I. BACKGROUND

Rural health services have been developed in Tanzania for quite some time in different directions. While by 1967 the number of Rural Dispensaries had increased to about 1200, their staffing had been limited to Dispensary Assistants, or more often than not dressers with limited training in outpatient care in hospitals.

Subsequently the Government of Tanzania, through the "Arusha declaration" put further development of rural health services as first priority, declaring availability of medical care to the whole population as its objective. To this end a pattern of training was developed aiming at improved staffing of a considerably expanded network of Rural Dispensaries and Health Centers. The training of nurses, rather diverse in many hospitals, was standardized in 17 Grade B nursing schools (3 years of training after Primary school), 3 Grade A Nursing Schools (4 years of training for Secondary school students having completed 4 grades in Secondary Schools and Grade B Nurses for 18 months).

For the team leaders of the health team in Rural Dispensaries a category of Rural Medical Aid was established and gradually 11 Schools for 3 year train- after Primary School were established to be further expanded to 16 such schools.

For the Health Centers, a category of Medical Assistants was established, trained in 7 M.A. schools for 4 years after 4 grades in Secondary Schools, while further upgrading of Medical Assistants was made possible to Assistant Medical Officers in 3 A.M.O. schools for 18 months training of M.A.'s. In addition the category of Health Auxiliary was developed for environmental and sanitary development of wards (groups of 5 villages within the district) for which 6 schools were established for 2 year training after primary school.

Before 1975, the M.C.H. services, such as were provided in a limited number of rural dispensaries and in all hospitals, were staffed by "Village Midwives" and "Nurse-Aids", both variably trained in hospitals. The hospitals

which trained these categories kept a considerable proportion of the trainees in the hospitals and the recognition that the MCH service required a much more concerted effort in staff development led to the establishment of the USAID assisted project for the training of MCH Aids in eventually 19 schools for 1 1/2 year training after primary school.

Table 1 lists the various categories of workers for primary health care with an additional category of village medical worker, a program started but temporarily suspended, in which young literate villagers were trained for 3-6 months. The trainees were not however, adequately supported by the villages and many sought employment elsewhere. It is the Government's intention to reactivate this program directing its training to a more established category of villagers. what happen

During the same time that this thoroughly constructed pattern of health manpower was being developed, the existing health facilities - many established by Voluntary Agencies (Missions) - were ordered in a pattern of echelons of medical care, with the Rural Dispensaries, rapidly expanding in number at the bottom. The Rural Health Centers with up to 15 beds supervising 6 Rural Dispensaries as the first referral level, 76 District Hospitals, many so designated and assisted with government funding among the Voluntary Agency Hospitals. Twenty Regional Hospitals also serving the district of their location and 3 Referral Hospitals eventually to be expanded to a total of 6 zonal Referral Hospitals constitute the highest referral level. The earlier emphasis of the Ministry of Health budget in hospitals os 80% was gradually reduced to 60%.

PRIMARY HEALTH WORKER

Basic Qualifications, duration of training and scope of activity

	Category	Basic Qualification	Duration of Training	Scope of Activity
1.	Village Medical Worker	Primary school	3-6 months	Help villagers in prevention of common diseases, to treat minor elements and provide first-aid.
2.	MCH Aids	Primary school	18 months	Run MCH services, conduct normal deliveries and provide health activities Tree
3.	Health Auxiliaries	Primary school	2 years	Work in rural health centres and dispensaries to assist with provision of general health education, to visit homes, schools and other centres to promote environmental health, to trace defaulting outpatients and to participate in campaign of specific diseases. NOT Tree
4.	Rural medical aide	Primary school	3 years training	Administering outpatients of simple diseases at dispensaries give initial treatment of serious illness pending referral to a rural health centres or hospitals after care of patients discharged from hospital and participate in immunization and community health programmes Tree
5.	Medical Assistants	Secondary Education	3 years training	In charge of health centres.

Tanzania (Mainland) with a land area of 937.062 km^2 and a population of 16.5 million has a very dispersed population. Overall population per region density of 17.5 km^2 ranging from 8 to 69 per km^2 with Dar es Salaam having a population density of 707 km^2.

Even so the concentration of the population, originally very disperse by individual households, into Ujama villages subsequent to the "Arusha" declaration of 1967, has generated some 7,500 to 8,000 villages of which 6,700 villages have contracted for incorporation in the overall development process for government service delivery in education, water supply and health services. Each Ujama village of around 1,500 population is organized through blocks of ten households with a Chief of Ten Houses while in the average 5 to 6 villages are organized in Wards, each level with their committees and Executive Secretaries. Each Ward has by now a Rural Dispensary for health care and will have in increasing numbers a Health Auxilliary assigned to the ward committee for environmental improvement. Four to five wards are organized in Divisions each with a Rural Health Center, and 3 Divisions in a District with a District Hospital. The District Medical Office supervises all health activities in the District and is responsible to the District Area Commissioner. Each of the 20 regions consist of 3-4 districts and has a Regional Health Officer responsible to the Regional Commissioner, supervising both the Regional Hospital and all other health services in the Region. Since 1977 the administration of the country has been decentralized, leaving technical advisory services to the Central Ministry of Health while the Regional Commissioner, with assistance from the Regional Health Officer operates quite independently, though within the frame of the Central Party guidelines and directives.

At all these echelons the MCH services were increased and increasingly staffed by MCH aids as they became available while an MCH directorate was established at the Ministry of Health and MCH Supervisors, 29 Nurses and 11 M.D.s were trained abroad through the AID project, established at zonal (6 zones), Regional and District levels. Also, some of these trainees are working in the Ministry of Health.

Further impetus to the development of MCH services was provided by the establishment of a nationwide Expanded Programme of Immunization with assistance from WHO, UNICEF and several bilateral donors. The actual utilization of MCH service activities was greatly enhanced by establishing a pattern of service delivery at the various echelons by which all women of fertile age and children below 6 years reporting for medical care are first routed through the MCH section of each echelon for control of child development, immunizations and pre and post-natal care. The policy was adopted in late 1975.

From the above it is all too apparent that the increase of earlier estr lished MCH service delivery, as well as the total of service categories in the low cost primary health care project, is caused by many factors and developments both in health manpower and health facility expansion and a range of sponsorships from government through International (WHO, UNICEF) to multilateral EEC, Scandinavian group, to bilateral developmental cooperation and voluntary agency assistance.

It is thus not possible to isolate the contribution of any particular development assistance to a particular sector or category of the health services or other development sectors (water supply, primary education) except through detailed study of a well circumscribed area; where individual assistance projects cover exclusively one or more development sectors. Such detailed studies were not within the charge of this mission.

On the other hand, it is possible to relate the overall development of health service utilization and coverage of specific (MCH) aspects relative to reported needs to overall investment costs of facility and health manpower development and the recurrent costs of the first two echelons of the health care system e.g. the Rural Dispensary and the Rural Health Center.

The Health Care Needs

The available Health Indicators are a crude death rate of 22, a crude birth rate of 47, a crude rate of population increase of 2.5%, an infant mortality rate of 167 and a life expectancy at birth of 44 years. In spite of the already well established reporting system, no information is available on the major causes of death in the first year of life.

On the other hand, the frequency of diarrhea among the MCH 1st attendances (0-6 yrs) varied from 19% in Jan-June 1976, to 31% in July-Dec. 1976 and 25.7% in Jan-June 1977. (Ref. Annex...) The range of malnutrition diagnosis as underweight (excluding kwashiorkor and marasmus) among these first MCH attendance varied from 18.7% in the first half of 1976 to 26.8% in the second half of 1976 and 27.2% in the first half of 1977. (Ref Annex...) These frequencies are not necessarily additive.

While with good rainfall the country is reported as self-sufficient in food, it is likely that the load of infantile and childhood diarrhea; and common childhood infections constitute a heavy burden on child development, making the strengthening of MCH services all the more relevant to the improvement of health of the rural childhood population. Furthermore three of the communicable deseases (measles, tetanus and tuberculosis) were responsible for 17% of all causes of deaths in hospitals in 1976 (Table II), while deliveries and complications of pregnancy and puerperium accounted for 19.22% of all causes of admission

to governmental voluntary agency hospitals in 1976 (Table III).

Measles accounted for 4.2% of all first MCH attendance below 6 years in 1976 and 8.75% in the first half of 1977 (Annex...).

Health Service Utilization

The reported number of outpatient services of rural dispensaries and rural health centers increased from 55 million in 1974 to 66 million in 1977 with a reported number of outpatient visits to hospitals of 5.5 million in 1976. It is not unreasonable to assume a total of 70 million OPP visits in 1977, or a total number of health service contacts of 4 contacts per person per year, an unusually high rate of health service utilization for most developing countries (except Sri Lanka and Malaysia and a few other smaller countries) indicative of the high degree of accessability and utility to the population of the health services network.

The target population for a dispensary is defined as the population living within 2 hours walking distance or a 10km radius. With the widely varying population density reported above average values have a limited use. However, for the national average, population density for an area of 10 km radius would contain around 5,000 population. With an average of 4 health service contacts per person per year, we would expect 70 visits per day per Rural Dispensary covering a population of 5,000, a figure observed in one of the Rural Dispensaries visited by the Mission.

On the other hand, the Mission observed a rather wide variation in visits to the few dispensaries visited, while the variation in population density must cause a wider variation in Rural Dispensary attendance further varying through the seasons per dispensary. Finally the population density must vary considerably within regions making an overall assessment of general health service utilization more hazardous.

MOST COMMON CAUSES OF DEATH IN HOSPITALS
1973 - 1976 (TANZANIA MAINLAND)

CAUSES	NO OF DEATHS CAUSED BY DISEASES IN HOSPITALS				% TO THE TOTAL NUMBER OF DEATHS IN HOSPITALS			
	1973	1974	1975	1976	1973	1974	1975	1976
1. Pneumonia (all forms)	2,973	1,923	861	838	14.1	13.4	11.09	12.70
2. Gastroenteritis (all forms)	1,317	704	88	162	9.0	10.2	2.70	2.40
3. Malaria (all forms)	659	274	71	188	4.5	3.9	2.18	2.80
4. Tuberculosis (all forms)	663	338	126	417	4.5	4.8	3.87	6.30
5. Defective (all forms)	1,005	554	167	486	6.9	7.8	5.13	7.40
6. Anaemia (all forms)	722	312	255	400	4.9	4.5	7.83	6.10
7. Condition of Early Infancy	495	552	32	431	3.4	7.9	0.98	6.60
8. Measles	1,628	620	860	562	11.1	8.9	26.41	8.60
9. Tetanus	552	134	430	132	3.8	1.9	13.21	2.00
10. Disease of the Heart	659	315	151	301	4.5	4.6	4.64	4.60
11. Meningitis	210	39	11	196	1.5	0.6	0.34	3.00
TOTAL	9,994	6,994	3,551	4,105	68.1	68.5	78.38	62.90

Note fall in #

Hospital Deaths

MOST FREQUENT CAUSES OF ADMISSION TO GOVERNMENT AND V.A. HOSPITALS 1973 - 1976 (TANZANIA MAINLAND)

CAUSES	ADMISSIONS				% TO ALL ADMISSIONS			
	1973	1974	1975	1976	1973	1974	1975	1976
1. Deliveries complication of Pregnancy and Puerperium	107,189	69,289	57,137	87,995	18.3	16.0	18.50	19.22
2. Malaria - all forms	49,241	29,162	28,922	34,789	8.4	6.7	9.36	7.59
3. Pneumonias	39,450	28,417	26,840	36,423	6.8	6.6	8.69	7.96
4. Gastroenteritis and other diarrhoeal diseases	36,160	10,952*	10,561*	9,473*	6.2	2.5	3.42	2.07
5. External causes of Injuries	11,646	13,507	5,874	7,536	2.0	3.1	1.90	1.67
6. Ankylostomiasis	15,846	13,887	7,635	11,291	2.7	3.2	2.47	2.47
7. Measles	23,620	11,567	14,651	22,073	4.0	2.7	4.74	4.82
8. Iron - deficiency Anaemias	11,268	18,509	4,758	9,631	1.9	4.3	1.54	2.10
9. T.B. all forms	9,922	5,670	6,321	8,454	1.7	1.3	2.05	1.85
10. Bronchitis emphysema and asthma	15,444	17,385	8,149	11,184	2.6	4.0	2.64	2.44
11. Neoplasm - all forms	3,831	4,136	4,899	2,798	0.7	1.0	1.58	0.61
12. Ascariasis	11,377	9,975	4,688	7,199	1.9	2.3	1.52	1.57
13. Other Anemias	11,196	3,148	6,093	8,790	1.9	0.7	1.97	1.92
14. Acute respiratory infections	8,964	4,413	2,606	6,688	1.5	1.0	0.84	1.46
15. Dysentries	9,624	3,909*	1,790*	3,673*	1.6	0.9	0.58	0.80
16. Infection of Skin & Subcutaneous tissue	9,989	4,693	5,212	5,152	1.7	1.1	1.69	1.13
17. Bilharzia	7,526	6,307	2,880	5,491	1.3	1.5	0.93	1.19
18. Hernias	5,642	5,227	6,905	4,786	1.0	1.2	2.24	1.05
19. Protein Malnutrition	6,864	4,171	945	5,887	1.2	0.9	0.31	1.29

* why the drop?
use of other facilities

Hospital Admissions

CAUSES	ADMISSIONS				% TO ALL ADMISSIONS			
	1973	1974	1975	1976	1973	1974	1975	1976
20. Other Nutritional diseases	5,819	2,625	2,464	2,172	1.0	0.6	0.80	0.47
21. Whooping Cough	5,902	2,514	1,735	3,197	1.0	0.5	0.56	0.69
22. Nutritional Marasmus	3,777	3,790	2,928	4,385	0.6	0.9	0.95	1.00
23. All other causes 66	170,927	160,153	94,921	167,980	29.8	3.70	30.72	36.69
TOTAL	584,224	433,406	308,912	457,774	100.0	100.0	100.0	100.0

With regard to utilization of MCH service, the information is indicative of the relatively recent expansion of these services, at best half completed, another change-over from specific days for MCH services to daily clinics in the Rural Dispensaries and Rural Health Centers so staffed and equipped (in a recent sample of 200 Rural Health facilities, only 40% were staffed with an MCH aid and by two provided immunizations). ?

Coverage

The target population for the MCH services would be the women of fertile age (15-44 years) and the children of 0-4 years together according to the 1975 data 40.6% of the total population. If applied to the 1977 estimated population of 16.5 million this target population of 6.7 million.

If we assume that the utilization pattern of this target population relates to regular immunization of infants (4 visits per year of children under one year - Ref. Table IV), partial attendance for infant and childhood diarrhea (25% attendance for a generally assumed incidence of 2-3 diarrhe attacks in children under 4 or 2-3 visits per child 1-4 yrs), limited attendance 10% for common childhood diseases (respiratory infections and skin diseases of minimal (2 incidents per year for 0-4 yrs or 1 visit per child 0-4 years) and antenatal care of 2 visits per pregnant women or roughly 4 visits for all women in the fertile age group. One would arrive at a total attendance by the target population of 4.5 visits per person per year, which is close to the old attendance of the total population.

The total attendance to MCH service increased from 3.1 million in 1976 to an estimated 7 million in 1978, or slightly more than one visit per person per year for the target population of the MCH services. With the estimated Expanded Programme of Immunization, aiming at an immunization schedule through four visits per child in the first year of life (Ref. Table IV). That this

TALBE IV

IMMUNIZATION SCHEDULE

	Tetanus	BCG	Smallpox	DPT	Polio	Mea
Before Birth	3 injections					
At Birth		X	X			
1st visit 1-2 months		(X)	(X)	X	X	
2nd visit 2-3 months				X	X	
3rd visit 1-4 months				X	X	
4th visit 6-9 months						X

utilization rate is so much lower than the overall utilization is puzzling, certa indicating that neither a regular immunization schedule for the new-born nor the likely frequent attacks of infant and childhood diarrhea have yet been gene.ally recognized as reason to attend the available services.

From the Mission field visits, it was obvious that the MCH aids, village maternity and nurse aids in the Rural Dispensaries were fully occupied with the M attendances already, though obviously the major workload for the Dispensaries and health centers must be outside the MCH target population. If the Rural Dispensar teamwork would generate better utilization of the MCH services only for regular i nization decided upon by the government the staffing of the Rural Dispensaries as planned at present should be quite adequate to cope with a projected workload. immunizations only, this would consist of 4 visits for infants or 4 visits for 350 newborn (total po. of 7500) or not more than 5 immunization visits per day on the average.

From the above reported MCH attendance of 1 visit per person per year for the target population, one would fear a too low average of immunization. That the Evaluation Report of the Expanded Programme in Immunization by the Government, DANIDA , WHO and UNICEF of 1978 (Ref. Table V) reports for one district (Urumeru) a close to satisfactory immunization level, for the 2nd district surveyed (Iringa) about a 60% satisfactory level and for the third district a definitely unsatisfactory immunization level accounting for the prevailing targets (which may be unnecessarily high for some immunizable diseases considering the level of naturally acquired immunity in the population) is thus surprising and difficult to reconcile.

It is possible that the immunization units are under-reported among the MCH attendance reports because the E.P.T. evaluation report should carry more weight as it is based on actual surveys. On the other hand, a previous survey (1974) reported an even lower attendance by children under 5 years (Ref. Table VI) which even considering a doubling of attendance from 1974 to 1978 cann be reconciled with the EPG evaluation reported immunization coverage.

Problem

TABLE V

AN EVALUATION REPORT OF THE EXPANDED PROGRAMME ON IMMUNIZATION
MINISTRY OF HEALTH, UNITED REPUBLIC OF TANZANIA
A JOINT MOH, DANIDA, WHO, UNICEF REPORT JUNE 1978

Figure 6. Results of the coverage evaluation in 3 districts June 1978

	District		
	* Arumeru	Iringa	Kisarawe
Estimated total population	** 150,000	269,000	235,900
Estimated population children 12-16 months	1,500	2,690	2,359
Children 12-16 months examined	216	207	212
% of children 12-16 months examined	14.4	7.7	8.9
Coverage (in %)			
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	40	53	33
Polio II	70	43	23
Polio III	53	34	17
Measles	46	36	17
Cluster Distribution by % Coverage of Measles Vaccinated.			
0-20%	6	11	21
21-40%	9	9	2
41-60%	8	6	6
61-80%	1	0	1
81-100%	6	4	0
TOTALS	30	30	30

* No impact noticed from rural dispensaries in Arumeru (Arusha) District with different situation in Iringa and Kisarawe

** More recent estimates reveal higher figures than reported
Arumeru 240,517 Iringa 290,101 Kisarawe 222,453

Frequency of Units to Dispensary for Children <5 Years
By Number of Interviewed Mothers

	District 1		District 2		District 3		Total		
	Strat 1	Strat 2	Strat 1	Strat 2	Strat 1	Strat 2			
Unknown	155	133	353	144	300	284	1399	40.3%	48.5
None	46	39	26	54	50	70	285	8.2	
One	27	23	15	20	21	28	134	3.9	16.5
2-3	107	84	51	66	72	66	446	13.	
4-6	104	93	49	32	72	68	418	12.	
7-11	80	64	36	15	68	50	313	9	35.
12+	104	56	132	68	60	61	476	14.	
	623	487	662	429	643	627	3471	100.4	

Child Protection Baseline Survey. March 1974. Community Medicine Department, Medical College. University of Das es Salaam.

Districts: Bajamoyo, Dodma, Moshi.

Introduction to Costing - Tanzania

The following presentation outlines investment and recurrent costs associated with rural dispensaries (R.D.s) and Rural Health Centers (RHCs), the two lowest functioning tiers in the Tanzanian Health Care System. It is through these facilities that the bulk of primary health care - both curative and preventive - is delivered to the Tanzanian population. Below the dispensaries is a tier composed of village medical helpers. This contingent of personnel and their respective offices/clinics is not yet implemented on a scale sufficient to allow reasonable estimation of costs or coverage, and so is not dealt with here. Within the system of RHCs and RDs more information has been obtained regarding the maternal and child health aide training program than any other element. This reflects primarily greater availability of detailed information on the A.I.D. sponsored program. Figures for discrete categories of costs, e.g., for construction of schools for rural medical aids or for drugs used in Rds, were not available. Overall figures, occasionally estimates, were available however and were readily provided.

All parties contacted in this study were most open and helpful, often going out of their way to search out information or interrupt busy schedules in order to accomadate our many requests.

Table 1b

SUMMARY OF SELECTED INVESTMENT, RECURRENT AND TOTAL COSTS - TANZANIA

MCHA Training	1975-1976	1976-1977	(1977-1978)[1]	Estimated full 1977-1978
Investment[2]	1,099,700	1,915,100	(1,113,600)	2,672,640
Recurrent[3]	1,149,800	2,333,300	(1,038,500)	2,492,400
Total	2,249,500	4,248,400	(2,152,100)	5,165,040
# MCHAs graduated	164	328		540[7]
Cost per MCHA	13,716	12,952		9,565
MCH Services				
Investment[4]	997,600	997,600	1,506,133	1,506,133
Recurrent[5]	<200,000	446,970	(516,220)	640,749
Total	<1,197,600	1,444,570	(2,022,353)	2,146,882
Total all MCH	<3,447,100	5,692,970	(4,174,453)	7,311,922
Overall RHC & RD Services				
Investment	7,753,433	13,119,493		9,329,473
Recurrent	7,000,000	7,810,000		11,880,000
Total[6]	14,753,433	20,929,493		21,209,473

1. Figures for MCHA training and recurrent MCH Services cost (which are dependent on training costs for estimation of the cost of retraining) based on data from 5 months rather than 1 year, due to delays in processing invoices within the government.
2. School construction, durables, vehicles, plant and maintenance (mostly vehicles), initial domestic training of school staff and overseas training of coordinators.
3. Nondurables, transportation (not vehicles), utilities, orientation seminars, student allowance and staff salaries.

4. One-third of construction costs for new RHCs and RDs, and full cost of MCH kits.
5. All MCH - related salaries, vaccines (estimated at 2/3 of what UNICEF has budgeted for 1980-82 - the only available figure on vaccine costs), and 1/3 of estimated replacement training costs.
6. These figures should be ragarded as upper limits since government budgets were used in some cost categories, and these budgets include an undetermined amount of international assistance, leading to double-counting since international assistance played a large role particularly in investment costs which have been added in. A reasonable estimate of the range of double counting is 10 to 30%. However, this is not an issue in regards to MCH training or services.
7. There were only 40% of students who passed the final exam in 1978 due largely, it is thought, to a change in the background of the student body - that was the first class of non-experienced young women and they took an exam previou designed for experienced village midwives who subsequently went to MCHA school. This situation is not indicative of long-term trends and has been ignored in estimating cost per student, even though the effective cost per graduate in 1978 was closer to 5,165,040/216 = 23900 (216 = 40% of 540).

1. As close as possible using available data. One notable exception is the case of MCHA schools for which the yearly period Nov. - Oct. was generally employed for funding by AID. A sliding scale was used (100% first year of operation, 80% second year, 60%...), which would have made estimation of cost by normal budget year very difficult. In this year are also

2a. E.G., food, uniforms, misc. supplies

2b. Educational supplies and equipment

3. These represent primarily the contributions of the Scandinavian countries.

4. These figures for 5 months only.

5. Estimates of staff salary requirements are made from expected staff patterns, available staff, and from salary scales for individual workers, as follows:

5. Table A

ESTIMATION OF THE NUMBER OF PERSONNEL BY TYPE REQUIRED FOR RURAL HEALTH CENTERS (RHCs) and RURAL DISPENSARIES (RDs)

	RHC			RD			OVERALL	
Personnel Type	Av. RHC Staff	RHCs 1977	Staff Req.	Av. RD Staff	RDs 1977	Staff Req.	Total Staff Req. 1977	Total Staff Avail. health system - 197
		161			2088			
AMO	1		161				161	233
RMA	1.5		241	1		2088	2329	1393
Nurse B	1		161				161	?
MCHA	2		322	1 (or N.M. or V.M.)		2088	2410	1400[a]
L.A.	1		161				161	?
P.A.	1		161				161	?
I.A.	1		161	.5		1044	1205	?
Driver	1		161				161	?
Sweeper	1		161					?
Tot AMO, RMA, Nurse B and MCHA Required =							5061	5061
Tot AMO, RMA, Nurse B and MCHA Available =								> 3026

a. MOH figure including village midwives and MCHAD. As of 1977, a total of 492 MCHADs had been trained in MCHA schools.

5. (continued)
Assuming at least 20% of the available stock of workers does not work in RHC's or RD's, this implies that the number actually working in RHC's and RD's is equal to 2420. Staff salary requirements are calculated assuming that $\frac{2420}{5061}$ = 50% of RHC's and RD's are staffed as indicated above using the salary table noted below. As evidenced in table 1, the estimates thus obtained are roughly 1/2 of the estimates given by the MOH (Mr. Dhalla) on a per RHC and per RD basis. The true figure probably lies between these two estimates since his admittedly very hypothetical estimate includes drugs, supplies and other resources.

NOTE 5 TABLE

CATEGORIES OF PERSONNEL - TANZANIA RURAL HEALTH CENTERS AND RURAL DISPENSARIES
YEARS OF TRAINING, and PRELIMINARY EDUCATION AND SALARY

		Years of Training	Preliminary Education	Salary
M.D.[1]		6	2°	$3050
A.M.O.	Asst. Medical Office	4	2°	$1900
M.A.	Medical Assistant	3	2°	$1500
PHNA	Public Health Nurse A a grade A nurse who has spent one year studying in the US in preparation for a position as an MCH cooridnator	4	2°	$20.
Nurse A		3	2°	$2000
PHN - B	A grade B nurse with 1½ years subsequent training in public health	4 1/2	1°	$1500
NM	Nurse Midwife	4	1°	$1200
Nurse B		3	1°	$1840
RMA	Rural Medical Aid	3	1°	$1840
HA	Health Auxilliary	2	1°	
LA	Lab Assistant	2	1°	$ 700
MCHA	Maternal and Child Health Aid	1 1/2	1°	$ 700

[1]Provided for reference.

6. These represent the sum of all costs of construction for schools completed in the year indicated. Six schools were opened in 1975, 8 in 1976, and 3 in 1977. One more is planned.

TABLE 6

CONSTRUCTION COSTS - MCHA TRAINING SCHOOLS, TANZANIA

1.	Njombe	$ 126,900	Rate of Exchange of
2.	Tukuyu	124,800	Bill Submitted
3.	Mwambani	127,900	
4.	Same	88,800	Billed Through Treasury
5.	Korogwe	89,800	Not in MOH Bills
6.	Nzega	104,500	
7.	Kahama	122,600	12 Contractors, 4 African
8.	Morgoro	91,800	1 Built 3
9.	Singida	78,500	
10.	Kondoa	83,100	Ministry of Works
11.	Nachingwea	130,700	Reimbursed Extra 16
12.	Mtwara	125,200	Percent on Some Aspects
13.	Mbulu	134,600	
14.	Tunduru	123,900	
15.	Geita	143,700	
16.	Bagamoyo	108,340	
17.	Kibondo	132,000	
18.	Tarime	140,700	

7 Table 3 includes figures on the cost of construction of particular schools and of training specific personnel. Operating expenses paid through bilateral agencies probably support the bulk of costs associated with training --- categories of personnel for RHCs and RDs other than MCHAD. They do not however, indicate costs incurred in the past. These are also estimated in Table 3.

8. Estimated based on the present estimated cost of training each category of worker, assuming that each school which started operation in the designated year had a principal, a tutor (each A nurse-A), and a warden (A nurse-B).

9. Figure from MOH recurrent health budget (see attached). This table excludes the costs of training and salaries for superviosry personnel aside from those in the MCHA program, e.g., district medical officers. This is primarily because these personnel have many obligations aside from those to the system of RHC's and RD's. This was not the case with MCH coordinators at the zonal, regional, and district levels. Also n mentioned are programs at the village level for which little information could be found.

10. This figure combines a part-year expenditure with a budgeted figure and thus is not an accurate estimate of yearly cost.

NOTE 11, TABLE A

Estimates of Selected Assets Existing
Relevant to the Costing of RHC's & RD's
Tanzania, as of 1975

Type	Est Unit cost	Est # in 1975	Est # used in RHC or RD area	Total Assests Relevant to RHC, RD at approx. 1977 prices
I. Facilities	$			
RMA school[1,2]	200,000	13	13	$ 2,600,000
RHCs	79,000	130	130	10,270,000
RDs	6,000	1700	1700	10,200,000
II. Personnel training				
AMO	5,800	160	80	464,000
Nurse A	2,700			
NM	3,600	4465	800	2,400,000
Nurse B	2,700 -- (av. $3000)			
RMA	1,800	790	700	1,260,000
				27.194,000

[1]Cost for MCHA schools (past 1975) was an average of $115,430 per school.

[2]Other categories of personnel are trained in either hospitals or in the field. No figures were obtained on these.

12. Estimated from the as-umption that much of the network of MCH coordination was yet to be established, and that nurses returning from overseas training in public health constitute the bulk of the coordination force at present. Twenty-nine such nurses have been or are completing such training.

13. Estimated as 15% of the recurrent expenses of all training programs in a given year.

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TABLE 13

NATIONAL HEALTH TRAINING PROGRAMME, 1972-1977 TANZANIA MAINLAND

Type of Taining	No. of Tr. Institutions (1977)	1972[1]	1973	1974	1975	1976	19
1. Graduate Doctors	1	90/47	71/60	71/53	80/58	96/41	90,
2. Asst. Medical Officers	3	-/22	22/-	22/24	-/-	41/33	33
3. Medical Assistants	7	146/48	200/72	191/86	206/140	261/171	2
4. Rural Medical Aides	13	146/40	353/43	459/85	347/94	454/259	5
5. Nurse Tutors	1	-/-	18/-	18/15	19/18	17/21	
6. Nurse/Midwives 'A'	3	126/39	130/37	129/59	129/81	122/96	1
7. Nurse/Midwives 'B'	21	530/270	500/331	488/355	474/423	492/360	5
8. Public Health Nurses	1	-/-	-/-	-/-	-/-	-/30	35
9. Maternal & Child Health Aide	14	-/-	-/-	-/-	172/-	460/163	6
10. Health Officers (Sanitarians)	1	26/20	20/24	12/16	16/18	16/13	
11. Health Auxiliaries	1	63/31	35/30	45/34	45/45	44/45	

1. 1972 is the year of the 'big push' in Rural Development.
(a) Excluding 5 Resits who will complete in 1978.
(b) Excluding 7 Failures who will resit in February, 1978.

TABLE 19

MEDICAL FACILITIES AS AT 1ST JANUARY 1977

TANZANIA (MAINLAND) - RURAL DISPENSARIES

Region	Estimated Population (1976)	Density of Pop. Per Km^2	Rural Dispensaries		Population Per Dispensary
			Existing	Under construction	
Arusha	801,000	9	109	5	7,349
Coast	475,000	17	95	-	5,000
Dodoma	945,000	23	133	3	7,100
Dar es Salaam	576,000	707	34	8	16,941
Iringa	913,000	17	134	11	6,815
Kigoma	586,000	16	77	7	7,610
Kilimanjaro	876,000	66	100	9	8,760
Lindi	522,000	8	89	4	5,865
Mara	757,000	35	101	2	7,495
Mbeya	821,000	16	119	3	6,899
Morogoro	830,000	17	158[1]	4	5,253
Mtwara	816,000	49	88	11	9,272
Mwanza	1,340,000	69	151	23	8,874
Ruhwa	371,000	9	56	4	6,625
Ruvuma	535,000	8	77	2	6,948
Shinyanga	1,172,000	24	137	6	8,562
Singida	596,000	13	77	9	7,740
Tabora	783,000	8	87	6	8,988
Tanga	1,187,000	42	1[illegible]1[1]	4	6,942
West Lake	954,000	33	95	12	10,042
Grand Total	15,855,000	17	2,088	133	7,593

[1] Note: Shows an increase of 35 because Private, Parasital, Military dispensaries have been included from figures of 1976.

TABLE 20

MEDICAL FACILITIES AS AT 1ST JANUARY 1977

TANZANIA (MAINLAND) - RURAL HEALTH CENTRES

Region	Estimated Population (1976)	Density of Pop. Per Km^2	Rural Health Centres		Population Per R.H.C.
			Existing	Under construction	
Arusha	801,000	9	10	1	80,100
Coast	475,000	17	5	2	95,000
Dodoma	945,000	23	12	2	78,750
Dar es Salaam	576,000	707	5(a)	2(a)	115,200
Iringa	913,000	17	7	4	130,429
Kigoma	586,000	16	5	3	117,277
Kilimanjaro	876,000	66	7	6	125,142
Lindi	522,000	8	6	3	87,000
Mara	757,000	35	8	3	94,625
Mbeya	821,000	16	9	4	91,111
Morogoro	830,000	11	9	3	92,222
Mtwara	816,000	49	7	4	116,571
Mwanza	1,340,000	69	18	4	74,444
Ruka	371,000	9	4	2	92,750
Ruvuma	535,000	8	8	2	66,875
Shinyanga	1,173,000	24	10	6	117,300
Singida	596,000	13	6	3	99,333
Tabora	783,000	8	6	2	130,500
Tanga	1,187,000	42	12(b)	1	98,917
West Lake	954,000	33	7	3	136,297
Grand Total	15,855,000	17	161	60	98,472

Note: (a) Urban Health Centres

(b) 2 of these are Urban Health Centres

TABLE 21

MEDICAL FACILITIES AS AT 1ST JANUARY 1977

TANZANIA (MAINLAND) - HOSPITALS

Region	Estimated Population (1976)	Density of pop. Per Km^2	Number of Hospitals (Govt.V.A. Ind. etc.)	No. of Hosp. Beds[1]		Population per Hosp. Bed.
				Existing	Under constr.	
Arusha	801,000	9	9	1,019	-	786
Coast	475,000	17	5	409	39	1,161
Dodoma	945,000	23	4	858	-	1,101
D'Salaam	576,000	707	5	1,429	-	403
Iringa	913,000	17	9	1,092	-	836
Kigoma	586,000	16	5	620	26	945.1
Kilimanjaro	876,000	66	12	1,394	26	628.1
Lindi	522,000	8	7	707	-	738
Mara	757,000	35	4	582	48	1,300
Mbeya	821,000	16	12	1,333	-	615
Morogoro	830,000	11	9	1,308	70	634.5
Mtwara	816,000	49	7	1,122	26	727
Mwanza	1,340,000	69	7	1,267	52	1,057
Ruvuma	371,000	9	3	225	52	1,648
Ruvuma	535,000	8	7	1,215	104	440
Shinyanga	1,173,000	24	6	439	210	2,671.9
Singida	596,000	13	4	593	13	1,005
Tabora	783,000	8	5	853	-	917
Tanga	1,187,000	42	12	1,950	-	609
West Lake	954,000	33	9	1,555	-	613
Grand Total	15,855,000	17	141	19,970	664	793

1. Special Hospitals like Leprosaria, Mental Hospitals and Parasital TB Centres have been excluded.

TABLE 23

KEY HEALTH MANPOWER INVENTORY AS AT END OF YEAR

	1972	1973	1974	1975	1976	1977	1978	1979	1980
1. Medical Doctors*	494	533	603	637	683	727			
National	195	231	278	324	356	400			
2. Assistant Medical Officers	140	140	160	160	193	233			
3. Medical Assistants	335	405	485	605	770	930			
4. Rural Medical Aids	578	621	706	790	1,049	1,393			
5. Nurses/Midwives	3,259	3,264	4,000	4,465	4,820	5,658			
6. Village Midwives/MCHA	700	775	850	910	960	1,400(a)			
7. Health Officer	78	98	122	138	156	170			
8. Health Auxiliaries	290	325	370	410	455	500			
9. Dentists	n.a.	n.a.	n.a.	12	15	18			
10. Assistant Dental Officers	27	27	27	27	27	27			
11. Dental Assistants	n.a.	n.a.	n.a.	15	21	27			
12. Pharmacists	n.a.	n.a.	n.a.	n.a.	11	25			

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Many Types

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*Excluding 34 Cuban and 64 Chinese doctors.

(a) Village Midwives up-graded to Maternal and Child Health Aids.

TABLE 24

GOVERNMENT RECURRENT HEALTH BUDGET BY TYPE OF ACTIVITY

1971/72 - 1977/78

Type of Activity	1971/72 Sh '000	%	1974/75 Sh. '000	%	1977/78 Sh '000	%	% Change 1971/72-1977/78
1. Administration	2,210.0	1.4	2,631.8	0.9	2,892.5	0.5	30.9
2. Hospital Services	121,964.0	78.9	181,792.5	60.2	351,223.5 (a)	65.5	188.0
3. Rural Health Centres	8,538.0	5.5	22,416.1	7.4	38,357.9	7.3	349.3
4. Rural Dispensaries	8,300.0	5.4	35,328.8	11.7	59,690.9	11.1	619.2
5. Preventive Services	5,965.0	3.9	37,499.7	12.4	47,098.2	8.8	689.6
6. Training and Manpower	4,767.0	3.1	18,875.5	6.3	27,570.4	5.1	478.4
7. Medical Production and Supplies	2,776.0	1.8	3,338.2	1.1	9,370.7	1.7	237.6
Total	154,520.0	100.0	301,882.4	100.0	536,204.1	100.0	247.0

(a) Shs.80 m. for Muhimbili Medical Centre 50% of which is for training of undergraduate doctors, pharmacists and post-graduate doctors. This has a distorting effect on the structure of expenditure.

. TShs. 7.9 = US $1.00 1973

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The Government Health capital expenditure over the past 6 years reflects the drive towards the implementation of the rural health, training and preventative programmes.

The following table shows the structure of the Health capital expenditure over the past few years:

TABLE 25

GOVERNMENT HEALTH CAPITAL EXPENDITURE
1971/72 - 1977/78

Type of Programme	1971/72		1974/75		1977/78	
	$ '000	%	$ '000	%	$ '000	%
1. Hospital Services[1]	2,280.2	52.0	8,860.0	22	23,454.0	19
2. Rural Health Centres and Dispensaries	1,447.1	33.0	17,727.0	24	43,160.0	36
3. Preventive Services	87.7	2.0	5,767.0	8	28,109.0	24
4. Training Programmes	570.0	13.0	39,635.0	55	23,999.0	20
5. Manufacturing and Supplies	-	-	360.0	1	1,070.0	1
	4,385.0	100	72,359.0	100	119,792.0	100

[1] Line item reflects the de-escalation of Government's involvement in hospital construction.

Table I

INVESTMENT AND RECURRENT COSTS FOR RURAL HEALTH CENTERS AND DISPENSARIES - TANZANIA

(In U.S.: 8.25 Shillings Tanzania = $1 U.S.)

Investment Costs	1975 - 1976 Phase Year[1]					1976 - 1977					1977 - 1978					1978 - 1979					1980 - 1985 Average Annual Cost Each Year	
	NEW	AID	Other Bilateral[3]	UNICEF/ Other UN	TOTAL	NEW	AID	Other Bilat.	UNICEF/ Other UN	Total	NEW[6]	AID[6]	Other Bilat.	UNICEF/ Other UN	TOTAL	NEW	AID	Other Bilat.	UNICEF/ Other UN	TOTAL	Other Bilat.	UNICEF
Initial Training of Personnel																						
MOH Project																						
School Construction[8]		807,000					832,000					546,500										
Dormitories[8]		676,500					1,352,000					622,500										
Dormitories[8]		185,700					149,700					30,000										
Vehicles Plant Motor		69,100					369,000					180,000	200,000									
Transportation		11,500					45,000					26,700										
Production		45,200					120,200					85,200										
Initial Domestic Training[8] School Staff	57,200					60,600					76,100											
Overseas Training for Coordinators	23,500	86,100				49,800	153,000	3,500			98,600	282,800				49,800	149,800					
Orientation Seminars		12,100					22,900					8,800										
Trainee Stipends		9,700					181,200					157,500										
Staff Salaries		415,400					647,900					158,000										
Total Cost of MOH Training Project	75,700	2,171,600			2,249,500	110,400	4,134,500	3,500		4,248,400	174,700	1,[illegible]	270,000		2,152,700[5]							
Other Training Programs[11]																						
Construction & Equipping			472,500					1,018,000														
Operating Expenses								848,500														
Construction and Equipment	2,149,000[10]					2,149,000[9]					3,690,000											
RC			1,784,700					1,182,000								5,231,000						
RD			678,500					1,842,400														
Staff Quarters																					180,000	170,[illegible]
Transportation																					35,000	207,[illegible]
Motor Vehicles								310,300	230,000			184,000						47,000	60,000			
Bicycles																						23,[illegible]
Supplies																						
MOH Kits		141,333	55,600	60,500			141,333	55,600	60,500			141,333	35,600	60,500								41,[illegible]
Medicine Kits																						41,[illegible]
Miscellaneous			145,500					436,400	544,000													21,[illegible] 97,[illegible] 45,[illegible]
TOTAL INVESTMENT COSTS	2,224,700	2,337,133	3,122,100	60,500	7,753,433	2,259,400	4,297,833	5,690,700	845,500	13,310,433	3,954,700	2,176,753	255,600	60,500	2,636,[illegible][5]	5,280,000	148,800	47,000	60,000	5,535,000	341,000	537,[illegible]
Recurrent Costs - Total																						
Salaries for RC and RD Staff[8]											2,600,000											
Salaries per RD											(8,962)											
Salaries per RC											(15,000)											
Fuel per RD											(1,815)											
(MOH Fuel)											(6,400)											
MOH Salaries						98,000					225,500											
Salaries for MOH Coordinators[12]						16,000					32,000					30,000						
In-service Training (Seminars)																						
Supplementary Training	500,000					625,000					400,000											[illegible]
Transport									910,000													
Building and Maintenance	4,6[illegible]																					
Image																						
Vaccines																						[illegible]
Total Recurrent Costs	7,000,000[1]				7,000,000	3,000,000[10]			810,000	7,810,000	11,000,000[10]				1,000,000[5]	N.A.						39,[illegible]
Cost Per Dec. Case per MO											70,000											
per MO											7,500											
TOTAL MOHW & INVESTMENT COSTS	9,224,700	2,337,133	3,122,100	60,500	14,753,433	5,259,400	4,297,833	5,690,700	1,675,500	20,920,433	13,000,700[11]	2,176,753[6]	255,600[6]	60,500	3,636,[illegible][5]	N.A.				N.A.		937,[illegible]

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