EVALUATION OF TANZANIA CANCER CONTROL PROJECT

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I. SUMMARY

This final evaluation of the Tanzania Cancer Control Project reveals that a larger number of the proposed project outputs were accomplished in spite of the untimely death of the expatriate project Director, Dr. Ulrich Henschke and the unplanned dispersement of most project funds during the first two years. Tanzania was fortunate to have a trained local national replacement available almost immediately following the loss of the first project Director. Because of the energies of numerous participants in project activities, most of the planned outputs were attempted and many of the end-of-project status indicators were achieved. The most impressive achievement was the institutionalization of a sophisticated cancer control center for Tanzania, capable of providing diagnosis of cancer, radiation therapy, chemotherapy and surgery for cancer patients. This enhanced capability provides the nation with a cost effective way of handling most cancer patients without the expense of sending them to Europe or other countries. Some progress was made on improving the data base about cancer in Tanzania, mounting public education campaigns and linking the rural hospitals to the cancer treatment center into an organized network of collaborating centers. A significant amount of continuing education and training of health workers was achieved.

The project fell short of reorganizing, computerizing and analyzing the available reports on cancer and performing the research projects suggested in the project paper. The center trained a strong cadre of professionals, only to lose many of them following the death of the first project Director, thus the cancer center remains understaffed. The present cost of the cancer center is supported by the GOT and will continue even though AID support has been discontinued.

II. EVALUATION METHOD

This final review is called for by the project paper and project implementation letter of December 1977. It follows up on the recommendations and project revisions made after the mid-term evaluation conducted in November 1980. This review was carried out in cooperation with the Tanzanian Cancer Center, the Muhimbili Medical Center (MMC), the USAID Mission to Tanzania and the Sponsor - Coordination in Development, Inc. (CODEL). It had been hoped that a multi-country, multi-disciplinary team would present their finding to a seminar, however funds for this meeting were not available. The purpose of the proposed meeting was to share the Tanzanian experience in cancer control with other African countries and International Health Agencies.

Information regarding the project, during this evaluation effort 27 January to 5 February, was obtained by:

1. Review the project documents, agreements, reports, correspondence, financial files, cables and memoranda. A review of records at the Ocean Road Hospital, the Tumor Registry, and Muhimbili Medical Center Radiation Therapy Units were also made.

2. Site visits were made to Ocean Road Hospital Cancer Center, and Muhimbili Medical Center, the Tumor

Registry and the Moshi Zonal Hospital at Kilimanjaro. Meetings were held with the Project Director, his staff, the members of the Tumor Board at MMC, the Director of Moshi Hospital, a representative of the Ministry of Health, the CODEL Coordinator, USAID/Tanzania Health Officers, Program Officer and an Oncology consultant from Harvard University Medical School. An interview with the Chairman of the Radio Therapy department at Howard University by the team leader was made prior to the field visit.

At the end of these discussions the USAID/Tanzania Evaluation Specialist made a list of the most important issues from these reviews including those which deserve AID's attention. These issues were discussed at the final review meeting with the Mission Director held on 3 February 1983, Dar es Salaam.

III. External factors have strongly influenced the project. The death of the first project Director, Dr. Ulrich Henschke, during year 3 significantly delayed progress toward completing the planned outputs. The project was fortunate to have its leadership assumed by a very capable Tanzanian Physician, Jeff Launde, who had been trained under project sponsorship. The sequelae of the aircraft accident in which the C.O.P. lost his life has not yet been cleared at the time of the final evaluation - several lawsuits and other claims for compensation continue to linger unresolved. The economic deterioration of Tanzania has also prevented full support of the recurrent cost. Lack of foreign reserve by the GOT's retards import of vital consumables such as petrol, spare parts and cancer medicines.

IV. PROJECT INPUTS

Project inputs include: a) $550,000 provided through AID grant 621-0147 to CODEL for technical assistance, commodities and administrative cost; b) $159,000 from Howard University for the salary of the project director, training several physicians, technicians, registry, providing residents (4) to staff the Tumor Center, administrative cost;

c) Muhimbili Medical Center $82,000 for salaries, training materials and administrative cost, recurrent cost of operating the Radiation Therapy Units, and the Ocean Road Hospital.

The evaluation has not identified problems with the delivery of the project inputs. The AID grant financed technical service provided through CODEL which were instrumental in achieving a large measure of success in the project. Most of the project inputs occurred early in the project and consumed most of the fiscal resources during the 36 months, leaving meagre support for the work of the Tanzania project director during the last 27 months. The GOT continues to provide strong support for the project, even though AID support has been minimal during his tenure. The project assistance completion date was extended by 90 days from 31 December 1982; in order to permit delivery of equipment.

The Cancer Center has become institutionalized within the Muhimbili Medical Center and recognized as a vital resource for the care of cancer patients. Ninety patients receive therapy each day. It has also served as an organizational focus for National Cancer activity and has attracted resources from the U.S. National Cancer Institute, the World Health Organization, the German Cancer Center, and a German Medical Equipment Manufacturer. A special organization has been formed to arrange support for the Center by the family of Dr. Ulrich Henschke - called the Friends of the Tanzania Tumor Center. It is directed by the daughters of Dr. Henschke.

Howard University College of Medicine and Howard University Hospital played a major role in the development and implementation of the project. Dr. Ulrich Henschke was Chairman of the Department of Radiation Therapy at Howard University and conceived the project. He arranged the agreement for MMC and the University of Dar es Salaam to serve as the focus of the Tanzanian Tumor Center. He had previously been involved in the establishment of the Radiotherapy Unit at MMC and installed the "Janus Unit" in 1971. He was able to gain the support of Howard University for the project, and arranged visits to Tanzania for the Vice President for Health Affairs, Carlton Alexis MD, and the Dean of the College of Medicine, Marion Mann.

As project director, Dr. Henschke persuaded USAID/ Tanzania to fund the project as an operational program grant through CODEL. CODEL served as a management mechanism for the grant but provided little in the way of technical input or management. This PVO had another project in Tanzania (Hanang District Primary Health Care project) which served as a cooperating clinical site for cancer.

Howard University Department of Radiation Therapy played a major role in the training of personnel and making the Radiation Unit operational. The University hospital provided training for the project director, a gynecologist, and a radiation technologist. Four radiation therapy residents were stationed at MMC on a rotational basis, during the time Dr. Launde was being trained. They were doctors: Cheek, Alexander, Hanton, Dulay. A radiation technologist from Howard worked on the equipment at MMC and Ocean Road Hospital. The Audio-Visual department assisted in making video tapes for teaching physicians and patients and taught the project staff how to use the equipment in the field. It had been planned that Dr. Alfred Goldson replace Dr. Henschke at Howard when the latter retired and became the full time project director in Dar es Salaam. Up until the time of the airplane crash, Dr. Henschke spent approximately three months per year at the MMC in three/year trips. During those visits he coordinated the work of the Center, visited rural hospitals, met with Ministry officials and members of local Missionary hospital groups. While in the United States and Europe, he organized support for the project. He arranged for the Wings of Hope Company to secure an aircraft and a pilot for project use in Tanzania. He used his own funds to make many of the project purchases and was reimbursed by CODEL. Thus, most of the project equipment was titled to Dr. Henschke, rather than CODEL.

After the death of Dr. Henschke there has been little or no contact with Howard University for unexplained reasons.

Project funds have been used to support consultants from Howard University on the subjects of radiation therapy and cancer surgery.

Consultants Visits to the Cancer Center
Dr. John Ziegler - National Cancer Institute,
Bethesda, MD, USA 1979

Dr. Lasalle Lafall
Chr. Dept. of Surgery
Howard University, College of Medicine
President American Cancer Society, 1978

Dr. Kurt Schear
Director General
German Cancer Center
Heidelberg, West Germany

Dr. Bruce Hintz

Mr. Thomas Rhodes
Architect, Germany

Dr. Roy Snider
Asst. Director, Howard University
Cancer Center
Washington, D.C.
Concerning public health measures of cancer prevention

Dr. Henry Wellman
German Cancer Center
Heidelberg, W. Germany

Dr. George Jones
Chr. Dept of Urologic Surgery
Howard University
Washington, D.C.

Dr. Guston Wagner
Director of Institute for Medical Documentation
and Biostatisk, Misioni to Help Epidemiologic
Studies, 1979

Dr. Dennis Burkitt, Surgeon - Great Britain
Mission: mid-term evaluation, 1980

Dr. Alfred Goldson
Faculty, Dept. of Radiotherapy
Howard University

Succeeded Henschke as Dept. Chairman in radiotherapy at Howard University, was with Henschke at time plane crashed.

Dr. Patyr
German Cancer Institute
Mission to install Radiotherapy machine at Ocean Road
Hospital, a mission not yet completed

Dr. Ross Berkowitz
Harvard University Medical School
Dept. of Obstetrics and Gynecology

Dr. Sam Hillman
Harvard University
Dept. of Radiotherapy

V. PROJECT OUTPUTS

This project was over-ambitious in design compared to the resources available. After the mid-term evaluation and change of project directors, two outputs were deleted while two others were revised:

Planned Outputs as of December 1982	Actual Achievement as of January 1983
I. Cancer Survey	
1.1 Coding of the existing cancer/ tumor registry	a) The project director revised the existing tumor registry form and developed a coding book with instructions for use of the form. This new system was not implemented. This output was deleted in 1981. The codes were found at Howard University.
1.2 Review the clincial records of Representative Hospitals to estimate the incidence of cancer in Tanzania	The records at six hospitals were reviewed prior to the airplane crash. The report of this Review was lost in the plane crash. No effort was made to continue this review because of transportation problems and heavy burden of clinical work at the Tumor Center after 1980.
1.3 Sample survey of Hanang district MCH project patients for Cancer of the Cervix by histopathology (Pap) smear and household interview.	A Pap Smear Survey of patients was performed during the first two (2) years of the project, but the later reports were lost by WHO. The logistic problems were too great to continue the effort. The project has decided instead to train a cyto pathologist for the Cancer Center and provide Pap Smears for urban dwellers only. The household survey was not attempted.
1.4 Yearly statistical publication	The effort to compile and analyze cancer data was abandoned early in the project. The microcomputer purchased for this purpose broke down soon after arrival and was not replaced or repaired. No effort was made to perform this task manually. The Tumor Registry Review by Evaluators revealed that the number of proven cases of cancer had climbed from 1500/year in 1977 to 2210/year in 1982. The Ministry of Health reported 6000 clinical diagnosis of cancer in 1981 from hospital reports. An analysis was made of estimated

		cancers reported in 1975 (prior to project) which was submitted with the First Annual Report (Appended). This activity was discontinued in 1980.
2.	Cancer Training	
2.1	Physicians	Dr. Jeff Launde trained at Howard and Harvard Universities. He is qualified for American Board of Radiotherapy and now serves as the Project Director (Since Oct 1980).
2.1.1	Radiotherapy and Nuclear Medicine	
2.1.2	Chemotherapy Medicine	Dr. Muindi, an Internist, trained at the Royal Marsdon Hospital from 1978-1980. He is now in Germany at the Cancer Centre. His return is expected.
2.1.3	Gynecology Oncology	Dr. Mgaya trained one year at Howard University 1978-1979. Returned to MMC in 1979 and works with the Cancer Center. He is receiving continuing education with visiting professor from Harvard Medical School, Dr. H.R. Berkowitz.
2.1.4	Chemotherapy Radiotherapy	Dr. Nkoma - trained at MMC Cancer Center by Howard University Resident (Dr. Alexander) in 1978 and by Dr. Wellman (University of Indiana). He is now studying in England on British Council fellowship. He is expected to return and serve as deputy director.
2.1.5	Continuing education of other physicians	Cancer teaching rounds and an effective Tumor Board have been instituted during the project. These activities have made great progress in rationalizing the treatment decisions necessary for the various forms of cancer. Many patients were being referred for treatment overseas at the expense of GOT when there was obviously no better treatment modulities available elsewhere. The Tumor Board

	review process resulted in a significant cost saving (especially foreign exchange) to the GOT. The level of physician awareness of the various forms of cancer and the appropriate treatment was raised. As a result the diagnosis of cancer is being made earlier and the possibility of curative rather than palliative, has become more frequent. The Cancer Center staff address various medical groups each year.
2.2 Medical Students	All medical students at the University of Dar es Salaam receive a series of lectures on cancer diagnosis and treatment and the public health aspects of cancer prevention.
2.3 Allied Scientists	
2.3.1 Physicist	
2.3.2 Engineers	Mr. Macha at the Dar es Salaam Institute in electrical engineering.
2.4 Electronics	One person was trained to repair and maintain electrical equipment and is still with the project.
2.5 Technologist. Plan to establish a school for technologists.	Ms. Ndewelle was trained for 8 months at Howard University but left the project. Mr. Mhina, Mr. Mbuya and Ms. Profiri were trained at MMC; all left the project. The training program was directed by Dr. Hanlon a Radiotherapist from Howard University. Mr. Julius and Ms. Kisomo were trained at the University of Dar es Salaam. Both left the project.
2.6 Registrars	Ms. Kulwa was trained as Secretary. She expired 1980.

2.7 Other health workers. Using pamphlets and audio visual material present cancer information to MCH project staff and V.H.W.	Audio visual material was prepared on videotape for teaching physicians and albino patients.
2.8 Public Education	A newsletter was distributed to the public. The Cancer Center staff prepared material for public release by the MOH Health Education Division. An effort has been made to organize a Tanzanian Cancer Society. Material was prepared for newspapers and USAID in the AID-supported Adult Literacy project.
3. <u>Cancer Research</u>	Several hypotheses were developed regarding cancer during the first 2 years. The following is the current status. Project support was stopped in 1981.
3.1 Cervix cancers	No studies designed.
3.2 Skin Cancer of the lower leg	No studies designed.
3.3 Skin cancer in albinos	Studies on treatment and prevention have been designed and implemented. This study is funded by the U.S. National Cancer Institute.
3.4 Liver Cancer	Medical students were funded to collect data for Dr. Hiza. Reports and findings were published in Tanzania.
3.5 Esophagal	No study designed.
3.6 Stomach	No study designed.

3.7 Kaposi Sarcoma	A review of the literature was made. Then a clinical trial was conducted using Radiation therapy rather than chemotherapy. The results of this study are pending.
3.8 Burkitts Lymphoma	No study designed.
3.9 Retino Blastoma	No study done.
3.10 Other Cancers	No studies done.

In 1981 it was decided to eliminate support for research under the grant.

4. Cancer Prevention

4.1 Plans are to be formulated after analysis of the data collected by the project.	No cancer prevention activities were carried out. A public education effort regarding early signs of cancer, the dangers of smoking, evidence of pollution and the need for an adequate diet was carried out in collaboration with MOH. The lack of data analysis prevented further development of prevention efforts; since no diseases could be targeted.

5. Cancer Detection

5.1 Cytopathology screening of women in the MCH project at Hanang district.	A study was attempted, but could not be completed because of logistical problems as reported under cancer survey, Section 1.
Study of most early detectable and preventable cancers.	Not done.
5.2 Cancer control network Expansion of the Oncology service at MMC in Dar es Salaam.	The Muhimbili Medical Center Oncology Service was expanded to the Ocean Road Hospital Facility in 1980. This center was equipped with treatment and diagnostic capabilities. Physicians, technologist, nurses and others being trained over the life of the project. 3417

	patients have been treated for cancers of all kinds using radiotherapy. Consultations and donations have been received from a wide variety of sources (see Appendix) in addition to those with AID support.
5.3 Kilimanjaro Christian Medical Center (KCMC) to be a Zonal Cancer Center	During the first 3 years of the project there were frequent visits to KCMC and consideration of placing a radiotherapy unit there. The hospital director has not been visited since 1980, but is a leading referral source for MMC.
5.4 Bugando Hill, Mwanza to be a Zonal Cancer Center	This hospital was visited and considered for a rural radiotherapy treatment site. It was decided that it would not be feasible to install radiotherapy equipment at Bugando Hill. No direct link has been established.
5.5 Regional Hospital 22 hospitals considered for their role in cancer care	Visits were made to a sample of regional hospitals 1978-80 with conclusion that they would best serve as referral sites and a venue for cancer teaching to raise professional and public awareness especially MCH clinics. Dareda district hospital in Hanang was considered as a focus for studies in Oncology. A study was attempted but not completed.
5.6 District hospital to be considered for cancer studies sites	
5.7 Other hospitals, dispensaries and mobile clinics to study their role in cancer control	No study reported.

VI. PROJECT PURPOSE

The purpose of this project is to establish a viable cancer control program which can effectively contribute to the health of the Tanzania people.

This evaluation reveals that this project met most of its end-of-project targets as of January 1983, and AID support should terminate at the project activities completion date of 30 March 1983.

The contribution of the project to the health resources of the Tanzanian Government have been significant and have been absorbed into the routine operation of the Muhimbili Medical Center and the Tanzania Cancer Center. The end-of-project status indications are as follows:

EOPS #1 Enhanced Cancer Information Capability

The Tanzanian Tumor Registry is a functional office in the Department of Pathology of MMC. It records all cancer cases which are proven by histopathology throughout the country. Surgical pathology specimens from all hospitals are interpreted and reported at MMC, and a record is made in a log book and on individual patient data cards. A system[1] for coding these cards for computer (or hand) analysis was developed by the project, but no effort was made to perform the analysis during the life-of-the-project. It is clear that there is little priority given to this data analysis and interpretation, nor is there sufficient trained staff available to compile the data. The data is in a well kept, up-to-date and a readily available format which can be analyzed at any time, in the future. At present the priorities of the Ministry of Health and the Medical School are appropriately directed to the more pressing infectious, immunizable, and diarrheal diseases which impacts on millions of Tanzanians and reduces the productivity of students, parents, and the workforce.

The effort to collect data from regional and zonal hospitals has become routine. The trend of increased reports of cancer can be monitored from the clinical reports from rural hospitals and from the Tumor Registry (tables attached). At this time several types of tumors seem to be diminishing (Burkitts and leg skin cancer) while others seem increasingly common (uterine cancer). The project director reported that in a one month sample of hospital deaths all age groups at MMC, cancer was the fourth leading cause of death. It was preceeded by infections, measles, accidents and injury, and followed by cardiovascular diseases, and gastrointestinal diseases and malaria.

No capability was established to determine the incidence of cancer by household survey. The mid-term evaluation team concluded that it was not necessary to have the cancer center develop this kind of capability, and this effort was dropped, as was the effort to review the records of the rural hospitals. These two activities are considered to be unlikely to produce any improvement in the data base and should not have been included in the project design.

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[1] Document File # _____. Tumor Form, Code Book, Instructions.

REGIONAL CANCER INCIDENCE IN TANZANIA (1975)

REGION	Estimated Population in 1975	Registered New Cancers in 1975	New Cancers per 100,000 population
Arusha	793,000	62	7.8
Coast	1,019,000	302	29.6
Dodoma	922,000	56	6.1
Iringa	897,000	57	6.4
Kigoma	615,000	16	1.0
Kilimanjaro	849,000	324	38.2
Mara	707,000	4	0.6
Mbeya	1,260,000	95	7.5
Morogoro	891,000	50	5.6
Mtwara	1,353,000	67	5.0
Mwanza	1,373,000	160	11.7
Ruvuma	511,000	28	5.5
Shinyanga	1,169,000	55	4.7
Singida	595,000	54	9.1
Tabora	732,000	28	3.8
Tanga	1,002,000	52	5.2
West Lake	857,000	68	7.9
Zanzibar	462,000	23	5.0
Tanzania	16,007,000	1501	9.4

Table 1 shows that cancer is frequent in Tanzania. We believe that the true incidence of cancer in most of Tanzania is between 30 and 40 per 100,000, a level reached in the Coast and Kilimanjaro Regions, where the two major hospitals (MMC and KCMC) are located. If this figure is accepted there would be for the present 17.5 million people in Tanzania (enumerated in the 1978 census) between 5250 and 7000 new cancer cases in Tanzania for the report year 1978.

RADIOTHERAPY PATIENTS 1981

No.	PRIMARY TUMOR TYPE	MALE	FEMALE	TOTAL
1	Cancer Cervix	--	204	204
2	Cancer Breast	--	45	45
3	Head and Neck	67	28	95
4	Ketoids	9	15	24
5	Cancer Esophagus	33	1	34
6	Non-Hodgkins Lymphoma	1	3	4
7	Cancer Bladder	22	7	29
8	Kaposis Sarcoma	24	--	24
9	Cancer Skin	1	4	5
10	Retinablastoma	12	3	15
11	Cancer Thyroid	--	2	2
12	Cancer Endometrim	--	4	4
13	Hodgkins disease	1	--	1
14	Cancer Vulva	--	--	--
15	Others	56	42	98
		226	358	584

RADIOTHERAPY PATIENTS 1980

NO.	PRIMARY TUMOR TYPE	MALE	FEMALE	TOTAL
1	Cancer Cervix	--	220	220
2	Cancer Breast	1	43	44
3	Head and Neck	63	28	91
4	Keloids	10	29	39
5	Cancer Esophagus	32	3	35
6	Non-Hodgkins Lymphoma	16	6	22
7	Cancer Bladder	22	5	27
8	Keposis Sarcoma	15	1	16
9	Cancer Skin	7	4	11
10	Retinablastoma	4	4	8
11	Cancer Thyroid	5	3	8
12	Cancer Endometrium	--	7	7
13	Hodgkins Disease	3	3	6
14	Cancer Vulva	--	6	6
15	Others	24	18	42
		389	220	609

Important Non-XRT Malignancies

Leukemia

Hepatoma

Burokits lymphoma

RADIOTHERAPY PATIENTS 1979

NO.	PRIMARY TUMOR TYPE	MALE	FEMALE	TOTAL
1	Cancer Cervix	2	200	200
2	Cancer Breast	?	?	45
3	Cancer Esophagus	?	?	39
4	Oral Cancer	?	?	34
5	Lymphomas	?	?	28
6	Skin Cancer	?	?	28
7	Bladder Cancer	?	?	22
8	Larynx Cancer	?	?	21
9	Kaposis Cancer	?	?	16
10	Nasopharlynx Cancer	?	?	14
		?	?	613

RADIOTHERAPY PATIENTS 1978

NO.	PRIMARY TUMOR TYPE	MALE	FEMALE	TOTAL
1	Cancer Cervix	?	100	100
2	Breast Cancer	?	?	26
3	Esophagus Cancer	?	?	24
4	Oral Cancer	?	?	30
5	Lymphomas	?	?	30
6	Skin Cancer	?	?	27
7	Bladder Cancer	?	?	16
8	Larynx Cancer	?	?	11
9	Keposis Sarc.	?	?	18
10	Nasopharynx Cancer	?	?	14
		?	?	441

AGE OF CANCER PATIENTS (1979/78)

NO.	CANCER TYPE	NUMBER	AGE (MEDIAN & RANGE
1	Cervix Cancer	300	42 (25-80)
2	Breast Cancer	71	48 (19-77)
3	Esophagus Cancer	63	55 (35-70)
4	Oral Cancer	64	51 (22-68)
5	Lymphomas	58	28 (10-60)
6	Skin Cancer	55	45 (13-60)
7	Bladder Cancer	38	45 (28-60)
8	Larynx Cancer	33	51 (28-60)
9	Kepsis Cancer	34	39 (8-56)

CAUSES OF DEATH at M.M.C.

DECEMBER 1982

TOTAL NO. OF DEATHS: 412

CANCER DEATHS: 39

Percent of all deaths caused by cancer is 9%.

Cancer was no. 1 cause of death above 40 years.

EOPS #2 To provide the GOT and the Cancer Control Program with sufficient trained manpower to establish a Cancer Center

This center is to be able to train new staff to provide several types of therapy for cancer and to provide leadership to the MMC cancer efforts and to the nation in cancer control.

As of January 1983 a number of physicians have been trained to provide direction and service to the Cancer Control Center. The project director is highly qualified and has successfully directed the Center for the past 30 months. He has been able to provide radiation therapy service for 600 patients annually, serve as secretary to the MMC Tumor Board, train Oncology assistants and radiographic technicians, teach medical students and residents and provide continuing education for physicians posted in rural and urban hospitals. He is assisted by two other physicians trained under the project, although they are not assigned to the Cancer Center, nor should they be. Two other physicians are currently being trained overseas.

There is not sufficient ancillary personnel available to the Cancer Center because the technologist, registrars and other workers left the project and were not replaced. The Center has a radiographic technician, 2 radiotherapy technicians, 2 nurses and nursing assistants. The Center needs clerical and administrative support in addition to at least one other radiotherapist.

The project staffing suffered a severe shock with the death of Dr. Henschke in 1980. Four (4) months elapsed before the return of Dr. Launde to serve as project director. During that period most of the Tanzanian staff trained at Howard left the project, and no new training opportunities were sought, nor were project funds available to finance more training in the U.S. or in Tanzania.

Public education efforts are now institutionalized appropriately in the Health Education Division of the MOH. The Cancer Center staff serve as advisors to that office. It should be noted that while Dr. Launde alone provides the Radiotherapy, the other members of the Tumor Board play a vital role in work of the Cancer Center. Dr. Phillip (Chief Surgeon) serves as Chairman of the Tumor Board, he is joined by Dr. Lema, a Hematologist, Dr. Maindi, a Chemotherapist, Dr. Shaba, a pathologist, Dr. Mgaya, a Gynecologist trained in cancer surgery, and the medical students and surgical residents.

EOPS #3 Cancer Research - Capability

The Cancer Center is capable of conducting research on various forms of cancer. The current studies are descriptive in nature, or deal with clinical trials of treatment modalities. The most prominent current studies are on the natural history, treatment and prevention of skin cancer in albinos.

The research capability is enhanced by the availability of advanced diagnostic equipment but is retarded by the lack of trained research staff.

EOPS #4 Cancer Prevention

As of January 1983 the Center has not developed the capability to prevent cancer in Tanzania. Without the statistical analysis it is impossible to identify the easily preventable cancer occurring in Tanzania citizens and design preventive programs to control them.

EOPS #5 Detection

The Cancer Center has the know-how for detection of cancer of the cervix, but it has not been able to develop the logistic and other kinds of support needed to launch a cost effective detection service.

EOPS #6 Cancer Control Network

The Cancer Control Center at MMC and Ocean Road Hospital has been developed to an adequate operational level. It is reasonably well equipped with diagnostic and therapeutic devices which permit it to function effectively as the focus of the Oncology service of the nation. The Ocean Road facility has been renovated sufficiently to house 20 inpatients, provide radiography, nuclear scanning, ultra sound, and other diagnostic services (see attached description of capability). A cobalt radiotherapy device is partially installed, awaiting parts purchased by the project.

The buildings house the albino study patients and a teaching facility equipped with video taped lessons and other audio visual aids. There are however no audio visual technicians to operate the equipment or to make new video tape presentations.

EQUIPMENT AND CAPABILITIES

DIAGNOSTIC

(1) 100 KV Siemens Ergophos X-ray Machine

This is a diagnostic x-ray machine installed at Ocean Road Hospital. Uses:

i) Treatment planning for radiotherapy. In this regard the unit has been modified to simulate the cobalt 60 therapy machine for purposes of field localization. Present level of operation is 4-5 simulations/month.

ii) Diagnostic x-ray studies have been restricted to special techniques like: IVPs, and lymphangiography. Esophogograms and transumbiliced portography for linear cancer investigation are envisaged. Minimal regular chest x-rays or bone surveys are currently done as these services are covered by the main diagnostic unit at Muhimbili Medical Center.

(2) Gamma Camera (Sigma 400 Ohio Nuclear)

For isotopic diagnostic imaging using technition m 99. Studies include Liner/Spleen scans, bone scans, brain scans, thyroid scans. These are all static images. Machine has no capability for flow studies due to absence of accessories. Polaroid films are used for image storage.

(3) Seimens Rontgenkugel 2E: Portable X-ray

Machine for cervix cancer intracavitory applicator positioning not currently in use.

(4) 2 Ultrasound machines. Not currently in use.

EQUIPMENT AND CAPABILITIES

THERAPY

(1) Janus 60 co Machine at Muhimbili Hospital

Our main therapy machine. Uses external beam. Currently treats about 600 pts/year for a total of about 23,000 single treatments/year. Current output allows average of 5-8 treatments/pt. Daily rate 60-90 pts treated.

(2) Cessium intracavitory sources

50 applications for cervix cancer patients.

(3) Radium Needles

Newly arrived from Harvard. Will be used for cervix cancer treatment.

(4) Cobalt 60 Remote afterloader for intracavitory treatment of Cervix cancer patients

Equipment needs source replacement. Source purchased and expected February/March 1983. Capacity 6-8 applications/week.

(5) Orthovoltage contact X-ray therapy machine

Used for superficial cancer therapy. Machine too old and unserviceable.

The Center provides a referral resource for patients diagnosed as having cancer throughout the country and a focus for cancer research, teaching, data collection, consultation, public and professional information, organization around cancer issues and a model cancer treatment program in an under-resourced African country.

Up to December 1982, 3514 patients have been treated by the center (Table 1), 14 hospitals are cooperating in the cancer network, and 140 Tanzanian physicians and health workers per year receive formal training through the center's programs.

VII. PROJECT GOALS, BENEFITS AND UNPLANNED EFFECTS

The goal of the project is to help Tanzania develop a system to control cancer in its population and thus improve the health status of the people, making them more productive, protecting them from cancer, reducing health hazards, and providing curative and palliative services to patients with cancer.

The project has succeeded in providing a health service which is now able to reach out to the rural areas to provide services. It has aroused the general public's awareness of cancer, and the need to do something about it. Cancer appears frequently in hospital data, which does not reflect the true incidences of the disease in the general population. The project failed in its efforts to collect and analyze data about cancer for a variety of reasons mostly because the project was overly ambitious in scope and had limited resources to carry out what it proposed. The project director achieved success in mobilizing support for the project and used innovative approaches to carrying out the goals and objectives.

They established a solid organizational focus for cancer activities in the country, started some research and trained a significant number of highly skilled personnel. The evaluation team felt that the quality of work currently ongoing was of high caliber carried out by well-trained experts. The shortcomings of the project are more than overshadowed by the achievements.

The project direct beneficiaries are the several thousand cancer patients who have received curative or palliative cancer therapy. The indirect beneficiaries are those whose cancers may be prevented or treated early enough for cure.

An unplanned effect: the patients who might ordinarily have been sent out of the country for radiation therapy are now able to receive adequate care at home. All cancer patients recommended for referral outside the country are reviewed by the MMC Tumor Board. In view of the fact that the majority of the MMC patients have far advanced disease, and can only receive palliative care, their treatment is provided at MMC rather than being sent to Europe or North America. The cost of therapy by radiation is far less expensive than chemotherapy. The direct cost of chemotherapy being $700 for the drugs alone as compared to $39 for the radiation.[2] The average hospital stay for a cancer patient is reportedly 50 days (a little less for a palliative course). The hospital bed/day cost is $10. If patients from rural areas could stay outside the hospital, radiation therapy might be even more cost effective.

Thousands and perhaps millions of Tanzanian citizens now have a better understanding of the disease - Cancer (which has no Kiswahili word). The lack of a Kiswahili word suggests it is a rare disease and has been unrecognized by the public. Early diagnosis is becoming a reality since the danger signals of cancer have been made part of public broadcasts and newspaper articles.

Medical Comments: The medical staff of MMC has become more acutely aware of cancer and the services available to treat it. Equipment and personnel are available to carry out up-to-date therapies.

Other Comments: The mid-term evaluation pointed out the problems of the overly ambitious project scope and recommended deleting the efforts at collecting cancer data and performing research in order to conserve funds and meet other project goals. These changes made some impact on the project final status, since the lack of analyzed data hampered prevention and detection activity planning. It left the project with training activities and establishing the Cancer Control Network. At that time, November 1980, only $100,000 was available for the next two years of the grant. This lack of funds made it impossible to replace the technologists and other workers who resigned after the airplane crash. The inability of the project director to travel (due to lack of petrol) to Zonal and Regional Hospitals blocked the effort to increase referrals and coordinate recordkeeping with the network control center. As a result the control center became an urban referral center and has had less impact on rural health services than anticipated.

[2]World Health Organization, Technical Report Series.

VIII. MANAGEMENT OF THE PROJECT

Management of any OPG project raises questions about AID's role. According to Handbook 1, Chapter 25, grants are given to assist an organization carry out an activity in which AID also has an interest, but for which AID does not wish to make a contract. The subject is frequently experimental and outside usual AID programming. The organization may conduct its ativities without much involvement with AID. The organization is given certain rules of management to follow, but does not usually receive the type of monitoring as is common in contracts or cooperative agreements.

Dr. Henschke served as Project Director from 1977 until his death, June 1980. He was the creator, organizer, shaker and mover of this project. He contacted all levels of the U.S., Tanzanian and other governments to persuade them of the value of the work. The World Health Organization was involved as well as the International Atomic Energy Commission and others. His management style was unusual in that he made project purchases with his own money and obtained reimbursement from CODEL by turning in receipts. CODEL accepted this procedure assuming AID concurrence. This project was implemented quickly and effectively; but there was little documentation and most project records became personal files of the late project director's estate.

The project directed by Jeff Launde 1980-83 has followed the rules of AID purchasing and disbursement with the funds available. There appears to have been much closer coordination between Dr. Launde and USAID/Tanzania than with Dr. Henschke on management questions, communications, etc. Dr. Launde has responded positively to the support provided by USAID/Tanzania and CODEL.

CODEL played a minor role in managing the project, permitting Dr. Henschke to direct the project pretty much as he saw fit. A project monitor (Sister Margaret Rogers) was assigned in 1979 and serves in that capacity to the present. She interprets CODEL's role as supportive rather than directive. She states that CODEL made no effort to intervene in the management style of Dr. Henschke. She states that CODEL never was involved with Howard University. She admits that CODEL paid the Wings of Hope Company to handle procurement of the aircraft and pilot.

USAID: The USAID/Tanzania management of the project during the first 30 months of the project is probably typical of the AID management of OPGs. Because there is no direct responsibility for OPGs activities, USAID project managers tend to give insufficient attention to OPGs projects. The USAID/Tanzania file is almost free of correspondence between

the time of the grant award 1977 and the naming of a new project director in 1980. After that time each health officer responsible for the grant has regularly placed notes in the file. These notes start with the mid-term review in November 1980 and continue until the final evaluation. It leads the evaluation team to conclude that effective USAID/Tanzania project management did not commence until the project was in trouble, i.e., most project funds expended within 2 years of a 5 year grant and a serious aircraft accident had occurred resulting in the death of the COP. There is a lack of records to explain major project decisions, and for the failure to achieve project goals and objectives.

IX. INSTITUTIONAL RELATIONSHIP

The Cancer Center is a part of the MMC which is operated as a parastatal organization of the Ministry of Health. There is a budget for the MMC of which the radiation therapy unit and the Cancer Center at Ocean Road are line items. The Center's relationship to the University of Dar es Salaam Medical School is a little less clear. The University is an activity of the Ministry of Education, and the staff of the MMC are the clinical faculty of the Medical School. This common situation works well.

The project relationship to CODEL is based on the latter's responsibility for managing the USAID funds. At present, CODEL responds to request of the project director for purchase of equipment and arrangements for consultants. Sister Margaret Rogers has made several visits each year to the project site. Most of the project funds have been expended, or obligated. No ongoing relationship is anticipated following the PACD.

The relationship to Kilimanjaro Christian Medical Center and the Bugando Hills Hospital is now based on their function as a formal referral source. No project activities are currently in progress at these locations. The Hospital director of KCMC, participated in the evaluation.

X. REPLICABILITY

The Cancer Control project has served a very useful purpose in Tanzania. It has demonstrated the possibility of providing a relatively simple, cost effective way of treating cancer patients in an under-resourced country. The economist planner for the MOH indicated that the cost savings experienced by not having to support the medical, transportation and living expenses of patients who would ordinarily be treated in Europe or North America, more than compensates for the recurrent cost of operating the Cancer Center. Each patient referred abroad is accompanied by a nurse and the government assumes the total

cost of hospitalization, travel, etc. It is estimated that each such referral cost not less than $50,000 in foreign exchange, while the cost for treatment at MMC for a 50 day hospital stay and radiation therapy is about $5,500. The Cancer Center thus permits adequate diagnosis and treatment in the country for what is a common cause of prolonged hospitalization. Cancer patients have the longest length of stay at MMC.*

- Cancer	50 days
- Diabetes	44 days
- Cerebrovascular accidents	39 days
- Tuberculosis	30 days
- Measles	5.5 days
- Anemia	3.5 days

According to MMC records,* cancer represents the leading cause of hospitalization for patients over 40 years of age. The leading causes of hospitalization at MMC* are:

1. Tumors both benign and malignant
2. Infectious diseases
3. Anemia
4. Cardiovascular diseases - stroke, congestive heart failure
5. Hypertension
6. Accidents and injury

It is therefore realistic for the project to provide the means to handle this problem effectively in the hospital, provide the capability to obtain epidemologic surveillance, work for early detection, provide public campaigns to prevent cancer, perform research on the causes and treatment of the disease, and to coordinate the care of cancer patients throughout the country.

Other African countries should consider developing cancer control programs if their hospital experiences reveal that cancer is consuming a large portion of their health care resources, as it does in Tanzania. In those countries where the practice has been established to provide external referral at government expense, the reasons might become more financially compelling. The cost of a simple radiation therapy machine can be borne by most African countries and does not represent a prestige item as do some other pieces of medical equipment.

*Data provided by Cancer Center for sample month.

Discussions regarding a Cancer Control program depends, of course, on national priorities. If the nations of Africa feel they want to give sufficient priority to cancer control as compared to primary health care efforts, it would be a national decision. It is particularly important to consider the potential cost savings if cancer patients are using a disproportionate amount of in-hospital care and funds. Reduced expenditures for cancer care should free up funds for primary health care programs. If the cancer control programs focus on prevention and surveillances, their cost benefit should be unquestionable.

XI. RECOMMENDATIONS FOR FOLLOW-ON ACTIVITIES AND POSSIBLE SOURCES OF FUNDS

1. The Center should refocus its efforts on Epidemiologic Surveillance. Its role should be to stimulate the work of the Ministry of Health which is currently very small in Cancer surveillance. They should work collaboratively with the Ministry rather than attempting to take primary responsibility.

The World Health Organization can be approached for support of the health planning work of the ministry. Through this resource it is possible to obtain consultant epidemiologist, information systems technologist, and possibly equipment for information processing.

2. The project should analyze their experience with referral hospitals to seek patterns of cancer occurrence and utilization of the Cancer Center.

3. The financial records of the project at CODEL should be audited, according to the customary practices of project management. Special attention should be given at that time toward identifying the equipment purchased with project funds.

4. Arrangements should be made by CODEL to turn over title to project equipment and supplies to the government of Tanzania as called for in the project documents.

5. The Cancer Center should make efforts to draw upon the resources of foundations and organizations now supporting biomedical research to support its efforts to perform needed studies in Tanzania. It should also seek participation in collaborative and cooperative studies on cancer now being designed.

6. The Center should seek the assistance of the World Federation of Public Health Associations in establishing a Tanzanian Cancer Society.

7. It should offer to train other African Radiotherapists and technologists from countries with radiation therapy programs. Source of funds-sponsoring countries.

8. It should maintain its relationships with U.S. Universities - Howard, Harvard and Indiana and seek the use of their good offices for serving as a source of information, training, communication and assistance.

9. Project staff could prepare journal articles which describe their efforts to establish the Cancer Control programs, both from a clinical treatment perspective and more importantly from the public health perspective, rather than focus solely on research results or clinical reports.

10. Request the participation of cancer experts in the annual meetings of the various medical organizations. Most cancer experts travel can be funded by WHO or other agencies, when the request is made by GOT.

11. That the project staff be provided with a management training opportunity at the earliest possible date, the project staff should be oriented to the activities of the various organizations working in International Health Research.

12. Identify the organizations most likely to be interested in supporting Cancer Control programs and cancer treatment programs. The aid programs of Japan, Italy, Kuwait come to mind.

13. A survey of the transportation equipment should be made by the GSO mechanic to put them in the best possible working order by the end of the project. Funds are available from the grant, but supervision of these needed repairs and maintenance is required.

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Q. What constraints does the project attempt to overcome?

The Cancer Control Project attempts to overcome several constraints in dealing with an emerging health problem, Cancer. Because of the increased life expectancy - Cancer and other chronic diseases have become more important to Tanzanian citizens. The project attempted to deal with the lack of information regarding the incidence and prevalence of various forms of Cancer, means of preventing and detecting Cancer, research into the causes and remedies for Cancer, and the provision of cost effective treatment modality. The lack of information blocks public awareness of the causes and access to treatment for Cancer, it blocks the organized response of the Ministry of Health and it prevents adequate training for health care workers and the development of health systems which have to deal with this problem.

The specific constraints to Cancer control tackled by the project include:

1. lack of adequate epidemologic, utilization, economic and demographic data regarding Cancer in Tanzania;

2. lack of the ability to process data into information about Cancer;

3. lack of personnel to treat and control Cancer;

4. lack of information about the causes and treatment of cancer;

5. lack of methods to prevent Cancer;

6. lack of ability to detect Cancer;

7. lack of an organized response to the Cancer problems;

8. lack of an adequate treatment program.

This project attempted to organize the information about Cancer, perform surveys to detect Cancer, perform research about Cancer and develop a Cancer control center to coordinate national efforts to deal with Cancer.

Q2: What technologies were transferred?

1. To deal with the lack of ability to provide information, the project attempted to develop an automated information system to process available data about Cancer from several sources. It sought to analyze clinical, pathological, and housewhole survey data into meaningful reports on the occurence of Cancer.

2. To detect Cancer, it attempted to use modern cytologic diagnosis procedures to screen women in Maternal and Child Health Clinics.

3. To remove the constraints of manpower, supply a broad spectrum of health workers were trained. These included physicians, technologists, registrars, and nurses. The technology at teaching was also transferred so that the project could train its own staff as replacements are needed.

4. To remove the constraint of lack of information about cancer causes and treatment, the project was engaged in research on these subjects. The techniques and methods for performing research were taught to the project staff.

5. To remove the constraint of lack of coordinated service, the project transferred the service of radiation therapy, nuclear medicines, radiology.

Q3: What technology was replaced by the new technologies introduced?

The project does not replace old technologies but rather provides Tanzania with several capabilities it had not had before.

Q4: When Will the Technology be Adopted?

The technologies for treatment of cancer with chemotherapy and radiation therapy has been adopted because it is effective therapeutically, and cost effective as compared to the option of sending patients overseas for treatment. It also provides an answer to the humanitarian motives of the Tanzanian people in regards to care of cancer patients.

The technologies for information gathering detecting and preventing cancer will permit the lay public and professional group to be, to plan responses to the various kinds of problems created by cancers. The know how and use of the information has been adopted, but there is limited staff available to implement this technological transfer.

Q5: What Characteristics do Beneficiaries Have -

The direct beneficiaries of the project are the staff of the Cancer Center. They prepared themselves professionally and academically to receive the training, equipment, and consultation provided by the project. The project staff brought a great deal of dedication with them which saw them through adverse events during the life of the project.

The indirect beneficiaries, the people of Tanzania, have responded by organizing around cancer problems and thereby becoming increasingly aware of the risks and problems of cancer.

Q6: Adoptive Role of the Project

The project generally moved to install and make operational all equipment and technologies provided.

Q7: What further exploration of project facilities can be expected?

The project has already obtained support from several sources including the U.S. National Cancer Institute, the German Cancer Institute and the World Health Organization. The Cancer Control Network is attempting to draw upon resources which are part of other projects such as the epidemiologic work done by SIDA at the MOH.

Q8: Private Input Suppliers -

No. Government policy does not encourage the private production of the inputs necessary for the project. Health is seen as the province of the Government only.

Q9: What system for delivering technology has been developed?

1. Physicians, technologists, registrars, etc., have been trained to provide the services of this project and to coordinate the activities with urban and rural hospitals and clinics.

2. The teaching program of the University of Dar es Salaam Medical School has incorporated teaching about cancer into its undergraduate and postgraduate programs and continuing medical education activities.

The public and allied health workers receive courses of information through meetings, newspapers and the radios.

Q10: What training techniques have been used?

Most of the training techniques include a mixture of lectures and on-the-job training, the public information (training) is more passive.

There is a great deal of discovery learning taking place at the level of project staff and by the staff of the hospitals. The effort to collect and analyze relevant data permitted large numbers of medical students postgraduate physicians, nurses, etc. to learn about cancer in Tanzanian populations.

The postgraduate physicians training program requires a thesis. The most common thesis subject is cancer. This is thought to be due to the ready and long-term availability of cancer patients in the hospitals for study.

Tanzania Cancer Control
Lessons Learned

1. The project implementation experience revealed how a project which truly involves the host country sponsors can produce the desired end-of-project status goals in spite of serious incidents and uneven disbursement of funds. Given the freedom of operation, the project was able to rapidly place personnel in training, purchase and install equipment, and carry out the project activities. As a result of the firm support by the staff of the Muhimbili Medical Center, the project has continued successfully after AID assistance diminished to a negligible flow of funds. As a result of the rapid implementation, a Tanzanian project director was available to take over during year three of a five year project. This was, of course, fortunate, since the expatriate project director had died. The lessons are:

a) Early start-up of training/or pre-project training (using AMNP funds) can pay high dividends in terms of institutionalizing the project;

b) sponsorship of a project concept by a local organization makes institutionalization more likely than attempting to start a new entity;

c) adding to an ongoing funded function of an organization makes continuation of financed support more likely;

2. In this project, AID assumed that CODEL would exercise adequate management controls over the project director who was an employee of Howard University. AID played a minor role in project monitoring in the field, thus the project director had a free hand at planning and operating the project. Whether AID procurement rules were followed is doubtful. Accountability requirements were not instituted by CODEL, since they assumed USAID/T concurrence with project management. After the death of the project director, it became clear that closer supervision was required.

Lesson -

a. USAID project managers need an easy method for reviewing all projects within their portfolio on a regular and routine basis (at least quarterly). A method has been offered to the Mission by AFR/TR/HN.

b. The management practices of an OPG need to be assessed at the beginning of the project and not assumed to be adequate.

3. The idea of cancer control in a hospital setting sounds inappropriate for AID support under its mandate to help the poorest of the poor and emphasize economic development. The health policy strategy of the Agency would seem to rule out cancer control, especially using radiation therapy. The evaluation team found that radiation therapy was cost effective for the treatment of cancer patients who might otherwise fill many hospital beds for long periods of time (50 day average). The economic analysis revealed that radiation therapy was effective for palliative and curative work and was less expensive than sending patients overseas for care ($550 for therapy in the cancer center vs $50,000 for treatment, lodging, nursing, hospitalization overseas.) An estimated 50 patients/year request overseas treatment of cancer (cost $2,500,000 est.) vs 600 patients treated in Tanzania for about $500,000. This should make $2,000,000 available for primary health care.

Lesson -

a. Cancer treatment with radiation therapy can be a cost saving for the Government of a lesser developed country.

Lesson 4 -

The MMC served as a referral resource for cancer patients from rural hospitals. Prior to the project, very few patients were referred for cancer treatment and most of them were in such advanced stages that only palliation was possible. With the training of a radio-therapist, technologists and nurses to staff a cancer control center, the number of patients rose rapidly from 48/year prior to the project to 600/year.

The rural hospitals were brought into a network of referral and information sharing which produced the increased referrals and better diagnosis of cancer. In addition, physicians were trained to make the diagnosis of cancer early enough to give the patient some reasonable hope of curative therapy rather than palliation for terminal disease.

a. Establishing a national focus of cancer control permitted improved patient care, coordinated education of health workers and the patients.

b. The establishment of the center made it possible to seek answers to cancer problems of the country.

Lesson 5 -

The project as designed had six major objectives, but had insufficient financial resources to carry them out. As a result of the project's inability to attract sufficient additional funds, several of the important project objectives were abandoned. The new project director had not been prepared to carry them out (they required public health skills and knowledge rather than the clinical therapeutics which had been the content of his training program). Unfortunately, the AID project advisors did not seek to remedy this lack by asking for assistance in the are of cancer data collection and analysis, detection and preventive programs. In the long term, these public health interventions have more national health status implications than do improvement of the treatment capabilities.

1. Lesson - while treatment rather than prevention usually has higher priority, USAID health advisors should always insist on the continuation of the public health aspects of the project in order to enhance the impact of the project on the population.

2. The information on cancer prevention developed by the project should be included in the health education courses presented to village health workers in primary health care projects and to employees of the MOH.

Project Documentation

1. Project Proposal - CODEL - 1977

2. Project Implementation Letter

   USAID/Tanzania to CODEL
   December 1977
   Grant # 621-17-110-78-4

3. First Annual Project Report
   1 Jan 1978 to 31 December 1978
   Prepared by Ulrich Henschke/Project Director

4. 2nd Annual Project Report
   1 Jan 1979 to 31 December 1979
   Prepared by Ulrick Henschke/Project Director

5. Mid-term Evaluation -
   Prepared by Prof. Denis Burnkit
   March 1982

6. Reply to a series of letters between the GOT Principal Secretary of Health and the Director General of Medical Services including Muhimbili Medical Center
   4 March 1980

7. Howard University Statement of Project Work
   Howard University Agreement to participate in Project - Dean Marion Mann, July 1976.

APPENDIX IV

Persons Contacted

1. Washington
   ARF AID - Joan Johnson EA Desk/T
   Paul Miller PD/EA
   Arjuna A. Cole TR/HN
   Brian Kline EA/OIC

   Howard University - Dr. Alfred Goldson - Dept of Radiotherapy
   Dr. Thomas Georges
   Dept. of Community Disease
   Dr. Carton Alexis - Vice President of Health Affairs

2. USAID/T - Arthur Hanly - Mission Director
   Paul Ehmer - Health Officer
   Jim Van DenBos - Program Officer

3. CODE L - Sister Margaret Rogers

4. Tanzania Cancer Control Project - Ocean Road

   Project Director - Goeffrey Launde, M.D.

   Muhimbili Hospital - John Phillips, M.D.
   Chmn., Dept. of Surgery, Chmn. Tumor Board

   World Health Organization Country Representative

   - John Phillips, Country Program Coordinator

   Muhimbili Hospital - Dr. L. Hiza - Surgery Oncology

   Dr. Lema - Hematology

   Dr. Shaba - Pathology

   Dr. A.M. Nhonoli - Hospital Director

   Dr. Mymuna- Epidemiology Dept.

   Ministry of Health

   Health Planner and Economist - Dr. Manumba

   Health Services Administration - Ntuyabaliwe

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