<b>68-82%</b>

Table 10

Vaccine Actually Present  
Compared to Inventory Records

EPI Central Warehouse (Doses) August, 1983

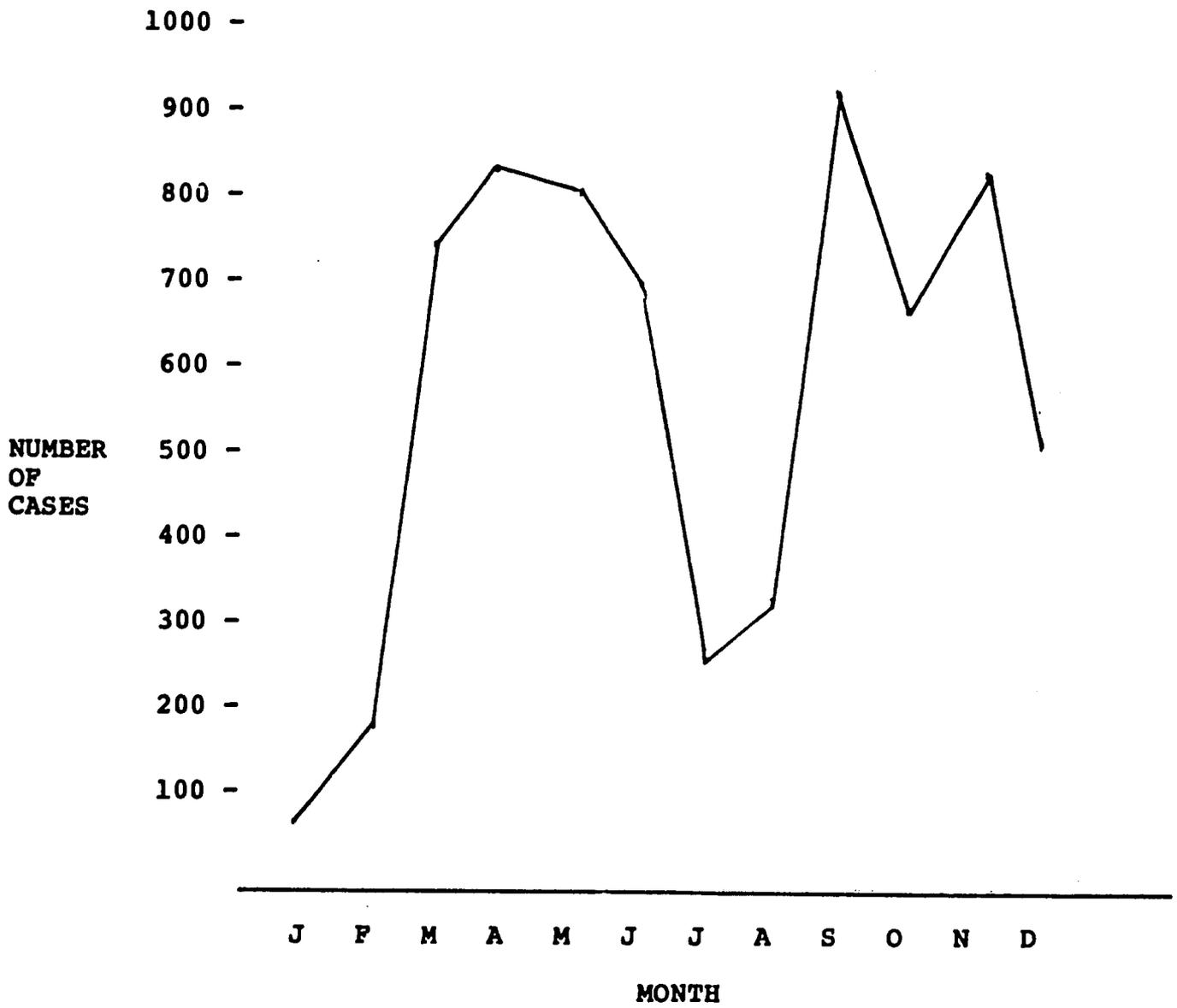
<u>Vaccine</u>	<u>Stock Listed in Inventory Register 3.8.83</u>	<u>Stock Actually Present on 7.8.83</u>
BCG	99.750	-
Measles	83.000	84.500*
DPT	501.900	-
Polio	389.000	330.000*

\* Evaluation team only counted Measles and Polio.

MEASLES CASES, MAURITANIA,

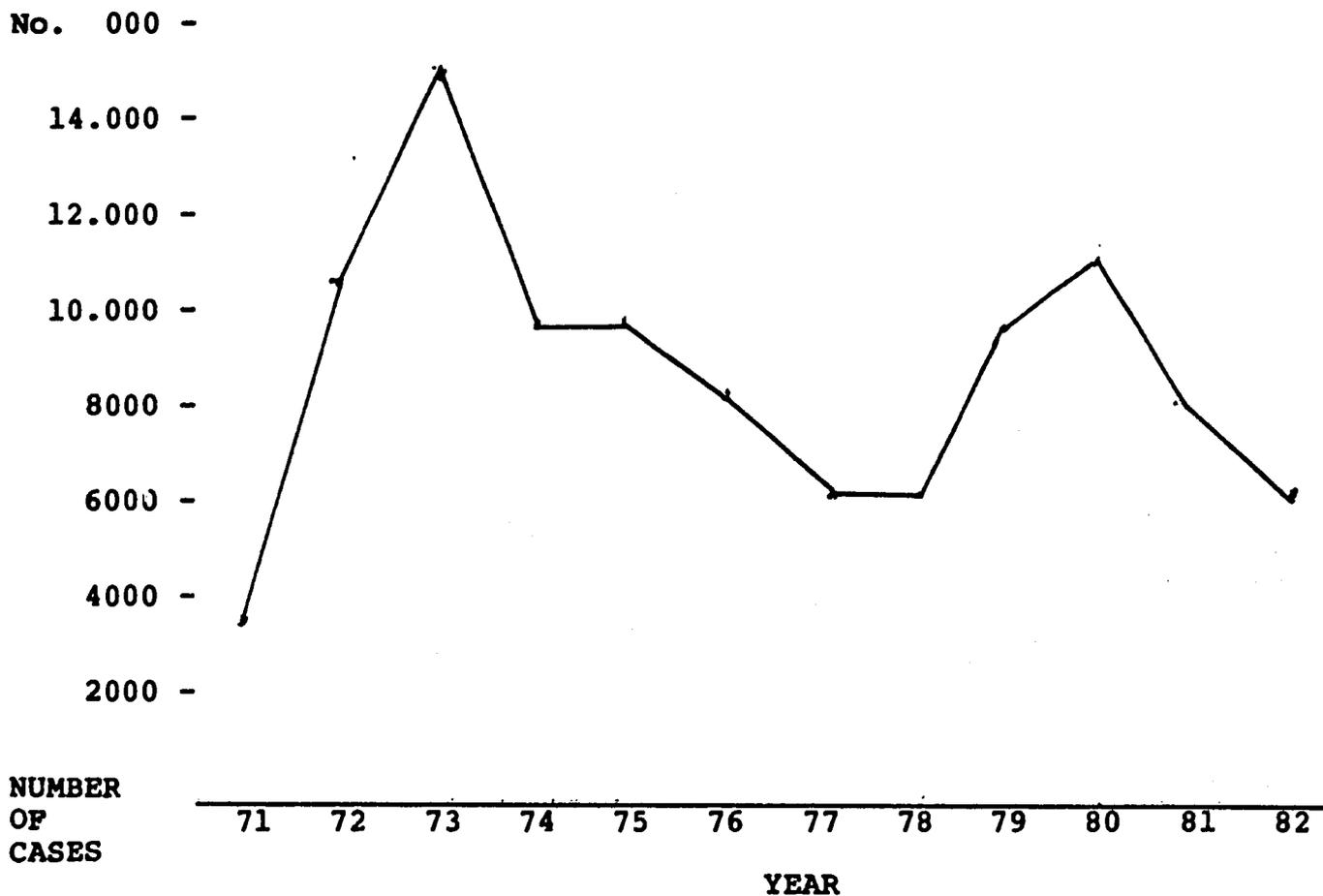
1982

By Month



Graph 2:  
MEASLES CASES  
MAURITANIA  
1971 - 1982

Source: Div. de Stat. & Doc.  
MOH

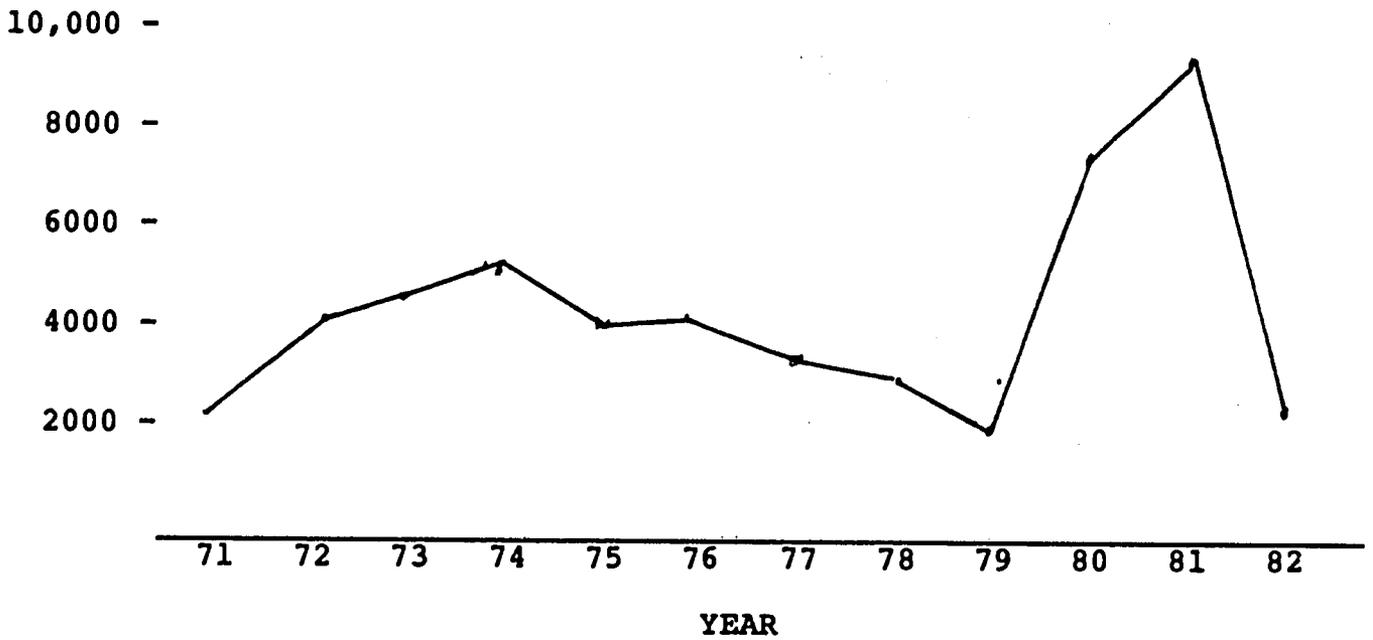


Note: Improvements in reporting of EPI diseases since 1978/79 may skew results.

Graph 3:  
CASES OF WHOOPING COUGH  
MAURITANIA

Source: Div. de Stat. & Doc.  
MOH

NUMBER  
OF  
CASES



Note: Improvements in reporting of EPI diseases since 1978/70 may skew results.

## 7.0 SUMMARY AND RECOMMENDATIONS

This final evaluation of the Mauritanian Expanded Program of Immunization has attempted to maintain a specific focus on the activities of the EPI, recognizing, however that such activities cannot, indeed, must not operate independently of other health activities. Historically EPI activities have been managed and administered as categorical programs, existing apart from the mainstream of Ministry of Health activities, with little attention to long-term planning for meeting the health needs of the population as a whole. Since their concurrence with the Declaration of Alma Ata in 1978, Mauritania has taken vigorous steps to develop a strategy of immunization services with a view towards integrating these activities into the mainstream of other equally important Ministry of Health Primary Health Care activities. However, the GIRM has not provided its own funding for EPI activities, but rather has relied almost completely on donor support to carry out this component of service delivery.

The willingness of the GIRM to conduct three coverage surveys and two operational assessments of EPI activities clearly attests to the importance attached to EPI activities in Mauritania. The evaluation team recognizes this importance and moreover, further recognizes the concern of the Ministry to integrate EPI activities into its Primary Health Care efforts, without simultaneously diluting the progress made over the past four years. The issue of integration is critical at this point in time. That Mauritania recognizes the situation and has noted the attendant problems and issues inherent in an integrated strategy is a major step toward its ultimate achievement.

In assembling the proposed recommendations for this evaluation, consideration was given to the recommendations of the 1981 evaluation. The concerns noted in 1981 have all been addressed during this evaluation and are either implied or explicit in the following recommendations. The principal recommendations made in 1981 were:

1. To improve the coordination between the MCH and EPI so as to have one program composed of fixed and mobile vaccinations activities.
2. To substantially improve the cold chain at regional and peripheral (MCH) levels;
3. To improve regional supplies of vaccine, vaccination material and vaccination cards;
4. To study the possibility of conducting retraining program for all EPI personnel and a mid-level EPI course in 1982.
5. To develop a health education program geared to promote EPI among the population by establishing a health education unit having resources available to it to carry out such activities;
6. To establish an epidemiologic surveillance system to monitor the EPI target diseases on a monthly basis through the creation of surveillance posts;

7. To improve EPI staff motivation by studying the possibilities of furnishing per diem;

8. To regularly conduct vaccination coverage surveys; and

9. To conduct a second evaluation with international participants within two years.

Overall progress towards achieving the recommendation made in 1981 has been disappointing. Nonetheless, the current evaluation team recognized efforts throughout the Program to address many of the recommendations and some progress has been noticeable. The team presents the following eleven categories of EPI activities addressing accomplishments to date, identification of continuing or new problems and recommendations.

### 7.1 Coordination

Since 1981 a Council on Primary Health Care and Health Education has been established which is designed to carry major responsibility for assuring adequate coordination of EPI activities at all levels. A working relationship has been established between PMIs and mobile teams which did not exist in 1981. Additionally, retraining seminars concerning EPI have been held, including personnel from both the mobile teams and Maternal and Child Health Centers.

Yet to be determined is the staffing pattern of the proposed Council as well as a definition of its role, functions and responsibilities. Currently, there is a lack of definite lines of responsibility between mobile team leaders and PMI chiefs.

### 7.2 Recommendations

7.2.1 The establishment of a commission to consider and define EPI coordination. This commission should include high level personnel from each service within the MCH involved in EPI. The commission should meet monthly and the timetable for these meetings should be prepared and distributed in advance to MCH and all donors involved in EPI.

7.2.2 The immediate establishment of a technical committee to determine needs and identify resources for EPI. This committee should consist of the Director of EPI or his delegate, the Director of the Maternal and Child Health Service or her delegate, Directors of other involved services or their delegates, EPI external technical advisors and representatives from involved donors. This committee should meet quarterly and a timetable for these meetings should be prepared and distributed in advance.

7.2.3 Minutes of the meetings of both commissions should be kept, printed and distributed to personnel involved in EPI and other interested persons, at all levels.

### 7.3 Cold Chain

Adequate refrigeration equipment is present at the central level. A contract has been entered into with a refrigeration firm in Nouakchott to assure continued maintenance and repair of the central level generator and cold chain equipment. Since 1981, 2 cold stores have been installed in Nouakchott, refrigerators distributed to PMIs, a generator procured for Nouakchott, and spare parts stocked for cold chain on all levels. Furthermore, equipment for cold chain has been purchased and distributed at the regional level and spare parts for maintenance are available. Cold chain has been the subject of a number of seminars for mobile team and MCH personnel. Understanding of the maintenance of the cold chain appears to be satisfactory at the regional level.

At the central level, security remains questionable. Apart from the contractor, there are no trained EPI cold chain technicians. Since January 1983 no cold chain reports have been received at the central level from the Regions. During the absence of the mobile team from their base, there is no formal system for safeguarding the cold chain. Present methods being used to maintain the cold chain limit mobile team tours to three or four days. Adequate maintenance of the cold chain while the team is on tour is questionable. Understanding of the cold chain by MCH personnel is highly questionable while management is inadequate.

### 7.4 Recommendations

7.4.4 Central level cold chain security needs to be reviewed. Systematic checks of the back-up generator should be initiated immediately and a written record maintained. Installation of a graphic thermometer for both walk in freezer and refrigerator should be undertaken immediately.

7.4.5 Identify, recruit and train a central level cold chain technician.

7.4.6 Institute a formal system of cold chain monitoring and reporting at regional levels including periods during which teams are on tour. Include such monitoring reports with reports sent to central level.

7.4.7 Immediately initiate a program to retrain all MCH personnel in cold chain maintenance and minor refrigerator repairs.

7.4.8 Institute a system of cold chain autonomy for mobile teams which will permit them to lengthen their touring time. Consideration should be given to installation of mobile refrigeration units which can be taken in vehicles. Choice of equipment and technical feasibility should be the subject of a brief but definitive study prior to any such determination.

7.4.9 EPI personnel at decision making levels should consider a work study visit to the A.P.M.P. supported immunization program in Kolda, Senegal to observe cold-chain in particular and other aspects of project management and administration which might be helpful in Mauritania.

7.4.10 Recommendation 7.4.9 should be considered at the first meeting of the joint Mauritanian - donor - technical advisor Commission established under recommendation 7.2.1.

7.4.11 Testing of vaccine potency through evaluation of vaccine samples or serologic studies should be considered for each level of the cold chain.

## 7.5 Logistics

Vaccine and vaccination equipment were generally found to be present in variable quantities. A modification of the vaccination card was made after the 1981 evaluation and use of the modified version is being encouraged. Vehicles were found to be functioning more or less reliably and all teams had access to fuel. Central level needs for long-term planning were recognized while some long term planning has been undertaken.

There exists uncertainty at all levels with respect to vaccine needs and how to adequately determine those needs. Excessive amounts of vaccine were found to exist at some levels, including the central level. Vaccination equipment although present is insufficient at all levels and single use equipment is of necessity being re-cycled. In some instances there is a dearth of vaccination cards, in particular at the MCH centers. Some PMI's prefer to have mother's purchase (20 UM) a small notebook which serves as a vaccination record as well as a record for additional child growth and nutrition information. The utility and durability of the present card is questionable.

## 7.6 Recommendations

7.6.12 Prepare a uniform plan for the receipt and delivery of vaccines at the regional level.

7.6.13 Immediately review and revise existing data for proposed future vaccine needs in Mauritania in light of achievable goals.

7.6.14 Immediate adjustments in deliveries must be made due to impending delivery dates. The Director of Preventive Medicine and UNICEF Representative should discuss and coordinate adjustments.

7.6.15 As a result of Recommendation 7.6.14, any funds made available as a result of this adjustment this year should be considered for possible reprogramming, particularly for the immediate purchase of vaccination equipment and supplies.

7.6.16 Prevent the recycling of single use vaccination equipment.

7.6.17 Review the present vaccination card with the aim of increasing its utility in view of the proposed integration of EPI activities into other components of the health system. Consider providing plastic envelopes or other materials which would preserve the life of the card in addition to maintaining a record of childhood growth and immunization history.

7.6.18 Undertake an assessment including a cost benefit analysis of the feasibility of introducing the two dose Tetracoq (DPT + killed polio).

7.6.19 Mobile team vehicles should be replaced. Additionally, consideration should be given to the provision of a means of transportation to MCH centers having adequate staff and demonstrating capability to effectively conduct outreach EPI activities. The outreach strategy needs further definition in order to assess needs and find adequate resources.

7.6.20 Review gasoline requirement for EPI activities and make adjustments accordingly.

7.6.21 Before the end of 1984, develop and distribute to all EPI personnel an EPI operations manual.

7.6.22 Undertake immediately a program to determine the vaccine needs for each level of operation so that:

1. The Central Level stock does not exceed six months' anticipated use;
2. The Regional Level stock does not exceed three months' anticipated use; and
3. Peripheral level or MCH Center's stock does not exceed one month's anticipated use.

7.6.23 Establish a well defined system for assuring the availability of moderate sums of petty cash funds for EPI central level activities.

## 7.7 Personnel

EPI personnel at all levels impressed the evaluation team with their dedication and willingness to maintain a strong and efficient EPI effort. The Ministry of Health has focused on issues which will be the subject of training seminars for EPI personnel. With the support of the W.H.O., public health and EPI activities have been introduced into the curriculum at the National School for Public Health in Nouakchott.

Despite the increase in the EPI over time, from three to 11 Regions, the numbers of central level personnel have remained constant. Central level personnel are insufficient to manage and administer a nationwide EPI. Mobile teams lack the full complement of

staff to function adequately. Some jobs are being performed by inappropriately trained personnel. Among the mobile teams, motivation is low and morale is being seriously jeopardized. Moreover, while dispensary nurses receive overtime pay for their extra 'garde' duty, mobile teams who necessarily must spend time away from their families, receive no such extra compensation. Mobile teams cannot expect villagers to provide them with lodging or food and must be prepared to deal with this situation independently when on tour. Some mobile team members indicated that because of the inordinate hardships placed on them by the EPI responsibilities without commensurate financial recompense, they had requested transfers to other services in the Ministry. There can be little doubt that problems such as these drift back to newly graduating nursing students who judge the merits of what they hear and request assignments accordingly. This issue must be faced by the GIRM head on and dealt within an equitable manner if the program as a whole is to survive.

### 7.8 Recommendations

7.8.24 Consideration should be given to the establishment of an organizationally separate administrative unit, within the Preventive Medicine Service. This unit must clearly include the position of the national EPI coordinator and possess the ancillary staff to address cold chain maintenance, equipment and vaccine supply, distribution, vehicle maintenance and EPI long-term planning, surveillance, monitoring and budget preparation.

7.8.25 In order to assure a continued effective EPI effort the GIRM must undertake immediate action to assure availability of funds for per diem for all persons involved in EPI. This recommendation should be considered with recommendation 7.22.54 (see page 17).

7.8.26 The GIRM should initiate a program to assure that the mobile teams and MCH Centers are staffed with adequate numbers and appropriately trained personnel. This initiative should include a strategy to assure stability of personnel once they have been posted.

7.8.27 EPI activities, as defined by the GIRM should be made an integral part of the curriculum at the National School of Public Health in Nouakchott.

7.8.28 Nurse training should include practical field training determined in conjunction with the EPI Director and Nursing School Director.

7.8.29 A re-training program should be established for all levels of EPI personnel including the Regional Medical Officers.

7.8.30 Selected regional Medical Officers should be given the opportunity to participate in the senior level EPI manager's course. Funding should be made available through EPI.

## 7.9 Supervision

The evaluation team recognized that EPI staff responsible for supervision were cognisant of the necessity to maintain this component of the program and that efforts are being made to do so.

The adequacy and frequency of supervision and supervisory visits is hampered by an insufficient number of central level personnel. There is no established plan for conducting such visits, nor a program for how they should be carried out. The present method of visiting EPI units and counting equipment neglects the most important aspect of supervision, namely teaching. Current supervision schedules allows little time for comprehensive on-site observation and instruction. MCH Centers suffer from the need for this critical aspect of supervision.

## 7.10 Recommendations

7.10.31 At the central level, supervisory personnel must be clearly identified and trained in adequate numbers.

7.10.32 EPI and the Maternal and Child Health Service must immediately identify and officially designate central level supervisory personnel, and provide them with the requisite authority and responsibility to supervise the activities of both mobile teams and MCH Centers. Joint supervision teams should be created.

7.10.33 At the Regional level, MCH Centers should be advised by the central level that technical backstopping for EPI activities will be provided by the mobile team leader and joint supervision teams as noted in 7.10.32.

7.10.34 At the central level, a program for regular supervisory visits emphasizing teaching, should be established which includes visits to mobile teams while on tour and observation of MCH Centers during a vaccination session. Regional level staff should be informed of this program and the time proposed for visits in advance.

## 7.11 Programming of Activities

The team observed that the MCH Centers have established schedules for vaccination sessions while the mobile teams plan and submit quarterly activity reports.

Regional level and peripheral level planning is done based on the previous month's activities. Identifying and planning around target populations is not done. MCH Centers vaccinate once or twice a week and do not always use the same antigens. This discourages the others and reduces the probability of full immunization of their children. The mobile teams have no fixed itinerary and most importantly there is no system to alert villages of their arrival.

## 7.12 Recommendations

7.12.35 Both mobile team's and MCH Centers should be provided technical assistance to develop their vaccination strategy using target populations as their base.

7.12.36 Program goals are seriously compromised by not administering all antigens. A uniform program should be established immediately which will assure that each MCH Center makes available all antigens during each vaccination session.

7.12.37 Mobile teams should establish a system whereby every step is taken to apprise villages at least three days in advance of their arrival and purpose.

## 7.13 Disease Surveillance

There exists a functioning centralized reporting system. Improvement in the frequency of reporting from health units has been noticed over the past two years. Additionally, efforts have been made to streamline and standardize the system.

There appears to be confusion at the regional levels as to what reports should be sent to the central level. Some units are still submitting reports in accordance with the former system, while others only submit a single form monthly as was requested in January 1983. Duplication of reports exists at the peripheral level while at the central level only tabulation of reports is undertaken and no analysis provided. The last published surveillance report was for calendar year 1980. No central level feedback to regional and peripheral level units is carried out.

## 7.14 Recommendations

7.14.38 The Director of EPI should designate a qualified person to monitor surveillance data. This person should coordinate activities with the Division of Statistics and should be responsible for the compilation of monthly data on EPI diseases and vaccination activity.

7.14.39 The system of reporting in use up to January 1983 should be reinstated for EPI units. This system should be thoughtfully integrated with the new system adopted since January 1983.

7.14.40 Special studies should be considered to develop data on specific EPI diseases, particularly polio, childhood tuberculosis and neo-natal tetanus.

7.14.41 Many mothers cited fear of complications as one of the reasons for not having their child vaccinated. Consideration should be given to including significant complications due to vaccination in the list of reportable diseases.

7.14.42 An annual EPI report should be compiled which presents and evaluates available surveillance data.

7.14.43 A system for providing feedback from the central level to regional and peripheral level units should be initiated. This should not be lengthy or too detailed, but should provide information as to what activities of major importance are being carried out by EPI. A start could be the results of this evaluation.

#### 7.15 Health Education

In 1982, a Division of Health Education was created within the Preventive Medicine Service. In late 1982, the MOH sponsored a seminar on Health Education issues for EPI personnel and the Regional Medical Directors. Personnel working on EPI activities in MCH Centers and dispensaries participated in a second Health Education Seminar held in May, 1983. A brief period of time was spent with radio announcements concerning vaccination activities. Most importantly the Council on Primary Health Care and Health Education has been created to address major health education issues, among its other responsibilities.

To date however, little has been accomplished in this area and it should be regarded as an entirely new aspect of EPI that needs significant attention and support. The Second Health Education Workshop in May, 1983 alluded to vaccinations three times but failed totally to address the role of EPI in Maternal and Child Health care activities. The EPI central warehouse has large stocks of health education materials which have never been used. Health Education is little understood and for practical purposes may be said not to exist.

#### 7.16 Recommendations

7.16.44 EPI should designate someone within its organization who can devote full time to health education planning and coordination with the Council on Primary Health Care and Health Education.

7.16.45 The Council should consider among its priorities the development of a health education strategy to promote EPI activities.

7.16.46 The Council should consider the feasibility of using mass media, the Structure for Mass Education and the Community Health Workers as conduits to promote EPI.

#### 7.17 Future Evaluations

Since July 1981, three coverage surveys and two operational assessments have been carried out under EPI. When the cold chain was suspected of having been ruptured, vaccine was tested. EPI central level personnel understand the importance of evaluation and consider this activity as having a positive influence on program activities.

The previous surveys were performed with the assistance of substantial numbers of non-Mauritanian participants. The evaluation team is of the opinion that adequate Mauritanian expertise presently

exists and is capable of planning and conducting future coverage surveys. There is a dearth of reliable data concerning the incidence of EPI target diseases namely polio and neo-natal tetanus. Program monitoring difficulties are compounded by the fact that the present surveillance system is at best unreliable and at worst uncertain. With respect to measles, for instance, it is not currently possible to demonstrate the expected seasonal fluctuations.

### 7.18 Recommendations

7.18.47 Without exception, the evaluation team unanimously recommends that Mauritania be encouraged to carry out periodic vaccination coverage surveys, using Mauritanian expertise. Various limited geographic area surveys will serve to provide adequate programmatic feedback to central level EPI personnel. The important point is that they be scheduled, performed, the data analysed and program modifications made accordingly.

7.18.48 Special studies which address the incidence of polio and neo-natal tetanus should be considered.

7.18.49 Implementation of the recommendations made as a result of this evaluation should be monitored and plans made for a formal EPI evaluation before the end of 1984 and 1985.

7.18.50 Recommendations 7.14.39 must first be implemented before more practical and reliable EPI evaluation results can be expected in Mauritania.

### 7.19 Strategies

Fixed and mobile vaccination strategies have been defined and are being implemented. Additionally, an outreach strategy for fixed centers is being experimented with. The potential for using the Structure for Mass Education has been demonstrated with positive results. Standardization of activities is being gradually introduced, particularly vaccination sites, reporting and to a lesser extent the use of green vaccination cards.

The concept of outreach activities is controversial at the central level and should be further thought out and better coordinated. Recently, the present target age of 0-5 years has come under scrutiny. Some quarters are suggesting a reduction to 0-2 years. Mauritania lacks sufficient data to take such a drastic step in the near future. In fact, some measles morbidity and mortality data strongly suggest a substantial proportion of cases in older children and adults.

### 7.20 Recommendations

7.20.51 Outreach activities should be encouraged, however future activities should be better planned and needed resources provided, including vehicles, if found necessary, to carry out a successful outreach strategy.

7.20.52 Standardization of EPI activities must be reinforced at all levels.

7.20.53 With the present low level of complete vaccination coverage coupled with uncertainties underlying disease epidemiology in Mauritania, the unanimous recommendation of the evaluation team is that prior to making any decision which would have the effect of modifying the EPI target age group, an in-depth epidemiological study be made which will determine the impact of such a modification on disease epidemiology and the associated program costs involved.

#### 7.21 Budget

Through external donors, EPI funding has been made available. The 1982 Ministry of Health and Social Affairs operational budget does not contain a line item for EPI activities.

#### 7.22 Recommendation

7.22.54 The team recognizes the problems related to EPI funding, in particular the recurrent costs that EPI will pose to the Ministry's financial burden. However, the evaluation team recommends that the GIRM initiate steps immediately to gradually and progressively assume costs for maintaining EPI after 1988 and further, that these costs be reflected as a line item in the operational budget of the Preventive Medicine Service in the Ministry of Health and Social Affairs.

Annex 1

List of Participants

<u>NAME &amp; TITLE</u>	<u>ORGANIZATION</u>	<u>PARTICIPATION*</u>
1. Dr. Kane Youssouf Director Preventive Medicine Service and Director, Expanded Program of Immunization (EPI) (Since June, 1982)	GIRM/MOH	1,2,3
2. Mr. Djibril Senghott Chief, Division Communicable Diseases and Supervisor, EPI	GIRM/MOH/SA	1,2,3
3. Dr. Mohamed Mahmoud O/ Hacem Technical Advisor to Minister of Health and Social Affairs (Formerly Director of EPI; 1979-June, 1982)	GIRM	1,2,3
4. Mr. Kane Mamadou Division of Statistics	GIRM/MOH/SA	1,2,3
5. Mme Ba nee Khady Sy Director, Maternal and Child Health Service	GIRM/MOH/SA	1
6. Mr. Dia Mohamed el Kebir MCH Service	GIRM/MOH/SA	1,2,3
7. Mr. Kane Barry Preventive Medicines, EPI	GIRM/MOH/SA	1,2,3
8. Mr. Antoine Ayoub Technical Officer	WHO/Nouakchott	1,2,3
9. Dr. Mustapha Sidatt National Coordinator	WHO/Mauritania	2
10. Dr. Lekie Botee Epidemiologist	WHO/Mauritania	1
11. Mr. Anthony Raby Liaison Officer	UNICEF/Mauritania	3

12. Dr. Martin Schlumberger Director, Project Kolda	APMP/Dakar	2,3
13. Ms. Erna Kerst EPI Project Manager	USAID/Mauritania	1,2,3
14. Mr. John McEnaney Health Development Officer Office of Health Bureau for Science and Technology	AID/Washington	1,2,3
15. Ms. Betsy Brown IDI, Public Health Advisor	USAID/Mauritania	1,3
16. Dr. Andrew Vernon Medical Epidemiologist	Consultant, CDC/ Atlanta, Georgia U.S.A.	1,2,3

\*Code: 1 = Initial planning sessions  
2 = Field survey and evaluatio  
3 = Recommendation sessions

Annex 2

Evaluation Planning Committee July, 1983

A. Members

1. Dr. Youssouf Kane, Chairman
2. Dr. Mahmoud Ould Hacen
3. Mr. Djibril Senghott
4. Dr. Lekie Botee
5. Mr. Antoine Ayoub

B. Members Ex-Officio

1. Mr. Mamadou Kane
2. Ms. Erna Kerst
3. Dr. Andrew Vernon
4. Mr. John M. Enaneir

Annex 3

COVERAGE EVALUATION SUB-COMMITTEE

1. Dr. Youssouf Kane, Chairman
2. Dr. Mohamed O/ Hacen
3. Mr. Mamadou Kane
4. Ms. Erna Kerst
5. Dr. Andrew Vernon
6. Mr. John P. McEnaney

OPERATION EVALUATION SUB-COMMITTEE

1. Dr. Lekie Botee, Chairman
2. Mr. Antoine Ayoub
3. Mr. Djibril Senghott
4. Mme. Ba nee Khady Sy
5. Mr. Dia Mohamed el Kebir
6. Dr. Andrew Vernon
7. Mr. John P. McEnaney



Unité de Santé \_\_\_\_\_

Lieu \_\_\_\_\_

Date \_\_\_\_\_

Enquêteur \_\_\_\_\_

## II. CHAINE DE FROID

### A. Réfrigérateur ou congélateur (1) ?

B. 1. a) (1)

Pétrole      Bahut  
Gaz            Armoire  
Electrique

b) (2)

Age : \_\_\_\_\_  
Marque : \_\_\_\_\_  
Dimensions : \_\_\_\_\_

2. Faites-vous des relevés quotidiens de température ? (1)      oui      non

Température trouvée ? (2) \_\_\_\_\_

Thermomètre présenté ? (1)      oui      non

Température maximum pendant le dernier mois (2) \_\_\_\_\_

Température minimum pendant le dernier mois (2) \_\_\_\_\_

3. Extérieur (1) :

. Protégé du soleil	oui	non
. > 15 cm du mur	oui	non
. Joints de porte bien ajustés	oui	non

4. Intérieur (1) :

. Vaccins rangés par ordre d'arrivée	oui	non
. Vaccins rangés par type	oui	non
. Vaccins rangés de manière aérée	oui	non
. Niveau de givre < 10 mm	oui	non
. Les vaccins "rougeole" et "polio" sont-ils en congélateur	oui	non

.../...

(1) Encercler la réponse correcte

(2) Voter la réponse correcte

**II. CHAÎNE DE FROID (suite 1)**

**4. Intérieur (suite) (1) :**

. Flamme :	Bleue	Jaune	Noirâtre	
. Paroi intérieure intacte			oui	non
. Bouteilles d'eau sur les étagères du bas			oui	non
. Pétrole filtré			oui	non
. Pétrole disponible			oui	non

**5. Pièces de rechange en stock (2) :**

Nombre	Type	!	Nombre	Type
_____	_____		_____	_____
_____	_____		_____	_____
_____	_____		_____	_____

6. . Fréquence du ramonage : \_\_\_\_\_ par mois (2)  
. Fréquence du dégivrage : \_\_\_\_\_ par mois (2)

7. Caisse/boite isotherm (2) : N° \_\_\_\_\_ Etat \_\_\_\_\_  
Thermos (2) : N° \_\_\_\_\_ Etat \_\_\_\_\_

**8. Pannes (2) :**

Nombre de pannes en 12 mois : \_\_\_\_\_  
Causes : \_\_\_\_\_  
Action prise : \_\_\_\_\_

9. Existe-t-il un plan d'urgence en cas de panne (1) ? oui non

Si oui, décrivez :

- (1) Encercler la réponse correcte  
(2) Noter la réponse correcte

Unité de Santé : \_\_\_\_\_

Lieu : \_\_\_\_\_

Date : \_\_\_\_\_

Enquêteur : \_\_\_\_\_

### III. ANIMATION ET EDUCATION SANITAIRE

1. Existe-t-il un calendrier précis pour les séances de vaccination (PMI) ou les itinéraires (équipes mobiles) (1) oui      non

PMI : Nombre de séances par semaine  
(1 séance = 1/2 journée) (2) : \_\_\_\_\_

2. Comment les gens sont-ils informés de l'heure et de l'endroit des séances ? (2)

3. Comment une séance d'éducation sanitaire est-elle organisée ? (2)

4. Posez, à 3-6 mères, les questions suivantes : Compris (1)

a) Quels sont les buts de la vaccination ? oui      non

b) Que vont ressentir les enfants après la vaccination ? oui      non

c) A quel âge les enfants doivent-ils être vaccinés ? oui      non

d) Quand faut-il revenir pour la prochaine vaccination ? oui      non

e) Contre quelles maladies les enfants sont-ils vaccinés ? oui      non

- f) Pourquoi êtes-vous venue aujourd'hui ? (2)

**III. ANIMATION ET EDUCATION SANITAIRE (suite 1)**

**(1)**

- g) Etes-vous bien reçue par le personnel  
du PEV au cours des séances de  
vaccination ? oui    non
- h) Avez-vous un carnet de vaccination  
pour votre enfant ? oui    non  
si non, pourquoi ? (2)
- i) Savez-vous pourquoi certaines mères  
ne font pas vacciner leurs enfans ? oui    non  
si oui, pourquoi ? (2)
- j) Avez-vous une radio ? oui    non

(1) Encercler la réponse correcte

(2) Noter la réponse correcte.

Unité de Santé : \_\_\_\_\_  
 Lieu : \_\_\_\_\_  
 Date : \_\_\_\_\_  
 Enquêteur : \_\_\_\_\_

**IV. STOCKS DE VACCINS**

Vaccins	Nombre de doses		Stock actuel au 1.1.83	Taux d'utilis. (2 : (1-3))	Stock actuel au moment de la visite	
	Reçues 1982	Administr. 1982			Total	dont périmé
	1	2			3	4 *
. Rougeole						
. DTCoq						
. Polio						
. BCG						
. Tétanos						

\* Le taux d'utilisation (colonne 4) doit être calculé par l'enquêteur

- . Quelle est la fréquence de livraison des vaccins ? (2) \_\_\_\_\_
- . Des pertes de vaccins ont-elles été constatées l'année dernière ? (1) oui non  
 Si oui : Combien de doses ? (2) \_\_\_\_\_  
 Causes ? (2) \_\_\_\_\_

(1) Encercler la réponse correcte

(2) Noter la réponse correcte

Unité de Santé : \_\_\_\_\_

Lieu : \_\_\_\_\_

Date : \_\_\_\_\_

Enquêteur : \_\_\_\_\_

**V. MATERIEL DE VACCINATION**

	Stock actuel au moment de la visite(2)	Le stock est-il suffisant (1)		Remarques
Seringues		oui	non	
Aiguilles		oui	non	
Carnets de vaccination/ de santé		oui	non	
Alcool		oui	non	
Savon		oui	non	
Coton Hydrophile		oui	non	
Glacières		oui	non	
Accumulateurs		oui	non	
Stylos/Crayons		oui	non	
Registres		oui	non	
Fiches de surveillance		oui	non	

(1) Encercler la réponse correcte

(2) Noter la réponse correcte

**V. MATERIEL DE VACCINATION (Suite 1)**

	Stock actuel au moment de la visite (2)	Le stock est- il suffisant (1)	Remarques
Fiches entretien des véhicules		oui non	
Fiches entretien des réfrigérateurs/ congélateurs		oui non	

Quelles références de base (cf textes médicaux) possédez-vous ?

---

(1) Encercler la réponse correcte

(2) Noter la réponse correcte

Unité de Santé \_\_\_\_\_

Lieu \_\_\_\_\_

Date \_\_\_\_\_

Enquêteur \_\_\_\_\_

## VI. TRANSPORT

### A. Véhicules

	Type	Marque	Année de mise en circulation	Kilométrage actuel (si connu)
1				
2				
3				

### B. Entretien

1. Fréquence d'entretien par mois (2) : \_\_\_\_\_

2. Est-ce que le chauffeur est formé comme mécanicien ? (1)    oui    non

3. Disponibilité des pièces de rechange dans la région ? (1)    oui    non

4. Disponibilité du carburant dans la région ? (1)    oui    non

5. Est-ce que la quantité de carburant donnée par la direction est suffisante ? (1)    oui    non

si non, pourquoi ?

6. Dépenses annuelles pour l'entretien du véhicule (2) : \_\_\_\_\_

Dépenses annuelles pour la réparation du véhicule (2) : \_\_\_\_\_

(1) Encercler la réponse correcte

(2) Noter la réponse correcte



**VII. OBSERVATION PAR L'ENQUETEUR D'UNE SEANCE DE VACCINATION (suite 1)**

(1)

- |  |     |     |
|--|-----|-----|
| . Le personnel du PEV demande-t-il les cartes de vaccination ?         | oui | non |
| . L'enregistrement des enfants est-il fait ?                           |     |     |
| . L'enregistrement de la quantité de vaccins administrés est-il fait ? | oui | non |
| . L'enregistrement de la quantité de vaccins perdus est-il fait ?      | oui | non |

- . Quel a été le nombre des séances annulées pendant le mois dernier ? (2)

\_\_\_\_\_

Causes : \_\_\_\_\_

- (1) Encercler les réponses correctes  
(2) noter les réponses correctes



**VIII. SURVEILLANCE (suite 1)**

- (1)
- . Les données de surveillance sont-elles disponibles par tranche d'âge ? oui    non
  - . Les données de surveillance sont-elles disponibles par statut vaccinal des cas ? oui    non
  - . Les données de surveillance sont-elles analysées à votre niveau ? oui    non
  - . Des rétro-informations sont-elles reçues au niveau régional du niveau central ? oui    non

Si oui, décrivez-les :

- . Demandez à la personne qui fait l'enregistrement des cas :

Quels symptômes utilisez-vous pour dépister la rougeole ? (3)

Fièvre

conjonctivite  
ou yeux rouges

Eruption

(1) Encercler la réponse correcte

(3) N'entourez que les réponses données par la personne interrogée

Unité de Santé : \_\_\_\_\_

Lieu : \_\_\_\_\_

Date : \_\_\_\_\_

Enquêteur : \_\_\_\_\_

**IX. EVALUATION DES CENTRES FIXES ET DES EQUIPES MOBILES**

A.

1. Population desservie : \_\_\_\_\_ personnes
2. Préciser la place des activités PEV dans le centre :
3. Décrire les rapports avec les services régionaux :
4. Préciser les rapports entre l'équipe mobile et le centre PMI :
5. Quand ont eu lieu les trois dernières visites de supervision des activités PEV du Centre ou de l'Equipe ? Compléter le tableau :

N°	Date de visite	Faite par	Lieu *	Sujets discutés	Utiles pour vous	Recommandations faites
1					oui non	
2					oui non	
3					oui non	

\* préciser : Centre, base, terrain

**IX. EVALUATION DES CENTRES FIXES ET DES EQUIPES MOBILES (suite 1)**

	(1)	Remarques
6. Existe-t-il un système de registre pour :		
. les données de surveillance ?	oui non	
. les enfants vaccinés ?	oui non	
. les inventaires de vaccins ?	oui non	
. le matériel ?	oui non	
. les rapports de supervision ?	oui non	
<b>B.</b>		
1. Calcule-t-on les besoins en vaccins ? (1)	oui non	
Si oui, sur quelles bases ? (2)		
2. Comment se fait la demande de vaccins ? (2)		
3. Comment le vaccin est-il reçu ? (2)		
. Qui est notifié ? (2)		_____
. Qui le réceptionne ? (2)		_____
<b>C.</b>		
1. Quels sont les problèmes les plus importants qui limitent le progrès du PEV ? (2)		
2. Que recommandez-vous pour résoudre ces problèmes ? (2)		

(1) Encercler la réponse correcte

(2) Noter la réponse correcte

## SONDAGE

### 1. Exclusion :

Résidence de l'enfant dans la région pour < 6 mois (fête du Maouloud)

### 2. Age 12-47 mois (1-3 années)

a) Carte ou acte de naissance

b) pas de carte ni d'acte de naissance :

1) Combien d'hivernages a l'enfant ?

2) L'enfant est-il né avant la prise de pouvoir par les militaires (10.7.1978) ?

3) Combien de mois (années) l'enfant est-il né après la prise de pouvoir ?

4) L'enfant peut-il marcher ?

### 3. Vaccins reçus et nombre :

a) cartes

b) pas de carte :

1) Combien de fois l'enfant a-t-il été vu par l'équipe (à la PMI) ?

2) Qu'ont-ils fait ? (p.e. "injection")

3) A quel endroit ? (Ne mentionnez pas les places spécifiques. pour être comptée, la réponse doit être donnée par la mère sans votre aide). Ne comptez pas les fesses comme place de vaccination.

Places standardisées : BCG - Avant-bras gauche

DTC - Fosse scapulaire

Rougeole - Bras droit

Polio - Voie orale

4) Quoi d'autre ? (p.e. "des gouttes dans la bouche")

5) Pour DTC + polio : "Combien de fois ?"

6) Pour le BCG : acceptez l'histoire de "l'avant-bras" gauche ou droit.

4. a) Acceptez l'enfant absent si on vous présente une carte de vaccination (supposant la durée de résidence acceptable)

b) Acceptez l'enfant absent si on vous présente un certificat de naissance (supposant la durée de résidence acceptable).

- N'Acceptez pas les enfants absents dans tous les autres cas -

SONDAGE (suite 1)

5. Histoire de la rougeole :

"L'enfant a-t-il déjà eu la rougeole"

oui = +  
non = -  
Inconnu = ?

6. si le n° 5 = +, précisez si l'enfant l'a eue avant ou après la vaccination contre la rougeole :

APRES = PR  
AVANT = AV  
INCÓNNU = ?

7. VAT à la mère :

La mère était-elle vaccinée contre le tétanos pendant la dernière grossesse ?

oui = +  
non = -

Lieu : \_\_\_\_\_

Date : \_\_\_\_\_

Enquêteur : \_\_\_\_\_

Nom et position du responsable :  
\_\_\_\_\_

REGION

**1. Organisation et responsabilités**

a) Expliquez brièvement l'administration, y compris la gestion, du PEV au niveau régional :

b) Fournir une liste des personnels ayant une responsabilité dans le PEV, sauf les personnels des Equipes Mobiles

c) Indiquez les trois dernières visites faites par le personnel du niveau central du PEV

d) Existe-t-il un système d'enregistrement pour :

(1)

1. Les données de surveillance	oui	non
2. Les enfants vaccinés	oui	non
3. Les stocks de vaccins	oui	non
4. Le matériel	oui	non
5. Les rapports de supervision	oui	non

e) Les autres formations sanitaires font-elles des vaccinations ?

	oui	non
--	-----	-----

---

(1) Encercler la réponse correcte



4. Education pour la Santé

(1)

a) existe-t-il au niveau régional un volet  
d'éducation pour la santé ?

oui non

b) Quelles activités sont menées pour informer  
la population ? (2)

c) Quelles sont les activités menées pour donner  
au personnel de santé conscience de l'importance  
du PEV ? (2)

1) par vous-même :

2) par les autres personnels :

5. Surveillance

Remplir le tableau

6. Supervision

Supervisez-vous les personnels du PEV ?

oui non

Si non, qui le fait ? (2)

Si oui, Comment ? (2)

7. Décrivez la formation que vous avez reçue concernant les  
activités et la gestion du PEV :

.../...

- (1) Encercler la réponse correcte  
(2) Noter la réponse correcte.

**7. (suite 1)**

**Décrivez vos besoins de formation pour vous rendre plus efficace dans la supervision des activités du P.E.V. :**

**Avez-vous des suggestions pour l'équipe d'évaluation ?**

**. Quels sont les problèmes importants ?**

**. Que recommandez-vous ?**

IMPRIME RECAPITULATIF DES FOYERS

(1) Grappe no. \_\_\_\_\_

(5) Région Gorgol

(2) Groupe d'âge évalué 12 à 47 mois

(6) Ville, agglomération ou village \_\_\_\_\_

(3) Date de l'interrogatoire \_\_\_\_\_

(7) Enquêteur/trice \_\_\_\_\_

(4) Ecart entre les dates de naissance  
du groupe d'âge à évaluer 24.7.79 à 24.7.82

No du sujet	(8) No du foyer	(9) Nom de l'enfant dans les limites du groupe d'âge	(10) Date de naissance	(11) Carte de vaccination (+, -)	(12) Vaccinations effectuées (Inscrivez la date de vaccination)								(13) Sujets complètement vaccinés (+, -)
					BCG	Polio 1 (P <sub>1</sub> )	Polio 2 (P <sub>2</sub> )	Polio 3 (P <sub>3</sub> )	DTCoq1 (D <sub>1</sub> )	DTCoq2 (D <sub>2</sub> )	DTCoq3 (D <sub>3</sub> )	Rou- geole (R)	
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													

TOTAL DES SUJETS  
COMPLÈTEMENT VACCINÉS

1/8

GROUPE N° \_\_\_\_\_

N° du sujet	Cicatrice BCG (+, -)	Nom de Famille de la mère	Lieu de Vac. 1. PMI 2. Equi. Mob. 3. Autre 4. Les 2(1+2)	Durée de réf. dépense dans la région (1/2, 1, 2, 3, 4, 5, > 5 ans)	VAT à la mère (+, -)	Histoire de la rougeole (+, -, ?) Avant (AV) ou Après (PR) ou? vaccination Cont. Rougeo.	Raisons pour vaccination ou non vaccination
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

Lieu \_\_\_\_\_

**A. Données démographiques (niveaux central et régional)**

. Population :

. Groupes ethniques :

. Caractéristiques climatiques :

. Caractéristiques économiques :

. Communications :

. Transport :

. Problèmes importants de la santé :

Infantile :	1.	4.
	2.	5.
	3.	6.

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Adulte :	1.	4.
	2.	5.
	3.	6.

Annex 5

CATEGORIES OF PERSONNEL

<b>Basic Educational Level</b>	<b>Nutrition (C.R.E.N. Centers)</b>	<b>MCH</b>	<b>Nursing</b>	<b>Primary Health Care</b>
<b>High School</b>		<b>Midwives (3 yrs. training)*</b>	<b>Nurses (Infirmier d'etat) (2 yrs. training at the national school of nursing).</b>	
<b>Primary School (6 yrs. training)</b>	<b>Nutrition Assistant (3 mos. training in preparation of nutritious weaning foods, supervised feeding and nutrition education)</b>	<b>Auxilliary Midwife (9 mos. training)</b>	<b>Auxilliary Nurse Nurse (Infirmiers brevetees) (2 yrs. training) in practical nursing at the national school of nursing.</b>	
<b>Little or no Formal Schooling</b>	<b>Mother/Organizer (on-site training) serves as an assistant to the nutrition assistant.</b>	<b>TBA (30 days training) in hygienic birthing practices birth registration. They are supervised by dispensary nurses (infirmier d'etat) who have been trained in MCH &amp; supervision</b>	<b>Nurses Aides (3 mos. training) at the school of nursing</b>	<b>Community Health Worker (6 weeks training)</b>

\* Midwives in some cases are also nurses, may have up to 5 years health training.

## Annex 6

### DOCUMENTS REVIEWED

#### IV Plan de Developpement Economique et Social

1. (Fourth Economic and Social Development Plan)  
Ministere du Plan et de l'Amenagement du Territoire, December 1981
2. Rapport D'une Evaluation du Programme Elargi De Vaccination En  
Republique Islamique de Mauritanie, 12 Juin - 30 Juin 1981
3. Recensement General de la Population, 1977, Volumes I and II  
Ministere de L'Economie et des Finances, Direction de la  
Statistique
4. Rapport du Seminaire National sur la Nutrition, December 1982  
Ministere de la Sante et des Affaires Sociales
5. Atelier su l'education pour la sante a l'intention des personnels  
des formations sanitaires du District de Nouakchott, May 1983
6. Analyse de Cout-efficacite du Programme Elargi de Vaccinations de  
la Republique Islamique de Mauritanie: Rapport de Mission  
D'Evaluation 15 Juin - 1er Julliet 1981: Sanoh Layes, Research  
Assistant
7. The following W.H.O. Publications for training Mid-Level super-  
visors:
  - a. Assurer La Formation
  - b. Diriger la Surveillance Des Maladies
  - c. Repartir les Ressources
  - d. Assurer la Participation du Public
  - e. Assurer la Fonctionnement de la chaine du froid
  - f. Superviser l'execution
  - g. Evaluer la couverture vaccinale
8. CCCD Management Training Program, Module 9, Part 7, Overall  
Evaluation
9. 1982 Operational Budget, Ministry of Health and Social Affairs
10. Project Paper, Project 625-0937, Expanded Program of Immunization  
June 20, 1980
11. PES and Evaluation report for Project 625-0937, dated 24 Aug. 1982
12. Project Paper, Rural Medical Assistance Project 682-0202  
January 29, 1979
13. Evaluation of Rural Medical Assistance Project, Dr. Ramiro Delgado

**14. Rural Assessment and Manpower Surveys**

AS-3            Demographic Projections  
FS 1-2        Rural Health Sector Outlines in Mauritania

15. Project Paper, Rural Health Services, Project 682-0230, July 1983
16. Project Grant Agreement, Rural Health Services, Project 682-0230  
July 27, 1983
17. Various statistical reports in the Ministry of Health with respect to morbidity and mortality data, all regional reports from Mobile Teams from 1980 to July 1983, Inventory registers at Central EPI warehouse and any records of supervisory visits.