FINAL REPORT

COMBATTING CHILDHOOD COMMUNICABLE DISEASES

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HEALTH MANAGEMENT GROUP, LTD.
CONTRACT NO. AID/AFR-C-1699
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III. BACKGROUND

To enhance the effectiveness of development support in Africa, six major donors (France, Great Britain, Canada, Belgium, the Federal Republic of Germany and the United States) recently established the Concerted Action for the Development of Africa (CADA). Within CADA, a member country may take the lead in proposing a strategy to deal with a particular problem area so as to develop a common approach or focus that will come together in an effort which CADA members will support. The United States has proposed that combatting childhood communicable diseases in sub-Sahara Africa become a CADA initiative in the health sector. The overall effort is called the "CCCD Program" and the specific activities the U.S. will undertake are designated the "CCCD Project."

Supporting the World Health Organization goal established in the 1970's of Health for All by the Year 2000 and following a series of meetings and discussions in Africa and elsewhere, the United States in 1978 undertook increased efforts to improve health in the developing region of sub-Sahara Africa. In that region of almost 50 nations lives a population exceeding 340 million, including approximately 60 million children aged five years or younger. See Annexes A and B.

Faced with the prospect that up to one-third of the children born each year in this region are now dying before reaching age five, the United States through the Agency for International Development working with the Center for Disease Control, African countries and WHO began to design a project to combat childhood communicable diseases. Although the overall effort will re-

quire two decades or more to reach its full objectives, a first five-year project to commence in 1981 has been planned.

To develop the project AID sent teams of specialists, including CDC personnel, to many African countries. In 1979 and 1980, visits were made to Burundi, Congo, Liberia, Rwanda, Somalia, Sudan and Tanzania. Other teams went to Ghana, Ivory Coast, Mali and Togo to determine the need for and likelihood of controlling yaws.

This resulted in AID funding five short term activities, each providing approximately $5oo,000 over two years to assist with EPI operations; in Congo, Ghana, Liberia, Rwanda and Somalia. AID is currently assisting or planning to assist the following countries in programs to combat childhood communicable diseases: Burundi, Congo, Ghana, Liberia, Mauritania, Rwanda, Somalia and Zaire.

Through the SHDS project, AID is funding EPI training and demonstration areas in Cameroon, The Gambia and the Ivory Coast. Three areas are included in each country, each area comprising approximately 200,000 persons. Training and demonstration covers the cold chain system, including maintenance of equipment, logistics, scheduling, record keeping, etc. As the CCCD project becomes operational, it anticipated that the training and demonstration areas described above will be incorporated into the CCCD project.

The several activities now underway or planned are forerunners to a larger CCCD program. It is anticipated that a continuation by AID of some of these initial efforts will be included in activities planned for the

first five years of the CCCD project; some activities will be continued by other donors.

To explore the potential role of CADA in the CCCD program, in the fall of 1980 a series of informal meetings was held in each of the CADA countries and with WHO in Geneva and UNICEF in New York. A technical working group, composed of representatives from the CADA countries, WHO and UNICEF, subsequently met in November to assess the merits and feasibility of the proposed program and to determine if the program would be an appropriate undertaking for CADA. The technical working group endorsed the program and at its Policy Level Group meeting in Brussels in mid-December, 1980, CADA accepted the CCCD program for concerted action.

In the CCCD project, AID will primarily provide for regional activities while other donor nations and organizations will mainly support country-specific bilateral projects. However, based on expressions of interest at the November technical working group session, it is likely that several CADA members will participate in regional activities -- particularly operational research and health education and promotion, and, to some extent training and evaluation. Similarly, AID will also support some country specific programs. Coordination of regional activities will be carried out by the Office of Regional Affairs of the Africa Bureau of AID, with technical assistance from CDC.

At the country-specific level, emphasis will be on donor coordination and collaboration. In addition to CADA members this will include the international agencies such as WHO and UNICEF and, where feasible, other donors, e.g., DANIDA.

IV. DESCRIPTION OF THE PROJECT

The goal of this project is to reduce morbidity and mortality in children under the age of five in sub-Sahara Africa from selected communicable diseases. To the extent feasible, this will be done within the framework of primary health.

The project purpose will be achieved through both regional and national aspects which involve five major activity components: regional and national training, data analysis and evaluation, operational research, health education and promotion, and communicable disease control interventions provided in specific African countries.

The project will link regional and bilateral activities together in an all-out effort to provide sub-Sahara African countries with a capability to immunize children and deal with other project or local endemic disease priorities. Much of the technical assistance, training, and vaccine and cold chain supply elements lend themselves to a regional approach, but implementation will need to be undertaken by the responsible national authority within each country aided by direct donor assistance.

A. Target Diseases

The communicable/infectious diseases which are the focus of this project directly or indirectly account for an estimated 75-80% of infant and childhood morbidity and mortality in sub-Sahara Africa. These diseases can largely be prevented by immunization and other relatively low cost health measures.

1. Immunizable diseases. Estimates are that less than ten percent of children or pregnant women in sub-Sahara Africa are now being immunized. As a result, hundreds of thousands of preventable deaths

and a similar number of needlessly crippled or mentally retarded children occur each year. To alleviate this situation, which is representative of many less developed areas, the World Health Assembly, established the Expanded Program on Immunization (EPI). Its goal is to reduce morbidity and mortality from diphtheria, pertussis (whooping cough), tetanus, measles, poliomyelitis, and tuberculosis by making immunization available to every child in the world by 1990. Other EPI goals are to promote countries' self-reliance in the delivery of immunization services and regional self-reliance in vaccine quality control and production. The immunization aspect of the CCCD project follows the WHO EPI protocol and is discussed below under target population.

2. Diarrheal disease. About one of every 10 children born in developing countries dies of diarhea before reaching the age of 5. In sub-Sahara Africa it causes millions of death each year and fills more than one-third of children's beds in hospitals. It causes malnutrition because children with diarrhea are often starved or have diminished appetites, and the food lost in the stools is not adequately replaced. But malnutrition also makes children more susceptible to diarrhea, and this creates a vicious killing cycle. Diarrhea can be prevented by breastfeeding infants and young children and weaning them with food and fluids which are clean and nutritious. Most diarrheas can be treated, preventing death and associated malnutrition, by giving the sick child an oral rehydration solution made from clean water and the right amount of salts and sugars and feeding the child as soon as possible.

Four strategies have been identified to control diarrheal dis-

eases in infants and small children.

a. Management of acute diarrheas by preventing and/or treating dehydration. Cases of acute diarrhea from any cause and in all age groups can be treated with a single oral rehydration fluid (ORS) containing sodium chloride, sodium bicarbonate, potassium chloride and glucose.[1/] Oral administration of this solution can replace fluids and maintain hydration in most cases of even severe diarrhea.

Oral rehydration therapy (ORT) is usually given by mothers in the home. It is also used in health centers and hospitals and reduces the need for costly intravenous fluids.

Several studies have demonstrated that when information on proper dietary practices (e.g., uninterrupted breast feeding, feeding of usual foods during diarrhea, as tolerated, and feeding of increased amounts of food in convalescence) is given along with oral rehydration, there is a significant weight gain over time. This contributes to interruption of the diarrhea-malnutrition cycle.

Antibiotics and other medication have proved to be of little value in the treatment of diarrhea, except for severe cholera and shigella and their use is not advised since it diverts health workers from the more important tasks of rehydration and dietary management.

[1/] The formula of ORS is NaCl-3.5g., $NaHCO_3$-2.5g., KCl-1.5g., glucose 20g. in one liter of drinking water. The salts and glucose are generally delivered in the form of a prepackaged mixture.

b. Material and child care practices. Diarrhea related morbidity and mortality can be reduced by:

* Breast feeding, uninterrupted during the first two years of life.

* Proper weaning practices; starting from the fourth to sixth month, locally available weaning foods should be added to breast milk.

* Care for pregnant and lactating mothers, including adequate food and a decreased work load.

* Good personal and food hygiene.

c. Improvement of water supply, sanitation and food hygiene, while not a part of the CCCD program are important elements in controlling diarrheal disease. Activities directed at achieving the necessary improvements will be integrated with the CCCD program wherever possible.

The CDD aspect of the overall project will mainly emphasize regional activities, described earlier. Assisting countries to become self sufficient in producing oral rehydration salts will be a priority effort. Emphasis will also be placed on incorporating diarrheal disease control into primary health care.

3. Other Important Childhood Communicable Diseases. Control of malaria, by far the greatest single cause of childhood morbidity and mortality, is being approached by AID and other donors through separate and discrete programs.

A major thrust of such programs is the presumptive treatment of fevers with chloroquine. This aspect of malaria control, which needs to be integrated into existing and developing Primary Health Care Systems (PHC), could also be closely coordinated with or integrated

into CCCD since one strategy of CCCD will include using village health workers for dispensing materials for oral rehydration. These same workers could also dispense anti-malarial drugs. At the inception of the CCCD project, malaria control will not be included. As the project progresses, however, the feasibility of adding presumptive treatment of fevers will be assessed.

In addition to the above mentioned childhood communicable diseases, other illnesses such as yaws are of increasing concern in certain African countries. Yaws is a chronic, nonvenereal spirochetal infection which is predominantly a disease of children, transmitted by discharges form skin lesions via body contact, clothing or insects. During the past decade, there has been a marked resurgence of this disease in Ghana, Togo and the Ivory Coast. Yaws can be effectively controlled by prompt detection and treatment with antibiotics such as penicillin. Such a program can be readily integrated with developing PHC systems.

AID is presently assisting yaws and yellow fever control in Ghana. This activity will become incorporated in CCCD when that project becomes operational.

B. The Target Population

The immunization aspect of the CCCD program aims to vaccinate all children during their first year of life: BCG at birth, diphtheria, pertussis and tetanus (DPT) and polio, at the third, fourth and fifth months and measles at the ninth month. This is the recommended schedule established by WHO and CDC.

Annexes A and B provide demographic data concerning sub-Sahara Africa. In mid 1980, the total population of 47 countries making up the potential recipients of CCCD activities was estimated at 346.5 million.

This includes an estimated 13.4 million infants under one year of age and 47.9 million between ages 1 and 4, for a total 61.3 million children under five.[1,2] This latter group is the target of the diarrheal disease control activities since they constitute the greatest group at risk.

It is also intended to immunize pregnant women against neonatal tetanus. All mothers with their first child should be immunized against tetanus as part of prenatal care. Mothers with subsequent pregnancies who are known to have received tetanus toxoid with prior pregnancies theoretically need not be immunized again. However, since tetanus toxoid has rare side effects and medical records in many African countries are often incomplete, it is safer to immunize all pregnant women. Not adjusting for multiple births, one tetanus toxoid injection should be planned for each pregnancy.[3] As medical records and health service coverage improve, it is likely that re-immunization of multiparous women can be reduced.

The target population for control of other communicable diseases affecting children will vary with the specific disease. For yaws which is primarily endemic in Ghana, Ivory Coast, and Togo, children fifteen and under are chiefly at risk. In 1980, the total population of these three countries was estimated at 22.2 million of which almost 50 percent are under fifteen. The aim of the yaws control program is to screen 80% of those under fifteen and to treat cases found with penicillin.

Annex B details the projected population of infants under one year and children 1 to 4 years of age in 34 sub-Sahara African countries. These

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1/ 1980, "World Population Data Sheet", Population Reference Bureau, Washington, DC.

2/ "Illustrative Functional Projections 1975-2000", Community and Family Study Center, The University of Chicago, 1979.

3/ This figure assumes that some women will be known to have been immunized and need no further injections; many will only need a single booster and others will require full immunization with two doses.

countries contain over 98 percent of the total population of sub-Sahara Africa excluding the Republic of South Africa. Population estimates are given for 1980, 1985, 1990 and 2000.

The present population growth of children under five in sub-Sahara Africa is somewhat over 2.5 percent per year.[1/] This rate of growth is expected during the five year period 1981-1986, of the CCCD program. Following that, according to estimates of the University of Chicago, mortality and population growth rates are expected to decrease moderately. These trends are taken into account in the population projections used.

It should be emphasized that except for the immunization activities which are ultimately targeted for all infants and pregnant women, other CCCD interventions will only affect children at risk from diarrhea and other specific diseases. The number of these children are relatively small as compared to those less than one year of age and their mothers.

The CCCD project calls for incrementally increasing the number of infants (and mothers) immunized, i.e., coverage, by 10 percent each year. Assuming that a 1981 population of infants under one year of 13.7 million[2/] is increased by 2 1/2 percent per year for the first five years and 2 percent for the subsequent second five years corresponding to the population projections in Annex B, the following table shows the number of children to be immunized each year to achieve 100% coverage in ten years.

[1/] Population Reference Bureau, Washington, DC.

[2/] 1980 estimated population of 13.4 increased by 2 1/2 percent.

Table I Number of Children to be Immunized

YEAR	NUMBER OF CHILDREN	COVERAGE	NUMBER OF CHILDREN TO BE IMMUNIZED
1981	13,700,000	10%	1,370,000
1982	14,043,000	20%	2,808,600
1983	14,394,000	30%	4,318,200
1984	14,750,000	40%	5,900,000
1985	15,122,000	50%	7,561,000
1986	15,422,000	60%	9,253,200
1987	15,733,000	70%	11,103,100
1988	16,048,000	80%	12,838,400
1989	16,369,000	90%	14,732,100
1990	16,696,000	100%	16,696,000

The above population figures are rough estimates and merely give an indication of the order of magnitude of the task ahead.

A basic question concerns the present status of EPI activities in sub-Sahara Africa. The WHO medium term program for the period 1978-1983 calls for the implementation of EPI activities in 25 countries so as to provide at least 60% coverage of the target population in these countries by the end of 1983.

At the 1980 EPI Global Advisory Group meeting, the representative for WHO/AFRO reported that as of the end of September, 1980:

* the program is being implemented in 30 countries (Angola, Botswana, Cameroon, Cape Verde, Congo, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Ivory Coast, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mauritania, Mauritius, Mozambique, Nigeria, Rwanda, Sao Tome and Principe, Sierra Leone, Swaziland, Tanzania, Uganda, Upper Volta, Zambia, Zaire);

* in five countries the program has been planned but not yet implemented, through lack of financial resources or for other reasons (Burundi, Chad, Equatorial Guinea, Senegal, Togo);

* in the remaining countries the program is being planned.

The targets for immunization coverage vary somewhat between WHO and the CCCD project. This difference is not significant. As the CCCD project becomes operational and as additional information is forthcoming from various sources, and cooperation and collaboration increase, coordinated targets and implementation plans for each country can be established with some confidence. Until this is done, each donor and supporting organization will continue to provide assistance on an ad hoc basis.

Annex A. Sub-Sahara Africa, Selected Demographic Data [1/]

COUNTRIES	Estimated Population Mid-1980 (millions)	Birth Rate	Rate of Nat. Increase (annual %)	Inf. Mort. Rate	Population 0 to 15 (%)	Total Fertility Rate
ANGOLA	6.7	48	2.4	203	44	6.4
BENIN	3.6	49	3.0	149	46	6.7
BOTSWANA	0.3	51	3.4	97	50	6.5
BURUNDI	4.5	47	2.7	140	44	6.3
CAMEROON	8.5	42	2.3	157	41	5.7
CAPE VERDE	0.3	28	1.8	105	36	3.0
CENTRAL AFRICA	2.8	42	2.2	190	41	5.5
CHAD	4.5	44	2.3	165	42	5.9
COMOROS	0.3	40	2.2	148	43	5.2
DJIBOUTI	0.4	48	2.5	132	46	6.6
EQUATORIAL GUINEA	0.4	42	2.3	165	42	5.7
ETHIOPIA	32.6	50	2.5	162	45	6.7
GABON	0.6	33	1.1	178	33	4.5
GAMBIA	0.6	48	2.4	217	41	6.4
GHANA	11.7	48	3.1	115	47	6.7
GUINEA	5.0	46	2.5	175	44	6.2
GUINEA BISSAU	0.6	41	1.8	208	39	5.5
IVORY COAST	8.0	48	2.9	154	45	6.7
KENYA	15.9	53	3.9	83	50	8.1
LESOTHO	1.3	40	2.4	111	40	5.4
LIBERIA	1.9	50	3.2	148	48	6.7
MADAGASCAR	8.7	45	2.6	102	43	6.1
MALAWI	6.1	51	3.2	142	44	7.0
MALI	6.5	49	2.7	190	48	6.7
MAURITANIA	1.6	50	2.8	187	42	6.9
MAURITIUS	0.9	27	2.0	35	37	3.1
MOZAMBIQUE	10.3	45	2.6	148	45	6.1
NAMIBIA	1.0	44	2.9	142	44	5.9
NIGER	5.5	51	2.9	200	47	7.1
NIGERIA	77.1	50	3.2	150	47	6.9
REUNION	0.5	26	1.9	36	38	2.8
RWANDA	5.1	50	3.0	127	47	6.9
SAO TOME & PRINCIPE	0.1	45	3.4	64	43	6.0
SENEGAL	5.7	48	2.6	160	44	6.5
SEYCHELLES	0.1	26	1.8	43	42	4.5
SIERRA LEONE	3.5	46	2.6	136	41	6.4
SOMALIA	3.6	48	2.8	177	44	6.1
SUDAN	18.7	48	3.1	141	44	6.6
SWAZILAND	0.6	47	2.8	168	48	6.4
TANZANIA	18.6	47	3.1	125	46	6.5
TOGO	2.5	49	3.0	163	46	6.7
UGANDA	13.7	45	3.0	120	45	6.1
UPPER VOLTA	6.9	48	2.6	182	44	6.5
ZAIRE	28.9	46	2.8	160	45	6.1
ZAMBIA	5.8	49	3.2	144	46	6.9
ZIMBABWE	7.4	47	3.4	129	47	6.6
TOTAL	346.5					

[1/] Source. 1980 World Population Data Sheet, Population Reference Bureau,

Annex B. Projections of Numbers of Children Under Age Five in Selected Sub-Sahara African Children [1/]

	Estimated No. of Children Under Age One Year (000)				Estimated No. of Children 1 to 4 Years (000)			
COUNTRIES	1980	1985	1990	2000	1980	1985	1995	2000
ANGOLA	309	351	386	396	1062	1237	1407	1579
BENIN	143	169	198	216	504	578	680	815
BURUNDI	167	191	212	236	588	665	742	864
CENTRAL AFRICA REPUBLIC	75	85	96	115	273	314	348	421
CHAD	151	166	176	181	532	587	635	684
COMOROS	15	15	18	24	57	60	69	90
CONGO	53	56	66	83	202	226	252	314
ETHIOPIA	1300	1422	1584	1806	4505	5095	5686	6686
GHANA	504	561	572	567	1674	1914	2107	2251
GUINEA	243	276	307	345	850	968	1123	1413
IVORY COAST	303	345	410	507	1165	1294	1464	1858
KENYA	717	768	806	993	2485	2836	3101	3701
LESOTHO	47	43	37	40	167	170	176	157
LIBERIA	65	67	72	90	238	261	282	341
MADAGASCAR	437	459	494	596	1517	1683	1849	2208
MALAWI	248	283	311	355	830	874	1108	1316
MALI	270	299	329	375	929	1053	1176	1358
MAURITANIA	49	53	62	71	181	202	230	274
MOZAMBIQUE	399	421	428	458	1396	1541	1632	1769
NIGER	239	281	320	370	810	956	1111	1361
NIGERIA	2985	3309	3611	4069	10423	11786	13133	15294
RWANDA	207	247	288	323	726	849	995	1206
SENEGAL	231	269	304	335	798	924	1063	1250
SIERRA LEONE	128	144	153	176	439	501	559	654
SOMALIA	181	207	211	227	579	687	767	847
SUDAN	708	805	910	1105	2564	2938	3335	4136
TANZANIA	765	829	905	1090	2689	3031	3364	4052
TOGO	110	128	148	167	381	444	517	626
UGANDA	527	564	601	707	1870	2092	2284	2679
UPPER VOLTA	223	266	304	326	823	930	1057	1227
ZAIRE	1072	1150	1200	1289	3808	4205	4507	4920
ZAMBIA	265	303	342	418	916	1074	1234	1541
ZIMBABWE	355	406	433	500	1163	1398	1505	1911
TOTAL	13284	14938	16294	18556	47145	53373	59498	69804

1/ Source, "Illustrative Functional Projections 1975-2000", Community and Family Study Center, The University of Chicago, 1979. Base data was primarily obtained from the World Bank and the Population Reference Bureau. In developing projections, a cohort of women aged 15-49 was taken from each country and age specific fertility rates were applied. This gives the number of births in a given year. Next, survival ratios from model life tables (Coale and Demeng) were applied to the births to derive the figures for surviving births.