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**UNITED REPUBLIC OF TANZANIA
REVIEW OF
EXPANDED PROGRAMME ON IMMUNIZATION**

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I. INTRODUCTION

In September, 1978, the United States Congress appropriated funds to assist sub-Saharan African nations develop and improve their childhood immunization programs. In the fall of 1978, the U.S. Agency for International Development (USAID) cabled all its missions in sub-Saharan Africa requesting that they discuss the possibilities for U.S. bilateral assistance for immunization activities with their respective Ministries of Health. The responses to this cable were summarized in the spring of 1979, and a Participating Agency Service Agreement (PASA 698-0421) was finalized with the Center for Disease Control (CDC), Atlanta, Georgia, to assess immunization programs and the feasibility of U.S. assistance in selected countries.

This report summarizes the findings of the CDC team which visited the United Republic of Tanzania in August, 1979.

II. BACKGROUND

A. Geographical, Cultural, and Administrative Features

The United Republic of Tanzania is composed of mainland Tanzania and the Islands of Zanzibar and Pemba. Located on Africa's East coast between the great lakes of the Central part of the continent and the Indian Ocean, its total land area is 945,000 square kilometers, including almost 60,000 square kilometers of inland water. Mainland Tanzania shares a border with eight other countries. Zanzibar is located about 32 kilometers off the coast and has an area of 1,656 square kilometers. Pemba lies 40 kilometers northeast of Zanzibar and has an area of 983 square kilometers.

The mainland of Tanzania has a largely tropical climate. Away from the coastal areas, however, most of the country is sub-tropical and forms a plateau 900-1200 meters above sea level. In these areas small farms are scattered amongst grasslands and woodlands. In the North, there are several mountains, including Kilimanjaro, the highest peak in Africa.

Transport and communications are limited and Tanzania's road network serves mainly the coastal, central, and north-central areas of the country. The Tanzania section of the former East African Railways Corporation operates approximately 2,580 km of railway. The Tan-Zam Railroad began operation in September, 1975. The principal ports of Dar Es Salaam, Tanga, and Lindi

are busy centers. Three international airports (Dar Es Salaam, Zanzibar, and Kilimanjaro) and 50 small airports also provide communication links.

Three non-African minority groups, Arabs, Asians, and Europeans, together account for one percent of the mainland population. Europeans and Arabs are settled predominantly in rural areas while Asians are concentrated in towns. Tanzania's African population consists of more than 130 ethnic groups, only one of which exceeds one million in number. The majority of Tanzanians are Bantu in origin while others are Nilotic.

About 45 percent of Tanzania's people follow traditional religious beliefs, some 30 percent are Muslim, and about 30 percent are Christian, mainly Roman Catholic.

Formerly known as Tanganyika, Tanzania became independent in 1961 and became a one-party republic in 1962. In April 1964, a treaty of unity was signed to join the mainland and the two islands of Zanzibar and Pemba into what is now known as the United Republic of Tanzania.

Dr. Julius K. Nyerere has been President of Tanzania since 1961. A council of ministers, headed by a prime minister, is responsible for running the government. Chama Cha Mapinduzi (CCM), formerly known as the Tanganyika African National Union (TANU), is the ruling party and policy-making body. The legislative body, the National Assembly, is composed of 141 members elected by the populace from a choice of candidates plus 62 members appointed by the Party. Sectoral Ministries are headed by ministers, who are assisted by junior ministers. Zanzibar has its own ministries and ministers.

For administrative purposes, Tanzania is divided into 25 regions - 20 on the mainland and 5 on Zanzibar. These are administered by Regional Development Directors under the direct supervision of the Prime Minister's office. Likewise, the 90 districts are governed by District Development Directors. Below this level are the wards to which the villages report. Registered villages constitute the smallest administrative units. Enormous emphasis has been put by the Government on resettling the scattered population of the country into villages which are perceived as the most important socio-economic units. Under the Enrolling Law of Villages and Ujamaa Villages Act promulgated in 1975, a village should consist of no less than 250 families and no more than 600 families.

B. Demographic and Economic Characteristics

Estimates for 1978 indicate the total population of the United Republic to be 16,558,300. A growth rate of 3.02% was estimated for 1970-1975. The population in the year 2000 is estimated to approach 34 million. The National Demographic Survey of Tanzania was conducted in 1973, and estimated a crude birth rate of 43.7 per thousand and a crude death rate of 16.8 per thousand for the period of 1970-1975. Although generally high, both fertility and mortality rates differ considerably from region to region.

Tanzania, like most developing countries, has a young population with 20 percent of the population 0-4 years of age and 27 percent 5-14 years of age.

According to the third five-year development plan, average life expectancy at birth rose from 40 years in 1967 to 45 years in 1974. Infant mortality is estimated at approximately 152 per thousand and another 90 children per thousand are estimated to die before age 5. The major causes of the high levels of morbidity and mortality are infections and malnutrition.

During the period of the first five-year development plan (1964-1969) the objectives of Tanzania's economic policies were the conventional ones of rapid growth in per capita income within a mixed economy. These early policies led to a number of trends, which became unacceptable to the country's political leadership: growth of an urban elite and widening of urban-rural income differentials, relative neglect of rural development, inappropriate educational development and an attitude which associated development solely with finance.

In 1967, however, President Nyerere's paper on socialism and rural development, which has become known as the Arusha Declaration, provided the country with a new socialist orientation in economic and social planning. The second five-year development plan (1969-1974) reflected Tanzania's basic dual philosophy of self-reliance and socialism. Tremendous emphasis began to be placed on decentralizing social services to the rural areas.

In 1974, the Tanzanian economy suffered serious setbacks due to the combination of a severe drought and sharp increases in import prices related to global energy costs. The resulting crisis in balance-of-payments delayed implementation of the third five-year

development plan (1976-1981). While still based on the Arusha Declaration, the development of the productive sectors, namely agriculture, industry and natural resources is now highly emphasized.

III. GENERAL HEALTH POLICIES AND THE MCH PROGRAMME (MAINLAND TANZANIA)

The Arusha Declaration also established new priorities for the health sector. Since 1970, the main objectives have been the extension of health care facilities to the rural areas, increased emphasis on preventive and environmental health, and the improvement of health manpower by emphasizing the recruitment and training of medical auxiliaries.

In order to facilitate these policies, the health services were decentralized to provide free health care for all. The per capita government expenditure for health has risen to over \$5 in 1978. Fifty-four percent of the health budget is allocated directly to the regions. Approximately 20 percent of the health budget is allocated to development projects, of which 70 percent come from external donors. Annex I demonstrates the trends in health spending from 1972 to 1978 and shows the nation's commitment to rural health, preventive services and training of paramedical auxiliaries.

Tanzania's commitment to the provision of preventive services has manifested itself in the development of a comprehensive program for maternal and child health (MCH). In the late 1960's, emphasis rested on the utilization of mobile teams which resulted in poor coverage. In 1971, a Committee for MCH was formed which set the goal of providing a comprehensive and integrated system of health care to at least 90 percent of the population by 1980. The resultant MCH/Child-spacing Programme is based on a network of rural dispensaries and health centers, run by specially-trained, multipurpose MCH Aides. The major components of the Programme are the provision of antenatal and postnatal care for pregnant women, including supervised deliveries; early detection and correction of malnutrition; immunization of children against measles, diphtheria, smallpox, poliomyelitis, tuberculosis, tetanus; chemosuppression of malaria; education on child spacing and the provision of contraceptives; health education on personal and environmental sanitation; and detection and treatment of common minor ailments and diseases.

A central MCH Unit was established in 1974 under the Division of Preventive Services in the Ministry of Health (see Annex II). Policy guidelines are formulated by an MCH Coordinating Committee. The country is divided into three MCH zones, each with an MCH Coordinator.

Regional and district MCH Coordinators report to the Regional and District Medical Officers. At the local level are the MCH Aides who actually provide the services.

It is estimated that approximately 60 percent of mothers and children now have access to MCH services. To achieve increased coverage, essential changes have been made at dispensaries and health centers. Services have been integrated and are provided on a daily basis rather than offering different services on separate days of the week. In addition, all mothers and children attending the dispensaries for any reason must first pass through the MCH clinics. Mothers are encouraged to bring all their children under age 5 years with them at each visit.

IV. EXPANDED PROGRAMME ON IMMUNIZATION

A. History

"The Young Child Study" of 1973, conducted by the Tanzania National Scientific Research Council recommended that Tanzania should take effective steps to introduce a cross sectional approach to maternal and child health services including immunisation. This recommendation stimulated the development of The Young Child Protection Programme, which included immunisation against smallpox, tuberculosis, diphtheria, tetanus, pertussis, poliomyelitis, and measles. This programme began as a pilot project in three districts (Bagamoyo, Dodoma, and Moshi) and adequately demonstrated the feasibility of a national multiple antigen programme.

The Expanded Programme on Immunization (EPI) began in 1975 and added the administration of tetanus toxoid to pregnant women. The EPI was designed to be a horizontal effort integrated into the MCH services as they are delivered by government hospitals, rural health centers, dispensaries, mobile teams and facilities run by voluntary agencies.

B. Objectives

The following objectives were emphasized in the Plan of Operations:

"Overall, to reach the highest possible level of coverage of eligible children with effective immunisation and to maintain this degree of effective coverage for successive cohorts.

Specifically,

1. Effective BCG vaccination of at least 80 percent of children under 1 year of age; revaccination of at least 75 percent of the population at school entry age,
2. DPT I delivered to at least 90 percent of eligible children and DPT III to at least 70 percent,

3. TT I delivered to at least 80 percent of expectant mothers in any particular year and consisting of at least two doses in the first pregnancy in 80 percent of initiated cases, and one booster dose in each subsequent pregnancy,
4. Effective poliomyelitis vaccination in at least 90 percent of children in their first year of life, and
5. Effective measles vaccination in at least 80 percent of eligible children."

Immunizations reported for 1972-1976 are shown in Annex III. Unfortunately, the eligible populations for those years are not clearly defined and coverage levels can not be determined. However, a joint WHO/DANIDA/WYO/UNICEF evaluation in June, 1978 did assess immunisation coverage in three districts and reported the following levels:

(Coverage in %)

<u>ANTIGEN</u>	<u>ARUMBU</u>	<u>IRINGA</u>	<u>KISARAWI</u>
BCG	63	63	42
Smallpox	57	61	38
DPT I	70	54	34
DPT II	64	43	24
DPT III	54	36	17
Polio I	70	53	33
Polio II	63	43	23
Polio III	53	34	17
Measles	46	36	17

C. Cold Chain

Central responsibility for vaccine procurement, storage, and distribution lies with the Central Vaccine Stores located at the Ocean View Hospital in Dar Es Salaam. Although the consultants were not able to evaluate the current situation in detail, it was stated that no major changes had occurred since the time of the joint evaluation in June, 1978. The major conclusions of that mission were as follows:

1. Excess vaccine was being stored and that a new procurement and inventory control system was needed;
2. Distribution and storage of vaccines at the regional and district levels appeared satisfactory;
3. Improvements in the maintenance and repair of cold chain equipment were required.

Samples of poliomyelitis and measles vaccine were also tested for potency by the joint evaluation mission. Vaccines were collected from the Central Vaccine Store, regional stores, district stores, and at local vaccination sites. All samples tested, except one, were found to be potent and the mission concluded that the present distribution system functions adequately. A locally produced cold box is used for the transportation of vaccines and appears adequate but has not been tested sufficiently.

D. Disease Surveillance

An attempt was made to assess the impact of the EPI on reported morbidity and mortality of the target diseases, but the information available did not permit such an evaluation. It is widely recognized that the nation's health information system is rudimentary and unsatisfactory. The planning unit of the Ministry of Health is currently considering specific measures to develop and strengthen the health information system.

A visit was also made to the Division of Community Medicine of the Muhimbili Medical Center, which has been collaborating with the Ministry of Health on the collection of epidemiological information related to the EPI. Although no data is yet available, it is anticipated that the results of a long-term study on measles will be available in the future. In addition, the WHO recommendations for the survey of poliomyelitis were discussed and it is possible that such a survey will be conducted during the next academic year.

E. Training

Although the authors were not able to observe any training sessions themselves, discussions were held with the individuals responsible for the training of the MCH Aides and the Bagamoyo school for MCH Aide training was visited. This training has been a cooperative effort involving the MOH and the Loma Linda School of Health contracted by USAID. The MOH has just about taken full responsibility for MCH Aide training and after a final revision of curriculum this year will take full responsibility in the summer of 1980. The joint evaluation mission of 1978 recommended that refresher courses for EPI be scheduled as necessary.

F. Supervision

In general, the planned organization of the EPI suggests that supervision should be adequate. In practice, however, the joint evaluation mission found that improvements are necessary at all levels. Changes in the central headquarters functions require

additional managerial skills. Support of the zonal MCH Coordinators requires the delegation of authority consistent with their responsibilities and the provision of adequate transportation to allow fulfillment of their duties. Well-defined responsibility for equipment and supplies at the health center and dispensary levels must also be clearly delegated.

G. Donor Assistance

Various multilateral and bilateral donors have been supportive of the EPI since its inception. Whereas a few donors contribute exclusively to the EPI, others contribute indirectly through the MCH programme, auxiliary health staff training, or the construction of medical facilities. The major donors are currently:

UNICEF: Commodities (including BCG, DPT, TT, OPV vaccines), immunization kits, MCH cards, transport (including landrovers, refrigerated Kombis and bicycles) and evaluation funds.

WHO: Technical assistance for planning, vaccines (smallpox and measles), and evaluation funds.

SIDA: Transport and construction of rural health centers.

NORAD: Construction of rural dispensaries.

USSR: Vaccines.

People's Republic of China: Technical assistance to the vaccine institute.

DANIDA: Immunisation kits, measles vaccine, and transport.

USAID: Construction of MCH Aide training schools, consultants for MCH Aide training, immunisation kits, and evaluation funds.

As a result of the joint evaluation in 1978, however, the Ministry of Health and DANIDA have negotiated a comprehensive 5-year agreement for direct assistance to the EPI. This agreement includes the services of three technicians (programme manager, operations officer, and service/maintenance technician) for 3 years each; expansion and construction of a new Central Vaccine Store; construction of ten zonal cold stores; supply of freezers and refrigerators to all regional and district vaccine stores; construction and equipping of ten zonal maintenance workshops; purchase of kerosene for entire programme; provision of 100 percent of measles vaccine and 70 percent of tetanus toxoid vaccine

requirements; training costs; evaluation costs; and 50 vehicles with spare parts. The total budget, exclusive of the technician salaries, is approximately \$5 million.

V. FINDINGS AND RECOMMENDATIONS

The 1978 joint evaluation mission recognized that in a few years' time Tanzania has been able to develop an immunization programme which can be regarded as one of the best in the developing world. The joint evaluation mission outlined several recommendations for strengthening the programme. Although the time available permitted only limited review, it was felt that the findings and recommendations were still appropriate. It is anticipated that the proposed DANIDA assistance will fulfill the programme needs adequately.

Recommendations

1. Pending finalization of the proposed DANIDA project, no immediate U.S. assistance appears indicated.
2. USAID/Tanzania should remain informed of future developments regarding EPI and should keep AID/W and CDC aware of possible future U.S. assistance.
3. Short-term assistance for the collection of baseline epidemiological data should be provided at the request of the MOH.
4. Short-term assistance for the development of an epidemiological information system should be considered when judged appropriate by the MOH.

VI. ANNEXES

**ANNEX I: HEALTH SECTOR EXPENDITURES
1972 AND 1978**

<u>CATEGORY</u>	<u>Development</u> <u>(%)</u>		<u>Recurrent</u> <u>(%)</u>	
	<u>1972</u>	<u>1978</u>	<u>1972</u>	<u>1978</u>
Hospital Services	52	19	80	58
Rural Health Facilities	33	36	11	18
Preventive Services	2	24	4	9
Training	13	20	3	13
Equipment	0	1	2	2
TOTALS:	100	100	100	100

Source: USAID/Tanzania

**ANNEX III
IMMUNIZATIONS DELIVERED, MAINLAND TANZANIA
1972-1976**

TYPE	1972	1973	1974	1975	1976
1. SMALLPOX					
a. Primary	864,182	274,863	382,698	407,721	510,153
b. Total	2,922,675	909,125	1,083,725	1,109,170	860,160
2. BCG	1,584,437	312,268	404,218	469,974	496,241
3. POLIOMYELITIS					
a. First dose	114,818	124,121	213,439	312,935	430,058
b. Second dose	48,858	64,799	102,837	156,979	189,510
c. Third dose	32,136	45,726	72,630	117,099	143,731
4. DPT					
a. First dose	104,416	94,832	163,373	283,190	352,717
b. Second dose	56,463	58,588	85,435	153,526	204,655
c. Third dose	34,247	69,849	65,879	115,973	149,400
5. MEASLES	71,872	133,561	290,129	662,464	749,175

ANNEX IV
PERSONS CONTACTED

1. Dr. Albert Henn, Health, Nutrition and Population Officer, USAID
Dar Es Salaam
2. Dr. Ngaliwa, Acting MCH Unit Chief, Ministry of Health
3. Dr. F.D.E. Mtango, Epidemiologist, Division of Community Medicine,
Muhimbili Medical Center (M.M.C.)
4. Mr. Bud Day, Sanitary Engineer, Division of Community Medicine, M.M.C.
5. Dr. Tangio Urrio, District Medical Officer, Bagamoyo
6. Ms. Ann Vander Stoep, Epidemiologist, USAID, Dar Es Salaam
7. Dr. C.O. Akerele, WHO Programme Coordinator
8. Dr. Q.M. Qhobela, Public Health Administrator, WHO
9. Mr. E. Lyimo, Chief, Central Vaccine Stores, MOH
10. Ms. Deborah Mendelson, Deputy Desk Officer, Tanzania, AID/Washington
11. Dr. Nkinda, Acting Director of Preventive Services, MOH
12. Mr. Alex Tosh, UNICEF Representative
13. Dr. Charles Hays, AID Consultant, University of Massachusetts,
School of Medicine, Worcester, Massachusetts
14. Dr. Steve Hunt, Medical Officer, Dar Es Salaam Municipality
15. Dr. Mnzava, Deputy Chief, MCH Unit, MOH
16. Mr. Dhalla, Statistician, Planning Unit, MOH
17. Mr. Erik Schmidt-Hansen, Project Manager, DANIDA, Dar Es Salaam
18. Dr. William Dyeinger, Loma Linda School of Health, MCH Aide Project Director
19. Sr. Mary Reese, MCH Aide Project
20. Ms. Norma Brainard, MCH Aide Project
21. Professor V.P. Kinati, Department of Pediatrics and Child Health, M.M.C.

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