MID-YEAR PROGRESS REPORT

STRENGTHENING HEALTH DELIVERY SYSTEMS

OBJECTIVE III - SURVEILLANCE

(PASA HZ/AR-0398-6-78)

Period Covered by Report:
January 1, 1979 - June 30, 1979

Report Submitted on:
August 25, 1979

by

RESEARCH AND DEVELOPMENT DIVISION
BUREAU OF SMALLPOX ERADICATION
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I. Introduction

In accordance with the Participating Agency Service Agreement (PASA HZ/AR-0398-6-78), this mid-year progress report is submitted by CDC for activities through June 30, 1979. The report is related to the project work plan, showing progress made towards the achievement of program objectives.

II. Achievements against Objectives

A. Sub-Objective I

Objective: To strengthen regional disease surveillance systems.

Achievement: Generally, progress has been satisfactory. As will be seen in the analysis of the activity elements included under this objective, there were some outstanding accomplishments and a few problems.

1. Provision of epidemiologists

Objective: Provide an epidemiologist to assist regional organizations and member countries to strengthen disease surveillance.

Group	Expected Date of Posting
O.C.E.A.C.	October 1, 1978
O.C.C.G.E.	August 1, 1979
Anglophone	August 1, 1979

Achievement: The O.C.E.A.C. assignment of Dr. David Heymann was effected October 1, 1978, as planned. Dr. Harry Hull will take up his assignment in Banjul in September, 1979, after completing a 1-month review of the Liberia immunization program. He is the epidemiologist for the Anglophone group of countries. The O.C.C.C.E. post in Bobo-Dioulasso is vacant. An epidemiologist, Dr. David Sokal, is under recruitment and could assume this post in early 1980.

Problems/Constraints: Difficulties in identifying a suitable candidate for the O.C.C.C.E. assignment will result in the loss of 5 or 6 person months of work.

2. Analysis of National Surveillance Systems.

Objective: Complete in-depth analyses of current national surveillance system, and submit recommendations for improvement.

Date	Countries
April 1, 1979	1
October 1, 1979	2
February 1, 1980	3
August 1, 1980	4
Total:	10

One-half (10/20) of the countries of the region will have had their surveillance systems analyzed during the first 2 years of project activity.

Achievement: The analysis of the Cameroon surveillance system was completed in June. A copy is attached (Annex I).

Problems/Constraints: The delay in posting the O.C.C.E. epidemiologist may compromise the scheduled performance of the analyses. We will have to reexamine this at the end of 1979.

3. Training courses

Objective: Provide training courses in surveillance of vaccine preventable disease, and planning, implementation and evaluation of expanded immunization programs. These courses will be modified versions of the "Training Course for National Managers of Expanded Immunization Programs" developed by CDC for WHO.

Dates	Participants	Place
January 1979	from Anglophone countries	Nigeria
April 1979	from Francophone countries	Ivory Coast

Achievement: The two courses were held as scheduled. A total of 82 participants were trained in Lagos and Abidjan. They evaluated the course as follows:

Aspect	Course	Very Sat.	Sat.	Unsat.
A. Admin. Arrangements	Lagos	26%	50%	24%
	Abidjan	38%	50%	12%
B. Course content	Lagos	69%	30%	1%
	Abidjan	66%	33%	1%
C. Skill development	Lagos	38%	56%	6%
	Abidjan	64%	33%	3%
D. Course methodology	Lagos	61%	24%	15%
	Abidjan	74%	20%	6%

The field exercise carried out as part of the Abidjan course was the subject of an article in the WHO Weekly Epidemiological Record (Annex II).

Problems/Constraints: None.

4. Baseline Morbidity/Mortality

Objective: Determine baseline levels of morbidity and mortality of neonatal tetanus, measles and poliomyelitis in immunization program demonstration-training areas. These diseases have been selected both because they are of priority importance and because feasible means exist for measuring incidence and/or prevalence.

Achievement: This determination has been completed in Cameroon; is in progress in Ivory Coast; and will be done in the Gambia upon the arrival of the epidemiologist.

Problems/Constraints: Although the absence of the O.C.C.C.E. epidemiologist could cause delays in implementing surveillance activities in Ivory Coast, Harry Godfrey (Operations Officer) and his national counterparts are making excellent progress. (See Annex III).

5. Establish ongoing surveillance

Objective: Establish in immunization program demonstration areas (see Sub-Objective III) ongoing systems of disease surveillance.

Cameroon by March 1, 1979

Ivory Coast by May 1, 1980

The Gambia by October 1, 1980

Achievement: Surveillance is ongoing in all 3 Cameroon demonstration training areas. Ivory Coast already has surveillance in 2 of the 3 areas.

Problems/Constraints: None

6. Assist Investigation of Epidemics.

Objective: Assist regional/national authorities in investigating unexpected outbreaks of morbidity and mortality. Such investigations may include both diseases included in national immunization programs (e.g., measles, poliomyelitis) and other diseases of low incidence but high mortality (e.g., African hemorrhagic fever, yellow fever). Such investigations are expected to involve 10 percent of Medical Epidemiologist"s time.

Achievement: See Dr. Heymann"s attached report (Annex IV).

Problems/Constraints: None

7. Identify Training Needs.

Objective: Identify specific training needs in data collection and analysis in countries with immunization program demonstration-training areas, countries where surveillance system evaluations have taken place, and among staff of regional health organizations (OCCGE, OCEAC). Develop and provide necessary training.

Achievement: Dr. Heymann"s analysis of the Cameroon surveillance systems (Annex I), Mr. Godfrey"s work in establishing surveillance in the Ivory Coast demonstration-training areas, and Mr. Kevin Murphy"s and Mr. Steve Fitzgerald"s efforts in Cameroon and the Gambia confirm that perhaps the

single greatest need for training in the SIMS project area is among mid-level personnel, the district and regional supervisors. We are currently working on the development of training materials to address this need.

Problems/Constraints: None

B. Sub-Objective II

Objective: Provide, on request, assistance in curriculum development and course presentation on disease surveillance and disease control methods to the WHO Regional Training Centers at Lome and Lagos, and to CESSIs at Dakar and Yaounde.

Achievement: None

C. Sub-Objective III

Objective: Expanded Immunization Program Demonstration-Training Areas.

Achievement: Overall, this activity is proceeding well. The development of delivery programs is progressing as scheduled; reduction of morbidity and mortality resulting from the immunization activities are beginning to be documented; training in the demonstration-training areas, however, has been limited to date. A detailed look at the activities which comprise this objective follows:

1. Develop demonstration training areas

Objective: Develop demonstration-training vaccine delivery programs in three countries. In each country the training area will be divided into three segments of 200,000 population each, or a total of 600,000 per country.

Ivory Coast	-	One area by October 1, 1978
		Two areas by December 1, 1978
		Three areas by April 1, 1979
Cameroon	-	One area by October 1, 1978
		Two areas by January 1, 1979
		Three areas by July 1, 1979
The Gambia	-	One area by January 1, 1980
		Two areas by April 1, 1980
		Three areas by July 1, 1980

Achievement:

Ivory Coast: Target date for third area (April 1, 1979) was inadvertently omitted from plan of action. All three demonstration-training areas now have functioning vaccine delivery programs. The three areas are Abidjan, Bangourou, and Korhogo.

Cameroon: Despite some unforeseen delays in reaching agreement with Ministry of Health on the areas to be selected, the three areas were operational by June 30, 1979. In addition to Yaounde, the areas of Eseka and Lefoasam/Bamenda were chosen.

The Gambia: Current plans call for developing the Western Division and the North Bank Division immunization activities first. The established timetable appears feasible.

Problems/Constraints: None.

2. Achieve 70% coverage

Objective: Achieve 70 percent coverage of identified target populations in demonstration areas within 18 months of initiation of full operations.

Achievement: Despite being less than 18 months into full operations, available data permit some observations.

Cameroon. Immunization activities in Yaounde have been ongoing since 1975, predating the inception of activities under this PASA. As can be seen in Dr. Heymann's report, Vaccination Coverage, Yaounde, 1976-1978 (Annex V), 70% coverage has not been attained even after 3 years of operation.

Ivory Coast. Coverage assessments after just less than one year of operations in Abidjan and Abengourou (Annex III, p.5) suggest that the 70% target may be reached.

Problems/Constraints: The coverage data from Yaounde are disconcerting. In April, 1979, a meeting was held in Atlanta to discuss this problem and attempt to identify possible causes. Those attending the meeting, including Dr. Heymann and his two predecessors in the CDC/OCEAC epidemiologist post,

decided that surveys need to be done to determine why mothers do not utilize the available immunization services. Subsequently, arrangements have been made to engage a social anthropologist to conduct these surveys.

3. Ongoing sample assessment

Objective: Document coverage through ongoing sample assessment in all areas.

Achievement: Assessment activities are ongoing in 3 of the 6 operational areas and will be initiated in the other 3 before the end of 1979. Assessment of coverage in the Gambia will be initiated within six months following establishment of immunization activities.

Problems/Constraints: None.

4. 50% morbidity/mortality reduction

Objective: Decrease by 50 percent morbidity and mortality due to target diseases by 36 months after initiation of full operations.

Achievement: Of the demonstration areas, only Yaounde has been operational 36 months. A detailed analysis of morbidity and mortality due to measles, poliomyelitis, whooping cough and neonatal tetanus is presented by Dr. Heymann in Annex V. These data must be interpreted in light of the immunization coverage levels and the knowledge that surveillance has improved with the addition of more reporting sites.

In Ivory Coast, where initial coverage rates are relatively high, reductions in morbidity and mortality during the less than one year the program has been operating are very encouraging (See Annex III, p. 6, and Attachments ((4-9))).

Problems/Constraints: Some of the Yaoundé data are discouraging. It is likely that the low coverage rates mentioned above are responsible for the lower than expected reductions in morbidity and mortality, particularly with measles.

5. Implement in-service training

Objective: Implement initial and continuing in-service training in administration, planning, supervision, supply, logistics, and evaluation for all demonstration-training area personnel. (Specific training courses will be available on maintenance and repair of injection equipment.))

Achievement: In-service training has been initiated in the demonstration areas thus far established.

Problems/Constraints: None

6. Train nationals from other countries.

Objective: Provide training in methods of planning, implementation and evaluation of immunization programs to personnel from other area countries. Training will take place within the three demonstration areas.

Date	Training Site	Number of Countries Providing Trainees	Number of Personnel Trained
April 1, 1979	Cameroon	2	8
July 1, 1979	Ivory Coast	2	8
Oct. 1, 1979	The Gambia	2	8
April 1, 1980	Cameroon	2	8
July 1, 1980	Ivory Coast	3	12
Oct. 1, 1980	The Gambia	2	8
	TOTAL:	13	52

Achievement: This objective has not been achieved except insofar as the Abidjan EPI training course in April served that purpose.

Problems/Constraints: Besides being preoccupied with the initiation of immunization services in the demonstration areas, program personnel also point out that no formal mechanism has been established to coordinate this activity. It would appear that invitations, scheduling, selection of participants, etc., could best be coordinated through the WHO Coordinators in the member countries. Now that demonstration areas in Ivory Coast and Cameroon are reasonably well established, this objective will have to be reexamined at year's end.

7. In-depth assessment of each demonstration-training area.

Objective: Conduct at least one in-depth surveillance and managerial assessment of each immunization program demonstration-training area prior to October 1, 1981. Personnel involved in such assessments will include both CDC and country staff.

Achievement: To date, the Yaounde area has been the only one so assessed. The report of that assessment, conducted jointly by CDC/SHDS, and WHO (Agle and Lichnevsky) has been circulated already. A thoroughgoing evaluation of the Ivory Coast demonstration-training area is scheduled for early 1980. These evaluations add a field observation element to the record-search/interview type evaluation normally done by SHDS Abidjan.

Problems/Constraints: None

D. Sub-Objective IV

Objective: Following the evaluation of individual country surveillance systems, provide, on request, further consultation on the development of country plans for expanded immunization programs. The Regional Medical Epidemiologists are expected to spend up to 25 percent of their time on this activity.

Achievement: To date, the only such evaluation has been that which Dr. Heymann conducted in Cameroon. He has already provided consultation for EPI development in Gabon, Central African Empire, and Congo, and will do a follow-up visit to Congo in August or September 1979. Dr. Hull will participate in such an activity in Liberia in August.

Problems/Constraints: Again, the late posting of the OCCGE epidemiologist will likely retard the schedule proposed for surveillance evaluations and perhaps limit the number of EPI consultations as well.

E. Sub-Objective V

Objective: Provide support to existing laboratory facilities in order to develop a coordinated laboratory system within the Region to provide back-up to disease surveillance and control activities. Surveillance systems require accurate laboratory confirmation of diagnoses as well as dependable interpretation of serologic specimens. While such facilities exist at CDC at the present time, there is a need to establish laboratory capabilities within the African region itself.

Achievement: Dr. Heymann has made excellent progress in developing laboratory capabilities at OCEAC headquarters in Yaounde. Mr. Godfrey has been instrumental in finding training programs for personnel of the Pasteur Institute in Abidjan which have resulted in an increase in laboratory services available.

1. Objective: Identify current capabilities:

Date	Facility and Location
January 1, 1979	O.C.E.A.C. Laboratory, Yaounde
January 1, 1980	O.C.E.A.C. Laboratory, Bobo-Dioulasso
April 1, 1979	Pasteur Institutes, Abidjan and Dakar
January 1, 1980	Medical Research Institute, Banjul

Achievement: The OCEAC laboratory and that of the Pasteur Institute in Abidjan have been surveyed and their capabilities inventoried. The Pasteur Institute in Dakar has not yet been visited. Nevertheless, the current capabilities of that laboratory are well known.

Problems/Constraints: None

2. Objective: By April 1, 1980, identify specific laboratory needs for surveillance support, both in those laboratories indicated in (1) and elsewhere.

   Achievement: This has already been done in Yaounde and Abidjan.

   Problems/Constraints: None

3. Objective: By July 1, 1980, identify and provide specific equipment or training needs required to meet surveillance objectives.

   Achievement: The OCEAC laboratory is being upgraded with some new and additional equipment and an additional technician is being trained. Training in measles vaccine assay and measles serology has been provided for personnel of the Abidjan Pasteur Institute.

   Problems/Constraints: None, except for some equipment procurement delays for Yaounde OCEAC laboratory.

DISEASE SURVEILLANCE, UNITED REPUBLIC OF CAMEROON
June, 1979 (English Version)

In Cameroon there are presently four independent systems of disease surveillance which ensure the flow of data concerning endemic disease morbidity and mortality to the ministry of health. Two of these, the ministry of health/OCEAC monthly reporting system of the Grandes Endémies and the ministry of health weekly system of reporting from sentinel posts are highly centralized. Data from these collection networks are processed at the ministry level where analysis and evaluation lead to decisions which are diffused back to the local (reporting) level as disease control policy. These systems do not encourage local analysis of the surveillance data collected as a means of evaluating local disease control efforts. The remaining two data collecting systems, a special ministry of health/OCEAC surveillance system for cholera, gonorrhea and the African hemorrhagic fevers (yellow fever, Ebola, Lassa) and a ministry/OCEAC system for the surveillance of diseases associated with the Expanded Program in Immunizations, are decentralized, with analysis of data and decision making occuring at the level where data are collected. These latter two systems encourage continuous local evaluation through analysis of the impact of control efforts on morbidity and mortality. Specific characteristics of the four surveillance systems in Cameroon are described below.

Grandes Endémies :

The Grandes Endémies surveillance system, originally designed in 1924 to aid in the evaluation of the sleeping sickness treatment campaigns, was expanded in 1946 to include data from the diagnosis/treatment campaigns for leprosy, tuberculosis, cerebrospinal meningitis, smallpox, yellow fever, cholera and measles. All Cameroonian government health units have been placed into 40 Grandes Endémies epidemiological sectors, each of which is headed by a physician who is in turn aided by a mobile surveillance team. Records are kept on treatment and incidence of the reportable diseases by the government health units, and each Month a standard report is submitted to the sector medical officer. He in turn compiles this data and forwards it to the director of Grandes Endémies (in Cameroon this is the Director of Public Health and Preventive Medicine) and to the Secretary General of OCEAC (Appendix A). This data is analyzed annually by OCEAC and the ministry of health and the disease control programs evaluated. Each October a joint report containing recommendations is presented to the minister of health at the annual

OCEAC Ministerial Conference. It is at this conference that the minister makes decisions regarding disease control policy for the coming year. These decisions, in the form of general public health policy, are then passed down to all levels of the health system for action. In this surveillance system, data collection is satisfactory. A credibility established by tradition, and a rigid line of communication based on the colonial, semi-military chain of command produces almost 75 % reporting from the epidemiological sector to the ministry of health and OCEAC. Reporting from the health center to the sector varies, however, and is not constant in any one sector. This system fails, however, to encourage analysis of surveillance data at the health unit and sector levels. Such analysis is needed for local evaluation of efforts in lowering morbidity and mortality, and for periodic modifications of policy which lead to more effective disease control.

Sentinel Reporting System :

The sentinel reporting system was designed in 1977, based on the recommendations of OCEAC/WHO and the Ministry of Health. This system is based on reports of disease from randomly chosen sentinel hospitals, health centers, dispensaries, under five's clinics (PMI's) and laboratories. These centers compile a weekly bulletin based on consultations the preceeding week for all cases of measles, febrile jaundice, polio, sleeping sickness, diarrhea, cerebrospinal meningitis and the so called quarantinable diseases (cholera, smallpox, yellow fever, plague and anthrax). This bulletin is sent each Monday to the departmental medical director (or in the case of the satellite clinics of the Douala and Yaoundé Central Hospitals, to the hospital medical officer) who then cables a report, in code, to the epidemiology service of the department of public health and preventive medicine (Appendix B). A more complete copy of this report is later sent by mail, and eventually these reports are collated in the department of public health and preventive medicine. Monthly they are sent on to the ministry department of statistics for analysis and inclusion in the annual report to the minister.

This system has not had the same success as the Grandes Endémies. Reports, if received at all, are often 6-7 months late, and so far in 1979 fewer than 18 % of the centers have reported regularly. At the ministry level analysis of data has likewise been sluggish, and since 1977 no annual report has been issued.

The system appears to lack motivation both at the peripheral reporting unit and at the central ministry, and as the system of Grandes Endémies, fails to encourage local evaluation of control programs with the data collected.

Surveillance of cholera, gonorrhea and the African Hemorrhagic Fevers in Zones at Risk :

These systems have been set up in the past ten years through a joint Ministry of Health/OCEAC (CDC) effort in zones at risk. The cholera system was established in 1971 after an epidemic of diarrheal diseases in Douala confirmed as cholera, and has since been extended to all coastal towns. A stock of Cary-Blair transport medium and case investigation forms are maintained at these sites (Appendix C). At the start, rectal swab specimens were sent in Cary-Blair transport medium to the Institut des Recherches Médicales in Yaoundé for culture and typing, but in early 1979, with an increase in suspect specimens and in an attempt to obtain immediate results so that control measures could be more rapidly begun, the system was changed. In Douala, nurses at the sector were trained by OCEAC to culture and type suspect specimens arriving from posts in the sector, and they were provided with all the equipment necessary to continue this work. Duplicated rectal swab specimens are sent to OCEAC and the Institut des Recherches Médicales for confirmation.

This system, no doubt facilitated by a fear of diarrheal diseases prevelant among Cameroonians, has had a great success. Since 1971, 976 specimens have been submitted for culture, with 136 of these having been analyzed in the sector at Douala this year. By decentralizing this system so that analysis can be done at the reporting level, immediate action results. Decisions do not depend on public communications for specimen transport. A report of the cholera cases is later included in the monthly Grandes Endémies report to the ministry, but well after the important necessary decisions and policies have been established at the periphery. Post treatment cultures of contacts and patients assure sound evaluation of control efforts.

The gonorrhea surveillance system, in zones with high population mobility, was begun in March 1979 at Victoria. Its purpose is to provide cultures to establish prevelance of disease in randomly chosen populations, and to culture treatment resistant gonorrhea. In the epidemiologic sector at Victoria a technician has been trained to obtain specimens and perform cultures. Media and equipment necessary are supplied by OCEAC/CDC, and to date over 240 cultures have been performed in an effort to establish the prevelance of asymptomatic gonorrhea in the region.

Five treatment failures have been cultured as well, with one only being a penicillin resistant strain. The gonorrhea system will be expanded to five more sites throughout the coming year. The RPR card test will then be added to this system to help establish the prevelance of treponemal diseases such as Yaws and Syphillis. This system likewise encourages local evaluation of treatment programs.

The third system in zones at risk, that for the African Hemorrhagic and Yellow fevers, has not had the success of the previous two. This is probably due to the need for specialized laboratory techniques which cannot be easily adapted to the field, so that the system remains somewhat centralized. In 1975, sentinel posts in the east of Cameroon, were established, and in 1978 posts were established further east and north. Kits containing instructions for blood drawing and viscerotomes, along with the necessary equipment, were left at each site along with case investigation forms (Appendix D). Specimens are sent directly to OCEAC which then sends them on to CDC for analysis, but since 1975 only 17 blood specimens and no viscerotomy specimens have been received. A recent inspection of centers equipped in 1975 showed that one of five had its kit available for use while in three of the remaining four centers, the kits could not be found.

Surveillance of EPI associated Diseases :

This system, begun with the advent of the expanded program in immunizations, has received this year a full committment from the ministry of health, again in conjunction with OCEAC/CDC. Two national seminars have been held at OCEAC to present the EPI surveillance and evaluation techniques to regional workers, and field training in the EPI zones has been carried out to further train local workers in the EPI methods of surveillance, evaluation and reporting. By means of weekly surveillance forms for measles and polio left at sentinel health centers, a local base of statistics is obtained and graphed on the epidemic curve in the local sector. A system of house to house surveys and school lame surveys has also been established to obtain mortality and morbidity figures from the EPI target diseases. Response has been enthusiastic at the local level, and in all zones a local monthly newsletter has been or is being established to report evaluations of the program and recommendations both to the local vaccinating centers and to the ministry.

These reports are well received, and in one case the recommendations were acted upon by the Director of Preventive Medicine and Public Health. This resulted in a threat of disciplinary action to the responsible in a poorly functioning vaccination center, who quickly remedied the situation.

This report, then describes four different systems of disease surveillance in Cameroon. Two of these are traditional systems, with data analysis, decision making and evaluation based exclusively in the hands of a few at the upper level of the ministry of health. The other two are dynamic and peripherally oriented, demanding active participation of local personnel in the collection and analysis of data, and in evaluation based on these analyses. The dynamic, decentralized systems deal with diseases for which a firm government committment has been made and for which active control programs are being initiated - the six EPI diseases, gonorrhea and the treponemal diseases, cholera and the hemorrhagic fevers. The centralized Grandes Endémies system, considered by the ministry to be its most important system, also deals with some of these same priority diseases, and in addition with others such as leprosy and sleeping sickness, for which firm government committments likewise exist. The newer sentinel system has failed in the eyes of the ministry, and through neglect it will presumably be phased out.

Diseases reported through these surveillance systems appear to have been carefully chosen - they are those which have been designated as priority diseases due to their mortality and morbidity, and are for the most part being actively controlled by preventive/treatment campaigns. Because of its long tradition, backed by the high esteem held by the technical advisors of the ministry of health and OCEAC, the system of Grandes Endémies will remain the backbone of Cameroonian surveillance and evaluation activities for some time to come. Supplemental decentralized surveillance systems such as described in this report, which to a certain extent work through the epidemiologic sectors composing the Grandes Endémies system will hopefully improve the Grandes Endémies system. By teaching local health personnel the techniques required to manage newer surveillance systems, it is expected that eventually data collected by the Grandes Endémies will also be analyzed, reviewed and used for evaluation at the periphery by these same personnel.

Attempt at change and decentralization must be furthered, however, and in Cameroon two resources exist to facilitate the process : enthusiastic medical and allied health students, and a monthly bulletin from OCEAC called EPI-Notes (Appendix E). Curriculum revisions of the national medical school, nursing schools and

the numerous paramedical schools must be made, to include courses with increased emphasis on basic disease epidemiology, analytic approaches to decision making and data analysis, and evaluation of disease control efforts. Young health personnel, arriving in the field from schools which have left them with the ability to analyze data in a systematic and rational manner, will easily adapt to the decentralization efforts, and be equipped to evaluate their own programs. This has already been noted among medical and nursing students who have worked closely with OCEAC in preparing their theses. Shortly after arrival at their first post, they return to OCEAC with questions, proposals for improving local surveillance methods, and simple analyses of the impact of existing treatment programs from data which had been previously placed in the archives by their predecessors. Attempts to evaluate existing treatment policies such as done by these young health workers are necessary if morbidity and mortality are to be decreased.

Encouraging these students to continue their efforts can be easily accomplished with feedback from the ministry/OCEAC level, constructive criticism of their ideas, and proposals of new concepts in periodic bulletins such as OCEAC EPI-Notes. With a circulation of over 200 to health units throughout the country, this bulletin has become a means of exchanging concepts and reports developed by Cameroonians not only among Cameroonian health personnel, but among health personnel throughout the five OCEAC Countries. The process of change, then, to a system of disease surveillance which encourages local program evaluation, is already under way. It remains for the government and OCEAC/CDC to continue these efforts within the ministry of health.

MINISTERE DE LA SANTE PUBLIQUE

DIRECTION DE L'ENSEIGNEMENT ET DE LA FORMATION DE L'HYGIENE PUBLIQUE

SERVICE DE L'EDUCATION SANITAIRE ET DE PROPHYLAXIE

REPUBLIQUE UNIE DU CAMEROUN
PAIX - TRAVAIL - PATRIE

N° _____/RDO/CSP/DEHP/SEP/ET.-

APPENDIX /-2

FICHE MENSUELLE OCEAC

Mois de _____ 197

	MOIS actuel	Total depuis le 1er/1 de l'année en cours	Total année précédente	Observations
1.- RENSEIGNEMENTS GENERAUX Populations visitées par les équipes de prospection systématiques				
2.- VACCINATIONS antivariolliques seules ou associées				
Antiamaryles (id)				
Antirougeoleuses (id)				
B.C.G.				
Antipoliomyélitiques				
Anticholéraique				
Antitétanique				
Antiméningococcique				
VTGOO				
Autres				
3.- TRYPANOSOMIASE Nouveaux dépistés				
Dont T+				
Nombre de trypanosomés en compte				
4.- LEPRE Nouveaux dépistés				
Nombre de malade en compte en fin du mois				
Nombre de malades traités dans le mois				
5.- TUBERCULOSE Nouveaux dépistés				
Nombre de malades en compte au dernier jour du mois				
Nombre de malades traités dans le mois				
6.- MENINGITE CEREBRO-SPINALE Dépistés				
DECES				

(rayer la mention inutile)

20

7.- VARIOLE Dépistés				
DECES				
8.- FIEVRE-JAUNE Dépistés				
9.- CHOLERA Dépistés				
DECES				
10.- ROUGEOLE Dépistés				
DECES				
Nombre de SDSR ayant envoyé le rapport mensuel (1)				

YAOUNDE, le

LE DIRECTEUR DE LA SANTE PUBLIQUE

P. LE MINISTRE DE LA SANTE

Best Available Document

Semaine N°. _____

FORMATION SANITAIRE _____

DEPARTEMENT _____

N.P.P. - OFF. - [illegible]

BULLETIN HEBDOMADAIRE

Semaine du _____ au _____ inclus

MALADIES		TOTAL	
		Cas	Décès
MALADIES TRANSMISSIBLES	ROUGEOLE		
	ICTERE FEBRILE		
	POLIOMYELITE		
	TRYPANOSOMIASE		
	DIARRHEES		
	TYPHOIDE		
	MENINGITE CEREBRO-SPINALE		
MALADIES QUARANTENAIRES	CHOLERA*		
	VARIOLE*		
	FIEVRE JAUNE*		
	PESTE*		
	CHARBON*		

OBSERVATIONS

* Noter les localités (villages) de ces cas _____
Noter les épidémies suspectes _____

A EXPEDIER CHAQUE SAMEDI POUR PARVENIR AU CHEF DE SERVICE DEPARTEMENTAL DE LA SANTE PUBLIQUE LE LUNDI SUIVANT.

APPENDIX B
1 of 2

SEMAINE N° _____

SOMMAIRE DU SECTEUR DEPARTEMENTAL DE LA MEDECINE PREVENTIVE ET RURALE DE _____

Semaine du _____ au _____ inclus

I.P.P. - OFF. - Yaoundé — 11 76 542/2 300

FORMATIONS (Hôpitaux - Dispensaires et autres)	MALADIES TRANSMISSIBLES														MALADIES QUARANTENAIRES						MALADIES RARES (à préciser)	
	Rougeole		Ictère Fébrile		Polio		Trypanosomiase		Diarrhées		Typhoïde		Méningite cérébro-spinale		Choléra		Variole		Fièvre jaune			
	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D
1																						
2																						
3																						
4																						
5																						
6																						
7																						
8																						
9																						
10																						
11																						
12																						
TOTAL																						

POUR TELEGRAMME HEBDOMADAIRE A ENVOYER AU SERVICE D'EPIDEMIOLOGIE — YAOUNDE

Semaine du _____ au _____ inclus

Nombre de formations sanitaires		055		070		041		087		009		001		036		000		050		060		Autres	
Existant	Ayant déclaré	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D

APPENDIX C

OCEAC - SURVEILLANCE DU CHOLERA

FICHE DE MALADE

RENSEIGNEMENTS GEOGRAPHIQUES

Village et quartier :

Canton :

Sous-préfecture :

Préfecture :

Pays :

RENSEIGNEMENTS SUR LE DEPISTAGE

Date : ___ ___ ___
J M A

Nom de la formation :

Qualité du dépisteur :
Médecin : _____
Infirmier Diplômé _____
Infirmier Breveté _____

RENSEIGNEMENTS SUR LE MALADE

Nom : Prénom : Age : Sexe :

Nom du père : Nom de la mère :

Profession : Occupations domestiques :

Loisirs : Lieu de baignade :

		Oui	Non	Date	Inconnu
Antécédent de vaccination :		___	___	___	___
Antécédent de chimioprophylaxie	Tétracycline	___	___	___	___
	Sulfamides	___	___	___	___

Date de début de la maladie ___ ___ ___
J M A

Villages visités par le malade dans les 10 jours avant le début des symptômes :

Village	Date	Village	Date
___	___	___	___
___	___	___	___

RENSEIGNEMENTS SUR L'ENVIRONNEMENT DU MALADE

Approvisionnement en eau : Rivière__, Barrage__, Puits protégés__, Puits non protégés____

	Type	Lieu d'approvisionnement
Alimentation cuisine	___	_____
	___	_____
	___	_____

Mouches : aucune___, rares___, nombreuses____

Elimination des déchets : bonne _____, mauvaise _____

Elimination des matières fécales : aucune _____(préciser le lieu fréquenté)
latrines_____, autres plus perfectionnées_____.

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APPENDIX D

FICHE A

IDENTIFICATION ET SIGNES CLINIQUES DES MALADIES FEBRILES RESISTANTES AU TRAITEMENT

RENSEIGNEMENTS GEOGRAPHIQUES

Nom de la formation : _____

Village : _____

Sous-Préfecture : _____

Préfecture : _____

RENSEIGNEMENTS SUR LE PRELEVEMENT

N° du prélèvement : _____

Date du prélèvement : _____

S'agit-il du 1er prélèvement ? (Oui) (Non)

" " 2è prélèvement ? (Oui) (Non)

Indiquer la date du 1er prélèvement _____

RENSEIGNEMENTS SUR LE MALADE

Nom : _____ Prénom : _____ Age : _____ Sexe : _____

Nom du Père : _____ Nom de la Mère : _____

Nom du Mari : _____ N° du dossier d'hospitalisation : _____

Adresse précise : _____

Village et Quartier : _____ Canton : _____

S/Préfecture : _____ Préfecture : _____ Pays : _____

RENSEIGNEMENTS CLINIQUES ET ANTECEDENTS MEDICAUX

Date du début du syndrome fébrile : _____

. Clinique

Signes	Oui	Non	Inconnu	Observations
Jaunisse				
Albuminurie				
Hémorragies diverses				

Antécédents de vaccination anti-amarile (Oui) (Non) (Inconnu)

Si Oui, date : _____

. Evolution

Signe	(1)	Date
Guérison		
Aggravation		
Décès		
Inconnue (évasion)		

(1) Cochez la case correspondante.

Cameroun Congo E.C.A. Gabon Tchad

OCEAC EPI-NOTES

Bulletin Epidémiologique Mensuel de l'OCEAC,
Organisation de Coordination pour la lutte
Contre les Endémies en Afrique Centrale
B.P. 288 - YAOUNDE, Cameroun

APPENDIX E

Tome 3 Numéro 3 Avril - Mai 1979

LE PIAN EN EMPIRE CENTRAFRICAIN

Une enquête a été réalisée dans la région forestière de l'Empire Centrafricain par le Dr. Wedy-Wirsky et une équipe de l'OMS pour essayer de déterminer la prévalence du Pian chez les pygmées. Tous les habitants des 8 camps de pygmées (458 habitants au total) ont fait l'objet d'un examen clinique, et de prélèvements de sang pour le test de VDRL. La maladie a été mise en évidence cliniquement chez 250 personnes soit 55 % au moment de l'enquête, et 87 % des sujets examinés ont eu un VDRL positif. Tous ces résultats sont présentés dans le tableau ci-après :

YAWS IN THE CENTRAL AFRICAN EMPIRE

A study in the rain forest area of the Central African Empire was carried out by Dr. Wedy-Wirsky and a WHO team to determine the prevalence of Yaws among the pygmies. All villagers in 8 camps (total population of 458) were examined clinically, and blood were drawn for VDRL analysis. A total of 250 persons were found to have clinical evidence of the disease (55 %) at the time of the study and 87 % of all persons were found to have a positive VDRL. The results of the study are summarized in the table below :

Villages Camps	No. examiné No. examined	Pian clinique clinical yaws	%	Prélèvements serologies	VDRL +	%
Bobelet	61	25	41	55	44	80
Bombabia	55	11	20	55	41	74
Bagandou	100	86	54	146	143	98
Sakabo	20	7	35	19	11	58
Ikoumba	33	22	67	31	31	100
Loko	70	53	76	70	55	79
Zomia I	37	30	81	33	32	97
Zomia II	22	16	73	21	19	91
Total	458	250	55	430	376	87

Note de la rédaction :

Des enquêtes similaires ont été effectuées au Cameroun, montrant la même prévalence élevée de la maladie et des sérologies positives (VDRL) chez les pygmées. Toutes ces enquêtes nous rappellent l'importance des campagnes de traitement de masse à l'aide de l'Extencilline, afin de pouvoir contrôler cette maladie qui, vers la fin des années 1960, avait presque disparu des Etats-membres de l'OCEAC. Pour un

Editor's note :

Similar studies to this have been carried out in Cameroon showing the same high prevalence of clinical disease and positive VDRL's among the pygmies. These studies serve to remind us of the importance of continued treatment campaigns with Extencillin in order to control this disease which had, by the late 1960's almost disappeared from the OCEAC countries. The reader is referred to Epi-Notes, Vol. 2, n° 1, December -

résumé de la stratégie du traitement recommandé par l'OCEAC, vous voudrez bien vous référer à Epi-Notes, Vol. 2, n° 1 de Décembre-Janvier 1977-1978. Ce traitement est d'ailleurs fort simple - 1 injection d'Extencilline - et permet la guérison de la maladie et la diminution de son expansion.

and January of 1977-1978 for a resumé of the treatment strategies recommended by OCEAC. The treatment is simple - one injection of Extencillin - and effective both in curing disease and decreasing its spread.

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SEROCONVERSION AU VACCIN ANTIPOLIO BUVABLE A YAOUNDE

Le Dr. John MCKUBE a, en 1978, effectué une enquête chez des enfants âgés de 2 à 11 mois, avant et après l'administration de la 1ère et 2è doses du vaccin antipolio vivant, trivalent (buvable).

Tous les enfants retenus pour l'enquête ont fait l'objet d'un prélèvement de sang au doigt à l'aide de tubes capillaires et d'un prélèvement de selles qui ont été conservées congelées dans une solution de Hank.

Voici les résultats obtenus sur les 35 enfants retenus pour l'enquête :

SEROCONVERSION TO TRIVALENT ORAL POLIO VACCINE IN YAOUNDE

A study of seroconversion after trivalent oral polio vaccine was carried out by Dr. John MCKUBE in 1978. Children in the study were 2-11 months of age.

A blood specimen was collected in capillary tubes by finger puncture before each dose of vaccine. At the same time, a stool specimen was collected in Hank's solution. All specimens were then stored frozen until analysis.

Results obtained on the 35 children investigated are as follows :

Anticorps antipolio dans le serum des enfants âgés de 2 à 11 mois - Yaoundé (Cameroun), 1978
Antibodies to trivalent oral polio vaccine, children 2 to 11 months of age, Yaounde (Cameroun), 1978

Nombre d'enfants Number of children	Avant la 1ère dose de TOPV Before 1st dose of TOPV	30 jours après la 1ère dose 30 days after 1st dose	30 jours après la 2ème dose 30 days after 2nd dose
Triple négatifs (absence d'anticorps) Triple negative (no antibody)	35 43 %	32 6 %	20 0 %
% d'anticorps Type I % with antibody Type I	34 %	47 %	70 %
% d'anticorps Type II % with antibody Type II	31 %	83 %	90 %
% d'anticorps Type III % with antibody Type III	17 %	54 %	70 %

Etant donné qu'il n'y a pas eu d'enfants témoins dans cette étude, nous ne pouvons pas affirmer que ces anticorps résultent de la vaccination. Cependant, les résultats

There was not a control group for this study, and therefore we cannot affirm that antibodies resulted from vaccination. The results of virus isolation in the stool,

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des recherches du virus dans les selles montrent l'efficacité du vaccin administré. Avant la 1ère dose, il n'y avait pas de virus polio dans les selles - on a cependant noté que 21 % étaient porteurs d'entérovirus de type non-polio. Trente jours après cette 1ère dose, on a noté 14 % d'entérovirus non polio, et 50 % d'entérovirus de type polio (présumé être du virus vaccinal). Un mois après la 2ème dose, il y avait 17 % d'entérovirus de type non-polio et 25 % d'entérovirus de type polio.

Note de la rédaction :

Cette petite étude est fort encourageante. Le vaccin polio buvable est un vaccin dont l'efficacité a été mise en doute dans des pays tropicaux par des enquêtes effectuées en dehors du Cameroun.

L'étude du Dr. Mokubé montre que dans des milieux comme Yaoundé où le vaccin buvable a été employé pendant 4 ans déjà, le taux de séroconversion peut être satisfaisant. La valeur de ce vaccin - mise en évidence par le taux élevé de porteurs de virus polio 30 jours après la vaccination - démontre que le vaccin peut circuler dans les familles et foyers voisins des enfants vaccinés, et problablement contaminer les non-vaccinés. Nous sommes disposés à encourager d'autres enquêtes de ce genre dans les pays de l'OCEAC.

however, show the efficacy of the vaccine. Before the 1st dose, there was no polio virus isolated from stools of these children, but 21 % were carriers of non-polio enterovirus. Thirty days after the 1st dose of vaccine, 14 % of the children still carried non-polio enterovirus and 50 % carried polio virus (presumably from vaccine). One month after the 2nd dose of TOPV, there remained 17 % of children with non-polio enterovirus and 25 % with polio virus in their stools.

Editor's note :

This small study is encouraging. Oral polio vaccine is a vaccine the efficacy of which has been cast in doubt by studies in tropical countries other than Cameroon.

The study of Dr. Mokubé suggests that in a city such as Yaoundé, where the oral polio vaccine has been used continuously for 4 years, seroconversion is satisfactory. The value of this vaccine - shown by the level of virus carriers 30 days after vaccination - shows that the vaccine is capable of circulating in the families and households of vaccinated children, and presumably can infect and therefore vaccinate those not having received vaccine. We encourage other similar investigations of trivalent oral polio vaccine in the OCEAC Countries.

A V I S

Les Notes Techniques OCEAC sont maintenant disponibles dans les deux langues : Français et Anglais - et peuvent être obtenues sur simple demande adressée au Secrétariat Général de l'OCEAC, B.P. 288 - YAOUNDE (Cameroon)

NOTICE

OCEAC Technical Notes are Now available in two languages - French and English - and may be obtained by writing to the Secretary General of OCEAC, B.P. 288 - YAOUNDE (Cameroon).

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MORTALITE DUE A LA ROUGEOLE AU CAMEROUN

Faisant partie de l'Enquête Nationale de 1977 sur la Nutrition au Cameroun, une série de questions ont été posées pour essayer de déterminer l'incidence annuelle de la rougeole et la mortalité qui en découle, parmi les enfants dont l'âge variait entre 0 et 4 ans. Les résultats de cette enquête viennent d'être publiés dans un rapport préliminaire. Le tableau ci-dessous présente

MEASLES MORTALITY IN CAMEROON

As a part of the 1977 National Nutrition Survey in Cameroon, a series of questions was asked to determine the annual incidence of measles and the mortality which results from this disease among children from birth to 4 years of age. The results have recently been published in the preliminary survey report. The table below summarizes these results,

ces résultats qui montrent que le taux de mortalité annuelle dans la tranche d'âge 0 à 4 ans, varie entre 2 % à Douala et Yaoundé, et 3 % en zones rurales, entrainant 14% de tous les décès dûs à la rougeole à Douala et Yaoundé, et 21 % en zones rurales. Le taux de léthalité de la rougeole est égal à 2 % à Douala et Yaoundé, atteignant facilement 5 % en zones rurales.

which reveal that annual mortality in the age group birth to 4 years ranges from 2 % in Douala and Yaoundé to 3 % in rural zones, with 14 % of all these deaths in Douala and Yaoundé due to measles and 21 % due to measles in rural zones. The case fatality rate for measles is equal to 2 % in Yaoundé and Douala, reaching a high of 5 % in rural zones.

Region	Nombre retenu No. chosen	Total décès Total deaths	% décès dûs à la rougeole % deaths due to measles	Cas de rougeole Cases measles	Taux de léthalité Case fatality rate measles
Yaounde/ Douala	952	21 (2 %)	3 (14 %)	152	2 %
Milieu urbain urban *	917	32 (3 %)	5 (16 %)	121	4 %
Zone rurale rural *	4.098	137 (3 %)	29 (21 %)	592	5 %

* Yaoundé et Douala non-comprises (excluding Yaoundé/Douala).

Note de la Rédaction :

La rougeole est une maladie mortelle pour les enfants dans les Etats de l'OCEAC, et elle peut effectivement être contrôlée par la vacâination. La vaccination des enfants dès le bas âge, juste après que les anticorps maternels aient disparu, est donc primordiale dans le cadre de la PMI. Cette vaccination doit être faite dès que les enfants atteignent l'âge de 9 mois. On sait aussi qu'au moins 70 % des enfants feront la maladie avant l'âge de 24 mois s'ils ne sont pas vaccinés.

Editor's note :

Measles is a disease which can kill children in the OCEAC countries, and a disease which can effectively be prevented by well controlled measles vaccination. Vaccinating children at a young age, and soon after protection from maternal antibodies disappears, is an important part of routine well baby care. The best age to administer measles vaccine, with a protection rate of greater than 95 %, is at 9 months. Children should be vaccinated with measles vaccine as soon as possible after the age of 9 months, realizing that by the age of 24 months at least 70 % of all children will have had the disease if unvaccinated.

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YAOUNDE (Cameroun)

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No. 29

WORLD HEALTH ORGANIZATION
GENEVA

ORGANISATION MONDIALE DE LA SANTÉ
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20 JULY 1979 — 54th YEAR — 54e ANNÉE — 20 JUILLET 1979

EXPANDED PROGRAMME ON IMMUNIZATION

Results of the evaluation of vaccination coverage in an urban district of Ivory Coast, April 1979

Introduction

IVORY COAST. — The Expanded Programme on Immunization was launched by the Government of Ivory Coast (estimated population over seven million) in June 1978 and has been operational for ten months in three demonstration zones located in different climatic regions of the country, i.e., urban zone: the capital Abidjan and its suburbs, situated in the south of the country (total population in 1979 estimated at 1 300 000); forest zone: Abengourou prefecture situated in the east (estimated population 100 000); and savanna zone: Korhogo prefecture in the north (estimated population 150 000).

According to the timetable, children aged 0 to 35 months should receive one intradermal dose of BCG by injection (preferably at birth in the maternity unit, otherwise as soon as possible), three doses of DPT by jet injector and oral poliomyelitis vaccine (preferably at the ages of three, four and six months followed by a booster one year after the third injection), measles vaccine by jet injector (either the initial dose at the age of six to eight months, with administration of the second dose after 12 months of age, or a single dose of vaccine if vaccination begins after the age of nine months).

The strategy selected for administration of the vaccines involves both fixed and mobile units. In Abidjan, in the eight existing maternal and child health centres, at which 52 nurses and midwives have recently been given special training, vaccinations are carried out regularly on weekdays. Moreover, two mobile teams (there were eight during the first six months of the programme) trained at the National Hygiene Institute make regular visits on fixed days to the 12 welfare centres organized for mothers and young children and to places where people congregate (markets, shanty towns, etc.)

During the inter-country course on planning and management for senior staff of the Expanded Programme on Immunization in French-speaking Africa, organized by WHO in Abidjan from 18 to 28 April 1979, about 60 participants from 22 African countries were invited to carry out an evaluation of vaccination coverage in the district of South Abidjan (the total population of 453 600 was subdivided into 432 equal residence units of 1 050 inhabitants each). The object of the exercise was to apply the method taught for evaluating vaccination coverage by sampling 30 clusters selected at random from the total population in the evaluation zone. The population sample studied was made up of children aged 13-25 months (born between 1 April 1977 and 31 March 1978), who ought to have received a complete set of primary vaccinations. The survey was carried out on 25 April 1979 by the participants and the course leaders, who were divided

PROGRAMME ÉLARGI DE VACCINATION

Résultats de l'évaluation de la couverture vaccinale dans une zone urbaine en Côte d'Ivoire, avril 1979

Introduction

CÔTE D'IVOIRE. — Le Programme élargi de Vaccination a été lancé par le Gouvernement de Côte d'Ivoire (estimation de la population: plus de sept millions d'habitants) en juin 1978. Il y a dix mois il est devenu opérationnel dans trois zones de démonstration situées dans différentes régions climatiques du pays, notamment la zone urbaine, Abidjan et banlieue, capitale située dans le sud du pays (la population totale en 1979 est estimée à 1 300 000 habitants), la zone forestière, préfecture d'Abengourou située dans l'est (population estimée à 100 000 habitants) et la zone de savane, préfecture de Korhogo située dans le nord (population estimée à 150 000 habitants).

Selon le calendrier, les enfants âgés de 0 à 35 mois doivent recevoir une dose de BCG intradermique à l'aiguille (de préférence à la naissance dans la maternité, sinon dans les meilleurs délais), trois doses de DT-COQ avec le pistolet sans aiguille et du vaccin antipoliomyélitique oral (de préférence, à l'âge de trois, quatre et six mois puis un rappel, un an après la troisième injection), le vaccin antirougeoleux avec le pistolet sans aiguille (soit la première dose à l'âge de six à huit mois avec l'administration de la deuxième dose à partir de 12 mois, soit une seule dose de vaccin si la vaccination est commencée après l'âge de neuf mois).

La stratégie choisie pour administrer les vaccins est à la fois fixe et mobile. A Abidjan, dans les huit centres existants de la protection maternelle et infantile (PMI) dont 52 infirmières et sages-femmes ont reçu dernièrement une formation spéciale, les vaccinations se font régulièrement les jours de semaine. En outre, deux équipes mobiles (elles étaient huit durant les six premiers mois du programme), formées à l'Institut national d'Hygiène, se déplacent régulièrement à des jours fixes dans les 12 centres sociaux organisés pour les mères et les jeunes enfants, ainsi qu'aux lieux de rassemblement de la population (marchés, bidonvilles, etc.).

A l'occasion du cours inter-pays de planification et de gestion pour les reponsables du Programme élargi de Vaccination de l'Afrique francophone, organisé par l'OMS à Abidjan, 18-28 avril 1979, une soixantaine de participants provenant de 22 pays africains ont été invités à effectuer une évaluation de la couverture vaccinale dans la zone d'Abidjan-sud (la population totale de 453 600 habitants a été répartie de manière égale en 432 blocs d'habitation comprenant chacun 1 050 habitants). Le but de l'exercice était d'appliquer la méthode enseignée au cours d'évaluation de la couverture vaccinale par l'échantillonnage de 30 grappes choisies au hasard dans la population cumulative de la zone en évaluation. L'échantillon de population étudié se composait d'enfants âgés de 13 à 25 mois (nés entre le 1er avril 1977 et le 31 mars 1978) donc susceptibles d'avoir reçu une série complète de primo-vaccinations. L'enquête a été

Epidemiological notes contained in this number:

Expanded Programme on Immunization, Influenza, Malaria Surveillance, *Mycoplasma pneumoniae* Encephalopathy.

List of Infected Areas, p. 227.

Informations épidémiologiques contenues dans ce numéro:

Encéphalopathie à *Mycoplasma pneumoniae*, grippe, programme élargi de vaccination, surveillance du paludisme.

Liste des zones infectées, p. 227.

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into 15 groups of four or five and accompanied by local health service officials so as to facilitate their contact with the inhabitants during their visits to homes. Each group of investigators had the task of visiting two residence units selected in advance, of identifying at least seven target children (which constitutes a cluster) within each unit, and of recording the vaccination status of the children in two clusters.

Results *(Table 1)*

1. The total number of homes visited was 1 000. Out of 30 clusters, eight (almost one third) were completed after visiting less than 20 homes, 18 clusters (almost two thirds) were completed after visiting less than 33 homes (average number of homes visited per cluster); of the 12 remaining clusters, five required visits to 60 or more homes, which may be due to the fact that these clusters were located in districts inhabited by temporary immigrants where there was only a very small number of target children (aged 13-25 months). On average, each evaluation team spent four hours on its visits (ranging from two hours for three of the teams to more than seven hours for two teams). This means that a single team could carry out the entire evaluation in 8-10 days.

   If the age range to be evaluated had been narrower (for example, six months instead of 12), which is desirable in order to minimize bias resulting from the migration of the urban population and also in order to obtain results that reflect the most recent vaccination activities, two evaluation teams would have been able to carry out the survey during the same period of time.

2. Altogether *212 children* aged 13-25 months were recorded. Twenty-four of the 30 clusters (80%) consisted of seven children each. Five clusters contained eight target children and one cluster contained only four children. Out of the 212 children recorded, 205 (97%) were present in person at the time of the survey and were therefore examined for a BCG vaccination scar.

3. A total of 160 children (76%) were in possession of a vaccination certificate (in most cases in the form of a health card).

4. **BCG Vaccination**

   4.1 Vaccination was confirmed by a vaccination certificate in *115 children*, i.e. *54%* of the total number of children recorded or *72%* of the children holding a vaccination certificate.

   4.2 A BCG scar was detected in *116 children*, i.e. in *55%* of the total number of children recorded or in *57%* of the children examined; 107 of the children examined held a BCG vaccination certificate; a BCG scar was found in 93 of them, i.e. 87%.

   4.3 Total BCG vaccinations were confirmed by a vaccination certificate or by the mother (or other relative) in *130 children*, i.e. *61%* of the total number of children recorded.

5. **Vaccinations against Diphtheria, Pertussis, Tetanus Neonatorum and Poliomyelitis**

   5.1 Vaccinations confirmed by a vaccination certificate:

   (a) First dose of quadruple (combined DPT and polio) vaccine (or DPT plus oral polio vaccines) in *136 children*, i.e. in *64%* of the total number of children recorded or *85%* of the children with a vaccination certificate.

   (b) Second dose of the vaccine(s) in *105 children*, i.e in *50%* of the total number of children recorded or *77%* of the total number of children who had received the first dose of DPT plus polio.

   (c) Third dose of the vaccine(s) in *83 children*, i.e. in *39%* of the total number of children recorded or *61%* of the children who had received the first dose and *79%* of the children who had received the second dose of DPT plus polio.

   5.2 *Total* of DPT plus polio vaccinations confirmed by vaccination certificate or by the mother (or other relative):

   (a) First dose of the vaccine(s) in 144 children (68% of the children recorded).

   (b) Second dose: 108 children (51% of children recorded).

   (c) Third dose: 85 children (39% of children recorded).

   (d) DPT plus polio booster vaccine(s): 13 children (6% of the total children recorded).

conduite le 25 avril 1979 par les participants et les animateurs du cours répartis en 15 groupes de quatre ou cinq, accompagnés par des fonctionnaires locaux des services de santé de façon à faciliter leur contact avec les habitants pendant leurs visites dans les foyers. Chaque groupe d'enquêteurs avait comme tâche de visiter deux blocs d'habitations préalablement choisis, d'identifier dans chacun d'eux au moins sept enfants cibles (ce qui constitue une grappe) et d'enregistrer le statut vaccinal des enfants de deux grappes.

Résultats *(Tableau 1)*

1. Le nombre total des foyers visités est de 1 000. Sur 30 grappes, huit (presque un tiers) furent complétées après la visite de moins de 20 foyers, 18 grappes (presque deux tiers) après la visite de moins de 33 foyers (nombre moyen des foyers visités par grappe), parmi les 12 grappes restantes, cinq grappes ont demandé la visite de 60 foyers et plus, ce qui peut s'expliquer par le fait que ces grappes étaient situées dans des quartiers résidentiels d'immigrants temporaires où le nombre d'enfants cibles (âgés de 13 à 25 mois) n'a été trouvé qu'en très petit nombre. En moyenne, chaque équipe d'évaluation est restée sur le terrain pendant quatre heures (avec des variations de deux heures pour trois équipes et plus de sept heures pour deux équipes). Il ressort qu'une seule équipe d'évaluation pourrait accomplir cette évaluation entre huit à dix jours de travail.

   Si le groupe d'âge à évaluer était plus étroit (par exemple six mois au lieu de 12), ce qui est souhaitable afin de minimiser le biais dû à la migration de la population urbaine et aussi pour obtenir des résultats reflétant les activités de vaccination les plus récentes, deux équipes d'évaluation auraient suffi pour effectuer cette enquête pendant la même période de temps.

2. Au total, *212 enfants* âgés de 13 à 25 mois ont été enregistrés. Vingt-quatre grappes sur 30 (80%) ont inclus sept enfants. Dans cinq grappes, huit enfants cibles ont été enregistrés et une grappe n'a inclus que quatre enfants. Sur 212 enfants enregistrés, 205 enfants (97%) étaient physiquement présents au moment de l'enquête et furent donc examinés à la recherche de la cicatrice postvaccinale BCG.

3. Cent-soixante enfants (76%) étaient munis d'un certificat de vaccination (dans la plupart des cas sous forme d'un carnet de santé).

4. **Vaccination BCG**

   4.1 Vaccinations confirmées par un certificat de vaccination chez *115 enfants*, soit *54%* du total des enfants enregistrés ou *72%* du total des enfants ayant un certificat de vaccination.

   4.2 La cicatrice de BCG a été décelée chez *116 enfants*, soit chez *55%* du total des enfants enregistrés ou chez *57%* des enfants examinés. Cent-sept des enfants examinés étaient munis d'un certificat de vaccination BCG; la cicatrice de BCG fut décelée chez 93 d'entre eux, soit chez 87%.

   4.3 Ensemble des vaccinations BCG confirmées par un certificat de vaccination ou par la mère (ou un autre parent) chez *130 enfants*, soit *61%* du total des enfants enregistrés.

5. **Vaccinations contre la diphtérie, la coqueluche, le tétanos nonnéonatal et la poliomyélite**

   5.1 Vaccinations confirmées par un certificat de vaccination:

   a) 1re dose du vaccin tétracoq (ou des vaccins DT-COQ + polio buvable) chez *136 enfants* soit chez 64% du total des enfants enregistrés ou *85%* du total des enfants ayant un certificat de vaccination.

   b) 2e dose du/des vaccin(s) chez *105 enfants*, soit chez *50%* du total des enfants enregistrés ou *77%* du total des enfants ayant reçu la 1re dose du DTC + polio.

   c) 3e dose du/des vaccin(s) chez *83 enfants*, soit chez *39%* du total des enfants enregistrés, ou *61%* des enfants ayant reçu la 1re dose et *79%* des enfants ayant reçu la 2e dose DTC + polio.

   5.2 *Ensemble* des vaccinations DTC + polio confirmées par certificat de vaccination ou par la mère (ou autre parent):

   a) 1re dose du/des vaccin(s) chez 144 enfants (68% des enfants enregistrés).

   b) 2e dose = 108 enfants (51% des enfants enregistrés).

   c) 3e dose = 85 enfants (39% des enfants enregistrés).

   d) Rappel du/des vaccin(s) DTC + polio = 13 enfants (6% du total des enfants enregistrés).

- **Vaccination against Measles**

  Total vaccinations confirmed by a *vaccination certificate* or by the mother:

  a) Total number of children who had received at least one dose of measles vaccine: 107, i.e. 51% of the total number of children recorded.

  b) *Total* number of children who had received either two doses of vaccine (when vaccination began before nine months of age) or one dose (if vaccinated after nine months of age): 81, or *38% of the total* number of children recorded.

  c) First dose of vaccine administered before nine months of age in 29 children (all held a vaccination certificate), i.e. 14% of the total number of children recorded; the second dose of vaccine was administered to three (10%) of these children.

  d) A single dose of vaccine administered after nine months of age to 78 children (73 with vaccination certificates, five confirmed by the mother), i.e. 37% of the total number of children recorded. None of them had received a second dose of vaccine.

6. **Vaccination contre la rougeole**

   Ensemble des vaccinations confirmées par un *certificat de vaccination* ou par la mère:

   a) Ensemble des enfants ayant reçu au moins une dose de vaccin antirougeoleux: 107 enfants, soit 51% du total des enfants enregistrés.

   b) *Ensemble* des enfants ayant reçu soit deux doses de vaccin (vaccination commencée avant l'âge de neuf mois), soit une dose (si vaccinés après neuf mois) 81 enfants, soit *38% du total* des enfants enregistrés.

   c) Première dose du vaccin administrée avant l'âge de neuf mois chez 29 enfants (certificat de vaccination pour tous), soit 14% du total des enfants enregistrés: la deuxième dose du vaccin a été administrée à trois (10%) de ces enfants.

   d) Une seule dose de vaccin administrée après l'âge de neuf mois chez 78 enfants (73 certificats de vaccination, cinq confirmées par la mère), soit 37% du total des enfants enregistrés. Aucun d'entre eux n'a reçu une deuxième dose du vaccin.

Table 1. **Results of the Evaluation of Primary Vaccinations Covering 212 Children Aged 13-25 Months in an Urban District of Ivory Coast (South Abidjan) April 1979**

Tableau 1. **Résultats de l'évaluation de primovaccinations chez 212 enfants âgés de 13 à 25 mois dans une zone urbaine de Côte d'Ivoire (Abidjan-Sud) Avril 1979**

Vaccinations performed / Vaccinations effectuées — Vaccination confirmed by / Confirmation d'une vaccination	BCG	DPT and Poliomyelitis * / DTC et antipoliomyélitique *			Measles — Antirougeoleuse	
		1st dose / 1re dose	2nd dose / 2e dose	3rd dose / 3e dose	At least one dose / Au moins une dose	Primary vaccination completed ** / Primo-vaccination accomplie **
(a) a vaccination certificate / *a)* par un certificat de vaccination	115 (54%)	136 (64%)	105 (50%)	83 (39%)	101 (48%)	76 (36%)
(b) BCG vaccination scar / *b)* par la cicatrice postvaccinale BCG	116 (55%)	— —	— —	— —	— —	— —
(c) mother *** (or other relative) / *c)* par la mère *** (autre parent)	15 (7%)	8 (4%)	3 (1%)	2 (1%)	6 (3%)	5 (2%)
(d) vaccination certificate or mother (or other relative) / *d)* ensemble par un certificat de vaccination et par la mère (autre parent)	130 (61%)	144 (68%)	108 (51%)	85 (39%)	107 (51%)	81 (38%)

* In the form of combined quadruple vaccine or separately.

** Total of children who received either two doses of vaccine (starting before nine months of age) or one dose (if given after nine months of age).

*** Mothers (other relatives) were questioned about the [illegible] vaccination status only if no vaccination certificate was available.

* Sous forme du vaccin associé tétracoc ou séparément.

** Ensemble des enfants ayant reçu soit deux doses de vaccin (vaccination commencée avant l'âge de neuf mois), soit une dose (si vaccinés après neuf mois).

*** Les mères (autres parents) étaient interrogées sur l'état vaccinal de l'enfant seulement en cas d'absence d'un certificat de vaccination.

EDITORIAL NOTE: Results of an evaluation of vaccination coverage in Abidjan show that the Expanded Programme on Immunization in the Ivory Coast is off to an excellent start. Using a combined fixed centre/mobile team strategy, relatively high rates of vaccination coverage were achieved with all antigens. Analysis of measles vaccinations showed that, while 51% of target children received one dose of measles vaccine, a very low proportion of children vaccinated before nine months returned for their second dose. Overall these results are very encouraging and show how evaluation techniques can highlight problems in vaccination strategy.

NOTE DE LA RÉDACTION: Les résultats d'une évaluation de la couverture vaccinale à Abidjan montrent que le Programme élargi de Vaccination a pris un excellent départ en Côte d'Ivoire. Une stratégie comportant l'utilisation combinée d'un centre fixe et d'une équipe mobile a permis d'obtenir pour tous les antigènes des taux de couverture vaccinale relativement élevés. Il est ressorti d'une analyse des vaccinations antirougeoleuses que, si 51% des enfants visés avaient reçu une dose de vaccin, la proportion de ceux vaccinés avant neuf mois qui se sont présentés pour recevoir la deuxième dose a été très faible. Dans l'ensemble, ces résultats sont très encourageants et montrent comment les techniques d'évaluation peuvent mettre en évidence les problèmes que pose la stratégie de vaccination.

MALARIA SURVEILLANCE

FEDERAL REPUBLIC OF GERMANY. — Until 1970, the increase in the number of imported malaria cases followed more or less the rising trend of tourist travel by air. Since then, and even more from 1975 onwards, there was a disproportionate increase reaching its maximum in 1977 with 318 cases *(Table 1)*.

SURVEILLANCE DU PALUDISME

RÉPUBLIQUE FÉDÉRALE D'ALLEMAGNE. — Jusqu'à 1970, l'augmentation du nombre de cas importés de paludisme suivait plus ou moins la tendance à l'augmentation des voyages touristiques par avion. Depuis lors, et en particulier depuis 1975, on a observé une augmentation disproportionnée, culminant à 318 cas en 1977 *(Tableau 1)*.

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Table 1. **Number of Imported Malaria Cases, Federal Republic of Germany, 1963-1977**
Tableau 1. **Paludisme — Nombre de cas importés, République fédérale d'Allemagne, 1963-1977**

Year — Année	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77
Cases — Cas	28	20	27	40	49	54	59	54	88	114	135	100	162	203	318
Relapses — Rechutes	8	20	21	12	12	14	8	11	12	20	11	5	13	15	19
Deaths — Décès	1	1	0	1	4	5	7	3	2	5	14	3	6	8	10

During the last five-year period, in addition to tourists, the increase was also due to malaria-infected foreign workers and refugees (after 1975, Turkish temporary workers and relatives and more recently an increasing number of young men from areas of the Indian subcontinent).

During the five-year period 1973-1977, most of the infections originated in West Africa (Nigeria 64, Senegal 42, Ghana 41, the United Republic of Cameroon 32, Ivory Coast 20, Togo 18, origin unknown 32) and from East Africa (Kenya 159, the United Republic of Tanzania 22, origin unknown 13). During the same period 82 cases had their origin in India, 37 in Pakistan and 14 in Indonesia. Eighty-four cases were imported from Turkey.

During the five-year periods shown in *Table 2*, the percentage of African cases went down to 67% due to the increase of cases imported from Asia and Europe (Turkey) during the period 1973-1977.

Nevertheless, in absolute figures the number of African cases doubled in each of the successive five-year periods; if one compares the past two five-year periods, the cases imported from Asia show a four-fold and from Europe (Turkey) a ten-fold increase.

Au cours des cinq dernières années, l'augmentation n'était plus due aux seuls touristes mais aussi aux travailleurs étrangers et aux réfugiés impaludés (après 1975, les travailleurs saisonniers turcs et leurs familles et, plus récemment, un nombre croissant de jeunes gens provenant de diverses régions du sous-continent indien).

Pendant la période 1973-1977, la plupart des infections avaient été contractées en Afrique occidentale (Nigéria 64, Sénégal 42, Ghana 41, République-Unie du Cameroun 32, Côte d'Ivoire 20, Togo 18, origine inconnue 32) et en Afrique orientale (Kenya 159, République-Unie de Tanzanie 22, origine inconnue 13). Pendant cette même période, 82 cas étaient originaires d'Inde, 37 du Pakistan et 14 d'Indonésie. Quatre-vingt-quatre cas étaient importés de Turquie.

Pendant les périodes de cinq ans indiquées dans le *Tableau 2*, le pourcentage des cas africains est descendu à 67% en raison de l'augmentation du nombre de cas importés d'Asie et d'Europe (Turquie) au cours de la période 1973-1977.

Néanmoins, le nombre de cas africains a doublé en valeur absolue pendant chacune des périodes de cinq ans successives; si l'on compare les deux dernières périodes, le nombre de cas importés d'Asie a quadruplé et le nombre de cas importés d'Europe (Turquie) a décuplé.

Table 2. **Imported Malaria Cases by Origin and Species, Federal Republic of Germany, 1963-1977**
Tableau 2. **Paludisme — Cas importés par origine et par espèce, République fédérale d'Allemagne, 1963-1977**

Origin and Species — Origine et espèce		1963-1967		1968-1972		1973-1977	
		No. — Nb	%	No. — Nb	%	No. — Nb	%
Origin — Origine:	Africa — Afrique	130	72.2	300	81.5	611	66.5
	America — Amérique	9	5.0	7	1.9	18	2.0
	Asia — Asie	32	17.8	45	12.2	193	21.0
	Europe (incl. Turkey — dont Turquie)	3	1.7	9	2.5	89	9.7
	Oceania — Océanie	0	0	0	0	1	0.8
	Origin unknown — Origine inconnue	6	3.3	7*	1.9	6	
	Total	**180**	**100**	**368**	**100**	**918**	**100**
Species — Espèces:	*P. vivax*	80	44.4	125	34.0	385	41.9
	P. falciparum	52	28.9	192	52.2	398	43.4
	P. malariae	12	6.7	14	3.8	44	4.8
	P. ovale	0	0	7	1.9	37	4.0
	Mixed infections — Infections mixtes	0	0	10	2.7	20	2.2
	Species unknown — Espèce inconnue	36	20.0	20	5.4	34	3.7
	Total	**180**	**100**	**368**	**100**	**918**	**100**

During the period 1973-1977 there was a nearly even distribution between *P. vivax* and *P. falciparum* (42% and 43% respectively).

Between 1973 and 1977, 40 deaths due to malaria were notified *(Table 3)*, representing 4.4% of the 918 imported malaria cases recorded during that period. Among the 40 deaths, there were 33 tourists.

Tourists (including persons on home leave) represent the most important group with 55% of all cases during 1973-1977, followed by professionals with 34% and immigrants with 11%. During the reporting period, tourists clearly outnumbered the professionals, whereas during the years 1963-1972 the reverse was the case. It seems that long-distance tourism increased but exact figures on tourism and professional travel are not available.

Pendant la période 1973-1977, les cas se répartissent à peu près également entre *P. vivax* et *P. falciparum* (42% et 43% respectivement).

Entre 1973 et 1977, 40 décès imputables au paludisme ont été notifiés *(Tableau 3)*, ce qui représente 4,4% des 918 cas de paludisme importés enregistrés pendant cette période. Parmi les 40 victimes figuraient 33 touristes.

Les touristes (y compris les personnes en congé dans les foyers) constituaient le groupe le plus important avec 55% du total des cas entre 1973 et 1977, et étaient suivis par les travailleurs avec 34% des cas et les immigrants avec 11% des cas. Pendant cette période, les touristes l'emportaient largement en nombre sur les travailleurs, tandis que pendant la période 1963-1972 c'était l'inverse. Il semble que les effectifs du tourisme lointain augmentent, mais on ne dispose pas de chiffres exacts sur les voyages touristiques et les voyages pour raisons professionnelles.

Table 3. **Imported Malaria Cases by Occupation or Affiliation, Federal Republic of Germany, 1973-1977**
Tableau 3. **Paludisme — Cas importés par profession ou catégorie, République fédérale d'Allemagne, 1973-1977**

Occupation or Affiliation Profession ou catégorie	Nationals — Ressortissants					Foreigners — Etrangers					Total %	
	73	74	75	76	77	73	74	75	76	77		
Tourists or persons on home leave — Touristes ou personnes en congé dans les foyers	63	43	74	73	140	14	15	15	24	46	507	55.2
Professionals — Travailleurs	41	27	54	69	73	8	6	8	7	14	307	33.5
Family members — Membres de la famille	7	4	5	6	5	—	—	—	—	—		
Employees shipping or air company — Employés des compagnies aériennes ou de navigation	11	4	12	9	5	6	4	6	5	8		
Students — Etudiants	3	1	6	11	13	—	1	—	—	—		
Helpers — Coopérants	2	2	6	4	2	—	—	—	—	—		
Military personnel — Personnel militaire	1	—	—	1	—	1	1	—	—	—		
Others — Autres	17	16	25	38	48	1	—	2	2	6		
Immigrants	—	—	—	—	—	8	8	11	30	45	102	11.1
No indication — Non précisé	1	1	—	—	—	—	—	—	—	—	2	0.2
Total	**105**	**71**	**128**	**142**	**213**	**30**	**29**	**34**	**61**	**105**	**918**	**100**

The fact that 70 seamen and employees of airlines acquired malaria during the five-year period is of great concern. A short stay in airports or seaports of malarious areas appears therefore to be sufficient to become infected due to mere neglect in taking prophylaxis.

During the five-year period 1973-1977, the age group 20 to 40 accounts for 67% of all imported cases. This shows a striking coincidence with the figures obtained during the evaluation of the period 1963-1972, supposing certain basic and unchanged factors underlying the importation of malaria.

There were no indications that clinical attacks occurred despite regular prophylaxis with chloroquine. Some of the patients had taken incomplete prophylactic measures or did not continue it long enough; all others had not taken any antimalarials.

Le fait que 70 personnes travaillant dans des compagnies aériennes ou maritimes aient contracté le paludisme pendant cette période de cinq ans est préoccupant. Il semble en effet qu'un bref séjour dans les aéroports ou les ports des régions impaludées suffise pour contracter une affection si on néglige le traitement prophylactique.

Pendant la période 1973-1977, le groupe d'âge 20-40 ans a contribué pour 67% au total des cas importés, ce qui coïncide de façon frappante avec les chiffres obtenus pendant l'évaluation de 1963-1972 et suppose qu'un certain nombre de facteurs fondamentaux stables régissent l'importation du paludisme.

Il ne semble pas que des atteintes cliniques se soient déclarées, lorsque le traitement prophylactique par la chloroquine a été pris régulièrement. Certains des malades n'avaient suivi que partiellement le traitement ou ne l'avaient pas poursuivi assez longtemps; le autres n'avaient suivi aucun traitement.

MYCOPLASMA PNEUMONIAE ENCEPHALOPATHY

UNITED KINGDOM. — A 20-year-old man was hospitalized with a two-week history of cough, muscle aches and malaise. On admission he showed signs of CNS involvement which were later diagnosed as encephalitis. Infection with *Mycoplasma pneumoniae* was diagnosed by serological investigations showing rising titres of antibodies in complement-fixing tests and by the detection of specific IgM in immunofluorescence tests. Erythromycin was administered for ten days. A dramatic improvement was seen during the first few days of treatment and then gradually over the following six weeks. The patient could be discharged after a hospital stay of over two months.

ENCÉPHALOPATHIE À *MYCOPLASMA PNEUMONIAE*

ROYAUME-UNI. — Un homme de 20 ans qui souffrait depuis deux semaines de toux, de douleurs musculaires et de malaise a été hospitalisé. Lors de son admission, il présentait des signes d'atteinte du SNC qui ont ultérieurement donné lieu à un diagnostic d'encéphalite. Une infection par *Mycoplasma pneumoniae* a été révélée par des explorations sérologiques indiquant une montée des anticorps dans les épreuves de fixation du complément et par la détection d'IgM spécifiques dans les épreuves d'immunofluorescence. De l'érythromycine a été administrée pendant dix jours. L'amélioration a été spectaculaire pendant les premiers jours du traitement puis graduelle au cours des six semaines suivantes. Le patient a pu quitter l'hôpital après y avoir séjourné plus de deux mois.

(Based on/D'après: *Communicable Disease Report*, No. 19, 1979; *Public Health Laboratory Service*.)

EDITORIAL NOTE: CNS involvement associated with *M. pneumoniae* infection is probably more common than generally thought. In 1977, 101 reports of laboratory-confirmed *M. pneumoniae* infections with CNS disease were received in WHO. Of these, 90 were with a well-defined diagnosis of meningitis, encephalitis or paralysis.

NOTE DE LA RÉDACTION: Les atteintes du SNC en relation avec des infections à *M. pneumoniae* sont probablement plus fréquentes qu'on ne le pense en général. En 1977, 101 cas d'infections à *M. pneumoniae* confirmées en laboratoire avec atteinte du SNC ont été signalées à l'OMS. Parmi ces cas, 90 avaient fait l'objet d'un diagnostic net de méningite, d'encéphalite ou de paralysie.

INFLUENZA

CHINA (22 May 1979). — [1] During the last influenza season, influenza outbreaks associated with virus B were reported in December 1978 and January 1979; they affected nurseries and kindergartens in some provinces and cities (including Peking, Shanghai and Kirin).

In 1979 as in 1978, several strains of virus A (H1N1), generally similar to A/USSR/90/77, have been isolated each month during localized outbreaks which occurred in different parts of the country. One of these strains, isolated in Shanghai in January 1979 from a 30-year-old woman, appears however to differ somehow from both A/USSR/90/77 and A/Brazil/11/78. The significance of this strain is being investigated.

Strains of virus A (H3N2) similar to A/Texas/1/77 were occasionally isolated during autumn 1978. However, an increase in activity associated with this virus was observed between February and April 1979, with sporadic cases and localized outbreaks in Shanghai and Kunming.

There were no reports of influenza-like illness among old people.

[1] See Nos. 26, p. 206 and 27, p. 214.

GRIPPE

CHINE (22 mai 1979). — [1] Pendant la dernière saison grippale, on a signalé en décembre 1978 et janvier 1979 des poussées de grippe associées au virus B qui affectèrent les crèches et les jardins d'enfants dans quelques provinces et quelques villes (dont Pékin, Shanghai et Kirin).

En 1979 comme en 1978, plusieurs souches de virus A (H1N1), généralement similaires à A/USSR/90/77, ont été isolées chaque mois au cours de poussées localisées survenues dans différentes parties du pays. L'une de ces souches, isolée à Shanghai en janvier 1979 chez une femme de 30 ans, paraît cependant présenter certaines différences aussi bien avec A/USSR/90/77 qu'avec A/Brazil/11/78. On étudie actuellement la signification de cette souche.

Des souches de virus A (H3N2) similaires à A/Texas/1/77 ont été isolées occasionnellement pendant l'automne 1978. Cependant une augmentation de l'activité associée à ce virus a été observée entre février et avril 1979, avec des cas sporadiques et des poussées localisées à Shanghai et à Kunming.

On n'a pas reçu de rapports concernant des affections d'allure grippale chez des personnes âgées.

[1] Voir Nos 26, p. 206 et 27, p. 214.

REWARD US$ 1 000 RÉCOMPENSE

A reward has been established by the Director-General of WHO for the first person who, in the period preceding final certification of global eradication, reports an active case of smallpox resulting from person-to-person transmission and confirmed by laboratory tests.

(Resolution WHA31.54, World Health Assembly, 1978)

Le Directeur général de l'OMS a institué une récompense à attribuer à la première personne qui, au cours de la période précédant la certification définitive de l'éradication mondiale, signalerait un cas actif de variole résultant de la transmission d'un être humain à l'autre et confirmé par des essais de laboratoire.

(Résolution WHA31.54, Assemblée mondiale de la Santé, 1978)

WORLDWIDE FREEDOM FROM ENDEMIC SMALLPOX — **90 weeks/semaines** — **MONDE ENTIER EXEMPT DE VARIOLE ENDÉMIQUE**

NOTE ON GEOGRAPHICAL AREAS

The form of presentation in the *Weekly Epidemiological Record* does not imply official endorsement or acceptance by the World Health Organization of the status or boundaries of the territories as listed or described. It has been adopted solely for the purpose of providing a convenient geographical basis for the information herein. The same qualification applies to all notes and explanations concerning the geographical units for which data are provided.

NOTE SUR LES UNITÉS GÉOGRAPHIQUES

Il ne faudrait pas conclure de la présentation adoptée dans le *Relevé épidémiologique hebdomadaire* que l'Organisation mondiale de la Santé admet ou reconnaît officiellement le statut ou les limites des territoires mentionnés. Ce mode de présentation n'a d'autre objet que de donner un cadre géographique aux renseignements publiés. La même réserve vaut également pour toutes les notes et explications relatives aux pays et territoires qui figurent dans les tableaux.

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DISEASES SUBJECT TO THE REGULATIONS — MALADIES SOUMISES AU RÈGLEMENT

Notifications Received from 13 to 19 July 1979 — Notifications reçues du 13 au 19 juillet 1979

C Cases — Cas
D Deaths — Décès
P Port
A Airport — Aéroport
... Figures not yet received — Chiffres non encore disponibles
i Imported cases — Cas importés
r Revised figures — Chiffres revisés
s Suspect cases — Cas suspects

PLAGUE — PESTE

America — Amérique

		C	D
UNITED STATES OF AMERICA ÉTATS-UNIS D'AMÉRIQUE	1.VII		
Colorado State			
Montrose County		1*	0
	14.VI		
New Mexico State			
San Juan County		1*	0

* These cases of plague have no significance to international travel / Ces cas de peste n'ont pas de conséquence sur les voyages internationaux.

CHOLERA — CHOLÉRA

Africa — Afrique

		C	D
BURUNDI	5-11.III		
. . . . .		9	0
BURUNDI *(contd — suite)*	26.II-4.III		
. . . . .		10	0
TANZANIA, UNITED REP. OF TANZANIE, RÉP.-UNIE DE	1-7.VII		
. . . . .		48	9
	24-30.VI		
. . . . .		52	11
	17-23.VI *r*		
. . . . .		119*r*	22*r*

Asia — Asie

		C	D
BURMA — BIRMANIE	1-7.VII		
. . . . .		41	2
INDIA — INDE	3-16.VI		
. . . . .		292	7
INDONESIA — INDONÉSIE	24-30.VI		
. . . . .		137	0
MALAYSIA — MALAISIE	17-23.VI		
. . . . .		2	0
	10-16.VI		
. . . . .		6	1
	3-9.VI		
. . . . .		4	0
	27.V-2.VI		
. . . . .		2	0
SRI LANKA	28.IV-4.V		
. . . . .		1	0

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Infected Areas as on 19 July 1979 — Zones infectées au 19 juillet 1979

For criteria used in compiling this list, see No. 27, page 215 — Les critères appliqués pour la compilation de cette liste sont publiés dans le N° 27, à la page 215.
× Newly reported areas — Nouvelles zones signalées.

PLAGUE — PESTE

Africa — Afrique

MADAGASCAR
Fianarantsoa Province
Ambohimahasoa S. Préf.
Kalalao Canton
Vohipoya Canton
Fianarantsoa S. Préf.
Fanjakana Canton
Majunga Province
Bealanana S. Préf.
Bealanana Canton
Tananarive Province
Manjakandriana S. Préf.
Merikanjaka Canton
Miarinarivo S. Préf.
Analavory Canton
Soavinandriana S. Préf.
Soavinandriana Canton

SUDAN — SOUDAN
Equatoria Province
Juba Rural Council

ZAIRE — ZAÏRE
Kivu Province
Région Nord-Kivu
Butembo Zone
Région Sud-Kivu
Shabunda Zone

America — Amérique

BOLIVIA — BOLIVIE
La Paz Department
Franz Tamayo Prov.: Hualata
Franz Tamayo Prov.: Tigrerumi

Asia — Asie

BURMA — BIRMANIE
Mandalay Division
Mandalay District
Sagaing Division
Sagaing D.: Sagaing
Shwebo D.: Shwebo

VIET NAM
Ho Chi Minh City (excl. PA)
Dong Nai Province

CHOLERA — CHOLÉRA

Africa — Afrique

BURUNDI
Bubanza Province
Gihanga
Kabulantwa
Muzinda
Rugombo
Bujumbura Province
Bujumbura Arrondissement
Musaga
Bururi Province
× Rumonge

CONGO
Kouilou Préfecture
Pointe-Noire S.Préf.

GHANA
Ashanti Region
Brong-Ahafo Region
Central Region
Eastern Region
Greater Accra (excl. PA) Region
Volta Region
Western Region

LIBERIA — LIBÉRIA
Montserrado County

MALAWI
Northern Region
Karonga District

MOZAMBIQUE
Cabo Delgado Province
Mocimboa de Praia District
Macomia District
Nangade District
Pemba District
Manica & Sofala Province
Beira District
Guro District
Marromeu District
Maputo Province
Maputo District
Nampula Province
Nampula District
Tete Province
Chiuta District
Tete District
Zambézia Province
Gilé District
Mocuba District
Quelimane District

NIGERIA — NIGÉRIA
Bauchi State
Azare
Bauchi
Bendel State
Warri
Cross River State
Oron
Kaduna State
Kaduna
Katsina Province
Katsina Prov.: Funtua
Zaria Province
Lagos State
Ikeja
Lagos Island
Lagos Mainland
Mushin West
Ogun State
Ijebu-Igbo Province
Ilaro
Ondo State
Akure
Oyo State
Ibadan Province
Oyo Prov.: Ikire
Oyo Prov.: Ile-Ife
Plateau State
Barakin Ladi
Bassa
Jos
Mangu
Nasarawa
Pankshin

RWANDA
Gisenyi Secteur

SUDAN — SOUDAN
Equatoria Province
Juba Town

TANZANIA, UNITED REP. OF — TANZANIE, RÉP.-UNIE DE
Kigoma Region
Kigoma District
Kilimanjaro Region
Hai District
Kilimanjaro District
Moshi District
Lindi Region
Lindi District
Nachingwea District
Mtwara Region
Masasi District
Mtwara District
Newala District
Rukwa Region
Mpanda District
Tanga Region
Handeni District
Korogwe District
Lushoto District
Tanga District

UGANDA — OUGANDA
Nile Province
South Nile D.: Padyere County
Southern Province
North Kigezi District
West Ankole District
Western Province
Rwenzori District

ZAIRE — ZAÏRE
Bas-Zaïre Province
Haut-Zaïre Province
Kivu Province
Shaba Province

Asia — Asie

BANGLADESH
Chittagong Division
Chittagong District
Chittagong Hill Tract District
Comilla (Tippera) District
Sylhet District
Dacca Division
Dacca District (excl. Dacca City)
Faridpur District
Mymensingh District
Tangail District
Khulna Division
Bakerganj (Barisal) District
Jessore District
Khulna District
Kushtia District
Patuakhali District
Rajshahi Division
Bogra District
Dinajpur District
Pabna District
Rajshahi District
Rangpur District

BURMA — BIRMANIE
Bassein (P)
Rangoon (PA) (excl. airport)
Irrawaddy Division
Bassein District
Myaungmya District
Myaungmya D.: Myaungmya
Pyapôn District
Pyapôn D.: Pyapôn
Mandalay Division
Mandalay District
Mandalay D.: Mandalay
Shan State
Lashio D.: Lashio
Taunggyi District

INDIA — INDE
Andhra Pradesh State
Hyderabad District
Delhi Territory
Gujarat State
Amreli District
Broach District
Kaira District
Kerala State
Alleppey District
Madhya Pradesh State
Indore District
Maharashtra State
× Ahmednagar District
Akola District
Amravati District
Aurangabad District
Bhir District
× Buldhana District
Dhulia District
Jalgaon District
Nagpur District
Nanded District
Nasik District
Osmanabad District
Parbhani District
Pune (Poona) District
Sangli District
Sholapur District
Yeotmal District
Manipur Territory (Central)
Mysore State
Bangalore District
Shimoga District
Orissa State
Cuttack District
Rajasthan State
Alwar District
Tamil Nadu State
Chingleput District
Dharmapuri District
Madras Corporation
Madurai District
North Arcot District
Ramanathapuram District
Salem District
South Arcot District
Tiruchirapalli District
Tirunelveli District
Uttar Pradesh State
× Allahabad District
Lucknow District
× Mathura District
West Bengal State
Calcutta Corporation

INDONESIA — INDONÉSIE
Jakarta Autonomous Capital Area
Jakarta Barat (West) Municipality
Jakarta Pusat (Central) Municipality (excl. Kemayoran airport)
Jakarta Selatan (South) Municipality (excl. emergency quarantine station)
Jakarta Timur (East) Municipality (excl. Halim Perdana Kusuma airport)
Jakarta Utara (North) Municipality (excl. seaports of Tanjungpriok, Sundakelapa & Kalibaru)
Aceh Autonomous Area
Aceh Barat Regency
Aceh Besar Regency
Aceh Tengah Regency
Aceh Tenggara Regency
Aceh Timur Regency
Aceh Utara (P) Regency
Banda Aceh Municipality
Pidie Regency
Bali Province
Badung Regency
Bangli Regency
Tabanan Regency
Jambi (Sumatera) Province
Jambi (P) Municipality
Kerinci Regency
Sarolangun Bangko Regency
Tanjung Jabung Regency
Jawa Barat (West Java) Province
Bandung Municipality
Bandung Regency
Bekasi Regency
Bogor Regency
Ciamis Regency
Cianjur Regency
Cirebon (P) Municipality
Cirebon Regency
Krawang Regency
Kuningan Regency
Lebak Regency
Serang Regency
Sukabumi Municipality
Sukabumi Regency
Jawa Tengah (Central Java) Province
Brebes Regency
Cilacap (P) Regency
Demak Regency
Grobogan Regency
Jepara Regency
Karanganyar Regency
Kendal Regency
Kudus Regency
Pati Regency
Rembang Regency
Semarang Regency
Surakarta Municipality
Tegal Regency
Jawa Timur (East Java) Province
Gresik Municipality
Sidoarjo Regency
Surabaya Municipality (excl. Tanjung Perak seaport)
Kalimantan Tengah Province
Barito Hulu Regency
Barito Utara Regency
Maluku Province
Maluku Tengah Regency
Maluku Utara Regency
Riau (Sumatera) Province
Bengkalis (P) Regency
Indragiri Hilir (P) Regency
Kepulauan Riau (P) Regency
Sulawesi Selatan Province
Ujung Pandang (P) Municipality

Best Available Document

Sulawesi Tenggara (South-East) Province
Kendari (P) Regency
Kolaka Regency
Muna Regency

Sumatera Barat (West) Province
Padang Panjang Municipality

Sumatera Selatan (South) Province
Lahat Regency

Sumatera Utara (North) Province
Asahan Regency
Binjai Municipality
Deli Serdang (P) Regency
Labuhanbatu Regency
Langkat Regency
Medan (P) Municipality
Nias (P) Regency
Pematang Siantar Municipality
Sibolga (P) Municipality
Simalungun Regency
Tanjung Balai Municipality
Tapanuli Selatan Regency
Tapanuli Tengah (P) Regency
Tapanuli Utara Regency
Tebing Tinggi Municipality

MALAYSIA — MALAISIE

Sabah
x Beluran District
x Sandakan District

Sarawak
x Bau District
x Kuching District

Peninsular Malaysia

Federal Territory

Kedah State
x Baling District
x Kuala Muda District

Perak State
Kinta District
Kuala Kangsar District

Perlis State
Perlis District

NEPAL — NÉPAL

Bagamati Zone
Bhaktapur District
Katmandu District
Lalitpur District

SRI LANKA

Jaffna Health Division
Vavuniya Health Division

THAILAND — THAÏLANDE

Bangkok (excl. PA)

Ayutthaya Province
Ayutthaya District
Bang Pahan District
Ban Sai District
Nakhon Luang District
Phachi District
Uthai District

Bangkok (Phra Nakhon) Province
Bang Kapi District
Bang Khen District
Dusit District
Huai Kwang District
Pathum Wan District
Phra Khanong District
Phaya Thai
Samphantha Wong District
Yan Nawa District

Chanthaburi Province
Chanthaburi District
Khlung District
Pong Nam Ron District

Chon Buri Province
Ban Bung District
Phan Thong District
Si Racha District

Chumphon Province
Chumphon District

Kamphaeng Phet Province
Kamphaeng Phet District

Khon Kaen Province
Ban Phai District
Chonnabot District
Khon Kaen District
Mancha Khiri District

Nakhon Nayok Province
Ban Na District
Nakhon Nayok District
Ongkharak District

Nakhon Si Thammarat Province
Khanom District
Nakhon Si Thammarat District
Si Chon District
Tha Sala District

Nan Province
Mae Charim District
Nan District
Pua District
Sa District

Nonthaburi Province
Nonthaburi District

Pathum Thani Province
Khlong Luang District
Pathum Thani District
Sam Khok District

Phetchabun Province
Chon Daen District

Prachin Buri Province
Ban Sang District
Kabin Buri District
Prachantakham District
Si Maha Phot District

Ratchaburi Province
Dammoen Saduak District
Ratchaburi District

Sakhon Nakhon Province
Sawang Daen Din District

Samut Prakan Province
Bang Bo District
Phra Pradaeng District
Samut Prakan District

Samut Sakhon Province
Krathum Baen District
Samut Sakhon District

Samut Songkhram Province
Amphawa District
Samut Songkhram District

Saraburi Province
Nong Khae District
Muak Lek District
Phra Phuttabat District
Sao Hai District
Saraburi District
Wihan Daeng District

Sing Buri Province
Tha Chang District

Si Sa Ket Province
Si Sa Ket District

Songkhla Province
Songkhla District

Sukhothai Province
Sukhothai District

Suphan Buri Province
Don Chedi District
Si Prachan District
Suphan Buri District

Surat Thani Province
Ba Na San District
Don Sak District
Kanchanadit District
Khiri Ratthanikhom District
Phun Phin District
Surat Thani District

Tak Province
Ban Tak District
Mae Sot District
Tak District

Thon Buri Province
Bang Khun Thian District
Bangkok Noi District
Bangkok Yai District
Khlong Yai District
Phasi Charoen District
Rat Burana District
Thon Buri District

Ubon Ratchathani Province
Warin Chamrap District
Yasothon District

YELLOW FEVER — FIÈVRE JAUNE

Africa — Afrique

ANGOLA

GAMBIA — GAMBIE
Upper River Division

GHANA

NIGERIA — NIGÉRIA

SUDAN — SOUDAN
Territory South of 12° N.
Territoire situé au sud du 12° N.

ZAIRE — ZAÏRE
Territory North of 10° S.
Territoire situé au nord du 10° S.

America — Amérique

BRAZIL — BRÉSIL

Para State
Tomé-Açu Municipio

Roraima Territory
Boa Vista Municipio
Caracaraí Municipio

COLOMBIA — COLOMBIE

Caquetá Intendencia
San Vicente del Caguán Municipio

Meta Intendencia
[illegible]

[illegible] *Santander Department*
Convencion Municipio
Las Mercedes Municipio
Ocaña Municipio
Petrólea Municipio
San Calixto Municipio
Tibu Municipio

Santander Department
San Vicente de Chucuri Municipio

Vaupés Comisaría
San Jo[illegible] del Guaviare Municipio

ECUADOR — ÉQUATEUR

Zamora-Chinchipe Province
Zamora Canton

PERU — PÉROU

Ayacucho Department
Huanta Province
San José de Santillana District

La Mar Province
Ayna District

Huanuco Department
Huamalies Province
Monzón District

Leoncio Prado Province
Padre Luyando District
Rupa Rupa District

Marañon Province
Cholon District

Junin Department
Chanchamayo Province
Chanchamayo District
La Merced District
Pichanaqui District

Satipo Province
Cubiriali District
Mazamari District
Pampa Hermoza District
Rio Negro District
San Martin de Pangoa District
Satipo District

Madre de Dios Department
Manú Province
Manú District

Tambopata Province
Inambari District

Puno Department
Sandia Province
San Juan del Oro District

San Martin Department
Mariscal Caceres Province
Juanjui District
Tocache District
Uchiza District

VENEZUELA

Zulia State
Mara D.: Luis de Vicente Municipio

Areas Removed from the Infected Area List between 13 and 19 July 1979
Zones supprimées de la liste des zones infectées entre les 13 et 19 juillet 1979

For criteria used in compiling this list, see No. 27, page 215 — Les critères appliqués pour la compilation de cette liste sont publiés dans le N° 27, à la page 215.

CHOLERA — CHOLÉRA

Africa — Afrique

BURUNDI

Bubanza Province
Bubanza Arrondissement

Bujumbura Province
Rushubi

Asia — Asie

INDIA — INDE

Andhra Pradesh State
Visakhpatnam District

THAILAND — THAÏLANDE

Ayutthaya Province
Sena District

Chachoengsao Province
Bang Khla District

Nakhon Nayok Province
Pak Phli District

Nakhon Ratchasima Province
Bua Yai District

Nakhon Si Thammarat Province
Cha Oud District
Pak Phanang District
Ron Phibun District

Nonthaburi Province
Pak Kret District

Pathum Thani Province
Lam Luk Ka District

Phuket Province
Phuket District

Prachin Buri Province
Sa Kaeo District

Samut Prakan Province
Bang Phli District

Samut Sakhon Province
Ban Phaeo District

Samut Songkhram Province
Bang Khonthi District

Thon Buri Province
Nong Khaem District

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IVORY COAST
EXPANDED PROGRAM ON IMMUNIZATION
SEMI-ANNUAL PROGRESS REPORT - July 1979

- ° -

INTRODUCTION

The GOIC (Government of Ivory Coast), in cooperation with WHO, USAID/SHDS, UNICEF, ICC (International Childrens Center i. Paris), and CDC, began outlining in détail an Expanded Program on Immunization (EPI) in October 1977 which became operational, after a reasonably uneventful human gestation, one year ago in June 1978.

EPI is part of a regional plan to strengthen health delivery systems (SHDS) in West and Central Africa. EPI, comprising "Objective III" of the SHDS project, was conceived to help improve regional and national disease surveillance and health information systems and to integrate these systems into national health planning delivery systems.

Three démonstrations zones were chosen for the initiation of an Expanded Program on Immunization in Ivory Coast: Abidjan, an urban zone with approximatly 1.3 million population; Abengourou, a forest zone with 100,000 population; and Korhogo, a savannah zone with about 150,000 population. Over 20% of the Ivory Coast population is included in the demonstration zones.

EPI headquarters, housed at the Institute of Hygiene in the capital city of Abidjan, coordinates the immunization, disease surveillance, health education, training and program evaluation activities in the three demonstration zones - see attachment 1.

In collaboration with other services within the Ministry of Health EPI has integrated its vaccination and surveillance activities into Maternal and Child Health Centers (PMI^{S}), Social Centers, Dispensaries, Maternities, Rural Medicine Sectors, Institute of Health Centers and Centers for tuberculosis control - see attachment 2.

Vaccines employed are diphteria, tetanus, pertussis, polio, measles and BCG (tuberculosis) for children 0 to 35 months of age and tetanus for expecting mothers.

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PROGRESS REPORT

In accordance with the implemation plan (revised 11 November 1978) provided by the Research and Development Division of CDC's Bureau of Smallpox Eradication, results of the sub-objectives of SHDS "Objective III" applicable to EPI-Ivory Coast are as follows :

SUB-OBJECTIVE 1

3. PROVIDE TRAINING COURSES IN SURVEILLANCE OF VACCINE PREVENTABLE DISEASES, AND PLANNING, IMPLEMENTATION AND EVALUATION OF EXPANDED PROGRAMS.....

   - The Inter-Country Planning and Management Course for EPI responsible personnel from 15 Francophone African countries was conducted as scheduled in Abidjan, Ivory Coast, April 1979. Sixty-eight participants, observers and course managers attended the two week session. Included in practical application aspects of the course was a field exercise carried out to determine vaccination coverage in the southern half of Abidjan.

4. DETERMINE BASELINE LEVELS OF MORBIDITY AND MORTALITY OF NEONATAL TETANUS, MEASLES AND POLIOMYELITIS IN IMMUNIZATION PROGRAM DEMONSTRATION-TRAINING AREAS. ----- BY FEBRUARY 1, 1980 IN IVORY COAST.

   - Baseline levels for measles are being collected in two of the three demonstration zones - see attachments 4,5,6,7.

   - Hospitalized polio cases and deaths in the pediatric ward of Treichville Hospital were charted for 1978 and 1979 - see attachment 8.

   - A polio prevalence survey was initiated June 1979 in 45 Abidjan schools. Nearly 11,000 school children ages 6 thru 11 years were screened. Exploitation of information is not yet completed but a preliminary report indicates a polio prevalence rate of 8 per 1000 children screened. Surprisingly, females accounted for over two chirds of the polio cases identified in the survey. The reason for the disproportionate number of polio cases among girls has not yet been determined. The polio survey will include samples from the interior as soon as schools reconvene.

   - Neonatal tetanus data is not yet complete.

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5. ESTABLISH IN IMMUNIZATION PROGRAM DEMONSTRATION AREAS ONGOING SYSTEMS OF DISEASE SURVEILLANCE ----- BY MAY 1, 1980 IN IVORY COAST.

- Supplementary morbidity and mortality reports are submitted monthly from all diagnostic centers and hospitals in Abidjan (13 centers + 3 hospitals) and Abengourou (2 centers + 1 hospital). The reports reveal precise age at onset of disease and distinguish between vaccinated and non vaccinated cases.

- Measles, Abidjan:

  seventeen percent (17%) of all measles cases reported January thru March 1979 were among vaccinees;
  less than two percent (2%) of measles occur before 6 months of age;
  fifteen percent (15%) of meales cases occur between 6 and 8 months of age;
  seventeen percent (17%) of measles cases occur between 9 and 11 months of age.

- Polio, Abidjan:

  less than seven percent (7%) of all polio cases in Abidjan occur before seven months of age and only five percent (5%) occur after 3 years of age - see attachment 9.

- Morbidity/mortality data has not been collected to date from Korhogo area.

6. ASSIST REGIONAL/NATIONAL AUTHORITIES IN INVESTIGATING UNEXPECTED OUTBREAKS OF MORBIDITY AND MORTALITY

- In the absence of an OCCGE medical epidemiologist the CDC assignee to the Ivory Coast assisted with several suspect smallpox and yellow fever investigations. Suspect smallpox specimens were sent to Atlanta and Paris and yellow fever specimens were examined at the Ivory Coast Pasteur Institute.

- The Ministry of Health (MOH) invited a Lassa Fever specialist from CDC to visit the Ivory Coast for épidemiologic discussions with Ivory Coast Health officials including virologists from Institute Pasteur and a pathologist from the University Hospital. Should the need arise, the Lassa Fever Laboratory supported by CDC in Sierra Leone is prepared to collaborate with the GOIC.

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SUB-OBJECTIVE II

Not applicable to EPI-Ivory Coast

SUB-OBJECTIVE III

1. DEVELOP DEMONSTRATION-TRAINING VACCINE DELIVERY PROGRAMS IN THREE COUNTRIES ------ BY DECEMBER 1, 1978 IN IVORY COAST (TWO AREAS).

- Demonstration-training vaccine delivery programs were launched in Abidjan, June 1978; Abengourou, July 1978; and Korhogo, December 1978 - see attachments 10,11.

- Abidjan

EPI activities are functioning well in seven Maternal and Child Health Centers (PMI^{s}) using trained PMI personnel.

Two mobile teams visit (at least once per week) eight Social Centers and one Dispensary. This operation has been less satisfactory (due to insufficient number of vaccinations) and an attempt is under way to make all fixed centers independent, i.e. using their own personnel.

Periodically, mobile teams are sent into areas where vaccination coverage is insufficient or when the reservoir of susceptibles becomes too large - see attachments 12,13,14,15.

- Abengourou

Vaccinations are administered daily in the Rural Medicine Sector of Abengourou town (pop. 35,000) and on a monthly bases in twelve surrounding villages. A mobile team brings vaccines from Abengourou to the villages and assists the local personnel with EPI activities. After completing the initial series of 3 vaccinations the villages go to a 3 months visit cycle.(Vaccination totals for villages not yet completed)- see attachment 16.

- Korhogo

Personnel from the Rural Medicine Sector, Hygiène Institute Annex, Center for Tuberculosis Control and the PMI received EPI training in December by personnel from the International Children Center, Paris (ICC) and EPI headquarters personnel. Vaccination activities got under way early in 1979 in the city of Korhogo (pop. 100,000). A review of Korhogo reports show vaccination coverage outside target age group. The twelve surrounding village chosen for demonstration

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purposes will be operational before the end of the year - see attachment 17.

2. ACHIEVE 70 PERCENT COVERAGE OF IDENTIFIED TARGET POPULATIONS IN DEMONSTRATION AREAS WITHIN 18 MONTHS OF INITIATION OF FULL OPERATIONS.

- Abidjan

After ten months operation a vaccination coverage evaluation in the southern half of Abidjan showed the following:

160 (76%) of the 212 target children randomly selected had personal vaccination cards

107 (51%) of children received measles vaccine

136 (64%) of children received at least one dose of diphteria, tetanus, pertussis, polio (DTP-POLIO) vaccine

105 (50%) received two doses of DTP-POLIO

83 (39%) received all three doses of DTP-POLIO

116 (55%) of the children had a BCG vaccination scar.

- Abengourou

After eleven months operation a vaccination coverage assessment in Abengouroutown revealed:

144 (69%) of 210 children ramdomly selected in the survey had personal vaccination cards

134 (64%) attended immunization clinic for measles vaccinations (29 were not vaccinated due to history of prior measles infection *). An additional 14 (7%) of the children had been vaccinated according to parent but were not counted as confirmed vaccinations

140 (67%) of children received first injection of DTP-POLIO. An additional uncounted 8% received first DTP-POLIO according to testimony of parent

132 (63%) received 2nd DTP-POLIO plus an additional 7% according to parent

117 (56%) received 3rd DTP-POLIO plus an additional 6% according to parent

143 (74%) of the 194 children present during survey had BCG vaccination scars.

* Policy subsequently changed due to unreliability of history

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3. DOCUMENT COVERAGE THROUGH ONGOING SAMPLE ASSESSMENT IN ALL AREAS.

   - See 2 above.

4. DECREASE BY 50 PERCENT MORBIDITY AND MORTALITY DUE TO TARGET DISEASES BY 36 MONTHS AFTER INITIATION OF FULL OPERATIONS.

   - Abidjan

     After 12 months operation, measles morbidity declined 22% from 3253 cases January thru May 1978 to 2865 cases during same time period 1979 - see attachment 4.

     Hospitalized cases declined 34% from 1166 cases January thru May 1978 to 773 cases in 1979 - see attachment 5.

     Measles deaths recorded in Abidjan hospitals declined 73% from 190 deaths January thru May 1978 to 52 deaths in 1979 - see attachment 5.

     Hospitalizations from post measles complications declined 54% from 265 during first six months of 1978 to 121 during first six months of 1979 - see attachment 6.

     Deaths attributed to post measles complications declined 63% from 100 deaths during first six months of 1978 to 37 deaths during equivalent time period 1979 - see attachment 6.

     Hospitalized polio case declined 74% from 58 cases during first half of 1978 to 15 cases during same time period 1979 - see attachment 8.

     Deaths among hospitalized polio cases decreased 95% from 20 deaths during first half of 1978 to one death during same period 1979.

   - Abengourou

     After 10 months operation measles morbidity declined 82% in the diagnostic center of Dioulakro Dispensary, from 364 cases January thru April 1978 to 66 cases during same time period 1979 - see attachment 7.

5. IMPLEMENT INITIAL AND CONTINUING IN-SERVICE TRAINING IN ADMINISTRATION, PLANNING, SUPERVISION, SUPPLY, LOGISTICS AND EVALUATION FOR ALL DEMONSTRATION-TRAINING AREA PERSONNEL.

   - The National Institute of Public Health conducted a week long EPI training session in June 1978 for 40 nurses, midwives and sanitarians.

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The participants consisted of personnel in charge of vaccination activities in PMI[S], Rural Medicine Sectors, Tuberculosis Control Centers and the Institute of Hygiene. The course included sessions on conservation, reconstitution, administration and association of vaccines, vaccination target groups, vaccine reactions and vaccine coverage assessments. Vaccination techniques were demonstrated and practiced in clinic sessions.

- A similar week long session was held in Korhogo in December 1978 - see last paragraph SUB-OBJECTIVE III (1)

- A session on EPI activities and priorities are included in the annual week long conference of physicians in charge of Rural Health Sectors.

- EPI training sessions are scheduled annually; however, the MOH is prepared to conduct training sessions [illegible]

- After formal training sessions EPI supervisory staff maintain weekly contact with fixed health centers involved in EPI activities to insure proper conservation of vaccines, proper vaccination techniques, correct target ages, adequate supplies, maintenance of records, reports and equipment.

- On-the-job-training and constant first line supervision is the essence of training and development in EPI-Ivory Coast.

6. PROVIDE TRAINING IN METHODS OF PLANNING, IMPLEMENTATION AND EVALUATION OF IMMUNIZATION PROGRAMS TO PERSONNEL FROM OTHER AREA COUNTRIES.

- Formal training sessions for personnel from other countries has not yet occurred in Ivory Coast as set forth in SUB-OBJECTIVE III (6). However, members from the SHDS Project Coordinating Committe from five Africain countries visited several Ivory Coast installations involved in EPI activities.

- Health Officials from Liberia paid a visit in April to observe Ivory Coast EPI in operation.

- Abidjan EPI served as the field training site for a vaccination coverage assessment exercise for the Inter-Country EPI Planning and Management course mentioned in SUB-OBJECTIVE I (3).

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7. CONDUCT AT LEAST ONE IN-DEPTH SURVEILLANCE AND MANAGERIAL ASSESSMENT OF EACH IMMUNIZATION PROGRAM DEMONSTRATION-TRAINING AREA PRIOR TO OCT.1, 1981.

   - The in-depth surveillance and managerial assessment of EPI Ivory Coast is scheduled for early 1980.

SUB-OBJECTIVE V

PROVIDE SUPPORT TO EXISTING LABORATORY FACILITIES IN ORDER TO DEVELOP A COORDINATED LABORATORY SYSTEM WITHIN THE REGION TO PROVIDE BACK-UP TO DISEASE SURVEILLANCE AND CONTROL ACTIVITIES.-----

1. IDENTIFY CURRENT CAPABILITILS ------ OF THE ABIDJAN PASTEUR INSTITUTE BY APRIL 1, 1979.

2. BY APRIL 1, 1980, IDENTIFY SPECIFIC LABORATORY NEEDS FOR SURVEILLANCE SUPPORT -------

3. BY JULY 1, 1980, IDENTIFY AND PROVIDE SPECIFIC EQUIPMENT OR TRAINING NEEDS REQUIRED TO MEET SURVEILLANCE OBJECTIVES.

   - Measles and polio sero-conversion tests are currently being done at the National Public Health Institute and Pasteur Institute in Abidjan

   - Oral polio vaccine titration is being done at Pasteur-Abidjan

   - Measles vaccine titration is not being done in Abidjan nor probably anywhere in West Africa.

   - The Pasteur Institute in Abidjan does tissue cultures, a basic requirement for measles vaccine titration.

   - Two laboratory technicians from Pasteur attended a measle/polio vaccine titration course at Mérieux Institute in Lyon, France in January this year.

   - CDC Atlanta is to provide a short term laboratory consultant (3 weeks and necessary materials to help initiate a sorely needed measles vaccine titration capability at Pasteur Abidjan.

CONCLUSION

- Measles, Abidjan

Measles deaths recorded in Abid n hospitals were lower during the past twelve months (July 1978 thru June 1979) than any time during the past decade (perhaps lower than anytime on record). Paradoxically the number of reported measles cases in Abidjan during first five months of 1979 were only 22% less than during same time period 1978, while recorded measles deaths were 73% lower. No doubt, measles surveillance in 1979 is considerably more efficient than it was in 1978 but probably not to the extent to explain the difference. The number of hospitalized measles cases were 34% lower. Two possible explanations for the disproportinate decrease in measles cases compared to deaths are : 1) fewer hospitalizations result in better care; 2) fewer deaths occur among vaccine "failures".Further analyses may shed more light.

The controversial practice of administering measles vaccine at six months of age and again at twelve months of age for children vaccinated at less than nine months of age will be reconsidered upon completion of a presently ongoing measles sero-conversion study and final analysis of vaccination results over an extended period of time.

A proposal to increase measles vaccination age from 6 to 9 months in less densely populated areas where measles transmission is more easily controlled is already under consideration.

- Measles, Abengourou

An 84% reduction in measles cases in Abengourou during first four months of 1979 indicates that the cold chain is working in the interior of the country. Also evident is: "the smaller the town, the easier to vaccinate". Good program supervision and direction, as demonstrated by the physician in charge of the Rural Medicine Sector responsible for EPI Abengourou, is indispensable.

..../....

- Polio, Abidjan

Hospitalized polio cases in Abidjan presently serve as the most accurate index to measure the impact of vaccinations on polio morbidity/mortality. Conclusion of results (74% reduction of cases and 95% reduction of deaths) after one year of operation may be premature. However, use of the much less expensive oral polio vaccine in the West African environment looks promising.

- Statistics

The MOH is in the process of upgrading its statistical services. Outside financial and technical assistance could be productive.

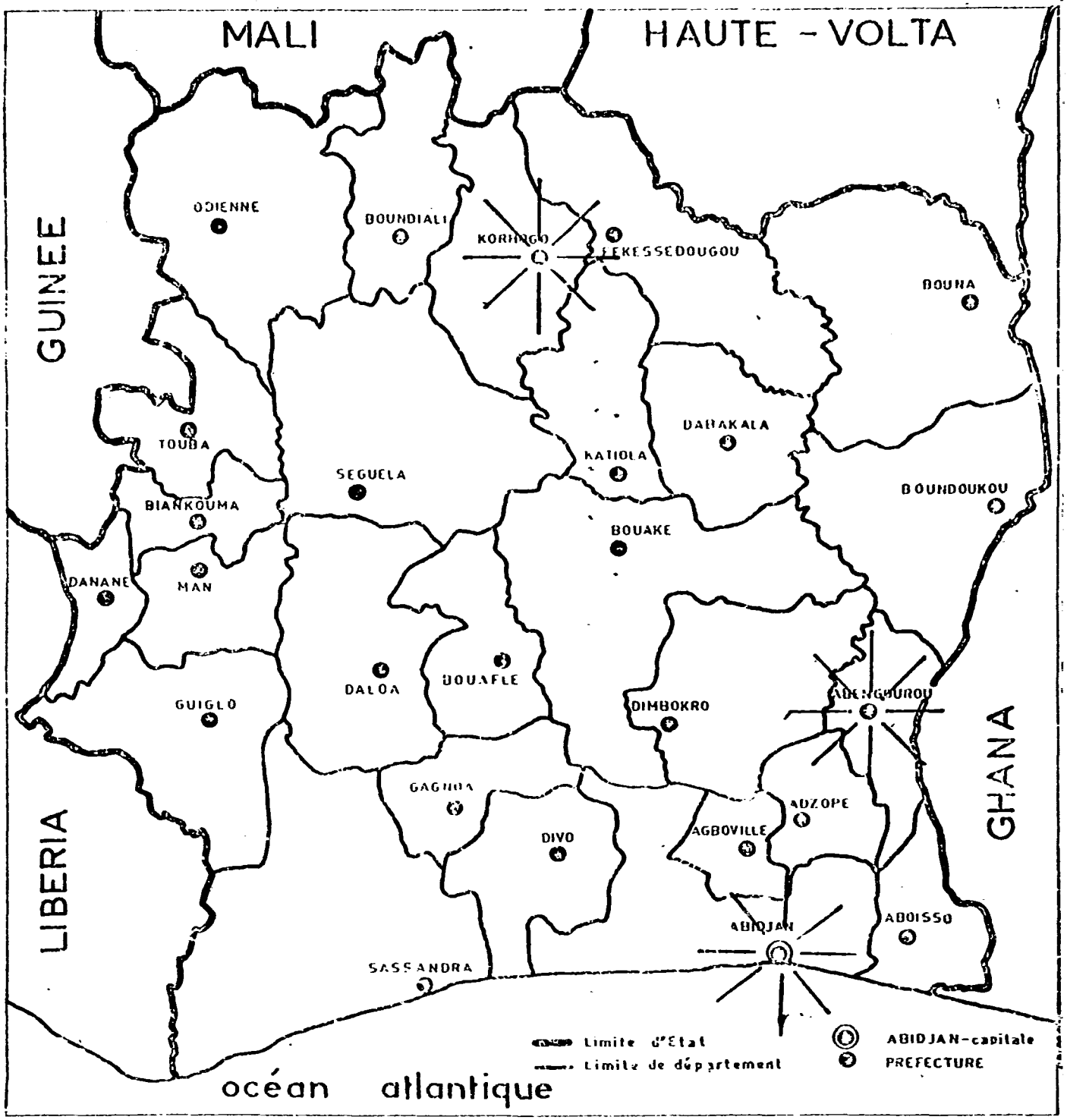
- Personnel

EPI headquarters personnel consist of a Director, Operations Officer, Surveillance Officer and Peace Corps Counterpart, Assessment Officer and Peace Corps Counterpart, Vaccine Control Officer, Immunization Clinics Coordinator, Chauffeur and Secretary. The Operations Officer Counterpart and the Health Educator positions have not yet been filled. All headquarters personnel perform multiple functions including health education, training, program analysis, collecting and maintaining records and reports.

- Expansion

With exception of adding six villages in the Abengourou Zone, no further program expansion is planned until all preent areas of operation are effectual.

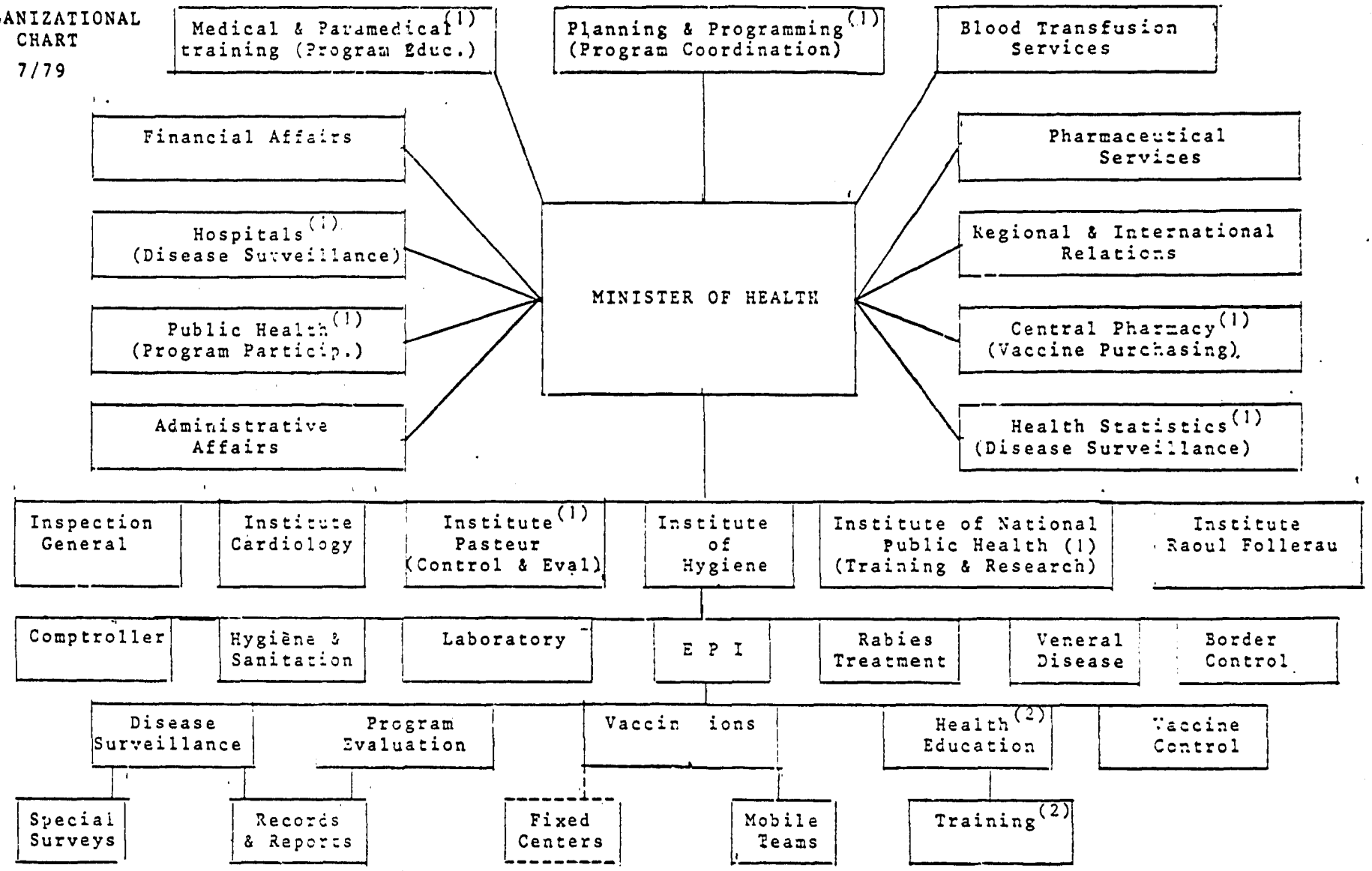
REPUBLIQUE DE COTE D'IVOIRE
découpage en départements



EPI DEMONSTRATION ZONES

EPI-IC Attachment 1

ORGANIZATIONAL CHART
7/79

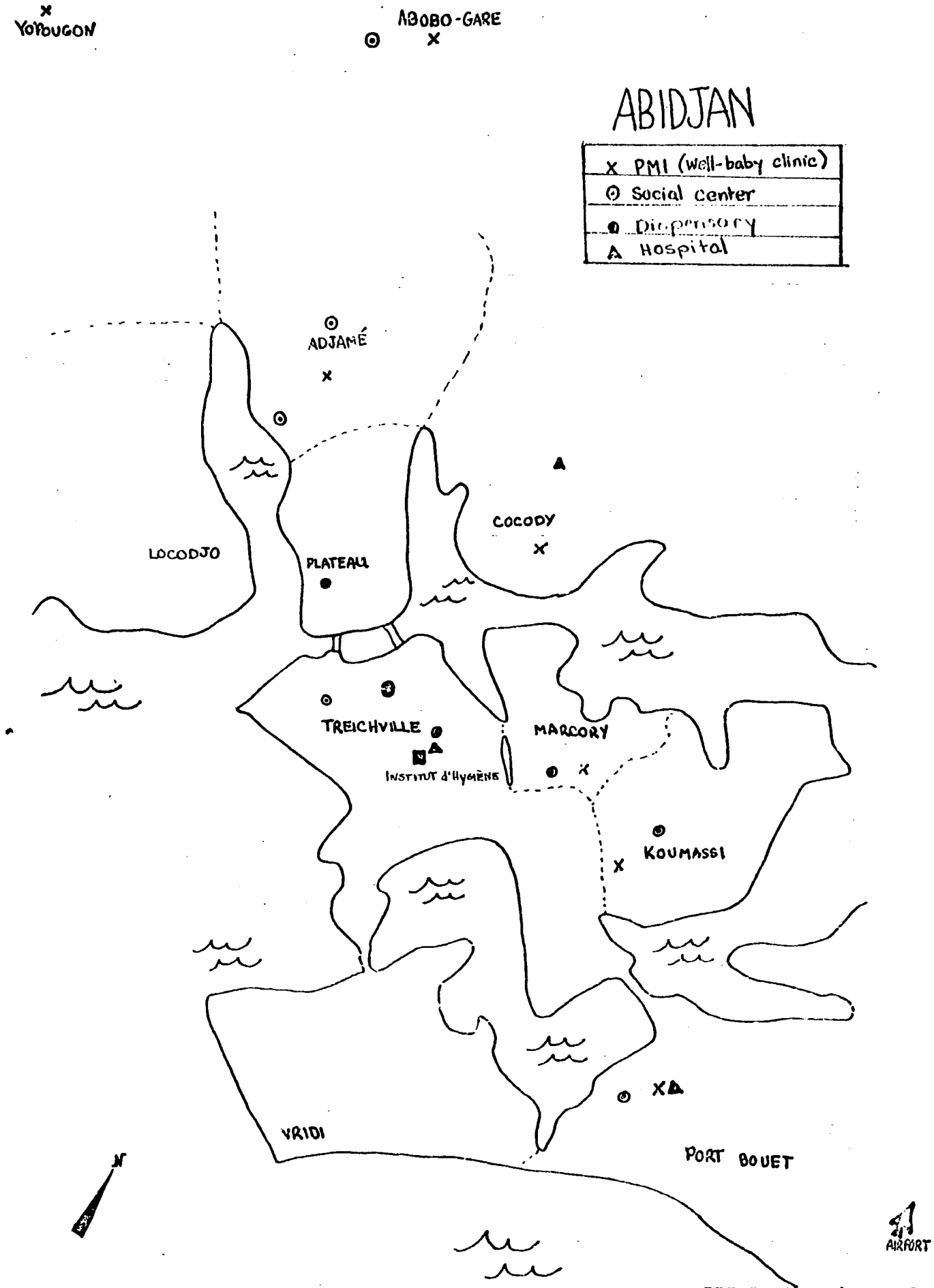


(1) Collaborating Services; ( ) = EPI functions

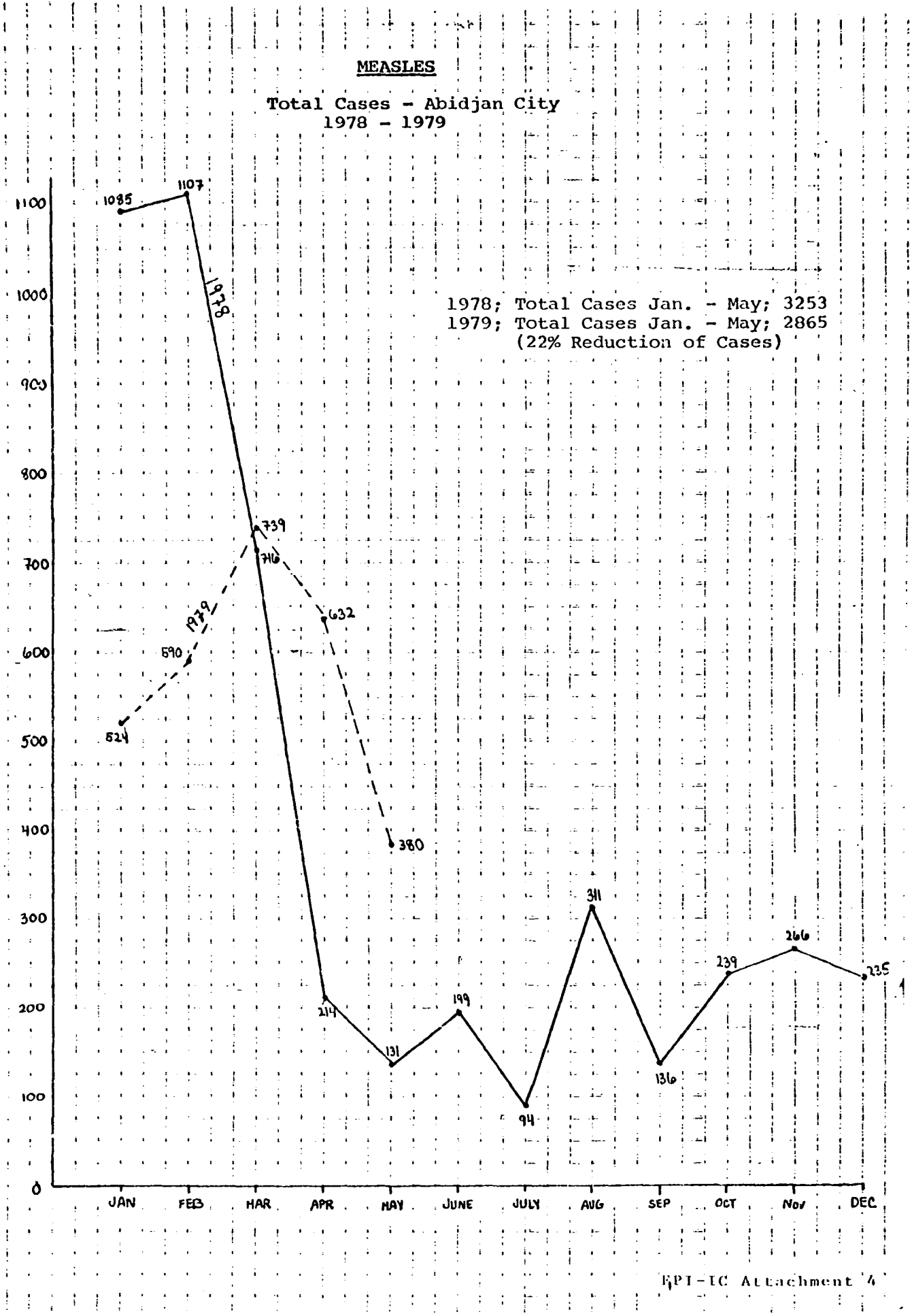
(2) All program personnel participate in Health Education & Training

---- Collaborating Centers

EPI-IC Attachment 2



EPI-IC Attachment 3



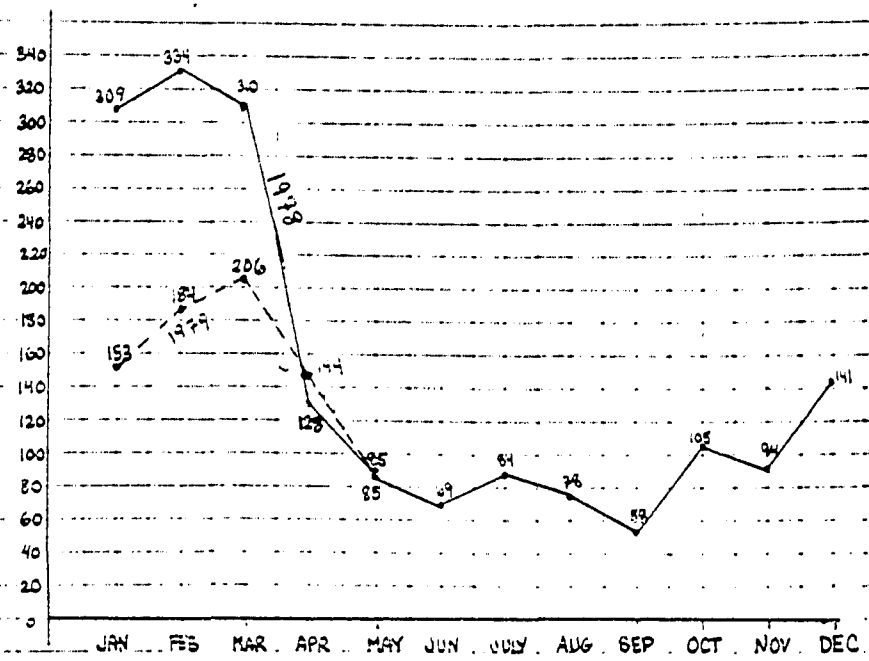
EPI-IC Attachment 4

51

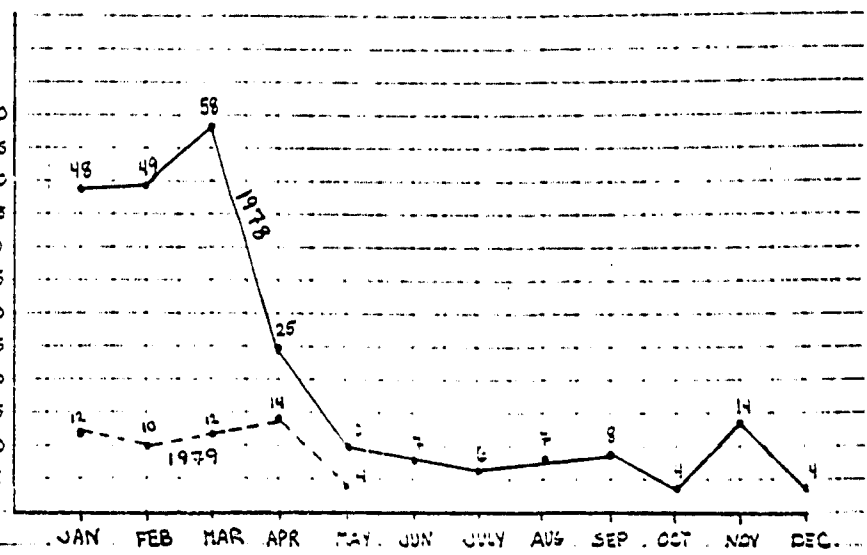
Best Available Document

MEASLES

Total Hospitalized Cases - Abidjan City
1978 - 1979



Total Deaths Among Hospitalized Cases - Abidjan City
1978 - 1979



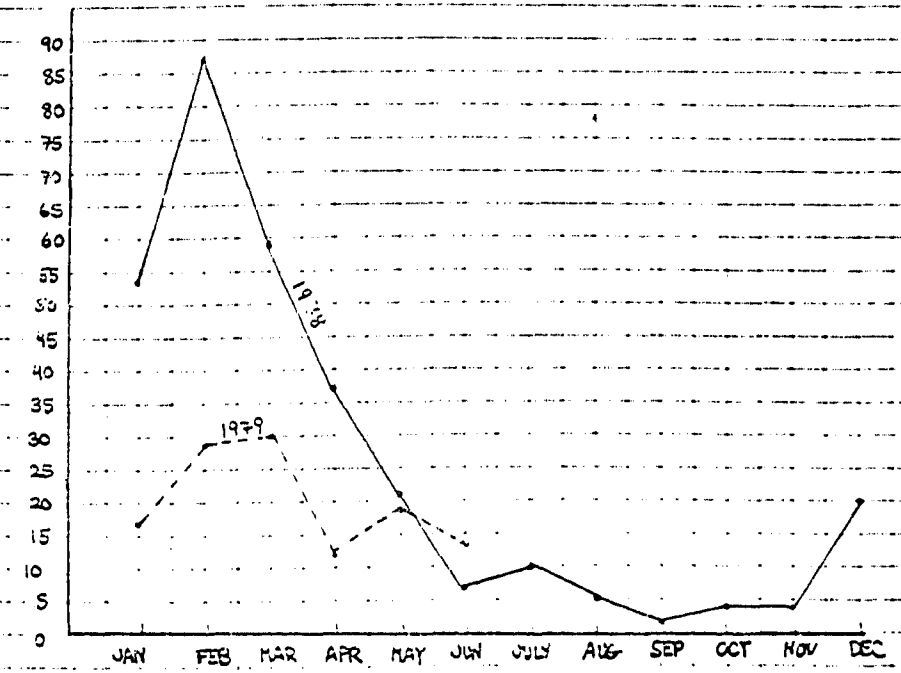
1978 Jan. - May; 1166 Hospitalized Cases
1979 Jan. - May; 773 Hospitalized Cases
(34% Reduction of Cases)

1978 Jan. - May; 190 Deaths Among Hosp. Cases
1979 Jan. - May; 52 Deaths Among Hosp. Cases
(73% reduction)

EPI-IC Attachment 5

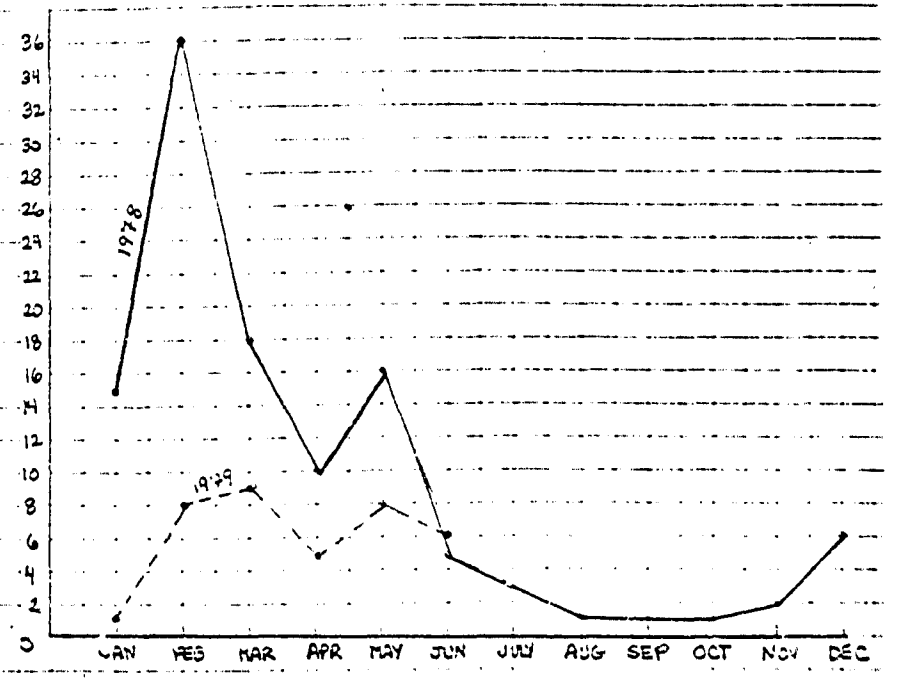
POST MEASLES

Post Measles Hospitalizations
Pediatric Ward-Treichville
1978 - 1979



1978 - Total; 310 Cases
1978 Jan. - June; 265 Cases
1979 Jan. - June; 121 Cases
(54% reduction)

Deaths Attributed to Post Measles
Complications
Pediatric Ward - Treichville
1978 - 1979



1978 - Total; 114 Deaths
1978 Jan. - June; 100 Deaths
1979 Jan. - June; 37 Deaths
(63% reduction)

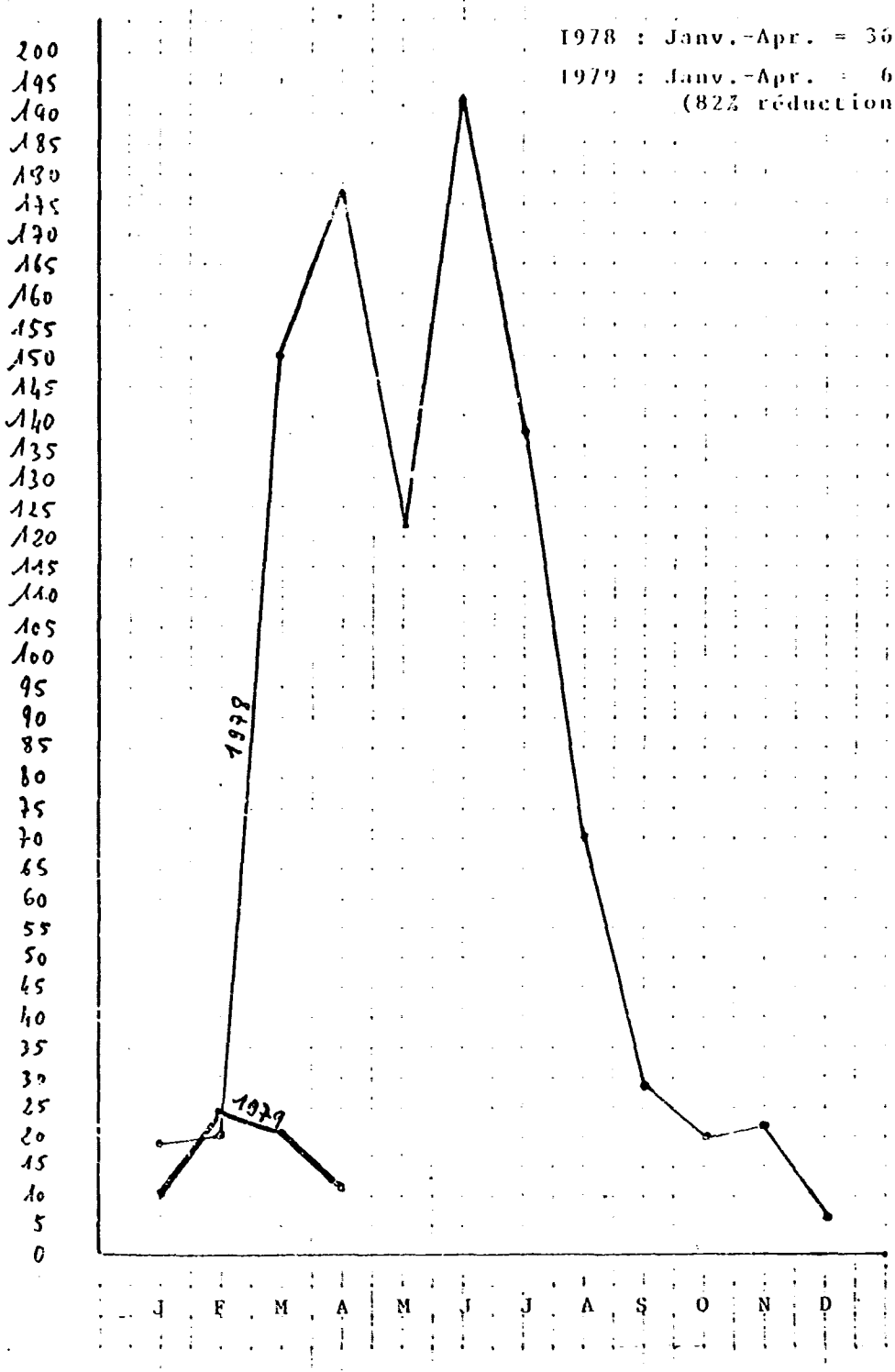
EPI-IC Attachment 6

MEASLES

Cases reported by major diagnostic center
(Dioulakro Dispensary)

ABENGOUROU CITY

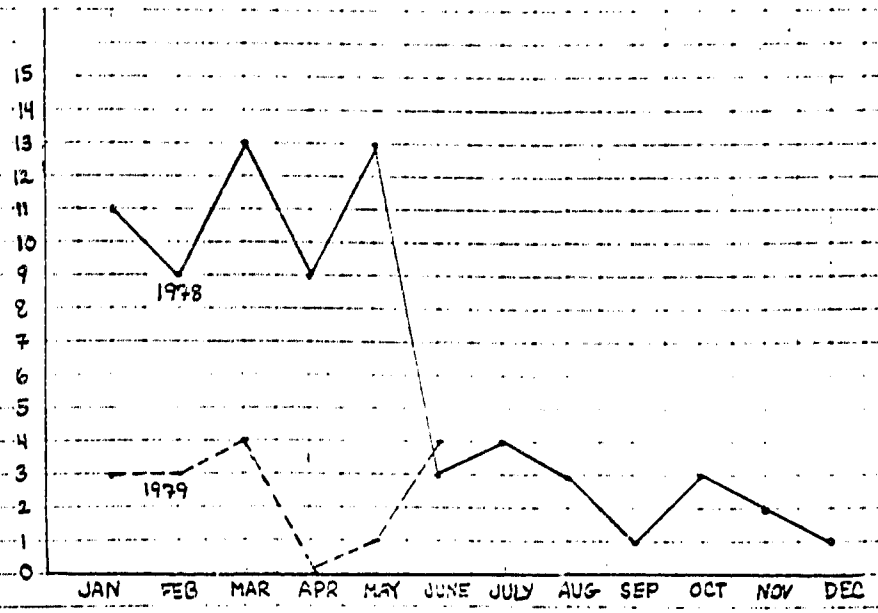
1978 - 1979



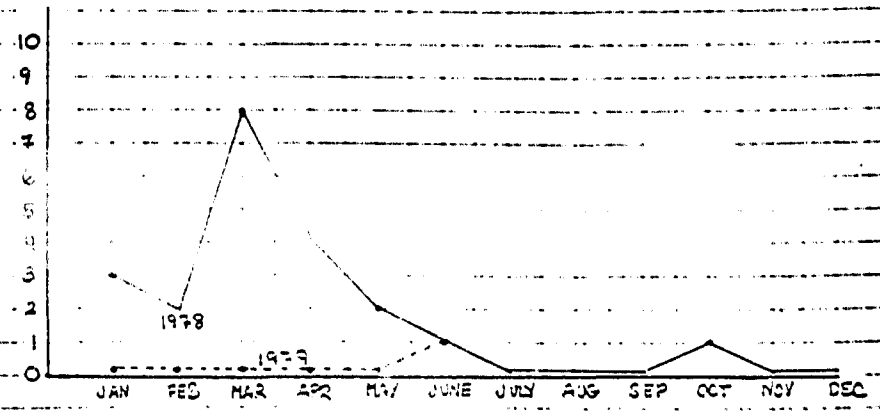
EPI-IC Attachment 7

POLIO

Hospitalized Polio Cases
Abidjan



Deaths Among Hospitalized Polio Cases
Abidjan

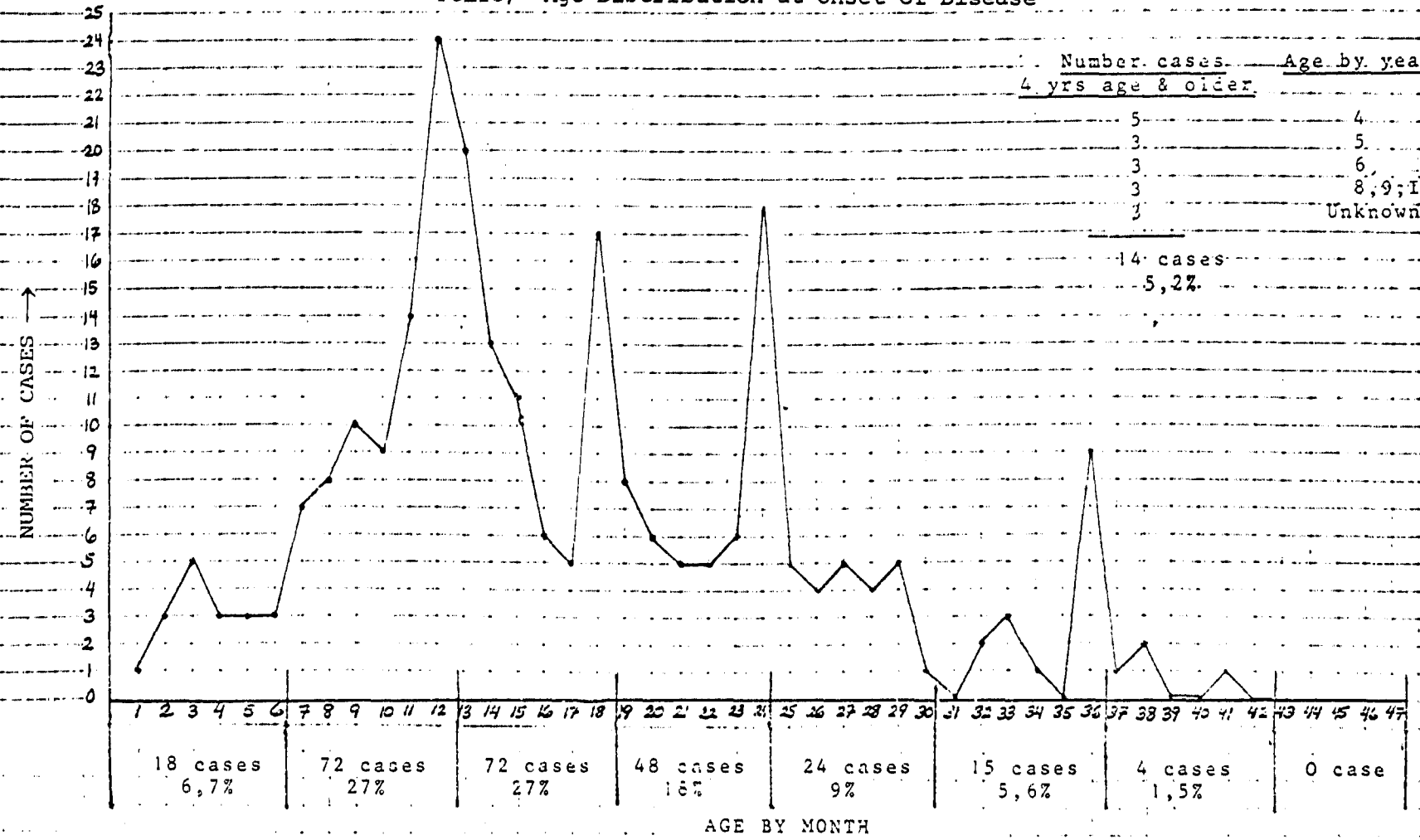


58 Hospitalized cases - Jan. thru June 1978
15 Hospitalized cases - Jan. thru June 1979
(74% reduction of cases)

20 Deaths among hospitalized polio cases - Jan. thru June 1978
1 Death among hospitalized polio cases - Jan. thru June 1979
(95% reduction of deaths)

RPI-IC Attachment 8

POLIO; Age Distribution at Onset of Disease*



Number cases 4 yrs age & older	Age by year
5	4
3	5
3	6
3	8,9;10
3	Unknown
14 cases 5,2%	

* Source: Inpatient and outpatient polio cases seen in pediatric ward of Treichville Hospital from 1975 through 1978

EPI-IC Attachment 9

PEV 9
7/79

VACCINATIONS PRATIQUEES EN 1978 - ABIDJAN CITY

PMI	BCG	D-T-COQ-POLIO					ROUGEOLE			TETANOS (Femmes enceintes)		
		1ère	2ème	3ème	Rappel	TOTAL	1ère	2ème	TOTAL	1ère	2ème	TOTAL
ABOBOGARE	3.380	4.236	2.693	1.891	371	9.191	2.974	31	3.005	2.155	1.829	3.984
MARCORY	5.581	3.582	2.250	1.741	458	8.031	3.102	127	3.229	4.000	3.245	7.245
ADJAME	1.200	5.403	3.564	2.967	690	12.624	3.377	337	3.714	9.150	5.788	14.938
KOUMASSI	435	396	152	55	27	630	345	43	388	572	333	905
PORT-BOUET	316	328	251	162	17	758	749	-	749	412	314	726
YOPOUGON	1.769	2.468	1.409	1.064	321	5.262	1.621	28	1.649	712	503	1.215
COCODY		?	?	?	?	7.207	?	?	1.963	-	-	-
TREICHVILLE		NOT OPERATIONAL										
TOTAL	12.681	16.413	10.319	7.880	1.884	36.496	11.568	566	14.097	17.001	12.012	29.013
EQUIPE MOBILE	-	28.246	8.435	3.737	5.497	46.415	34.673	5.329	40.002	-	-	-
Mass measles campaign in Feb. and Mar'78 to stop épidemie...							65.000		65.000			
TOTAL GENERAL	12.681	45.159	18.754	11.617	7.381	82.911	111.241	5.895	119.099	17.001	12.012	29.013

FORMATION : TOUTES LES FORMATIONS D'ABIDJAN

ETABLI PAR : E.BENOIT

DATE : 12 Jul.1979

Mois en cours / Total cumulatif

EPI-IC Attachment 10

PEV 9
7/79

VILLE D'ABENGOUROU

VACCINATIONS PRATIQUEES EN 1978 (JUILLET/DECEMBRE)

	BCG	D-T-COQ-POLIO					ROUGEOLE			TETANOS (Femmes enceintes)		
		1ère	2ème	3ème	Rappel	TOTAL	1ère	2ème	TOTAL	1ère	2ème	TOTAL
0 - 5 mois	45 / 737	135 / 844	123 / 533	57 / 120		315 / 1497	/ 41		/ 41			
6 -11 mois	123 / 524	154 / 1185	108 / 804	185 / 662		447 / 2651	570 / 1609		570 / 1609			
12-23 mois	169 / 798	210 / 1630	200 / 1.123	234 / 996	/ 23	644 / 3772	469 / 1442	17 / 116	486 / 1558			
24-35 mois	119 / 501	189 / 1307	195 / 972	184 / 946	4 / 32	572 / 3257	375 / 1016		375 / 1016			
36-47 mois	94 / 449	171 / 1125	144 / 780	153 / 536	1 / 26	469 / 2467	365 / 897		365 / 897			
48-59 mois	58 / 304	117 / 717	103 / 599	118 / 363	1 / 7	339 / 1686	311 / 649		311 / 649			
60-71 mois	37 / 314	58 / 527	88 / 384	71 / 239	6 / 15	223 / 1165	323 / 578		323 / 578			
TOTAL	645 / 3.627	1.034 / 7.335	961 / 5.195	1.002 / 3.852	12 / 103	3009 / 16495	2413 / 6.232	17 / 116	2430 / 6348			

FORMATION : SECTEUR DE MEDECINE RURALE D'ABENGOUROU

ETABLI PAR : E.BENOIT

DATE : 12 JUILLET 1979

Mois en cours / Total cumulatif

EPI-IC Attachment 11

58

PEV 5
IO/77

FICHE DE VACCINATION PAR AGE - ABIDJAN

MOIS DE JANVIER/JUIN 1979

	BCG	DT - COQ - POLIO					ROUGEOLE			AUTRES VACCINATIONS
		1ère inj.	2ème inj.	3ème inj.	Rappel	inc. TOTAL	1ère vacc.	2ème vacc.	inc. TOTAL	
0 - 5 mois	2315 / 13829	2144 / 12181	1283 / 6541	622 / 3122	/ 6	4049 / 21850	9 / 61	/ 1	9 / 62	
6 - 11 mois	25 / 215	594 / 3697	790 / 5567	1061 / 6049	16 / 60	2461 / 15373	1736 / 8988	4 / 73	[illegible] / 9061	
12 - 23 mois	26 / 134	407 / 2070	273 / 2235	376 / 3129	238 / 1103	1294 / 8537	444 / 2570	269 / 943	[illegible] / 3513	
24 - 35 mois	19 / 108	194 / 1247	192 / 1477	162 / 1450	197 / 876	745 / 5050	189 / 1237	108 / 370	[illegible] / 1057	
36 - 47 mois	3 / 36	142 / 932	114 / 785	110 / 731	50 / 405	416 / 2853	136 / 760	43 / 168	[illegible] / 928	
48 - 59 mois	/ 19	132 / 750	64 / 485	71 / 318	57 / 240	324 / 1794	108 / 568	23 / 152	[illegible] / 720	
60 - 71 mois	/ 15	124 / 662	69 / 381	66 / 297	54 / 208	313 / 1548	79 / 507	26 / 109	105 / 616	
TOTAL	2388 / 14356	3737 / 21539	2785 / 17472	2468 / 15096	612 / 2898	9602 / 57005	2701 / 14741	473 / 1816	[illegible] / [illegible]	

	1ère injection	2ème injection
NOMBRE DE FEMMES ENCEINTES VACCINEES CONTRE LE TETANOS	20.757	14.882

Centre de vaccination de :

- PMI ADJAME
- PMI ABOBOGARE
- PMI YOPOUGON
- PMI KOUMASSI
- PMI MARCORY
- PMI PORT-BOUET
- PMI COCODY
- PMI TREICHVILLE (NOUVEAU DISPENSAIRE)

Etabli par : E.BENOIT

Date = 12 Juil 1979

Signature :

Légende : Mois en cours / Total cumulatif

EPI-IC Attachment 12

59

PEV 5
IO/77

FICHE DE VACCINATION PAR AGE - ABIDJAN

MOIS DE JANVIER/JUIN 1979

	BCG	DT - COQ - POLIO					ROUGEOLE			AUTRES VACCINATIONS
		1ère inj.	2ème inj.	3ème inj.	Rappel	~~inc.~~ TOTAL	1ère vacc.	2ème vacc.	~~inc.~~ TOTAL	
0 - 5 mois		309 / 2463	212 / 1[illegible]	73 / 673	5 / 29	599 / 5049	24 / 59	/ 32	24 / 91	
6 - 11 mois		29 / 512	87 / 637	153 / 1154	3 / 41	272 / 2344	198 / 1538	/ 52	193 / 1590	
12 - 23 mois		3 / 207	13 / 16[illegible]	7 / 141	/ 75	23 / 583	10 / 153	/ 9	10 / 162	
24 - 35 mois		1 / 77	/ 59	2 / 45	5 / 42	8 / 223	6 / 73	2 / 9	3 / 82	
36 - 47 mois		2 / 48	/ 24	1 / 17	/ 14	3 / 103	2 / 2	/ 2	2 / 4	
48 - 59 mois		6 / 40	/ 8	/ 16	3 / 10	9 / 74	10 / 15	/ 6	10 / 21	
60 - 71 mois		/	/ 1	/ 1	2 / 3	2 / 5	/	/ 2	/ 2	
TOTAL		350 / 3347	312 / 2773	236 / 2047	18 / 214	916 / 8399	250 / 1840	2 / 112	252 / 1952	

NOMBRE DE FEMMES ENCEINTES VACCINEES CONTRE LE TETANOS

Légende : Mois en cours / Total cumulatif

Centre de vaccination de :
CENTRES SOCIAUX (ABIDJAN)

Etabli par : E.BENOIT

Date = 12 Jul.I

Signature :

EPI-IC Attachment 13

60

PEV 5
IO/77

FICHE DE VACCINATION PAR AGE - ABIDJAN

MOIS DE JANVIER/JUIN 1979

	BCG	DT - COQ - POLIO					ROUGEOLE			AUTRES VACCINATIONS
		1ère inj.	2ème inj.	3ème inj.	Rappel	inc. TOTAL	1ère vacc.	2ème vacc.	inc. TOTAL	
0 - 5 mois		167 / 1738	45 / 233	6 / 49		218 / 2020	/ 5	/	/ 5	
6 - 11 mois		229 / 4034	107 / 1629	95 / 860	21 / 57	452 / 6580	280 / 4654	5 / 24	/ 4678	
12 - 23 mois		242 / 4845	127 / 2458	91 / 1635	43 / 693	503 / 9431	275 / 5624	137 / 878	/ 6502	
24 - 35 mois		230 / 4796	112 / 2219	106 / 1387	58 / 1082	506 / 9483	263 / 5826	95 / 1336	/ 7162	
36 - 47 mois		/ 75	/	/ 1	/ 3	/ 79	/ 54	/ 1	/ 55	
48 - 59 mois		/	/	/	/	/	/	/	/	
60 - 71 mois		/	/	/	/	/	/	/	/	
TOTAL		868 / 15488	391 / 6838	298 / 3932	122 / 1835	1679 / 28093	818 / 16155	237 / 2239	1055 / 18402	

NOMBRE DE FEMMES ENCEINTES VACCINEES CONTRE LE TETANOS [ ]

Centre de vaccination de : EQUIPES MOBILES- ABIDJAN Etabli par : E.BENOIT Date =12 Jul. 19

Signature :

Légende : Mois en cours / Total cumulatif

NB : Mobile teams administer fewer 2nd and 3rd D-T-COQ-POLIO vaccinations than fixed centers because reappointments referred to fixed centers

EPI-IC Attachment 14

61

PEV 5
10/77

FICHE DE VACCINATION PAR AGE - ABIDJAN

MOIS DE JANVIER/JUIN 1979

	BCG	DT - COQ - POLIO					ROUGEOLE			AUTRES VACCINATIONS
		1ère inj.	2ème inj.	3ème inj.	Rappel	~~inc~~ TOTAL	1ère vacc.	2ème vacc.	~~inc~~ TOTAL	
0. - 5 mois	2515 / 13829	2620 / 16382	1540 / 8658	701 / 3844	5 / 35	4866 / 28919	33 / 125	/ 33	33 / 158	
6 - 11 mois	25 / 215	852 / 5243	124 / 7823	1309 / 8063	40 / 155	3185 / 26294	2214 / 15180	4 / 149	2223 / 15329	
12 - 23 mois	25 / 134	652 / 7122	413 / 5153	471 / 4905	251 / 1871	1826 / 19051	729 / 8347	406 / 1830	1135 / 10177	
24 - 35 mois	19 / 108	425 / 6120	306 / 3754	270 / 2882	260 / 2075	1259 / 14750	458 / 7186	209 / 1715	667 / 8901	
36 - 47 mois	3 / 36	144 / 1055	114 / 809	111 / 749	50 / 424	419 / 3037	138 / 816	43 / 171	181 / 987	
48 - 59 mois	/ 19	138 / 790	64 / 494	71 / 336	60 / 250	333 / 1819	118 / 533	23 / 158	141 / 761	
60 - 71 mois	/ 15	124 / 662	69 / 382	66 / 295	56 / 211	315 / 1553	79 / 507	26 / 111	105 / 618	
TOTAL	2587 / 14356	4955 / 42376	3488 / 27893	3002 / 21075	752 / 4942	12197 / 93641	3769 / 32744	716 / 4167	4485 / 36911	

	Ière injection	2ème injection
NOMBRE DE FEMMES ENCEINTES VACCINEES CONTRE LE TETANOS	10954	14882

Centre de vaccination de :
Toutes les Formations d'ABIDJAN

Etabli par :

Signature :

Date = 12 Jul. I

Légende : Mois en cours / Total cumulatif

EPI-IC Attachment 15

PEV 5
IO/77

FICHE DE VACCINATION PAR AGE - ABENGOUROU

MOIS DE JANVIER/AVRIL 1979

	BCG	DT - COQ - POLIO					ROUGEOLE			AUTRES VACCINATIONS
		1ère inj.	2ème inj.	3ème inj.	Rappel	~~inc~~ TOTAL	1ère vacc.	2ème vacc.	~~inc.~~ TOTAL	
0 - 5 mois	38 / 262	137 / 755	59 / 302	22 / 111		218 / 1.168	1 / 1		1 / 1	
6 - 11 mois	54 / 562	89 / 763	128 / 437	170 / 494		387 / 1.694	144 / 1048		144 / 1048	
12 - 23 mois	71 / 478	108 / 1157	84 / 472	114 / 531	10 / 36	316 / 2.165	70 / 1053	1 / 105	71 / 1159	
24 - 35 mois	59 / 910	76 / 1276	74 / 530	135 / 478	5 / 15	290 / 2.305	76 / 1055	20 / 20	16 / 1115	
36 - 47 mois	35 / 711	61 / 425	54 / 390	84 / 313	1 / 6	220 / 1.704	49 / 732	1 / 1	50 / 733	
48 - 59 mois	33 / 530	54 / 665	60 / 341	97 / 319	1 / 5	212 / 1.3[illegible]	54 / 534		54 / 534	
60 - 71 mois	32 / 359	45 / 418	41 / 200	86 / 230	1 / 5	173 / 853	21 / 368		21 / 368	
TOTAL	332 / 4422	570 / 5967	510 / 2648	718 / 2499	18 / 65	1846 / 11219	345 / 2432	22 / 127	417 / 3059	

NOMBRE DE FEMMES ENCEINTES VACCINEES CONTRE LE TETANOS [illegible]

Centre de vaccination de : Ville d'ABENGOUROU

Etabli par : E.BENOIT

Date = 12 July [illegible]

Signature :

Légende : en cours / Total cumulatif

EPI-IC Attachment 16

63

PEV 9
7/79

VILLE DE KORHOGO
VACCINATIONS PRATIQUEES EN 1979 (MARS/JUIN)

	BCG	D-T-COQ-POLIO					ROUGEOLE			TETANOS (Femmes enceintes)		
		1ère	2ème	3ème	Rappel	TOTAL	1ère	2ème	TOTAL	1ère	2ème	TOT.
0 - 5 mois		70 / 463	25 / 197	11 / 22		106 / 602	5		5			
6 -11 mois		50 / 564	55 / 236	57 / 101	6	162 / 907	75 / 1325	1	75 / 1326			
12-23 mois		70 / 1496	102 / 466	121 / 199	2 / 9	295 / 2170	61 / 1332	12	61 / 1344			
24-35 mois		88 / 1873	166 / 1046	116 / 342	5 / 41	355 / 3302	78 / 2291	1 / 20	79 / 2311			
36-47 mois		322 / 3768	355 / 2123	384 / 878	3 / 58	1064 / 6827	280 / 4425	26	280 / 4451			
48-59 mois												
60-71 mois												
TOTAL		600 / 8164	683 / 3988	689 / 1542	10 / 114	1982 / 13808	494 / 9375	1 / 59	495 / 9437			

FORMATION : SECTEUR DE MEDECINE RURALE DE KORHOGO

ETABLI PAR : E.BENOIT

DATE : 12 JUILLET 1979

Mois en cours / Total cumulat

EPI-IC Attachment 17

Best Available Document

ANNEX IV

I - Surveillance of Quarantinable Diseases :

Docteur David L. HEYMANN
EPIDEMIOLOGISTE
OCEAC B.P. 288 Yaoundé
CAMEROUN

(1) Smallpox

Since October 1978, the data of the last OCEAC Ministerial Report, 2 suspect smallpox specimens were sent to OCEAC for analysis. Both of these specimens, from Cameroon, were negative for smallpox at the WHO smallpox reference laboratory, CDC (Atlanta).

No smallpox has been confirmed from the member nations of OCEAC in 10 years - since 1969 - and in September 1978 Central Africa was declared eradicated of smallpox. The Global Commission for the Eradication of Smallpox has advised that routine smallpox vaccination is no longer necessary, except in countries of, and adjacent to Ethiopia and Somalia (W.H.O. Weekly Epidemiological Record Nº 5, 2 February, 1979).

(2) Cholera

The system of routine surveillance for cholera in zones at risk is functioning well. Between October 1978 and October 1979, sixty six suspect specimens were received for culture at OCEAC of which 20 were positive, all from Cameroon. The system detected an epidemic of cholera-like illness in Douala in January and February 1979 (18 clinical cases, 5 deaths) and at this time cultures of 16 of the suspect cases including one who later died, were positive. Wells in Douala and the estuary were randomly sampled for culture, and one isolate from a well and one from the estuary were found positive. Immediate response by the ministry of health prevented a large scale epidemic. Two nurses at the sector in Douala were taught culture and typing techniques for cholera during this epidemic by the epidemiology service of OCEAC in conjunction with the ministry of health. The lab in Douala was supplied with an incubator culture media and typing serum and will be maintained in this zone at risk so that immediate culture results are available. Immediate results will assure prompt action and prevent epidemic spread.

(3) Yellow Fever

The sentinel surveillance system for Yellow Fever and the African Hemorrhagic Fevers (Lassa, Ebola, and Marburg) the febrile illnesses which

Available Document

let respond to treatment, has been extended in Cameroon this year further east and to the north. The system has been modified so that analysis can be made from blood collected on filter paper by capillary puncture. Two specimens are required, an acute specimen at the time of illness and a convalescent specimen (if available) two weeks later. Because there is a delay of several weeks between specimen collection and confirmation of diagnosis at OCEAC, immediate control measures including patient isolation must be initiated to prevent epidemic spread, even before results are received.

Through this system, antibody levels suggest that Ebola virus is present, as a mild febrile disease, among the pygmey tribes in East Cameroon and the Central African Empire. No yellow fever has been confirmed since October 1978, date of the last ministerial conference.

II - Expanded Program in Immunizations :

The seminar on the Expanded Program in Immunizations (EPI), held in Abidjan for the francophone nations of Africa, was well attended by representatives from the OCEAC Countries. Twenty three African countries were represented at this conference with a total of 69 participants and course leaders of which 14 (20 %) were from the OCEAC Countries.

This seminar, which lasted from April 16 to April 28, introduced the participants to the methods of designing, implementing, managing and evaluating childhood vaccination programs. Through a series of self-instruction modules, based on facts and statistics from a hypothetical country called Mondalia, a comprehensive immunization program was designed and evaluated by seminar participants.

This seminar, coordinated by WHO (AFRO) and the Project SHDS (Abidjan) took the place of the epidemiology seminar held at OCEAC on years when there is no OCEAC Technical Conference.

Among the OCEAC Countries, four - Cameroon, the Empire of Central Africa, Peoples Republic of Congo and Gabon have begun EPI projects and are in the process of designing five year plans for their programs. WHO and UNICEF, as well as FAC and USAID are allotting certain resources for the EPI and should be consulted for assistance as soon as five year plans based on those recommended at the Abidjan seminar, are approved.

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Cameroon has to-date given a strong committment to the EPI, and four zones - Yaoundé, Douala, Bamenda/Bafoussam and Eséka are committed for programs. All four of these zones are functioning and evaluations presently being carried out. More EPI zones are planned in Cameroon for the coming year.

The Empire of Central Africa, Congo and Gabon have likewise begun similar programs in the Capitol cities, and are planning expansion to other zones.

The epidemiology service, in conjunction with the WHO and the Center for Disease Control (Atlanta) conducted a program evaluation of Cameroon's EPI the month of December. A written report with recommendations was submitted to the ministry of health and provides a valuable guideline for program planning. This service is available to all member nations of OCEAC, who may request such an evaluation through OCEAC or WHO (AFRO).

In conjunction with WHO, OCEAC and the Cameroonian ministry of health are in the process of developing survey techniques in schools and house to house to aid in establishing the prevelance of EPI target diseases. As soon as these techniques are perfected they will be presented to the other OCEAC member nations at a seminar in Yaoundé.

The ped-o-jet repair seminar, scheduled for March 1979 was not conducted because of difficulty in obtaining parts required for repairs. As soon as these parts are received at OCEAC the member nations will be asked to provide one candidate each for the 10 day training workshop.

III - Vaccine Field Trials

Field trials have been carried out on three vaccines during the past year in coordination with the Cameroonian Ministry of Health and CUSS medical students.

Rimevax and Attenuvax, both heat stable measles vaccines, have been shown to give a satisfactory seroconversion after storage unreconstituted at 37°C for one week.

A study by a CUSS medical student, in preparation of his thesis for the doctorate of medicine has suggested a satisfactory seroconversion

after two doses of trivalent oral polio vaccine. The number of participants in this study (35) was small and it is planned to continue this very important work during the coming year.

A second trial of Attenuvax, kept at 37°C for 8 hours after reconstitution, and at 25°C for 48 hours after reconstitution has also been carried out. Results are not yet available, but will be presented after seroconversion rates are established, in a forthcoming issue of OCEAC EPI-NOTES.

IV - Yaws Diagnostic Procedures

In conjunction with the ministry of health, surveys in eastern Cameroon have been conducted to establish the prevelance of Yaws and begin treatment programs.

Clinical incidence of the disease appears to be approximately 12 % among the pygmies at any one time, with 95 % of all pygmies greater than 11 years of age having VDRL and FTA evidence of treponemal disease. A field diagnostic test, the RFR card test, was tried in these studies and results will be compared to those obtained from VDRL and FTA.

Similar studies of Yaws among the pygmies have been carried out by WHO and the ministry of health of the Central African Empire.

V - African Hemorrhagic Fever

Fluorescent antibody evidence of Ebola virus infection has been found in sera of the pygmies of East Cameroon, giving a prevelance of disease of approximately 20 % among adults. It appears that most cases of Ebola disease are not distinguishable from other diseases in the area, and it does not appear to be associated with high mortality as in Zaïre 1976 (280 deaths).

Approximately 2 % of this same pygmey population has been found to have fluorescent antibody to Marburg virus as well, a disease previously found only in southern African nations. To-date no animal reservoir in nature has been found for either the Ebola or Marburg viruses.

VI - Gonorrhea Surveillance

In conjunction with the Cameroonian ministry of health and the sector at Victoria, a gonorrhea surveillance system was established to determine the prevelance of asymptomatic gonorrhea among the population and to culture treatment resistant strains of gonorrhea.

A prevalance of 10 % asymptomatic disease among males 16 to 19 years of age, and 23 % among females of the same age, has been established by culture and one strain resistant to treatment with Penicillin has been discovered in a patient not responding to penicillin.

The laboratory technician at the Victoria sector has been trained in culture technique and supplied with materials necessary to continue this work. During the coming year, this system will be expanded to other regions of high population mobility in Cameroon.

VII - Studies by CUSS Medical Students in conjunction with the OCEAC epidemiology service as preparation of thesis for their M.D.

(1) Gonorrhea

The incidence of gonococcal infection among women delivering at the Central Maternity, Yaoundé and in the eyes of their infants was determined. Forty of 296 mothers (14 %) and 12 of 296 infants (4 %) had positive cultures for gonorrhea. Results were published in OCEAC Epi-Notes and the WHO weekly review.

(2) Polio

Seroconversion studies after trivalent oral polio vaccine revealed that after two doses of the vaccine, all children had at least one type of antibody to polio as opposed to 43 % who had no antibody at the start. More important, the vaccine was shown to be present in the stool of 50 % of the vaccinated children one month after vaccination. Results of this study have been presented in OCEAC Epi-Notes.

(3) Pertussis

The incidence of pertussis by culture among randomly chosen children with upper respiratory infections was established at 8/60 (13 %) at the PMI, Yaoundé. Serovoncersion to pertussis vaccine as part of DPT vaccine was shown to approach 100 % after 3 doses in the same study. Results of this study have likewise been presented in OCEAC Epi-Notes.

(4) Gonorrhea

Presently doing a study to establish incidence of culture positive gonorrhea among secondary school students in Yaoundé.

(5) Measles

Presently doing a study to determine duration of maternal antibody to measles among children from birth to 12 months of age in Yaoundé.

(6) Cholera

Presently doing cultures to determine the endemnicity of cholera in Douala on a randomly chosen sample of population.

(7) Tunga Penetrans

Presently studying the incidence and complications of T. Penetrans in the Bamenda region.

(8) Urinary Tract Infections

Presently studying the prevelance of urinary tract infections among groups of women with varying sexual promiscuity and gynecological disorders.

VIII - Laboratory to Support Surveillance of Transmissable Diseases in the OCEAC Countries

The laboratory constructed with funds from the project SHDS (Abidjan) has been functioning during the past year and has been used by medical and paramedical students in preparing for their theses, and as a back up for training technicians and paramedical personnel in gonorrhea and cholera surveillance. The following analyses are currently available through the laboratory services :

(1) Serology for measles HI antibody from blood specimens collected on filter paper.

(2) Serology for pertussis antibodies from sera collected in capillary tubes.

(3) Serology for fluorescent antibodies of Yellow fever, Lassa, Ebola and Pertussis.

(4) Cultures of pertussis, gonorrhea, cholera and salmonella.

(5) Typing of cholera.

(6) Dark field for spirochetes.

(7) RPR, VDRL, and FTA for treponemal diseases.

IX - OCEAC EPI-NOTES

Circulation of EPI-NOTES has been increased to 500 this year, and participation of member nations in submitting reports has increased. Since October 1978, 7 articles originating from studies carried out in the OCEAC countries have been published (4 from Cameroon, 2 from Gabon, 1 from Central African Empire). The response to last year's request for active participation has been good and we again ask for increased participation for the coming year, especially from the countries which have so far not participated in the preparation of articles.

Epi-Notes is presently written in both English and French.

OCEAC EPIDEMIOLOGY SERVICE.

I - Expanded Program in Immunizations

(1) Continued work with the member nations in designing, implementing and evaluating childhood vaccination programs. Consultation is available upon request through the secretary general.

(2) Continued development of new survey methods both historical, and serological to establish morbidity and mortality from the EPI target diseases (measles, pertussis, neonatal tetanus, polio, tuberculosis and diphtheria).

(3) Ped-o-jet repair seminar, with one participant from each member nation. Date will be announced after repair parts have been received.

II - Vaccine Field Trials

Continued determination of seroconversion to trivalent oral polio vaccine in the OCEAC countries. These studies will be carried out in conjunction with the Cameroonian ministry of health and CUSS. Vaccine is available for trials in other OCEAC countries as well and laboratory support assured.

III - Yaws

Continued evaluation of treatment programs and field diagnosis with the RPR card test.

IV - African Hemorrhagic Fever

Continued definition of Ebola virus epidemiology and a search for the reservoir of Ebola virus in the Central African Empire and Cameroon.

V - Cholera

Continued training for surveillance systems with local laboratory support in zones at risk. Materials and training will be provided upon request through the secretary general.

VI - Gonorrhea

Continued training for surveillance systems supported by culture to establish prevelance of disease and penicillin resistant strains. Materials and training will be provided upon request through the secretary general.

VII - Studies in conjunction with physicians, medical and paramedical students

(1) The OCEAC/SHDS laboratory is available to any physician, health worker or health student in the OCEAC member nations to support research or field studies in infectious diseases. Requests should be directed through the secretary general.

(2) The following tests are presently available, and others to meet specific needs will be set up upon request :

- Serology for measles HI antibody from blood specimens collected on filter paper.
- Serology for pertussis antibodies from sera collected in capillary tubes.
- Serology for fluorescent antibodies of Yellow fever, Lassa, Ebola and Pertussis.
- Cultures of pertussis, gonorrhea, cholera and salmonella.
- Typing of cholera.
- Dark field for spirochetes.
- RPR, VDRL, and FTA for treponemal diseases.

VIII - OCEAC EPI-NOTES

(1) Continued emphasis will be placed on articles and reports written by local investigators and health workers. Circulation of this bulletin to international organizations such as WHO, Geneva, and various African universities make it an important means of communication from the OCEAC Countries.

(2) Circulation will be increased as requests for subscription are received. There is no cost for a subscription to this monthly bulletin.

[illegible]e following summaries of disease epidemiology, expanded program in immunizations, Yaoundé, etc. are the works of many persons including Dr. M. [illegible]chea, Dr. B. Guyer, Dr. [illegible], Dr. G. Kesse[illegible], Dr. J. Nakano, Dr. J. Mokoé, Dr. A. Luma, Dr. V. [illegible], Mr. P. Djoudon, Dr. [illegible], Mr. B. Ndengue and myself. These results should be treated as preliminary, and additions will be made throughout 1979 as new data is collected.

Dr. David L. HUYMANN

YAOUNDÉ, [illegible] 1979

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VACCINATION COVERAGE, [illegible]

Present studies are being planned [illegible] evaluate the factors influencing vaccination coverage. An important factor which will be considered is the mobility of [illegible] children. It has been established that approximately 5[illegible] of children less than 24 months of age are newly arrived in [illegible] every [illegible], and presumably there is a corresponding figure, though smaller, for those children who leave [illegible] every two months. With a mobility of this level, it is not yet clear what maximum level of vaccination coverage can be expected at any one time.

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Couverture vaccinale à Yaoundé, 1976 - 1978,
enfants âgés de 12-23 mois choisis au hasard

Vaccination coverage, Yaoundé, 1976 - 1978
children age 12-23 months chosen randomly

Année Year	Enregistrés Registered	DTC Polio 1 DPT Polio 1	DTC Polio 2 DPT Polio 2	DTC Polio 3 DPT Polio 3	BCG	Rougeole Measles
1976	46 %	35 %	22 %	17 %	38	39 %
1977	54 %	46 %	36 %	27 %	49 %	40 %
1978	41 %	41 %	33 %	27 %	44 %	32 %
1979						

ROUGEOLE A YAOUNDE - 1969-1979

MEASLES IN YAOUNDE - 1969-1979

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MEASLES IN YAOUNDE, 1[illegible] - 1978

Over the past four years there has been a decrease in the number of children with measles diagnosed at 3 different health centers in Yaounde (Table I, Figure I), and reported through the weekly sentinel reporting system (Table II). Important to note is that this decrease in measles has occurred at the same time that there was a decrease in doses of measles vaccine administered. In 1975, the target group for measles vaccination was modified to children 9 to 24 months of age in order to decrease vaccine wastage and increase efficacy (the target group had been previously children 6 months to 4 years of age).

The decrease in measles reported has occurred despite a birth rate of 44 (per thousand population), a large population mobility in Yaounde where 5 % of children less than 24 months of age move into the city every 3 months, and a measles vaccination coverage among children 12-23 months of age of [illegible] to 40 %. Attendance at the PMI centrale has increased each year, from 155,412 in 1971 to 609,649 in 1978, and this trend of increased attendance is the same in the other health centers chosen for surveillance.

The age of children with serious complications for measles has changed since 1971, when [illegible] of all cases of measles were in children less than 9 months of age and [illegible] were in children less than 24 months (Table III). In 1977, only 1[illegible] of all cases were under 9 months of age, and [illegible] under 24 months. That measles is becoming less prevalent in younger children is confirmed by antibody studies among children 12-23 months of age which show a decrease in antibody among unvaccinated children from 6[illegible] in 1972 to 57 % in 1977. On the other hand, among vaccinated children, those with antibodies have increased from 8[illegible] in 1972 to [illegible] in 1977 showing an improvement in vaccine seroconversion among children who have less natural antibody during this same period.

Case fatality rate for children with measles admitted to the central hospital, however, has remained at [illegible] during the past 5 years of decreasing measles admissions (Table V). During the last 4 years there seems to have been a change in the age of children dying from measles: in 1975 28 % of children who died were younger than 9 months of age, while by 1978 this number had decreased to 6 % (Table VI

Case fatality rate from measles, studied in the general population (not hospital admissions) has been found to be 2 % in Yaoundé, while measles causes 14 % of all deaths among children from birth to four years of age in Yaoundé (Table VII). It must be remembered, though, that African mothers many times confuse febrile illness with measles when in fact it is not. Diagnosis of measles presents a problem for health personnel as well. Thirty six per cent of all cases of measles diagnosed in one month by the chief physician at the PMI centrale in Yaoundé were not measles (Table VIII) and further studies are under way to determine what these diseases are.

Measles mortality has been studied still another way in Yaoundé, by a house to house survey, and these results when tabulated, will give us an idea of any change in measles death rates in recent years (Table IX).

Finally, measles vaccine studies in Yaoundé have been designed and carried out to test the heat stable measles vaccines in the hope of finding the means for more effective measles control measures (Table X, XI).

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I - Cas de Rougeole dépistés à la PMI centrale, à l'hôpital central et à la PMI de Tsinga, d'après les registres de consultations, Yaoundé 1971 - 1979

Measles diagnosed at the PMI centrale, central hospital and PMI Tsinga, based on the registers of consultations, Yaoundé, 1971-1979

Year Année	PMI centrale	Hôpital central	PMI Tsinga	Doses of measles vaccine administered Doses de vaccin antirougeoleux administrées
1971	3.282	unavailable indisponible	-	11.947 +
1972	10.944	unavailable indisponible	-	17.687 +
1973	4.350	unavailable indisponible	(From August du mois d'Aout) 54	7.667 +
1974	4.375	unavailable indisponible	102	15.535 +
1975	863	(July-December) (Juillet-Décembre) 413	59	3.171 °
1976	1.158	792	31	7.602 °
1977	682	597	48	7.198 °
1978	1.233	(Jan - April) (Janvier-Avril) 213	106	7.864 °
1979				

+ Children 6 months to 4 years old
Enfants âgés de 6 mois à 4 ans.

° Children 9 months to 2 years old

II - Cas de rougeole déclarés à la PMI centrale et dans d'autres centres sentinelles à Yaoundé, d'après le système de surveillance hebdomadaire de l'OCEAC/Ministère de la Santé Publique, 1971 - 1979

Measles reported at the PMI centrale and at other sentinel reporting sites in Yaoundé, based on the OCEAC/Ministry of Health weekly surveillance system - 1971 - 1979

Year Année	Cases reported Cas déclarés	Number of reporting centers Nbre de centres déclarants	Doses of measles vaccine administered Doses de vaccin antirougeoleux administrées
1971	1.805	1	11.947 +
1972	5.896	1	17.887
1973	4.439	1	7.607 +
1974	2.666	1	15.535 +
1975	2.639	1	[illegible].171 °
1976	2.019	5	7.602 °
1977	2.046	13	7.198 °
1978	2.830	13	7.864 °
1979			

+ Children 6 months to 4 years old
Enfants âgés de 6 mois à 4 ans.

° Children 9 months to 2 years old
Enfants âgés de 9 mois à 2 ans.

III - Répartition cumulative par âge, cas de rougeole déclarés par le système de surveillance hebdomadaire de l'OCEAC/Ministère de la Santé publique, Yaoundé, Cameroun - 1971 - 1979.

Cumulative percentage by age of measles reported to the OCEAC/Ministry of Health weekly surveillance system, Yaoundé, Cameroon, 1971 - 1979

Year Année	6 months 6 mois	9 months 9 mois	24 months 24 mois	36 months 36 mois
1971	1 %	38	58 %	90 %
1975	1 %	30 %	70	83 %
1976	1.5	15 %	59	89 %
1977	1 %	16 %	69	80 %
1978	2.5 %	15 %	65	84 %
1979				

IV - Anticorps HI Antirougeoleux, échantillons d'enfants de 12-23 mois choisis au hasard, 1972-1979 - Yaoundé.

HI Antibody to measles, random samples of children 12-23 months of age, Yaoundé - 1972 - 1979

Year Année	Vaccinés (Vaccinated)		Non-vaccinés (not vaccinated)	
	+ AC AB	- AC - AB	+ AC + AB	- AC - AB
1972 Août	35 (62 %)	20 (38 %)	40 (66 %)	21 (34 %)
1975 Août	36 (70 %)	15 (30 %)	37 (40 %)	56 (60 %)
1977 Août	66 (80 %)	17 (20 %)	45 (37 %)	77 (63 %)
1979				

V - Mortalité due à la rougeole à l'hôpital central de Yaoundé - d'après les registres de l'hôpital, 1975-1979

Mortality from measles at the central hospital, Yaoundé - based on hospital records - 1975-1979

Year Année	No. case measles Nbre de cas de rougeole	No. measles deaths No. décédés de la rougeole	Case fatality rate Taux de léthalité
	(July-December / Juillet-Décembre)		
1975	413	25	6 %
1976	792	105	13 %
1977	597	60	10 %
	(January - April / Janvier-Avril)		
1978	213	16	8
1979			

VI - Age des enfants décédés de la rougeole à l'hôpital central de Yaoundé, d'après les registres de l'hôpital, 1975-1979.

Age of children who died from measles at the central hospital based on hospital registres, 1975 - 1979

Year Année	<6 months mois	6-8 months mois	9-12 months mois	>12 months mois
1975	0	7/25 (28 %)	10/25 (40 %)	8/25 (32 %)
1976	3/105 (3 %)	23/105 (22 %)	40/105 (38 %)	39/105 (37 %)
1977	2/60 (3 %)	4/60 (7 %)	20/60 (33 %)	34/60 (57 %)
1978	0	1/16 (6 %)	4/16 (25 %)	11/16 (69 %)
1979				

VII - Décès dûs à la rougeole, Cameroun, 1977 - d'après l'enquête nationale de nutrition, enfants de la naissance à 4 ans.

Deaths from measles, Cameroon, 1977 - based on the national nutrition survey, children from birth to 4 years.

Region Région	Number surveyed Nombre recensé	No. with history of measles during the preceeding year Nbre avec antécédents de rougeole pendant l'année précédante	No. died from measles the preceeding year No. décédés de la rougeole pendant l'année précédante	Measles case fatality rate Taux de léthalité suite à la rougeole	No. died of other causes the preceeding year Nbre décédés des suites d'autres causes pendant l'année précédante	% deaths measle % des déc la rouge
YAOUNDE / DOUALA	952	152 (16 %)	3 (0.3 %)	2 %	19 (2 %)	1
Urban Urbaine	917	121 (13 %)	5 (0.5 %)	4 %	27 (3 %)	1
Rural Rurale	4.098	592 (14 %)	29 (0.7 %)	5 %	108 (3 %)	2

VIII - Diagnostics faux, cas de rougeole, PMI centrale, Yaoundé, Mars - Avril 1978, d'après des prélèvements aigus et convalescents de tous les cas dépistés par le Médecin-chef.

Misdiagnosis of measles, PMI centrale, Yaoundé, March-April 1978, based on acute and convalescent serum of children diagnosed by the chief physician

Age of children Age des enfants	Total examined Total examiné	Antibody ≥ 1:10 acute serum Anticorps ≥ 1:10 échantillon aigu	Antibody < 1:10 acute serum, no rise convalescent Anticorps < 1:10 échantillon aigu, pas d'augmentation dans l'échantillon convalescent
<9 months mois	12	4/13 (31 %)	0/13
≥9 months mois	38	13/38 (34 %)	2/38 (5 %)

Overall misdiagnosis
En tout = 36 % diagnostics faux

IX - Mortalité due à la rougeole, début à Yaoundé, d'après l'enquête de case en case, 1979

Measles deaths with onset in Yaoundé, based on house-to-house survey, 1979

Deaths among children born years 1969-1975 Décès parmi les enfants nés entre 1969 et 1975			Deaths among children born since 1975 Décès parmi les enfants nés depuis 1975		
No. surveyed Enregistrés	No. died Décédés	Rate Taux	No. surveyed Enregistrés	No. died Décédés	Rate Taux

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X - Séroconversion (≤ 1:10 à ≥ 1:20) aux vaccins antirougeoleux thermostables, après exposition à une température de 25°C et 37°C, enfants âgés de 9-23 mois - Cameroun.

Seroconversion (≤1:10 to ≥1:20) to heat stable measles vaccines after storage at 25°C and 37°C, children 9-23 months old - Cameroon.

Température / Temperature	Vaccin / Vaccine	Intervalle de temps / Interval endi[illegible]										
		24H	48H	72H	96H	120H	144H	168H	192H	216H	240H	264H
25°C	Rimevax		8/9 (89 %)	21/21 (100 %)	23/25 (92 %)	15/16 (94 %)	21/22 (95 %)	14/16 (88 %)	20/23 (87 %)			
37°C	Rimevax											
	Attenuvax											

XI - Séroconversion (< 1:10 à ≥ 1:20) aux vaccins antirougeoleux thermostables après dilution et conservation à 25°C et 37°C, enfants âgés de 9-23 mois - Cameroun.

Seroconversion (< 1:10 to ≥ 1:20) to heat stable measles vaccines after reconstitution and storage at 25°C and 37°C, children 9-23 months old - Cameroon.

Température Temperature	Vaccin Vaccine	Intervalle de temps Interval time					
		2H	4H	6H	8H	24H	48H
25°C	Attenuvax						
37°C	Attenuvax						

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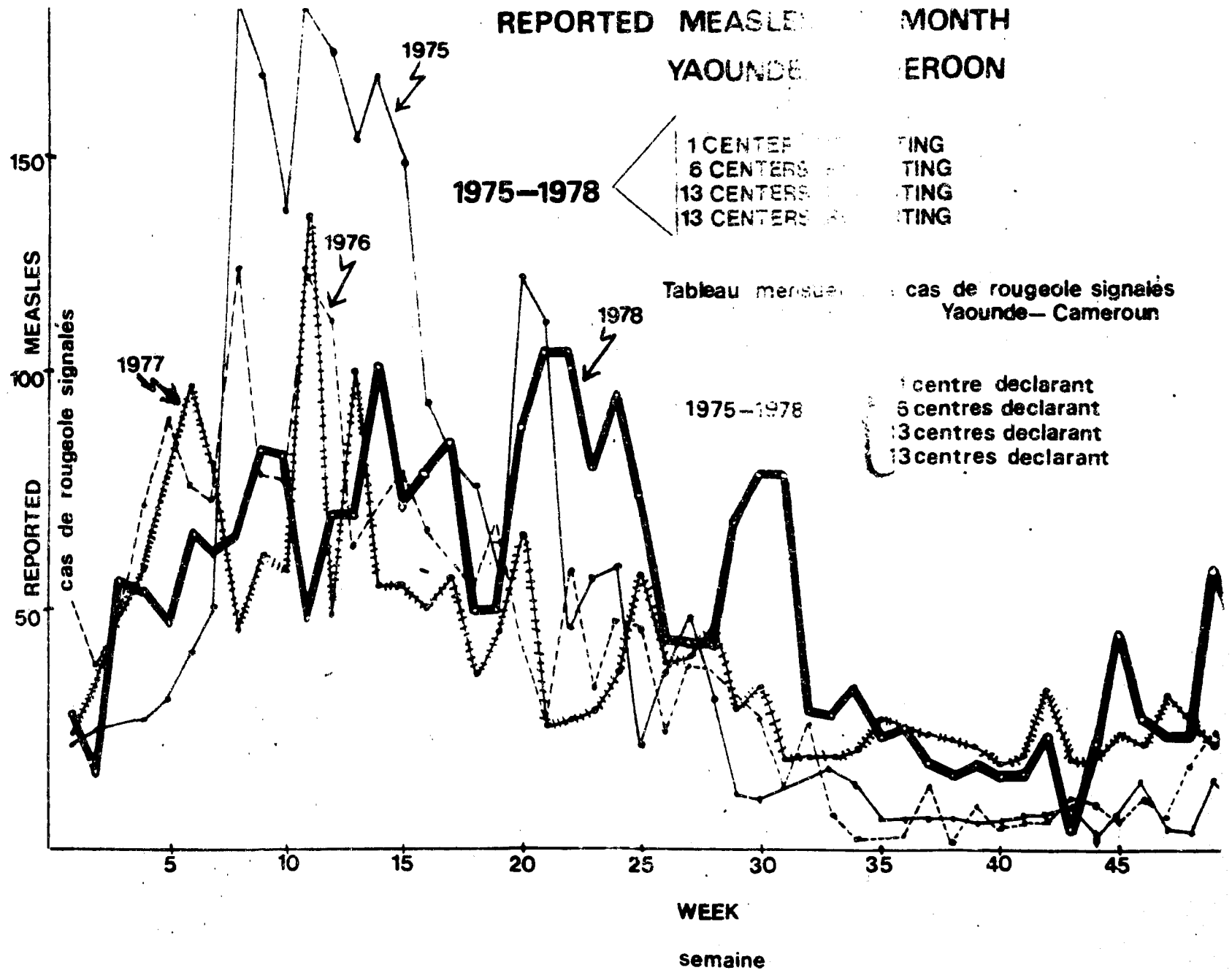
REPORTED MEASLE MONTH
YAOUNDE EROON
1975–1978
1 CENTE TING
6 CENTERS TING
13 CENTERS TING
13 CENTERS TING
Tableau mensue cas de rougeole signalés
Yaounde– Cameroun
1975–1978
1 centre declarant
6 centres declarant
13 centres declarant
13 centres declarant
1975
1976
1977
1978
150
100
50
REPORTED MEASLES
cas de rougeole signalés
5
10
15
20
25
30
35
40
45
WEEK
semaine

POLIOMYELITE ET PARALYSIES FLASQUES A YAOUNDE - 1969 - 1979

POLIOMYELITIS AND FLACCID PARALYSIS IN YAOUNDE - 1969 - 1979

POLIOMYELITIS AND FLACCID PARALYSIS IN YAOUNDE, 1969-1979

Reports of flaccid paralysis among children living in Yaounde have steadily decreased in the years since 1975, based on consultations of newly paralyzed children at the Yaounde Center for Handicapped Children (Table I, Figure I). This has occurred with a polio vaccination coverage among children 12-23 months of age of 22 % - 33 % for 2 doses (the vaccination program began in 1975). One might postulate that the vaccination coverage is actually greater, however, due to spread of the vaccine virus throughout the community. There is some evidence to support this hypothesis (Table II): in 1971, 17 % of children aged birth to 11 months and not vaccinated (numbers are small) had antibody, but by 1974 antibody among unvaccinated children of this same age had increased to 57 %. Efficacy of oral polio vaccine in tropical countries has many times been placed in doubt. Small studies in Yaounde (to be continued and expanded this year) have shown satisfactory seroconversion of children with no polio antibody (triple negative) to positive for at least one type of polio antibody after 2 doses of vaccine (Table III). Among these same children, 28 % were carrying the polio virus one month after vaccination (Table IV). Polio antibody levels among vaccinated children (1 or more doses of POPV) have been shown to be greater than 90 % in random samples of vaccinated children in Yaounde (Table V).

The age of children with flaccid paralysis seen at the center for handicapped children has remained constant since 1975, with 75-80 % of all cases having onset before the age of 24 months. (Table VI) Polio reported in the registers of the PMI centrale, the central hospital in Yaounde, and at the Tsinga PMI give no definite trends in incidence of disease, as cases are generally not registered at these three institutions but referred directly to the handicapped children's center for consultation. (Table VII)

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School surveys done in 1979 among 7-11 year old children show a prevelance of flaccid paralysis at 9 per 1,000 (approximately 23 of these children did not become paralyzed in Yaounde). (Table VIII) A house to house survey, in an attempt to better establish prevelance of Yaounde onset flaccid paralysis, will give an idea of any trends or changes in prevelance over the past 11 years (Table IX).

Finally, as seen on Table I and VII, and in Figure I, from 40 to 60 of all cases of flaccid paralysis in Yaounde appear to be related to injection. This is either due to injection facilitated paralytic polio as suggested earlier or is due to a coincidental relationship between injections at the time of any febrile illness, including paralytic polio. Further studies must be designed to investigate this association.

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I - **Paralysies flasques, Yaoundé, par année du début - d'après les fiches de la première consultation - Centre de Rééducation des Handicapés de Yaoundé (La première consultation est gratuite), 1973 - 1979**

Flaccid paralysis, Yaoundé, by year of onset, based on records of first consultation - Center for the Reeducation of Handicapped children of Yaoundé (First consultation is at no cost), 1973 - 1979

Year Année	Number cases of flaccid paralysis Nombre de cas de paralysies flasques	% cases with onset within 30 days of IM injection % des cas avec début dans les 30 jours suivant une injection IM	Doses of TOPV administered - Yaoundé Doses de TOPV administrées - Yaoundé
1973 °	48	-	Unknown Inconnu
1974	154	-	Unknown Inconnu
1975	184	99 (54 %)	Unknown Inconnu
1976	96	46 (48 %)	15.494
1977	63	42 (67 %)	27.763
1978	56	36 (64 %)	20.990
1979			

° **First full year of consultations**

Première année entière des consultations.

II - Anticorps antipolio (≥ 1:10), échantillon d'enfants choisis au hasard de la naissance à 23 mois et non-vaccinés contre la polio, Yaoundé 1971 - 1979

Polio antibodies (≥ 1:10), random sample of non-vaccinated children from birth to 23 months, Yaoundé - 1971 - 1979

Year / Année	Children from birth to 11 months / Enfants de la naissance à 11 mois		Children from 12-23 months / Enfants de 12 à 23 mois	
	Antibody to at least one type / Anticorps à au moins un type	No antibody / Pas d'anticorps	Antibody to at least one type / Anticorps à au moins un type	No antibody / Pas d'anticorps
1971	2/12 (17 %)	10/12 (83 %)	13/22 (59 %)	9/22 (41 %)
1977	27/44 (61 %)	17/44 (39 %)	68/89 (76 %)	21/89 (24 %)
1978	° 20/35 (57 %)	15/35 (43 %)	-	-
1979				

° Based on seroconversion study, not random

D'après étude de seroconversion - pas choisis au hasard.

III - Seroconversion apres la vaccination antipolio orale (buvable, trivalent) chez 35 enfants âgés de 2 à 12 mois - Yaoundé, 1978

Seroconversion after vaccination with TOPV (oral, trivalent), 35 children age 2 to 12 months - Yaoundé - 1978.

	Before 1st dose Avant la 1ère dose	30 days after 1st dose 30 jours après la 1ère dose	30 days after 2nd dose 30 jours après la 2ème dose
No. children Nbre d'enfants	35	32	20
% AB triple negative % AC triple négatif	15 (43 %)	2 (6 %)	0
% AB Type I % AC Type I	12 (34 %)	15 (47 %)	14 (70 %)
% AB Type II % AC Type II	15 (43 %)	29 (91 %)	18 (90 %)
% AB Type III % AC Type III	6 (17 %)	19 (60 %)	14 (70 %)

IV - Isolement du virus polio dans les selles après l'administration du vaccin polio (buvable, trivalent) chez 35 enfants de 2 à 12 mois, Yaoundé - 1978

Polio virus in stool after vaccination with TOPV (oral, trivalent) 35 children age 2 to 12 months - Yaoundé - 1978

	Before 1st dose Avant la 1ere dose		30 days after 1st dose 30 jours après la 1ere dose		30 days after 2nd dose 30 jours après la 2ème dose	
No. children Nbre d'enfants	22		32		17	
No. without virus Nbre sans virus	16	(73)	18	(56 %)	10	(58 %)
No. non-polio enterovirus Nbre entérovirus non-polio	5	(23 %)	5	(16 %)	4	(24 %)
No. poliovirus Nbre virus polio	1	(4 %)	9	(28 %)	3	(18 %)

V - Anticorps antipolio, échantillon d'enfants choisis au hasard de la naissance à 23 mois ayant reçu une dose au moins de vaccin Polio oral - Yaoundé - 1977 - 1979

Polio antibodies, random sample of children from birth to 23 months and having at least one dose of TOPV, Yaoundé - 1977 - 1979

Year Année	Children from birth to 11 months Enfants de la naissance à 11 mois		Children from 12 to 23 months Enfants de 12 à 23 mois	
	Antibody to at least one type Anticorps à au moins un type	No antibody Pas d'anticorps	Antibody to at least one type Anticorps à au moins un type	No antibody Pas d'anticorps
1977	10/11 (91 %)	1/11 (9 %)	9/9 (100 %)	0
1978	° 30/32 (93 %)	2/32 (6 %)		
1979				

° Based on seroconversion study - not random

D'après l'enquête de séroconversion - enfants pas choisis au hasard

VI - Répartition cumulative par âge au début, cas de paralysies flasques, Yaoundé, d'après les fiches de la première consultation au Centre de Rééducation des Handicapés de Yaoundé - 1973 - 1979.

Cumulative percentage by age at onset, flaccid paralysis in Yaoundé based on records of first consultation, Center for the Reeducation of Handicapped Children of Yaoundé, 1973 - 1979

Year Année	% of cases of paralysis with onset prior to 11 months of age % cas de paralysies flasques avec début avant l'âge de 11 mois		% of cases from 12 months to 23 months % des cas de 12 mois à 23 mois	
1973	11/48	(23 %)	36/48	(75 %)
1974	46/154	(30 %)	114/154	(74 %)
1975	50/184	(27 %)	157/184	(85 %)
1976	29/96	(30 %)	76/96	(79 %)
1977	20/63	(32 %)	51/63	(81 %)
1978	16/56	(29 %)	46/56	(82 %)
1979				

VII - Poliomyélite, cas dépistés à la PMI Centrale, l'hôpital central et à la PMI de Tsinga - d'après les registres de consultations, Yaoundé, 1971 - 1979

Poliomyelitis, cases diagnosed at the central PMI, the central hospital, and the Tsinga PMI, based on the registers of consultations, Yaoundé - 1971 - 1979

Year Année	Cases diagnosed at central PMI Cas diagnostiqués à la PMI centrale	Cases diagnosed at central hospital Cas dépistés à l'hôpital central	PMI Tsinga
1971	3	unavailable indisponible	
1972	0	unavailable indisponible	
1973	0	unavailable indisponible	0
1974	0	unavailable indisponible	0
1975	0	4	0
1976	2	3	0
1977	9	2	0
1978	0	3	0
1979			

VIII - Paralysies flasques parmi les élèves âgés de 6-11 ans Yaoundé, 1979 - d'apres l'enquête en milieu scolaire

Flaccid paralysis among students 6-11 years old, Yaoundé, 1979, based on school survey

No. children 6-11 years surveyed Nbre d'enfants de 6-11 ans enregistrés	No. children 6-11 years with flaccid paralysis by examination Nbre d'enfants de 6-11 ans présentant une paralysie flasque après examen (Prevalence)			No. children 6-11 years with history of fever and IM injection within 30 days of flaccid paralysis onset. Nbre d'enfants âgés de 6-11 ans avec antécédents de la fièvre et injectio IM pendant les 30 jours précédant le début de la paralysie flasque.		
9.494	82 (9 per 1,000)			55/65 (80 %)		
	Onset Yaounde Début à Yaoundé	Onset outside Yaounde Début hors de Yaoundé	Unknown place of onset Lieu du début inconnu	Onset Yaounde Début à Yaoundé	Onset outside Yaounde Début hors de Yaoundé	Unknown place of onset Lieu du début inconnu
	46 (56 %)	19 (23 %)	17 (21 %)	37/46 (80 %)	15/19 (79 %)	17

IX - Paralysies flasques, début à Yaoundé, d'après l'enquête de case e case - 1979

Flaccid paralysis, onset Yaoundé, based on house to house survey, 1979

Prevelance among children born Years 1969 - 1975 Prévalence parmi les enfants nés entre 1969 - 1975			Prevelance among children born since 1975 Prévalence parmi les enfants nés après 1975		
No. surveyed Enregistrés	No. paralyzed Paralysés	Prévalence	No. surveyed Enregistrés	No. paralyzed Paralysés	Prévalence

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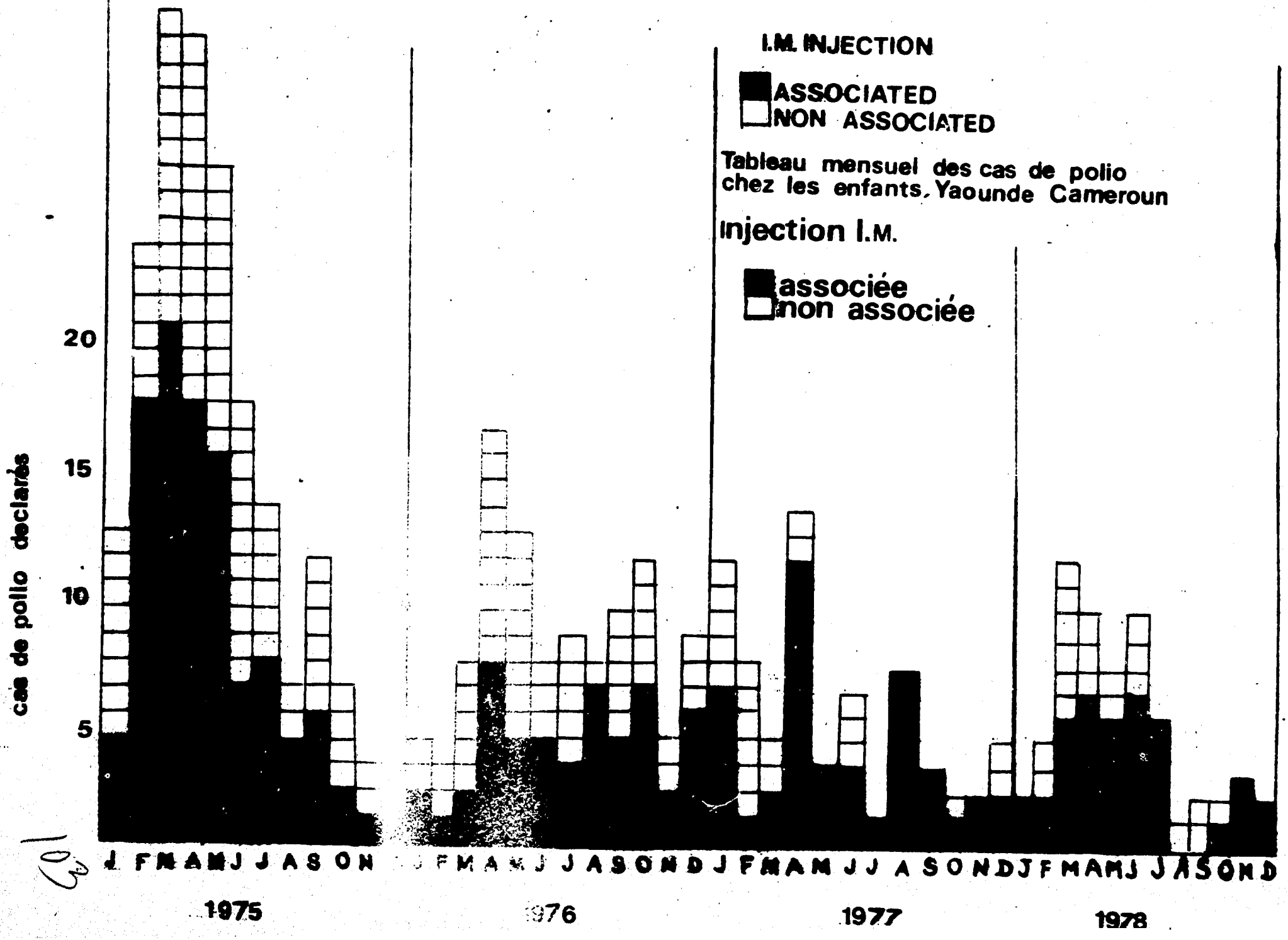
FLACCID PARALYSIS IN CHILDREN BY MONTH YAOUNDE CAMEROON 1975 – 1978



COQUELUCHE A YAOUNDE, 1969 - 1979

WHOOPING COUGH (PERTUSSIS) IN YAOUNDE, 1969-1979

WHOOPING COUGH (PERTUSSIS) IN YAOUNDE, 1969-1979

Consultations of children with pertussis have decreased at the PMI centrale since 1974, and appear to fall into a pattern of increased incidence every 3-4 years, while vaccination coverage for pertussis since 1975 (3 doses) has varied from 17 -27 . Preliminary pertussis surveillance data in the Bamenda area shows this same 3 to 4 year cycle of increased incidence. Pertussis seen at the central hospital and the PMI Tsinga has not yet shown any trends, and must be studied several more years before any conclusions can be made (Table I). The cumulative total of children with pertussis by the age 11 months varies from year to year, and appears to depend on the three to four year epidemic cycle, when during an epidemic year there are more children who become ill at a younger age (Table II).

A special study of 50 children with cough at the PMI centrale in May 1978 showed 8 children (13) to have positive cultures for B. Pertussis, giving an idea of the incidence of the disease at this time of year (Table III). These studies will be continued throughout the coming year. Mortality from pertussis has been studied by a house to house survey, and will reveal any difference of trends in mortality rates over the past 11 years (Table IV).

Antibody has been studied among vaccinated and non-vaccinated children from birth to 12 months of age. Results (though numbers are small) suggest a highly significant difference in antibody levels between those unvaccinated and those having received two doses or more of DPT vaccine (Table V). Validity of these results must be questioned, and Dr. Manclark has been consulted.

I - Cas de Coqueluche dépistés à la PMI Centrale, Hôpital Central et PMI de Tsinga, d'après les registres, Yaoundé - 1971 - 1979

Whooping cough diagnosed at the PMI Centrale, Central hospital and PMI Tsinga, based on the registers of consultations, Yaoundé, 1971-1979

Année Year	PMI centrale	Hôpital central	PMI Tsinga	Doses of DPT administered, Yaoundé Doses de DTCoq administrées, Yaoundé
1971	1 531	unavailable indisponible	-	
1972	1 983	unavailable indisponible	-	
1973	1 605	unavailable indisponible	20 (From August) (du mois d'Août)	
1974	537	unavailable indisponible	0	
1975	98	3	15	
1976	83	3	16	13 754
1977	64	1	4	25 282
1978	178	3	9	34 111
1979				

II - **Age des enfants atteints de la coqueluche, d'après les registres des consultations, PMI Centrale, Yaoundé, 1971 - 1979**

Age of children with diagnosis of whooping cough, based on the registers of consultations, PMI Centrale, Yaoundé, 1971 - 1979

Year Année	% Cases by Age Group % Cas par Tranche d'Age	
	0 - 11 months mois	≥ 12 months mois
1971	23 %	77 %
1972	26 %	74 %
1973	25 %	75 %
1974	35 %	65 %
1975	76 %	24 %
1976	29 %	71 %
1977	30 %	70 %
1978	52 %	48 %
1979		

III - Cultures° du Nasopharynx effectuées sur des enfants âgés de 1-24 mois choisis au hasard parmi les enfants consultés à la PMI Centrale pour la toux, Yaoundé - Mai 1978

Nasopharyngeal cultures performed on children age 1-24 months, chosen randomly from among children seen for cough at the PMI Centrale, Yaoundé, May, 1978

No. cultures Nombre des cultures	Positive cultures cultures positives	% of children with positive cultures, by age % des enfants avec des cultures positives, par âge			
		1-6 months mois	7-12 months mois	13-18 months mois	19-24 months mois
60	8 (13 %)	2/12 (17 %)	2/21 (10 %)	2/13 (15 %)	2/12 (17 %)

° Milieu de culture Bordet-Gengou
Vérification - coloration au Gram suivi par l'immunofluorescence

Culture media Bordet-Gengou
Verification - Gram stain followed by immunofluorescence.

IV - Décès dûs à la Coqueluche, avec début à Yaoundé, d'après l'enquête de case en case - 1979

Deaths due to whooping cough, with onset Yaoundé, based on house to house survey - 1979

Whooping cough deaths among children born years 1969 - 1975 Décès dûs à la coqueluche parmi les enfants nés entre 1969 - 1975			Deaths due to whooping cough among children born since 1975 Décès dûs à la coqueluche parmi les enfants nés depuis 1975		
No. surveyed Enregistrés	No. died Décédés	Rate Taux	No. surveyed Enregistrés	No. died Décédés	Rate Taux

V - Anticorps anticoquelucheux (≥ 1:8), échantillon au hasard d'enfants de la naissance à 11 mois d'après leur statut vaccinal, Yaoundé, 1978

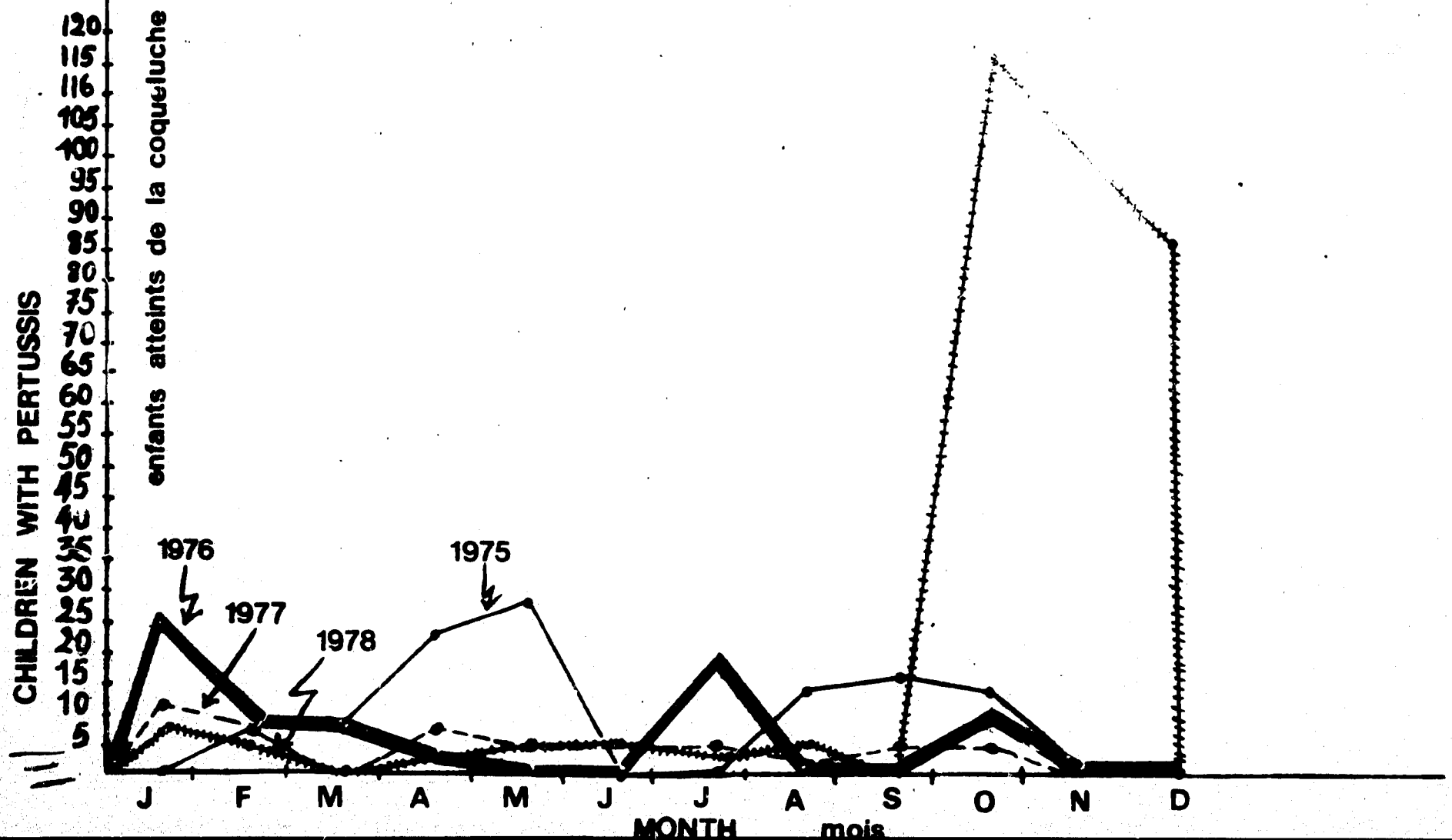
Pertussis antibodies (≥ 1:8), random sample of children from birth to 11 months of age according to their vaccination status, Yaoundé, 1978

Age months mois	No DPT Pas de DTCoq		1 Dose DPT 1 Dose de DTCoq		2 Doses DPT 2 Doses de DTCoq		3 Doses DPT 3 Doses de DTCoq	
1 - 3	3/23	(13 %)	0/4	(0)	1/1	(100 %)	0/0	-
4 - 6	1/20	(5 %)	12/18	(67 %)	24/25	(96 %)	5/5	(100 %)
7 - 9	1/7	(14 %)	3/5	(60 %)	5/5	(100 %)	12/13	(92 %)
10 - 12	0/4	0	1/2	(50 %)	2/3	(67 %)	4/4	(100 %)

WHOOPING COUGH PERTUSSIS BY MONTH, PMI CENT

YAOUNDE 1975 – 1979

cas de coqueluche declares par mois
PMI centrale – yaounde 1975 – 1979



TETANOS NEONATAL A YAOUNDE - 1969 - 1979

NEONATAL TETANUS IN YAOUNDE, 1969 - 1979

NEONATAL TETANUS IN YAOUNDÉ, 1969-1979

Children seen with neonatal tetanus at the PMI centrale have decreased in the past three years, though this same trend is not evident at the central hospital, where several more years of observation are necessary before any conclusions can be made (Table I). For the past 4 years the PMI centrale has had a program of tetanus vaccination for pregnant women, and this may be reflected in the decrease in children brought there with tetanus after birth (it is thought that mothers in Africa generally go to the same PMI for prenatal care as for care of their new born infants). Vaccination of pregnant women throughout Yaoundé, by the mobile vaccination team, was begun in October 1978, and should show its impact over the coming years.

Case fatality rate from neonatal tetanus varies from 50 % to 68 % (Table II) among admissions at the central hospital since 1975. The figure of 17 in 1978 is being investigated further to determine its accuracy.

The house to house survey done in June 1979 will help to establish a mortality rate from neonatal tetanus in Yaoundé (Table III), and will give a baseline for future house to house evaluations.

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I - Cas de tétanos néonatal dépistés à la PMI Centrale, hôpital central, et PMI de tsinga - d'après les registres de consultations, Yaoundé, 1969-1979

Neonatal tetanus diagnosed at the PMI Centrale, Central hospital, and PMI Tsinga, based on the registers of consultations, Yaoundé - 1969 - 1979

Année Year	PMI Centrale	Hôpital Central	PMI de TSINGA
1971	17	unavailable indisponible	-
1972	23	unavailable indisponible	-
1973	16	unavailable indisponible	0
1974	18	unavailable indisponible	0
1975	21	19	0
1976	10	33	0
1977	5	26	0
1978	7	12	0
1979			

Tous les cas de Tsinga ne sont pas enregistrés, mais sont envoyés directement à l'hôpital central.

Children with tetanus are referred directly to the central hospital and not registered at Tsinga.

II - Mortalité due au tétanos néonatal à la PMI Centrale - d'après les registres de l'hôpital, Yaoundé, 1975 - 1979

Deaths due to neonatal tetanus at the PMI Centrale - based on hospital registers, Yaoundé, 1975 - 1979

Year Année	No. cases Nombre de cas	No. deaths Nbre de déces	Case fatality rate Taux de léthalité
1975	19	13	68 %
1976	33	23	70 %
1977	26	13	50 %
1978	12	2	17 %
1979			

III - Décès dûs au tétanos néonatal, avec début à Yaoundé, d'après l'enquête de case en case - 1979

Deaths due to neonatal tetanus with onset in Yaoundé, based on house to house survey - 1979

Deaths among children born on years 1969 - 1975 Décès survenus parmi les enfants nés entre 1969 - 1975			Deaths among children born since 1975 Décès survenus parmi les enfants nés depuis 1975		
No. surveyed Enregistrés	No. died Décédés	Rate Taux	No. surveyed Enregistrés	No. died Décédés	Rate Taux