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PROGRAM DEVELOPMENT AND SUPPORT - J.F.K.

NATIONAL MEDICAL CENTER, LIBERIA

(USAID/Liberia Project 669-51-540-054)

F I N A L

E V A L U A T I O N

R E P O R T

(Work Order 2, Contract AID/otr-C-1381)

9 JULY 1976

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PREFACE

In July 1976, AID contracted with Wolf and Company for an evaluation of the institutional capability of the John F. Kennedy National Medical Center in Monrovia, Liberia, within the context of USAID/Liberia's Project 669-51-540-054, and the Center's ability to support the GOL's National Health System.

Together with personnel from the GOL and USAID, Wolf was to (a) revalidate and revise the original project design as described in the Logical Framework; (b) examine progress toward the achievement of targets at the output, purpose and goal levels; and (c) reassess the reasonableness of the assumptions and the validity of the hypotheses linking inputs to outputs, outputs to purpose, and purpose to goal.

The evaluation was conducted in Monrovia from 19 June through 10 July 1976. The team consisted of:

- Wolf and Company
  - Herman L. Myers, Evaluation Specialist, Team Chief
  - Michael R. McGarvey, M.D., Patient Services
  - Leonard R. Piccoli, Hospital Administration
- Government of Liberia
  - Nehemiah H. Cooper, M.D., Chief Medical Officer, National Medical Center
  - Wilfred Sei Boayue, M.D., Deputy Minister, Ministry of Health and Social Welfare
  - Cecilia Kennedy, Assistant Minister for Health and Social Welfare
  - Moulai B. Reeves, Ministry of Planning
- USAID/Liberia
  - Jack P. Keeve, M.D., Health Specialist

The Wolf team reviewed many project documents, reports and related material in Liberia; made first-hand assessments of services and systems at the Center; and interviewed a cross-section of the Center's management and staff, and officials of USAID and concerned

GOL ministries. Most of the team's research effort took place in Liberia. Much was accomplished in Washington, DC, subsequent to the team's return. Relatively little data had been available at AID/W, before the team's departure.

The authors of this report are:

Herman L. Myers, Deputy Contract Supervisor for the Wolf and Company IQC. A Senior Design and Evaluation Generalist, he served with AID and its predecessor agencies for 21 years until his retirement in 1973. For the last two years of that service, he was Director of Latin American Evaluation (LA/DP).

Michael R. McGarvey, M.D., health care specialist and educator. He is Vice President for Health Affairs, Hunter College/CUNY, and chief administrative and academic officer for the College's Schools of Health Professions, including Hunter College-Bellevue School of Nursing, and Hunter College Institute of Health Sciences.

Leonard R. Piccoli, hospital administration. He has been Executive Director of Bronx Municipal Hospital Center since 1973. Previously, he was chief executive officer of Bird S. Coler Memorial Hospital, Roosevelt Island, NYC, and Misericordia Hospital, and administrative assistant at Montefiore Hospital, the Bronx.

The undersigned, Contract Supervisor for the Wolf and Company IQC, edited the report and takes final responsibility for its contents.

Stanley A. Barnett

I. SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

I-A. Major Findings and Conclusions

Since 1972 when it received its first patient, the John F. Kennedy National Medical Center (NMC) has been operational and has provided both in-patient and out-patient care. By almost any standard -- number of patients, case mortality, bed occupancy, growth and quality of Liberian staff, among others -- the Center has been a successful effort. When compared with its predecessor, the Monrovia Government Hospital, which lacked even rudimentary sanitation facilities, the NMC represents a great advance.

From its original concept as a modern general hospital serving Monrovia and Montserrado County, the scope of the NMC has been successively expanded to include service as a training center for nursing and allied health personnel; a referral center for Liberia and parts of West Africa; hub of a National Health System including progressive responsibility for a series of specialized patient-care institutions (maternity, cholera, tuberculosis and psychiatry); and, finally, as the principal clinical training facility supplying rural Liberia with physicians, nurses, physician assistants and sanitarians.

The functions being performed by NMC which form the hub of Liberia's National Health System are: (1) training of medical and para-medical personnel; (2) referral services for county health facilities; (3) purchasing, warehousing and redistributing drugs and medical equipment and supplies; and (4) providing health care under its function as Government Health Facility for Montserrado County. The national scope of JFK Memorial Hospital's activity is revealed by the large number (20% to 50%) of patients admitted and treated who come from outside of Monrovia and Monserrado County.

The quality of care, training, referral and supply at the NMC are good and above what we would have expected in the short time since operations began. Barring a catastrophe outside the control of the Center and the Government of Liberia (GOL) -- natural disaster or major economic or social dislocations -- we do not foresee a complete closing of the NMC in the next five years, under any circumstances.

Even with its currently thin technical staff, the NMC's training and referral functions can be expected to continue, if not grow. A powerful forward momentum has been generated at the Center.

Although the forces adversely affecting these functions are in part organizational, funding is a more critical key to the future level and continuity of the NMC's services. The Center is a Liberian institution. It, therefore, is the GOL which must bear the primary responsibility for ensuring its funding requirements.

The training of physicians and para-medical personnel is accomplished at NMC under established programs of the Ministry of Health and Social Welfare (MHSW) and the University of Liberia's Medical School.

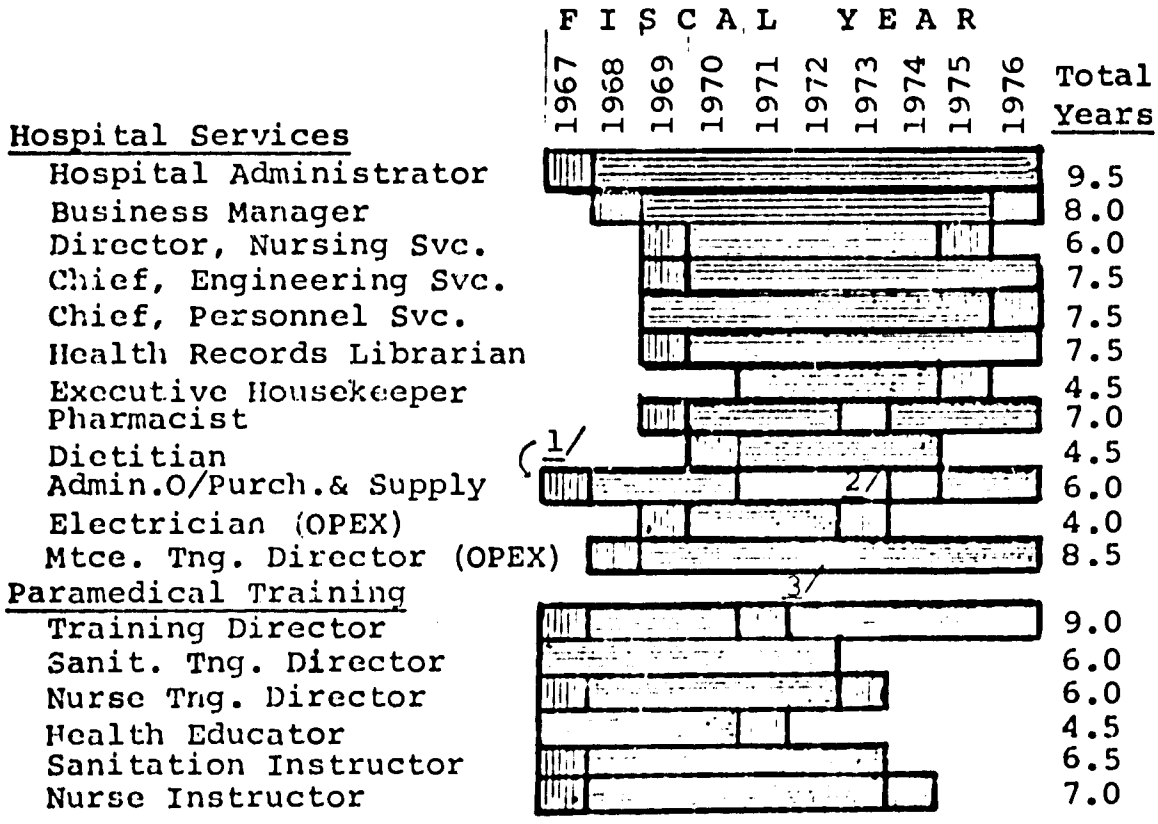
The autonomous charter of NMC from its inception, and its separation from the MHSW, have been beneficial, if not critical to its internal achievement and success. Its autonomy also has permitted a greater contribution to development of the design of the National Health Program. The NMC does not compete with the MHSW for funds. Its budget represents an additional amount available for health care purposes over and above normal MHSW appropriations.

The evaluation team noted progress in the development of administrative and support systems and services as a result of participant training, technical advisory support and the joint efforts of USAID/ Indian Health Service (IHS) personnel and their Liberian counterparts. However, there is need for intensified in-service training programs directed at the rank and file and supervisory employees in a number of departments, and to teach managerial personnel basic techniques in management and supervision. Continued provision of technical advisors and participant training also are desirable.

The role of hospital administration at NMC requires strengthening through increasing involvement with department heads. Communication with medical staff should be increased: day-to-day incidents occurring in direct patient care could lead hospital administration to problem solving situations which result in improved patient care and visible improvements in the Center's operation.

From FY 1967 through FY 1976, AID supplied 18 advisors in particular areas of hospital administration, clinical medicine and para-medical training for periods ranging from four to nine years. The chart of the next page details this technical assistance. The NMC's self-sufficiency and viability are threatened by the phasing down by FY 1977

POSITIONS AND PHASING OF USAID TECHNICAL ADVISORS
PROVIDED TO THE NMC, FY 1967-1976



Key: ▥ Partial Year ▭ Full Year; 1/ Administrative Officer; 2/ Purchasing & Supply Officer; 3/ Was Medical Director/ Training from 1972-76.

Source: U.S. Indian Health Service

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of a number of technical advisors. Technical advisory support continues to be needed -- in some instances to maintain current levels of hospital service; and in others to provide the wide range of services required of the NMC in its role as hub of the National Health System, and to meet current needs for upgrading. (See Section I-B.)

Ninety-two Liberian technicians were trained in the U.S. under the AID Participant Program. Nevertheless, the Center suffers from lack of trained manpower in many departments. In general, there is little or no middle-management throughout the Center. Continued participant training in the above and related skills is needed to provide the NMC with key specialists.

Although NMC's budget and staff increased as the patient load increased over the past five years, financial support for the purchase of materials, supplies and equipment has been insufficient. This inadequacy coupled with the higher prices resulting from inflation and a shifting of purchases from USAID sources to Liberian sources combined to cause crises in patient care when drugs, linen, cleaning supplies, laboratory and medical/surgical supplies and equipment are "out of stock."

Serious physical plant equipment deficiencies abound at the Center. Major repairs, maintenance, provision of spare parts and replacement of strategic equipment are critical to continued operation at its current level of efficiency. There is inadequate scheduling for depreciation, even though much equipment is deteriorated and faces breakdown.

Because of repeated out-of-stock incidents, NMC's administration should establish an investigative procedure to identify causes and document those related to underfunding and cash management problems.

The cash management problem inherent in the present system of quarterly allocation by the GOL to the NMC requires more effective means of fiscal control, such as competitive bidding, close monitoring of budgets vs. expenditures and purchasing through a U.S. or European office.

An upgrading of the salaries paid to various echelons of personnel at the NMC to the levels paid in the concessions and other enterprises in Liberia will alleviate current serious retention problems. The upgrading should encompass key personnel, including nurses, physicians, and maintenance and engineering staff. Nepotism, "free lance" outside work by physicians, and the conduct of personal businesses by professional staff at the NMC detract from its effectiveness.

Among steps conducive to continuation and improvement in the operation of NMC are: clarification and enforcement of physician performance standards; consideration of conversion to "full full-time" or "geographic full-time" physician-employment arrangements; continued GOL support for postgraduate physician-training scholarships in selected specialty areas; construction of house staff residence facilities on the Hospital grounds, and a new maternity center as part of the Hospital complex.

Also: coordination of enrollment at the Tubman National Institute of Medical Arts (TNIMA) with manpower needs as anticipated by MHSW and the Ministry of Planning and Economic Affairs; clarification of the role of the proposed rural training center, to avoid duplication with

present TNIMA activities; development of a post-R.N. nurse/midwife program under the aegis of TNIMA; and assumption by the GOL of the costs of the Physician Assistant Program, presently borne by UNICEF but scheduled for phase-out.

The team found no evidence of an overall coordination and monitoring approach by either the USAID or Indian Health Service. Although IHS advisors prepare monthly and quarterly reports, the reports do not fully reflect long-term project purposes. Beginning reports detailing specific objectives or end-of-tour reports showing achievement are not required of its individual contract advisors, although recently prepared reports on hospital administration and medical records detailed progress from 1972 to 1975. A single report on internal medicine set objectives for an expected 10-year planned period of advisory service.

Advisory service fields and related training appear to have been planned originally to provide assistance in paramedical training, rather than assistance in the context of a functioning medical complex. The targets were not fully adjusted to take into account the shift of emphasis required to backstop the NMC in its gradually enlarging role as linchpin of the National Health Plan.

Additionally, no plans or actions were developed to enable other personnel, such as those of the Peace Corps, to overlap with and be integrated into the advisory service requirement plan. The integration might have given those services more authority and continuity.

Incomplete coordination and monitoring reflect changes in project concentration: the original need to organize and partly redesign JFK Memorial; and subsequently to make an expanded NMC operational. In part it also reflects the very short time in which the Center has been operational. During the early period, most of the efforts of the staff were concentrated on development of outputs -- developing the basic infrastructure of the Center. Rather than a planned functional relationship between the NMC and the National Health Plan, the autonomous existence of the NMC and the ability and influence of its leadership to seize opportunities has fostered development of a meaningful relationship. The 1975 evaluation by USAID attempted to set forth this evolving relationship in its PROP.

Various options are open to the GOL, NMC and AID in meeting the Center's requirements. The options are circumscribed by manpower problems reflected in the difficulty experienced by NMC in retaining trained technicians, and by the lack of a pool of Liberian technicians to replace losses. As a prerequisite to further assistance, several factors have to be studied carefully, including: the cost of these

continuing requirements to 1981, self-help actions and budgets planned by the GOL, and the effects of funding on the staffing and service levels to be provided by NMC. As a minimum, the NMC needs to detail and obtain agreement at all levels on what specific objectives it hope to attain by additional advisory services and participant training, an the time frame within which it expects to meet these objectives.

On balance, the evaluation team recommends that the options suggested in Section I-B, below, be examined jointly in the next few months by the GOL and AID to determine the degree to which the alternative projects and other actions are realistic and will provide assistance to the NMC through 1981. Should an alternative or alternatives be found viable, the impressive achievements of the Liberians can be recognized by the official phase-out of Project 054 as scheduled. If on the other hand, the options are not considered sufficiently supportive, AID should consider authorizing a new 4-year project of assistance to the NMC which incorporates the new national health objectives and will permit self-sufficiency to be explicitly planned and monitore Minimum prerequisites to such help would be specific GOL actions to assure retention of trained staff and funding of scheduled operational requirements. This will also provide an opportunity to develop new relationships between the NMC, University of Liberia Medical School, and MHSW.

I-B. Issues and Options

AID/NMC Project 054 was begun in 1961. Construction of the JFK Memorial Hospital started in 1965 and was completed in mid-1971. It was not until 1972, therefore, that organized patient care became a reality. For those intimately connected with the project, four years may seem a short start-up time. On the other hand, for those in AID who face the Congress each year and have to compete for funds for new projects to help developing countries build viable institutions, the 15-year period and $10,000,000 level of assistance may appear unduly long and large. AID project funding already has been extended for a two-year term (from 1975 to 1977). The annual submissions to the Congress for FY 1976 and FY 1977 categorically state that project assistance will be completed with the FY 1977 funding. AID's FY 1977 submission summarizes progress of the Center and the expansion of its original role to justify a last year of assistance.

Our investigation and findings show that those who predicted that the NMC would be a "white elephant" and would never work have been proved grossly wrong. The NMC *is* operational and works in every sense. Its coordination and combination of several related medical facilities has taken advantage of scarce monetary and human resources. However, much remains to be done. Four years is not, as we noted earlier, a long time to train and retrain top- and middle-management. In many departments, equipment is short and overworked machines and instruments are

beginning to wear out or break down. Spare parts are unavailable and funding is not assured, even for current operations, let alone replacement.

There is no guarantee that new and different problems will not appear in the future. Even if additional training, technical assistance and commodities are available to the NMC after 1977, there is no assurance that temporary setbacks will not occur. But, although continuance of the Center's operations even at their current level will require continuing infusions of local and foreign funding and technical expertise, there is no question that NMC is an impressive and effective indigenous Liberian institution that plays a key role in its nation's health-care effort.

During the remaining 15 months of AID project support, the GOL should investigate potential assistance from all possible donor agencies for those functional areas within which the NMC still requires help for continuance of current levels of operation or for improvement (i.e., those outlined in this report).

One prerequisite to further assistance from AID would be much more definite scheduling of the GOL budget to assume NMC costs, and greater assurances that expenditures will promote self-sufficiency by no later than 1981. In view of the many years of technical-advisory and participant-training man-years and commodity support already provided, specific and measurable objectives and targets should be tied to any extension or modification of project assistance.

The GOL also should investigate the possibility of receiving needed technical assistance, training support and commodities through 1981 -- through other projects, through cooperative agreements with bilateral and multilateral donors, and through its own efforts. Such aid could provide the GOL with equivalent or, in some categories of assistance, even greater benefits.

The number and scheduling of these categories of help would depend on: negotiations between the GOL and other donors and USAID; availability of AID, other-donor, and GOL funds; and changing requirements, including absorptive capacity. A wide variety of options appears to be available, and they are not necessarily interdependent. Some are complementary, others are interchangeable. A representative series of options is reviewed below.

I-B-1. Technical Assistance

Project 054 is funding technical assistance in the form of advisors in (a) Engineering, (b) Maintenance Training, (c) Medical Records, and (d) Procurement, through September 1977.

The evaluation team has reviewed past and current technical advisory support, as well as demands made upon the NMC to maintain current levels of hospital service, and in its upgraded role as hub of the National Health System. Technical advisory support continues to be needed. In order to maintain current levels of service, positions in Engineering, Maintenance Training, Medical Records and Procurement should continue to be filled. For the NMC to provide the wide range of services required in its role as hub of the National Health System, and to meet current needs for upgrading, it is important that positions be filled in Hospital Administration, Laboratory Management, Nursing, Personnel (training coordinator), Housekeeping, and Dietetics. Our conclusions are summarized below and in the table on page 9:

- Major deficiencies in physical plant and major equipment (see Section IV-C) require continued service of Engineering and Maintenance-Training advisors.

- The Center badly needs a Clinical Laboratory Operation/ Supervision Advisor (and permanent staff in that area).

- A Hospital Administrator advisor is needed to (a) guide and encourage the administration to become more involved in day-to day problems, (b) monitor and guide department heads, and (c) monitor the overall plan of objectives.

- Medical Records and Procurement advisors are required to maintain current levels of service and for NMC's hub function. Both positions are being funded through FY 1977.

- A Nursing advisor is required to supervise hospital operations training and nursing service administration. Previous occupiers of the position concentrated on paramedical training.

- The same is true for a Personnel advisor, who is needed to intensify in-service training programs directed at the rank and file and supervisory hospital employees, and to teach managerial personnel basic techniques in supervision and management.

- Housekeeping and Dietary advisors were phased out in FY 1975 and FY 1976 respectively and replaced by Liberians. New advisors would enable the NMC to better fulfill its role as hub of the National Health System.

TECHNICAL ASSISTANCE NEEDS: PROJECTED ADVISORY SERVICES FOR NMC

HOSPITAL SERVICES POSITION	Service in Liberia		# Years in Liberia When NMC in Operation	# Yrs. Additional Service thru 1981		
				To maintain current level of services		To Upgrade & Fill Role As Hub
	# Years Through FY '76	Last Year Svc.		Weefur 2/	Wolf Team	
A. Engineering	7.5	'77 1/	4.0	4	4	4
Maintenance Training	8.5	'77 1/	4.0	4	4	4
Laboratory Management	0	0	0			4
B. Hospital Administrator	9.5	'76	4.0		2	3
Medical Records	7.5	'77 1/	4.0	2	2	3
Procurement	2.5	'77 1/	2.5	2	2	3
Nursing	6.0 3/	'73	0.5			3
Personnel (Training Coordinator)	9.0 3/	'76	0			3
C. Housekeeping	4.5	'75	2.5			2
Dietary	4.5	'74	2.0			2

1/ Contract runs through 30 September 1977.
2/ Recommendations of M. Kronyanh Weefur, General Administrator of NMC to its Board of Directors, July 29, 1975.
3/ Served in paramedical training, not hospital training.

The Wolf evaluation team suggests the following possibilities for the period through FY 1981:

(A) AID could contract for a portion or all of the IHS advisors for the periods indicated in the foregoing table for the two major alternatives, i.e., maintenance of current level of services, and enabling the Center to fill its hub function and/or upgrade services.

We briefly considered the possibility of suggesting that one or more of the newly acquired technical advisors be attached to the Lofa project. However, the presence on that project of unneeded and costly personnel, some of whom would be siphoned off to the NMC, would compromise effective analysis of the Lofa pilot undertaking and might erroneously suggest, on evaluation, falsely high costs and inefficiencies, adversely

affecting the development of other Liberian projects. Alternatively, funding of continued assistance to the NMC for technical assistance, training and commodities under a proposed Rural Health Structures project would provide guaranteed coverage of NMC costs through FY 1981 and relate closely to its new role.

(B) A second option might be use of IHS in FY 1977 to train other advanced or semi-advanced trainers. In the past, Peace Corps volunteers have served at the NMC. While we made no in-depth investigation of the background qualifications of the volunteers, they reportedly were unable to command the respect of the NMC staff and the confidence of its management. The youth of the volunteers may have worked against even those who were competent and well-trained. For its part, NMC management appears to have eroded the authority of the volunteers, treating them as workers rather than trainers, and seems equally at fault for the eventual breakdown of relations and utilization. Although it is unlikely that the Peace Corps can supply many such personnel, those they can field would provide an ancillary benefit -- they would not disturb existing project systems established by IHS.

(C) A third and more attractive option is for USAID to develop a middle-management training project, one phase of which would permit in-country training, either by IHS or similarly prepared advisors. Here again, it seems important to minimize radical changes from current channels for providing advisory services, and to continue to train Liberian personnel on-the-job.

(D) A fourth option for investigation by the GOL and AID is for the GOL to contract directly with the IHS for continued services through FY 1981. We have not explored the legal or procedural aspects of the change. If the idea proves unworkable, the GOL could reimburse AID through a Trust Fund arrangement for contracting with desired advisors. We estimate the yearly cost of each on-board technical advisor at approximately $50,000 on a full-time basis. Newly hired advisors could generate up to $80,000 of costs annually. Short term advisors who serve in Liberia without their families also should be considered.

(E) A fifth option would be to "Liberianize" the NMC. Indeed, the hiring of permanent expatriate residents with expertise in the required disciplines, for fixed training periods, may be the most efficient way to fill specific weak areas at the NMC during the next four to five years.

Options (A), (C) and (E) appear to the team to offer the most realistic possibilities.

I-B-2. Training

(A) If still possible, AID should include in its FY 1978 program a well-defined middle management training project to fund qualified Liberians for training in the U.S. under conditions guaranteeing their return (i.e., student visas), and with appropriate payback arrangements. In the field of health, specified critical occupations (e.g., Laboratory Technicians, Maintenance Engineers, etc.) would be included and the GOL would guarantee that jobs at the NMC would be funded and would be filled by them on their return. The middle management project could also provide training for other ministries of the GOL. We stress that such a project should not be open-ended: it should apply only where jobs have been certified to be critically short of qualified candidates; where funding by GOL is available for transportation and living costs; and where it is consistent with remaining uncompleted areas of needed expertise. This option imposes no new burden on the GOL, since Liberia already covers the cost of transportation of participants. AID would, however, cover certain costs such as tuition and living costs.

(The NMC is requesting extension of advisory assistance to permit participants to work under guidance. A middle-management trainee should not once again trigger such a request.)

(B) We assume that USAID is already tapping such regional projects as the African Manpower Project to make training available to NMC technicians. We do not anticipate that this option will provide many, if any, study opportunities. However, even one or two in the next few years without major costs to GOL/USAID would be helpful where management is so thin.

(C) In some countries, the fostering of sister-sister relationships with foreign medical hospital/universities has proven of long-term value, once permanent ties have been established. In this connection, the team has pinpointed opportunities for academic and on-the-job training at the Bronx Municipal Hospital Center in New York, which would necessitate funding only for transport and incidental living costs. Room, board, and supervision would be supplied by the hospital Additional institutions appear to be available in New York City and might be approached for such assistance through two of the members of the Wolf evaluation team.

This low-cost option should be investigated in addition to any other options which might prove desirable and feasible. Its potential is only limited, even in the long run, by the availability of qualified candidates, and assurance that they will return and work at NMC.

I-B-3. Commodities

No commodity funding has been provided by AID directly to the NMC through Project 054 in FY 1976 and none is scheduled in FY 1977. Commodities received in those years to date result from a long pipeline which is slowly emptying. About a half-year's supply remains. It might prove difficult for AID to request new funding from the Congress for commodities under this project, after a lapse of two years.

However, the Center has deficiencies in physical plant and major equipment that are becoming increasingly critical. A chart on the following page indicates specific items and facilities which require replacement, repair, spare parts, reorganization and/or upgrading, and identifies the causes of the needs.* In some cases substantial outlays appear called for in the immediate future, certainly by 1978.

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* The evaluation team did not include a civil engineer. The data on the chart result from first-hand investigation by the team's hospital administration specialist, and represent his estimates of the situation We recommend that the GOL, with the aid of the IHS Engineering advisor, review the items in detail to develop a precise list of required commodities and actions. We recommend further that a system be installed to project the annual cost of parts and equipment for the Center based on depreciation schedules and regular inspection visits by competent technicians and professionals.

The key is availability of funds. The decision to extend the project through FY 1977 was based on the assumption that the GOL would increase its contribution as AID phased out its support. Because this is not taking place in line items, especially commodities, a deficit is beginning to develop. It will be magnified as breakdowns occur, the pipeline dries up, and inflation eats into the budgets. In the 15 months which remain of assistance by the IHS Engineering advisor he -- together with the GOL and independent IHS and AID engineers on short-term TDY -- should develop a system to assure uninterrupted services and to reduce long-term costs. Subsequently, AID might provide a regional loan or finance officer to assist the NMC to cost out project requirements, including added operational costs which may result from the purchase and installation of equipment and from training, once the level of technology has been decided.

REQUIREMENTS IN PLANT AND MAJOR EQUIPMENT

	N E E D				C A U S E				
	Keep current Level of svc		Upgrade &/or Meet Hub Aim						
	Re-Place	Fix/ Spare Parts	Reor-gan-ize	Up-grade/ Expand	Originally Bad	Originally Inadeq Capac	Up-grade	De-pre ciate	Pri-or-ity
Chillers	X			X	X	X			1
Air Conditioners				X	X				1
Boilers				X		X			1
Generators (JFK)				X		X			1
Generator (Maternity)				X					2
Water/Steam Lines	X	X			X				1
Refrig. Equipment	X							X	2
Communications Equip		X			X				2
Drugs/Supplies Dist			X				X		2
Floor	X				X				3
Maternity Center	X						X		1
Central Sterile Supply			X				X		1
X-Ray Equipment				X				X	1
Transportation Equip				X				X	2

The below-listed options should be reviewed with the chart in mind.

(A) AID-wide experience in obtaining commodities such as heavy equipment for road building, agricultural implements and other machinery, and used commodities from U.S. Government surplus stocks through GSA, generally has been unsatisfactory. Nevertheless, the possibility of worthwhile hospital equipment remaining from no-longer-needed Vietnam requirements should be investigated. This could provide some equipment to NMC at low cost to the GOL outside the project. If field hospital equipment in good condition can be found, it could also serve county hospitals.

(B) Similar to options noted above under "Technical Assistance," USAID should investigate the feasibility of establishing a Trust Fund with the GOL under which AID can procure for GOL account. This may prove legally and/or administratively impossible or cumbersome. It was, however, done for Venezuela after that country's entire program was phased out.

(C) There are many cooperative purchasing associations which permit hospitals in the U.S. to obtain quantity discounts, favored treatment on delivery, and other advantages. NMC should be encouraged to investigate the feasibility of joining one or more such associations.

(D) The GOL may already be purchasing supplies and commodities for its needs under other programs through GOL procurement offices in the U.S. or Europe. If so, it may be possible for a special medical procurement officer to be attached to such an operation. If not, a GOL-wide procurement office using an experienced U.S. professional during a two-year start-up period, would more than likely pay for itself. Such an operation could facilitate deliveries and assure a minimum pipeline for all GOL requirements.

* * * * *

The GOL will be in a stronger position to discuss these alternatives if the following are first considered and quantified:

(1) What are the costs of such continuing requirements?

(2) In light of the significant losses to the NMC of trained manpower and expected annual and five-year depreciation and breakdown of facilities and equipment due to wear and tear -- what scheduling will the GOL establish and what actions will it take to ensure an effective Center and help it reach reasonable self-sufficiency in the foreseeable future?

These are questions which can only be answered by the NMC and the GOL, since they involve considerable outlays of Government-budgeted funding for equipment, staff, and services. They may also result in reconsideration of full upgrading of current plant, and substitution of lesser technology, with concomitant savings in operational costs.

We recommend that the remaining IHS advisors, in addition to providing normal training through the remainder of their stay, concentrate on the schedules and actions implied in these questions. The advisors should have no difficulty in determining engineering replacement requirements. (It is surprising that this has not already been done and that spare parts have not been given higher priority.)

Incentives, in the form of higher relative salary and other benefits which spur the retention of trained personnel in health operations, are prerequisite to new training programs funded in cooperation with AID and other donors. Certainly the GOL should make maximum use of low-cost programs (e.g., training at private hospitals), even if other cooperative projects are available.

II. MEASURING PROJECT PERFORMANCE

The JFK National Medical Center is a semi-autonomous unit of the Liberian Government, with a board of directors chaired by the Minister of Health and Social Welfare, who is a cabinet-level officer appointed directly by the President. The NMC's budget is deposited to a trust fund on a quarterly basis (thereby protecting it from several layers of cumbersome day-to-day budgetary control). The President serves as Grand Councillor to the NMC Board of Directors. Although he exercises no vote on the Board, The Board has power only to recommend candidates for General Administrator of the NMC to the Grand Councillor. The General Administrator of the Medical Center is, therefore, essentially a Presidential appointee.

The Chief Medical Officer of JFK was recruited into that position in 1972 by the President on the strength of his progressive and visionary concept of the Medical Center as a support to a decentralized national care system emphasizing service to the nation's large rural population. A successful practicing physician with training in the U.S. as a cancer surgeon, the Chief Medical Officer enjoys the confidence and respect of the President and serves as his personal physician.

Although minor jurisdictional disagreements have occasionally arisen between the NMC and the Ministry of Health and Social Welfare regarding jurisdiction over certain discrete organizational units (e.g., The supplies depot, West Point Clinic, and TNIMA), no basic divergence has been evident with regard to basic health policy issues. Working relations between the major officers of the two agencies have been generally cordial and mutually supportive. Significantly, competition between the two agencies for budgetary resources seems minimal. Resources allocated to the NMC appear to be over and above what would otherwise be allocated to MHSW, rather than at the expense of the MHSW budget.

The NMC currently comprises five separate institutions under one centralized management: (1) John F. Kennedy Memorial Hospital, a 275-bed general medical and surgical teaching hospital and out-patient clinic; (2) Maternity Hospital, a 200-bed and 100-bassinet obstretrical unit; (3) John Reugene Roberts Memorial Tuberculosis

Hospital, a 200-bed facility; (4) Catherine Mills Rehabilitation Hospital, a 60-bed acute Psychiatric facility; and (5) the Tubman National Institute of Medical Arts, a paramedical training facility. The Center is located in Monrovia.

Approximately 70% of the NMC's support comes from Liberian sources. Data from the Ministry of Planning and Economic Affairs indicate that the GOL provided $4,238,300 to the Center in CY 1975, and that revenues from patients of the Center accounted for an additional $91,600 -- for a grand total of $4,329,600. For the same period, the Ministry estimates that $1,784,000 of grants were provided to the NMC by non-Liberian donors: $1,272,000 from USAID ($1,078,000 for the Center, plus $194,000 for its Outreach Program); $288,000 from WHO; $122,000 from the Peace Corps; and $102,000 from UNICEF.

II-A. The 1975 Evaluation; Review of a Changing Project Concept

In the current evaluation's scope of work (see the Preface to this report), the team was asked to identify the status of recommendations made following the last project evaluation. That evaluation report, PAR (72-2) dated March 11, 1975, proposed two actions, whose implementation is discussed in this subsection:

1. "USAID/Liberia will request quarterly progress reports from SER/COM to ascertain action being taken to improve commodity procurement and shipment." The target date for completing this action was 30 June 1975.

No quarterly reports are known to have been requested or instituted. This may be because SER/COM decided to take even more direct and effective action. For two separate periods in 1975, experienced AID/W officers were in Liberia on TDY. In June 1976, a full-time AID Supply Officer was assigned to the Liberian Mission. She reports that all bills-of-lading for the NMC now come directly to her instead of to the GOL/GSA, where many were formerly lost or delayed. She in turn sees that the documents are sent rapidly to the NMC for recovery of commodities at the port.

It appears unlikely that SER/COM could have complied with a request for quarterly reports from an individual Mission.

AID commodity assistance to NMC phased out in FY 1976. No commodity assistance is budgeted for FY 1977. About a half-year's supply in the pipeline remains to be delivered. Reasons for delays in PIO/C deliveries may become academic and future delays, if any, will not be the result of internal AID procurement practices.

An understanding of the reasons for past delays could prove helpful in facilitating deliveries of expected shipments under the Lofa project and other health projects which require commodity financing. The USAID should give priority to such a study by its new Supply Officer.

A related commodity problem is the manner in which current PIO/Cs combine shipments. Commodities for the NMC are shipped together with Lofa County and USAID administrative purchases, among others, and charged on a volume basis. This makes it difficult if not impossible to determine the actual cost of shipment of NMC supplies.

The GOL will have to assume full responsibility for the funding and procurement of NMC/MHSW commodities in the near future. Section I-B-3 of this report suggests alternatives open to the GOL in obtaining the advantages of competitive bidding and bulk purchasing. Current NMC advisory services which concentrate on materials handling, recovery from port, warehousing, inventory control, and distribution -- all important in themselves -- may not prove germane to offshore procurement. Funding and procurement delays are partially outside of NMC control and require the combined attention of NMC's top management, budget and fiscal expertise, and possibly procurement experience not now available at the GOL/NMC.

Underlying this entire question is the uncertainty of whether or when a separate depot will be built to supply MHSW facilities. Given the experience of NMC, the relative importance of NMC requirements, and the tightness of MHSW funding availability, we recommend that NMC continue to serve as the National Depot for the next several years.

2. "Even though project activities are mostly on schedule, there exist many indications that some targets may not be met by present phase-out dates, due to the many complexities and intricacies of training manpower resources to desired levels of competence. These matters are to be reviewed and studied over the coming months." The target date for action was December 1975.

A careful reading of successive project proposals reveals a gradually growing set of performance indicators and an enlarging Center.

Original AID/GOL purposes were to obtain financial support for construction of the JFK Memorial Hospital, related technical services at all levels, and training for paramedical personnel. Referral for outlying medical facilities was recognized, and it was anticipated that paramedical graduates would fill county medical positions for the short-term future. JFK Memorial, the Maternity Hospital and TNIMA were designated as the institutions to be assisted. Operational assignments were to precede and accompany advisory capacities.*

By 1968, the NMC was seen as the clinical center for Liberia, with hospital management and a qualified administrative and paramedical staff as the output targets: "In the development of health manpower, the Project will focus upon the training of paramedical personnel... professional and subprofessional personnel other than physicians and dentists."**

The scope and general nature of management and supportive services were described and timetables set:

Category of Advisory Service	NMC Self-Sufficiency	Service to Terminate***
Hospital Administration	CY 1970	CY 1975
Accounting and Business Management	CY 1972	CY 1975
Nursing Service Management	CY 1971	CY 1974
Personnel and Manpower Management	CY 1971	CY 1973
Engineering and Maintenance Mgmt.	CY 1975	Indefinite
Health Care Records Management	CY 1972	CY 1975
Dietary (Admin. & Therapeutic) Mgmt.	CY 1972	CY 1973
Housekeeping and Laundry	CY 1971	CY 1972
Pharmacy Service	CY 1970	CY 1972
X-Ray Department	CY 1971	CY 1972
Laboratory Technical Services	CY 1972	N.A.

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* See U-520 Report, 14 September 1967.

** PROP 15 April 1968.

*** It will be noted that in the case of at least three of the 11 advisors, scheduled termination coincided with the opening of JFK Memorial Hospital, in whose operation they could have been quite useful, and that the services of two additional advisors were scheduled to end a year after that. During the early years, in the absence of an operating JFK Memorial Hospital, advisors concentrated on paramedical training. Ironically, the full flood of advisory assistance had begun ebbing by the time JFK Memorial opened its doors.

With publication of the Ten Year Health Plan, Liberia, 1967-1976, in 1968, there came a shift of emphasis from curative to preventive medicine. Although the project was well detailed by then, its goals were seen as not inconsistent with the newly announced national priorities: development of a health system, a referral center, and a training center for medical and paramedical personnel.*

The 1973 project proposal added two additional years of advisory services (through 1977) for Hospital Administration, Fiscal and Budget, Clinical Physician, and General Engineering advisors; further defined participant training requirements; and proposed up to $800,000 in medical equipment, hospital supplies and related commodities for the operation of the NMC. (The amount represented U.S. commodity assistance during a four-year period starting with $300,000 in FY 1973 and continuously declining until FY 1976, when the GOL was expected to provide from its own or other resources the commodity support necessary for further operation of the system.**)

The Liberian Presidential Address of 2 October 1972 incorporated the Mills Rehabilitation Hospital and the Roberts T.B. Sanatorium into the NMC. The Center was given semi-autonomous authority. AID-financed advisory services were to be limited to JFK Memorial, the Maternity Hospital and TNIMA.

The last PROP, dated 17 January 1975, estimated total AID grant assistance through 1977 at $10,000,000: $6,500,000 for personnel, $1,000,000 for participants, $1,800,000 for commodities, and $700,000 for other costs. For the three remaining years of project assistance (FY 1975 - FY 1977), funding of $2,000,000 was obligated by AID. This provided for advisors in six fields through 1977: Hospital Administration, Purchasing/Property Management, Clinical Physician, Engineering, Maintenance Training, and Medical Records, plus short-term consultants. Dietary, X-Ray, and Laboratory advisors were eliminated. The Purchasing/Property Management advisor and the Clinical Physician reflected new directions.

In the same document, USAID repeated its 1973 admonition that the GOL was expected to provide from its own budget the commodity support needed for effective operation of the NMC. The USAID requested $200,000 in 1975 and $100,000 in 1976 for commodities, and projected

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* Report of Study Team, 15 October 1969

** PROP, 19 January 1973.

GOL funding requirements for operations at $4,000,000 for CY 1975, $4,300,000 for CY 1976, and $4,600,000 for CY 1977. By 1975, moreover, the T.B. and Rehabilitation Hospitals were included, without comment, as integral parts of the NMC and eligible for institutional support.

In summary, therefore, a project that initially was intended to assist only three elements (JFK Memorial, the Maternity Hospital and TNIMA) was, by 1975, providing administrative and supporting services to the entire NMC complex. (Advisory, participant training, and commodity support services are not broken down separately by institution.)

Over the years, emphasis has shifted to the training of graduate physicians to provide (1) leadership for paramedical personnel in the field, and (2) referral services via radio in settings where transportation and roads are practically non-existent.

USAID data indicate that GOL/NMC has consistently agreed throughout the changing and evolving project design, to assume responsibility for operational and replacement costs of the Center. Thus, in practice, AID will have provided initial support and the GOL will cover the costs of continuing and maintaining the NMC.

II-B. A New Log Frame to Better Measure Progress

With the foregoing background in mind, the Wolf evaluation team attempted to analyze progress of Project 054 since the 1975 evaluation. To do so, we examined in detail the performance indicators being used by NMC and the USAID (Figure 1, "NMC PROP, 17 January 1975 - Logical Framework", on the next page).

Although the purpose of the complex is not clearly spelled out, the NMC staff were found to be well aware of its aim and of the functions it performs:

(1) Training of medical and paramedical personnel for the National Health Service.

(2) Referral of difficult medical cases, and advise on installation of county health facilities.

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY 62 to FY 77
Total U S Funding $ 10.0
Date Prepared: June 1, 1975

Project Title & Number: [illegible] Medical Center 669-51-590-074

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Program or Sector Goal: The broader objective to which this project contributes: To improve the physical, mental and social well-being of the people of Liberia to enable them to contribute adequately to the national development effort.	Measures of Goal Achievement: 1. A national health delivery system established with JFK as the hub. 2. Improved health-care training programs and qualified staff to conduct them. 3. Adequate health facilities to serve the majority of the population. 4. Qualified medical, technical, and administrative staff. 5. Acceptance of the system by people. 6. GOL's full funding of the JFK. 7. Family planning program established in rural and urban areas. 8. Reduction of mortality rate in infants. 9. Health statistical data available.	Observation, reports, field investigation, national budget, patient records, health statistics as compiled by MOH, MOH, MOP through it's statistical division.	Assumptions for achieving goal targets: 1. The JFK will be adequately staffed and ample financial resources will be available. 2. The JFK will have sufficient authority to manage and implement the affairs and plans set forth. 3. The GOL will rely on the JFK as the nucleus of it's health care and family planning delivery system. 4. Proper incentives implemented to retain JFK personnel. 5. The JFK will become an effective institution and will be the hub in the development of a nation-wide curative and preventive medical service as well as family planning. 6. The AID and the JFK agree on mutually acceptable roles in implementing program.
Project Purpose: To strengthen and improve the effectiveness of the JFK as the key GOL institution which will serve as the hub of the GOL five year plan for a nation-wide health delivery system.	Conditions that will indicate purpose has been achieved: End of project status. The JFK will 1. Administer effectively all phases of health care. 2. Use the GOL five year National Health Plan to provide basic health units of ascending complexity converging at the JFK. 3. Effect the appropriate balance between the delivery of health care, family planning and preventive medicine program. 4. Retain personnel and maintain all buildings, equipment and facilities	Observation, reports, immunization and health records, coalition reports.	Assumptions for achieving purpose: 1. The GOL will invest the JFK with sufficient authority to implement the National Health Care Delivery System using JFK as the key element. 2. JFK charter will guide implementation. 3. Appropriate actions taken to retain, hire and train qualified staff to give continuity to implementation plan. 4. GOL budgetary support will increase proportionately to the decrease of US inputs.
Outputs 1. Trained Liberian staff. 2. Improved health services. 3. Improved and well maintained facilities. 4. On-going in-service training. 5. Increased supply of technical and professional personnel. 6. Adequate administrative and fiscal system. 7. The JFK hospital will be used to train new doctors.	Magnitude of Outputs: 1. 100 participants in the US, 500 in country. 2. Board certified department chiefs, procedure manuals, medical records and data systems. 3. Trained supply and maintenance staff. 4. Seminars and in-service training for JFK and outside personnel. 5. National licensing for medical, paramedical and technical personnel. 6. Administrative system installed including payroll, accounts receivable, accounts payable, statistics, stock controls, personnel control, etc.	Observation, participant records, medical records, training records, legislation, business accounts.	Assumptions for achieving outputs: 1. GOL will sustain adequate budget support. 2. JFK able to hire, train and retain qualified personnel.
Inputs 1. Technical Assistance (USAID). 2. Participant training (USAID). 3. Commodity support (USAID). 4. GOL budget support. 5. GOL staff support. 6. Other donor support.	Implementation Target (Type and Quantity) 1. 11 technicians in various hospital administration fields. 2. 25 participants to the US in various fields. 3. $500,000 in hospital equipment and supplies over a two year period. 4. GOL budget $16.9 million over a three year period. 5. Full staffing of all JFK units. 6. Estimated $235,000 other donor contribution in FY 1975.	USAID records, on site inspection, review of GOL annual budget.	Assumptions for providing inputs: 1. GOL continues adequate funding. 2. Qualified JFK candidates identified and made available for training.

Figure 1. JFK PROP, JANUARY 17, 1975 - LOGICAL FRAMEWORK

(3) Procurement, warehousing and distribution of drugs, medical equipment and supplies for all GOL health facilities.

(4) Provide clinical and preventive health services for Montserrado County.

The evaluation team found the NMC to be effective and reasonably efficient in performing these functions. Other portions of this report show, however, that NMC's viability objectives have not been met, as measured by level of funding, availability and retention of skilled counterparts, maintenance and repair of plant and major equipment, and replacement of defective equipment and of expendables.

By its very nature, the Center will continue to remain operative and will grow and provide additional services annually, especially during the next few years when alternatives are unavailable to clients. The physical plant and equipment will require constant replenishment and maintenance, much of which can be predicted in terms of time and cost.

But, unlike most AID-sponsored projects which are self-perpetuating once they reach self-sufficiency, the NMC will remain heavily dependent on GOL funding and on retention of trained personnel in all departments. Neither of these is assured.

However, the NMC has been engaged since 1975 in a two-year effort to shore up and complete its training base; procure, recover and use commodities in the pipeline; and take stock of where the Center stands should the remaining advisors depart by 30 September 1977 as scheduled.

We did not find the Figure 1 performance indicators easily subject to evaluation. They are non-specific and are tied to a non-verifiable standard of completion, primarily of training objectives. Figure 2, on the next page, revises the original Figure 1 Logical Framework to provide an easier basis for analysis, and to clarify different levels of interrelationships. Even so, lack of quantitative targets, except in "inputs", seriously hampers evaluation.

II-B-1. Inputs

As planned, 11 technical advisors were active in FY 1975. Except for the Medical advisor, all were in administrative service fields. The scheduled phase-out of the advisors left nine in FY 1976 and only four by August 1976: those in Engineering, Maintenance Training, Medical Records and Purchasing/Supply. (The Medical advisor appears to have terminated sooner than scheduled.)

Figure 2 - PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK
(Revision of Figure 1)

Project Title & Number: JFK National Medical Center

Life of Project: From FY 1961 to FY 1977
Total U. S. Funding
Date Prepared: July 1977

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Program or Sector Goal: The broader objective to which this project contributes: Sector Goal: Support the Ten Year National Health Plan. Sector Sub-Goal: Support GOL Five Year National Plan.	Measures of Goal Achievement: Reduction of infant mortality rate. Health statistical data system established. Acceptance by the people. Rural-Urban Family Planning Pgm. Established Adequate County Health Facilities construction. National Health Delivery System established.		Assumptions for achieving goal targets: NMC is nucleus/key element of Nat. Health Plan. GOL/MHSW Implementing National Health Plan.
Project Purpose: Develop an effective National Medical Center.	Conditions that will indicate purpose has been achieved: End of project status. Improved health care. Physicians and Paramed graduates trained in clinical, preventive, and family planning (No./Type). Referral services (No./Type).		Assumptions for achieving purpose: GOL will work out NMC/MHSW coordination.
Outputs: Qualified staff: medical, technical and administrative. Full staffing of all units Trained Liberian/Resident Staff Supply & maintenance Viable In-Service Training Program Facilities maintained. Administrative, fiscal, medical records, other systems.	Magnitude of Outputs: Board-certified department chiefs (No. Eligible/Dept.) Licensed technicians (No./Field) Schedule of positions/% attrition In-service course offered (No/Type - 500 target): Liberian-run Advisor-run No. operational/% completion/ manuals available.		Assumptions for achieving outputs: Professional/Technical Personnel (available). National Licensing Board standard available. Salaries and other incentives competitive. GOL full-funding of NMC.
Inputs: AID Technical Assistance Participant Training Commodity Support GOL Budget support Other Donor	Implementation Target (Type and Quantity) 11 advisors/technicians in Adm. (1975-1977). 100 participants - 1967-77 25 participants - 1975-77 $300,000 in hospital equipment & supplies - 1975-76 $16.9 million over 3 years $235,000 other-donor contrib.		Assumptions for providing inputs: GOL Budgetary support will increase proportionately to decreased U.S. support.

Of the 100 participant trainees planned, we accounted for 92, for all years. Of 25 planned for FY 1975 through FY 1977, 22 appear to have been placed. The team could not discern any particular relationship between the numbers or timing of participants and the need for advisory services, even though backstopping of returned participants was the reason given for requesting additional advisor years.

Of the $300,000 requested by USAID for equipment and supplies, about $200,000 was appropriated. The NMC planned to use the shortfall to help overcome the serious lack of spare parts ($65,000), and improve dietary/food service, etc. ($35,000).

Major findings from our analysis of input status include:

1. Data from USAID, the Ministry of Planning and Economic Affairs, and NMC differ on revenues available to the NMC. The Ministry shows approximately $150,000 available from AID in excess of the amount shown by USAID.

2. NMC revenues from charges to patients are close to $100,000 per year. GOL employees in Montserrado County comprise one of the major client groups of the Center. Suggestions have been made to cover them with a minimal mandatory health insurance plan, partially financed from a monthly $2.00 levy against GOL employees and a charge to individual GOL agencies proportionate to the number employed. The plan might provide an assured, additional revenue base to the Center, while enabling it to lower charges to current classes of clients. At a monthly charge of $3.00 for the 15,000 or so GOL employees in the Monrovia area, the minimal health insurance plan could produce annual revenues of $450,000 for the NMC.

3. Total budgetary support of the Center by the GOL may not be meaningful or consistent with other assumptions relating to retention of workers and reduced AID support. Ministry of Planning data indicate that GOL support of the NMC almost tripled from $1,500,000 in 1972 to $4,238,000 in 1975. But, the Center's two added institutions -- the Tuberculosis and Rehabilitation Hospitals -- account for about $1,250,000 of the 1975 total; they contain a third of the bed capacity of the NMC, and account for about 15% of its employees. If the GOL 1975 contribution is confined solely to the sums made available to JFK Memorial, the Maternity Hospital

and TNIMA (the original three components), the 1975 total of $3,000,000 represents a doubling of financial support in three years. Since an annual inflation rate of 14% during the period has eaten away half of the apparent increase, it is clear that GOL funding increases have been far more modest that they first appear.

4. Retention of staff depends heavily on relative salary levels at the NMC compared to those offered similar personnel at other Liberian institutions. Fifty-nine percent ($2,500,000) of the Center's 1975 expenditures covered personnel costs. With a tight NMC operating budget, increases in GOL support which markedly favor staff and salary to the detriment of plant, equipment and supplies leave the NMC vulnerable in these latter areas.

* * * * *

In order to develop measurable targets and indicators of project achievement and performance, we have expanded and rearranged the original Log Frame into a suggested illustrative matrix (see Figure 3 on the next two pages). The new Log Frame points up the critical objectives and assumptions in resources (inputs), institution building (outputs), specific functions (purpose), and the relation of NMC to the overall health sector of Liberia (goal). The following comments on "outputs" and "inputs" should be reviewed in conjunction with the Figure 3 Log Frame.

II-B-2. Outputs

Other sections of this report indicate the substantial progress which has been made in basic infrastructure at the NMC, especially in terms of medical staff and training, and in administrative and supporting services.

Areas that still require considerable attention include inadequate laboratory direction and facilities, specialty nursing, equipment for intensive care, greater in-depth training in record-keeping, continuing losses of personnel to concessions, attrition of TNIMA graduates, resident housing, and deficiencies in physical plant and major equipment.

Repairs and replacement of equipment, and essential upgrading of plant and equipment point to a requirement of approximately $500,000 for the next two years, if present levels of services and functions are to be maintained.

Country: Liberia
Project Title and Number: JOHN F. KENNEDY NATIONAL MEDICAL CENTER, JFK-NMC (054)

FIGURE 3 - PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK
(Suggested Illustrative)

Life of Project: 1961-1977
Design Planning Span: 1975-1981
Date Prepared: July 9, 1976

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	Targets 1975 '76 '77 '78 '79 '80 1981	IMPORTANT ASSUMPTIONS
Program or Sector Goal: The broader objective to which this project contributes: Support the GOL Four-Year Health Plan (GOL National Socio-Economic Development Plan, July 1976 - June 1980	Measures of Goal Achievement: By 1981: Number of days of sickness or workdays lost reduced to _____ Reduce birth rate from 3.5% to 3.4% Increase life expectancy from age 45 to age 50 Reduce infant mortality rate from ____% to ____% Reduce major endemic diseases by stated % (see Annex ___) Reduce maternal death rate by ____% Reduce malnutrition patient workload by ____%		Assumptions for achieving goal targets: Following will provide goal support: Immunization/Control Projects Rural Water Projects Rural Road Projects County Health Center Constr. & Operation Prog. County Hospital Construction Program Lofa County Health Outreach Sanitation Projects Agricultural Production/Marketing Projects MOH Planning Project Epidemiology teams Family Planning Associations Nutition education
Subgoal: Develop National Health System	Number of patients served/cured in county hospitals Number of people immunized (TB, measles, cholera, yellow fever) Number of people (a) practicing family planning (b) receiving family planning commodities Medical Health Statistical System producing data: (a) (b) (c) } Specify Evaluation System installed Type/number of NMC-trained { physicians serving GOL facilities para-med personnel serving GOL facilities Number of Health Services provision sites operational (See Annex ___) Medical supplies on hand in County hospitals, Centers, and Posts (See Annex ___)		Design/preparatory work of County Hospitals undertaken by 1980 Concessions cooperating in system Modern medicine acceptable
Project Purpose: Establish a self-sufficient, operational Liberian Medical Clinical, Training, Referral, and Health Supply Center	Conditions that will indicate purpose has been achieved: End of project status. I. Effectiveness Number/type of qualified medical graduates (a) Liberian (b) Other Number/type of qualified para-medical graduates or trainees Number/type/man-hours/medical cases referred (a) To NMC (b) By NMC staff at MHSW facilities Technical assistance to County Health Facilities by Liberian staff (1) Number of man-days for advice/medical services (2) Number of man-days for establishment of laboratories (3) Number of man-days for development of supporting services (4) Other Average month's supply of medicines/shelf life Volume/value of medicines distributed (a) To NMC (b) For redistribution to MHSW facilities Death rate, by Department (Schedule of maximum norms) (a) In-patient (b) Out-patient Number/Department of patients served II. Efficiency For in-patient/out-patient: Cost per patient, total Cost per patient-day Average duration, patient stay % of bed utilization Patient/Physician ratio Administrative cost % to total cost (Continued)		Assumptions for achieving purpose: Medical graduates pass license examinations Physicians and other professionals accepted for graduate training abroad Gradual specialization of NMC in hard-diagnostic cases; common cases shifting to clinics County Morgue established

Country: Liberia

Project Title and Number: JOHN F. KENNEDY NATIONAL MEDICAL CENTER, JFK-NMC (054)

FIGURE 3 - PROJECT DESIGN SUMMARY LOGICAL FRAMEWORK (Continued) (Suggested Illustrative)

Life of Project: 1961-1977
Design Planning Span: 1975-1981
Date Prepared: July 9, 1976

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS 1/	Targets 1/ 1975	'76	'77	'78	'79	'80	1981	IMPORTANT ASSUMPTIONS
Project Purpose:	Conditions that will indicate purpose has been achieved: End of project status. (Continued) % of retail cost for bulk purchases not in excess of ___% Evaluation reports prepared (number) III. Viability: % revenue from Liberian sources Amount/% revenue from services/other (Specify) Retention rate of staff exceeds minimum of __% by Department % NMC equipmt, supplies order/delivered on schedule (Sched. ___)								**Assumptions for achieving purpose:**
Outputs:	**Magnitude of Outputs:**								**Assumptions for achieving outputs:**
A. Number/Type of Liberian Staff in Place: Qualified physicians on staff Qualified para-medical staff Qualified administrative staff Qualified training staff Qualified other support staff; e.g., engineering, repair, transport, mech., supply	Number and Type: Board-certified/eligible department heads and physicians. Licensed/Degree-holders: Nurses, engineers, instructors, administrative personnel, etc. Public Health, clinical, para-medical, family planning, laboratories, dormitories, library, clinics, mobile units, etc. Licensed/Degree-holders: Nurses, engineers, instructors, administrative personnel, etc.								A. Participants return to jobs as scheduled Salaries and other benefits competitive GOL-NMC appropriation level authorized No interruption in scheduled GOL financial support Staff working full-time for NMC
Complete/maintain facilities; type/cost	Replacemmnt/spare parts schedules (Annex)								Cooperation among agencies and/or professions
Auxiliary organizations	Family Planning Associations West African Medical Association								Qualified students available in planning period
Systems of operation	Fiscal/Personnel/Housekeeping/other Manuals up to date								
Means of coordination	Regular monthly meetings of Executive Committee, Board of Directors, department heads, Administrators, NMC/MHSW/University								
B. Drugs, supplies, equipment, and spare parts scheduled for NMC/MHSW	Value/volume purchased Value/volume warehoused								B. GOL/MHSW uses NMC depot for government facilities Port/transport systems operational
C. Instruction	Number and types of courses: Public Health (Preventive medicine) Clinical Para-medical Other (Family planning)								C. GOL/MHSW uses NMC/TNIMA for P.A./rural training
Inputs: 2/	**Implementation Target (Type and Quantity)**								**Assumptions for providing inputs:**
									GOL support for major categories, especially commodities, will increase proportionately to scheduled AID reduction (Schedule ___)

Inputs: 2/

Agency	Loans	Grant ($000) Project Ex. 1976	1976	1977	Total
USAID	5,850	See Table ___			16,850
Peace Corps					
SWICHP		190			
WHO		80			
France		15			
UN		50			
Israel		60			
GOL: Budget/staff		See Table ___			
NMC Revenue		See Table ___			
Private					
Total	6,850				17,245

Advisors	Supplies	Equipment	Participants
Table ___			Table ___
Annex ___			
Laboratory		Laboratory	
Annex ___			
Medical			
Cholera			
Opthalmology			
		Cobalt Unit	

1/ Indicators and targets to be determined cooperatively by MHSW, NMC and USAID. Annexes, tables and schedules to be attached.

2/ Incomplete data

The intern/residency clinical medicine in-service program is already being offered by the Liberian staff of the NMC. Programs are also offered for nurse-anesthetists, pharmacy dispensers and X-ray technicians. As noted earlier, NMC's management has reflected a need for continued advisory assistance in Engineering, Maintenance Training, Medical Records, and Purchasing/Supply. We have found laboratory management weak and critical in regard to the maintenance of current levels of service and with respect to the NMC being able to fill its role of hub for the National Health System.

Emphasis in training and health care is concentrated on the curative aspect of medicine. Considerable efforts are under way to provide training and leadership in preventive medicine. The Tuberculosis Hospital and cholera unit are functioning NMC components, and preventive training for those two diseases is active. With the development of the General Duty Medical Officer concept, the payback service year, and initiation of preventive medicine programs in the rural areas, training for the National Health Program is proceeding apace.

Even though the NMC appears effective and relatively efficient, uncertainty and inability to guarantee a continuing viable project result from seemingly endemic problems regarding plant, equipment and supplies; constant threat of attrition due to lack of depth in top and middle management, as well as low salaries; and the scarcity of capital to complete the Center.

A rough estimate of the budget needed to cover operating costs at NMC in CY 1977 is $4,500,000 ($2,500,000 for personnel and $1,500,000 for commodities, plus an inflation factor over CY 1975). This amount would cover present plant, with only minimum provision for replacement and repairs of plant and equipment, at present levels of services.

The GOL is currently budgeting 1976-1979 funds* for some of the specific requirements noted above:

1. NMC Improvements - $2,430,000, including: Construction ($794,000), Equipment ($1,375,000), Misc. Maintenance ($241,000) and Other ($20,000). This covers funds for medical staff housing, and a central administrative building for the mental hospital; replacement of auxiliary

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* Ministry of Planning and Economic Affairs, List of Projects, 1976-1979, Annexes III and IV.

generators and laboratory equipment; establishment of the supply depot; replacement of roof and steam lines; waterproof elevator towers; and fence for the Tuberculosis Sanitorium grounds. (NMC)

2. Residency Training Program - $616,000, including stipends to participants in residency training program covering surgery, pediatrics, internal medicine, and OB/GYN. This is a four-year training program, providing 16 doctors at any given time. (NMC)

3. TNIMA - $1,445,000, including $1,265,000 for building, and $180,000 for operational costs. (MHSW)

4. Laboratory Technician Training - $57,000, continuation of 1974 WHO/UNICEF course for 10 trainees per year. Expenditures are for instructor salaries. (MHSW)

5. Central Medical Store - $280,000, for construction of building and purchase of equipment. (MHSW and Ministry of Public Works)

Projects 1, 2 and 4 are "Category A" projects, having high priority, detailed project description, and designated source of funds. Projects 3 and 5 are "Category B" projects, and are not assured of approval or funding.

II-C. The Log Frame, and Liberian/AID Health Sector Goals

In March 1975, using 1972-1973 data, the World Bank compared the health status of 40 developing countries. Liberia ranked with the others as follows in four major indicators:

- In Per Capita Income - 20th
- In Crude Birth Rate - 30th
- In Crude Death Rate - 29th
- In Infant Mortality - 25th
- In Life Expectancy - 29th (tied with three other countries)

Thus, although Liberia's income was at mediam for the group (it was 20th among 40), it had comparatively high birth, death and infant mortality rates. Twenty-eight of the countries had higher longevity,

while three had the same and only eight reported lower average lifespans.*

A similar comparison among 30 developing countries' health budgets as percentages of national budgets ranked Liberia 20th; and as a percent of GNP, Liberia's health budget ranked 18th out of 29.**

These sets of indicators suggest that Liberia's potential health goals have not been achieved by its health efforts through mid-July. The results of programs and training started by and currently under way at the NMC (and increasingly being supplemented by the MHSW) have not had time to bear fruit. It will be recalled that the JFK Memorial Hospital received its first patients in the latter part of 1972 -- concurrent with the period covered by the above data.

The results of NMC's efforts should become evident in the near future. Liberia's virtual elimination of smallpox after a four-year program of immunizations holds promise for progress in eradication of similar diseases. And the growing and continuing supply of NMC graduates serving in the countryside should have measurable effect on the medical and nutritional education of outreach workers and subsequently on the health of the rural population.

As can be seen from the long list of supplementary and complementary projects which are currently working to support the Liberian National Health Plan (see "Goal Assumptions" on the Figure 3 Log Frame), the NMC is only one of many entities working to reduce disease and to provide a healthier life for the mass of the population. Measurable attribution of results to any one of them would be difficult if not impossible. From the perspectives of cost and time, much can be accomplished through the simpler technical projects (water purification, immunization, sanitation). But, without the functions performed by the NMC, the base of the pyramid would be shaky at best. The inputs of the NMC provide long-term stability and professional human resources unavailable in any of the other related projects.

The Liberian economy has improved its ability to produce and generate budgetary resources. Predictions for the next several years, based on prospects for iron ore, rubber and lumber, are optimistic that funding will be available for new developmental efforts as well as for current operations.

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* World Bank, HEALTH, March 1975, Annex 2, pages 72-73.

** Ibid, Annex 3, page 74.

The evaluation team reviewed other relevant AID-sponsored projects -- especially the Health Management Planning Assistance project, and the demonstration Lofa County Outreach project. While the health sector goals shown for the former have great similarities to those of NMC, the Lofa County project goals differ. All USAID-sponsored projects should have common goals -- the same health objectives, indicators, and probably the same complementary projects. We recommend that USAID compare these various projects to assure consistency in goals. Analysis of the other projects probably would result in changes or additions to the prototype suggested Figure 3 Logframe.

Each of the four functions which underlie the purpose of the NMC (see page 1 of the report) directly serves the National Health Program in Liberia. A close reading of the 1975 project design (Figures 1 and 2) reveals undue preoccupation with the need for the NMC to be identified as the key element in the national program. One of the assumptions therein is that the GOL will bring about coordination of the NMC with the MHSW. Interviews with key Liberian officials in both organizations indicate predisposition on the part of top management, especially at technical levels, to work closely together. There is no question that the NMC works within the overall program of the MHSW, and that ultimate responsibility for health care rests with that Ministry. Interlocking relationships on NMC committees, ability to issue separate, non-competing budgets, and the benefits to MHSW of full use of the NMC, all provide a basis for mutual compatibility.

The initiative taken by NMC's staff in development of the General Duty Medical Officer concept, and the payback arrangement to ensure a pipeline of NMC graduates to county facilities has been discussed. NMC's TNIMA is the logical training base for the National Health Plan.

We have seen that referrals are a significant proportion of the NMC's patient load. In the absence of documentation, sources of referral are not known.

We have suggested indicators which will lead to the development of documentation of such cooperation, both to and from the NMC.

The Lofa demonstration project provides a basis for testing various methods of making referral more useful and effective.

The purchase and supply of drugs and equipment involves both materials handling and bulk purchase, with attendant savings. The development of systematic ordering and distribution has yet to be systematically installed. Considerable study remains to determine the minimum and optimum type and quantity of drugs or other types of equipment and replaceables for particular types of facilities.

Because of the higher priority accorded rural development by the GOL and AID, there has been a tendency to downplay the services provided by the NMC as the Montserrado County medical facility serving primarily an urbanized Monrovia. Montserrado County's population is about 500,000, some 30% of the Liberian total. The County is growing at a 4.5% annual rate. Monrovia is growing at an 8.0% annual rate, doubling every nine years.

As a result of the services provided by the NMC, the GOL has made no plans to provide a new hospital for Montserrado County -- an objective of the National Socio-Economic Development Plan which is being implemented for each of the other counties. If the NMC facilities were not already in place, a County/Capital hospital would have to be built and staffed at considerable cost. (Given the geography of Lofa County, the NMC is far closer to many of its inhabitants than is Voinjama, Lofa County's capital, and may be the logical medical center to serve them until a closer facility is constructed.)

Important to internal effectiveness and efficiency at the NMC is its development of a regular and systematic method of coordinating functional and supporting departments (administration, engineering, transportation) to permit service functions (clinical, paramedical) to reduce or remove obstacles to performance. A set of related indicators has been included in Figure 3. Similar coordination is critical among the three major Liberian health-care entities: MHSW, University of Liberia Medical School, and the NMC. Representatives of these organizations should be of the highest possible level -- at least department heads and deputy ministers.

* * * * *

The administration and staff of the NMC are preoccupied with time-consuming day-to-day problems. They cannot be faulted for not being overly concerned with meaningful long-term indicators of achievement when their roles are well defined and their success is measured in terms of short-term performance of care and related training. Certainly the National goals are not their direct concern, although the NMC plays a strategic role in achievement of the goals.

Ideally, the evaluation team should have had time to work directly with the NMC staff to develop meaningful ways of measuring performance. Constraints on time, and on availability of staff prevented this.

Figure 3 suggests a new design which we believe will provide a minimum indication of performance and achievement in the NMC's four functions. To be useful and meaningful, the USAID Project Manager and the USAID Evaluation Officer should sit down with the Clinical Director, the NMC Administrator and the IHS Chief-of-Party to obtain agreement on the required schedules, annexes and quantitative targets implied in Figure 3 for the input, output and purpose indicators.

The USAID should consult separately with MHSW and Ministry of Planning and Budget representatives on the indicators of goal achievement and the required GOL financing and coordination shown as probable and required. It may prove immediately that the financing required to operate the Center at even present levels will not be forthcoming. The shortfall, if any, will have to be negotiated, keeping in mind that the self-help basic responsibility is that of the GOL. We recommend that a loan officer from the African Regional Office be detailed to TDY to assist in working out these cost requirements.

III. PATIENT SERVICES AND PHYSICIAN TRAINING

III-A. Patient Services: Expansion to Meet Increasing Needs

From the original idea of a modern general hospital serving Monrovia and Montserrado County, the scope of the NMC was successively expanded to include service as a training center for nursing and allied health personnel; a referral center for the nation and hub of a National Health System including progressive responsibility for a series of specialized patient-care institutions (maternity, cholera, tuberculosis, and psychiatry); and finally as the principal clinical training facility for medical students and physicians-in-training. From the medical point of view, NMC has moved aggressively to meet each of these responsibilities and has demonstrated considerable progress during the past four years.

Service Volume Indicators

The JFK Memorial Hospital itself has logged a remarkable increase in the volume of patient services provided in the period under consideration.

SELECTED SERVICE VOLUME INDICATORS
THE JFK MEMORIAL HOSPITAL 1972 - 75

Indicator	1972	1975	% Change 1972-1975
Admissions	4,590	6,651	+ 44.9%
Avg daily census	165	251	+ 52.1
Patient days	61,788	80,125	+ 29.7
Length of stay	14	12	- 14.3
Clinic visits	23,807	70,674	+196.9
E. R. visits	9,148	25,160	+175.0
X-rays	20,575	28,907	+ 40.5
Prescriptions	91,460	143,538	+ 56.9
Lab procedures	34,298	57,731	+ 68.3

The evaluation team made an effort to determine the composition of the workload, i.e., the nature of conditions and diseases, treated at JFK Memorial.

The following information was provided by the Medical Records Department.

Diseases Present in the Hospitalized Population in Descending Order of Frequency

Diagnosis:

Gastroenteritis and Diarrheal Disease
Cholera
Broncho-pneumonia
Malaria
Other parasitic diseases
Measles
Anemia

Diseases Present in the Outpatient Population in Descending Order of Frequency

Diagnosis:

Malaria
Pneumonia
Parasitic and infectious diseases
Respiratory diseases
Gastroenteritis
Anemia
Measles

The tabulations reflect the prevalence of the principal diseases of the country. Data were not available to distinguish between those conditions which actually required hospitalization or caused the patient to seek care at the hospital, and those conditions which were incidental findings accompanying the major presenting condition. Since a large majority of patients have common disorders as incidental findings such as those listed, these tend to be the most frequent diagnoses.

Many of the listed conditions may be effectively diagnosed and treated outside the hospital setting. Review of records of hospitalized patients, however, gave no evidence that individuals were admitted for conditions that could have been appropriately treated in another setting.

In addition to patients referred for sophisticated surgical procedures, diagnosis and treatment of neoplastic diseases, and diagnosis and treatment of elusive or complex disorders fitting the Hospital's role as referral center, patients with serious cases of common diseases and trauma were also present--as one would expect in any general hospital population.

A system should be developed to provide information distinguishing between frequently occurring conditions (incidental diagnoses) and those requiring hospital care (primary diagnoses).

An effort as made to project potential future workload. It seems likely that certain conditions will in the future be diminished by developmental and public health efforts at the village and county level, e.g., cholera, malaria, other parasitic diseases, etc. As the National Health Plan progresses, JFK Memorial's role as referral center will undoubtedly increase.

Service volume indicators for other patient-care units for which the NMC progressively assumed responsibility during the years 1972-74 reveal differing patterns which reflect the application of more modern and progressive principles of patient care.

For example, admissions to the John Reugene Roberts TB Sanitorium rose from 497 in 1972 to 610 in 1975, while the Average Daily Length of Stay dropped from 121 to 107 days. These figures reflect the leadership of the NMC Medical Staff in reorienting treatment of tuberculosis in line with modern practice which emphasizes shortened but more aggressive in-patient treatment, with newer drugs used as indicated in resistant cases, followed by carefully monitored, aggressive extended out-patient treatment on effective medications. Under the leadership of the NMC, two additional tuberculosis out-patient clinics with appropriate outreach staff for follow-up of patients have been put in operation.

Less complete statistics reveal a similar emphasis on short-term hospitalization followed by supportive out-patient services for patients treated by the Catherine Mills Rehabilitation Hospital (psychiatric-mental health) since its incorporation into the NMC complex.

Similar indicators for the Maternity Center, which has been in operation since the 1930s, also reveal significant increases in volume of services provided during the period under review. These data are consistent with the high birth rate and population growth in the Monrovia area, and the increased attractiveness to the populace of institutional deliveries as reported by the Center's professional staff.

NMC's Medical Leadership

The NMC has also been responsible for either stimulating or implementing a number of other medically sound and progressive efforts. These include the launching of a national BCG vaccination campaign to be conducted by the MHSW as an outgrowth of NMC's redirection of the nation's tuberculosis treatment efforts. Eventually, this campaign may be expected to have significant impact on morbidity and mortality from tuberculosis, currently estimated to affect some 10% of the Liberian population, and should also provide some protection against leprosy.

The medical leadership of NMC moved promptly in 1972 to close the former cholera treatment unit, recognizing it as a significant public health hazard because of its location and sewage disposal practices, and relocated the unit to the grounds of the JFK Hospital. The cholera unit has subsequently received international recognition for the quality of its work and was selected by WHO as the location for a recent regional training program on cholera.

Additional efforts of the NMC's medical leadership have been instrumental in expanding both the service and training capacity of the MHSW's West Point Clinic, located in what is probably the nation's single most highly populated and squalid area; in stimulating the demonstration Lofa County Outreach Project for provision of health services to the nation's large rural population; in developing the concept of the General Duty Medical Officer as the key physician staff for the provision of services to the rural areas; and in stimulating a number of efforts aimed at drawing the University of Liberia's Medical School and the professional community of Liberia into closer association with their West African counterparts.

Referral Services

As the largest and most sophisticated GOL hospital in the nation, JFK Memorial has been expected to develop a significant role as referral center for the country. Hard data to document the extent of this function have been difficult for the Hospital to accumulate, principally because of the unreliability of patient responses to questions regarding location of their homes. Patients appear reluctant to answer honestly, because of fear that they might not receive services if they live at a distance, or that they might be subject to retribution from their local practitioners, be they folk or medical. Estimates from knowledgeable professionals at JFK place the number of patients

treated from outside the City of Monrovia at from 20% to 50% of the total patient load of the JFK Memorial Hospital.

In order to develop a more quantitative approach to this matter, the evaluation team scanned all charts available on one day on the Medical, Surgical, and Pediatric Services of JFK Memorial to ascertain evidence of medical referral from outside Monrovia and Montserrado County. Only letters of referral were accepted as such evidence. Of 188 patient charts reviewed, 39 (20.7%) bore notes or letters of referral from health providers outside of Monrovia. Thirty (15.6%) of the referrals were from providers outside of Montserrado County. Most providers were physicians in county hospitals. However, referrals were also noted from Mali (1), Sierra Leone (1), and Ivory Coast (1). It can be assumed that a substantial number of additional patients may have been self-referred from outside the City and County, or may have been referred without benefit of a referral notice from their provider.

Further evidence of its role of referral center is provided by examining where patients are referred for outpatient services following their discharge from the TB Sanatorium. Records for 1975 indicate that 63 patients were referred to localities in Montserrado County and 72 patients were referred to other counties. Institutions referring patients <u>to</u> the Tuberculosis Hospital were recorded as follows:

Concession:	Lamco	9	County Hospitals:	Grant	5
	Bong Mine	9		Bassa	2
Hospitals:	ELWA	12		Ganta	1
	Catholic	23		Rennie	2
	Phebe	22			
	Mines	2	Private clinics:		<u>0</u>
	Firestone	2		Total	89

Finally, the establishment of the Tumor Registry, Tumor Clinic, and radiotherapeutic capacity of JFK Memorial, centered around the cobalt treatment unit donated by Howard University Medical School, have established the Hospital as the Nation's principal diagnostic and treatment center for neoplastic diseases.

It is appropriate, therefore, to conclude that the JFK Memorial Hospital <u>is</u> serving effectively as a referral center for patients from beyond Monrovia and its surrounding county.

Patient Care

Although time and resources were not available to conduct an in-depth quality-of-patient-care review during the evaluation, the team's health systems specialist conducted extensive interviews with physician staff, was taken on rounds of hospitalized patients, and made independent chart reviews and physical examinations of ten randomly selected patients on the hospital services. Certain impressions were gleaned from this review.

- The level and quality of diagnosis and treatment is generally good. Serious and complicated medical, surgical and pediatric problems are generally well handled.

- Although nearly all patients have as incidental findings malaria and various other parasitic infestations, presenting conditions requiring hospitalization include a number which are rich material for clinical and basic research because of their apparent patterns of occurrence. Examples of this are hepatoma; myocardopathy and cardiac failure; hypertension, stroke and other evidences of arteriosclerotic disease and the almost total absence of myocardial infarction; advanced malnutritional states in children; etc.

- Efforts by the staff to reduce further the length of patient stay have been seriously hampered by "placement problems" quite similar to those encountered in the public hospitals of the United States -- families reluctant or unable to take back into the home a child or health-impaired adult who no longer requires hospital care. Proposals have been made by the medical leadership for the establishment at the University of Liberia of a curriculum to prepare a social work aide to assist with such problems as well as patient compliance and follow-up.

- Charts maintained by the hospital services, with the exception of nursing notes, are generally inadequate. Although the By-laws of the Medical Staff call for documentation in the chart of complete work-ups and follow-up notes, physician work-ups as revealed by the charts are quite incomplete and follow-up notes give little information regarding evolutions of the cases. Charts in adult medicine appear to be the best, those in pediatrics the worst, and those of surgery and the subspecialities are intermediate. None are truly complete and informative.

- o Laboratory information appears inadequate, especially in the areas of chemistry and antibiotic sensitivities. The physician staff complains of unreliability and episodic unavailability of tests.

- o Nursing care was reported to be a problem by all of the services reviewed. Although the assignment of a permanent supervisor to the pediatric service has helped, a shortage of well-trained specialty nurses is a continuing problem.

- o The recently established Intensive Care Unit functions almost without specialized equipment, and, in spite of its eight-bed capacity, is limited to two, because of staff shortages.

- o Although the institution's overall death rate has been more or less constant over the past four years, significant improvements have been achieved in lowering the death rate in pediatrics from the 30% prior to the opening of JFK to the present 16%. Each of the past four years has seen a decline in the death rate on this service.

- o Shortages of such basic supplies as linens and sheets are a chronic problem.

- o Dental services were not reviewed. The dentist staff consists of five Liberian dentists and one expatriate. A sixth Liberian dentist is scheduled to arrive in 1976.

* * * * *

Certain areas of importance to the provision of patient services warrant specific comment:

1. Physician staff report frustration over periodic exhaustion of supplies of important basic drugs and material. Episodes during which X-ray film of certain sizes, absolute alcohol for laboratory use, scalp vein needles, and antihypertensive medication were not available are acknowledged by the administrative staff. Administration states that at times satisfactory alternate drugs and supplies were available for use on an interim basis, but that physician staff refused to make use of them.

It is clear that certain basic inventory and supply problems exist. It also is clear that a closer working relationship between medical staff and administration could be developed to anticipate and deal constructively with such situations.

2. The Pathology Department is experiencing difficulties in meeting the heavy demands placed upon it. The well-qualified anatomical pathologist who heads the Department is called upon to serve as ad hoc County Coroner in addition to his heavy responsibilities for supervising all of the Center's laboratories, and fulfilling teaching responsibilities for the house staff and medical students. We recommend either establishment of a separate County Morgue and Medical Examiner's office, or supplementation of staff and facilities at NMC to meet this function. A microbiologist/pathologist has recently joined the staff.

The area of clinical chemistry, however, suffers from the lack of an experienced clinical pathologist or chemist to organize, develop, and supervise this area. The laboratories have kept to a minimum the use of sophisticated automated equipment because of fear of becoming dependent upon machines which are delicate to operate and difficult to maintain in the face of procurement problems, climate, and limitation of available trained repair personnel. Capacity is therefore generally limited to manual tests. Experienced technical advice might permit selective automation and improve the capacity and reliability of the laboratory.

3. Capacity appears to be further limited by problems with personnel administration which make it difficult to reward certain able staff who have received advanced training, and to discipline other staff in whom motivation is low and willingness to learn new approaches is limited. It is conceivable that more intensive supervision by a qualified chemist/laboratory director would improve this situation.

4. A marked drop in the activity of the Radiology Department was noted from the 1974 level of 39,045 X-rays taken, to the 1975 level of 28,907. Three events occurred during this time which might have contributed to this decrease in activity: (a) a delay in securing appropriate film; (b) the Ministry of Education reinstituted a program of chest X-rays for students; and (c) the Director of the Department of Radiology became more deeply involved in private practice activities outside the Medical Center. It is difficult on the basis of available information to assess the relative impacts of these factors.

5. New policies which permit the admission of private patients to JFK Memorial Hospital in recent months, combined with the ability of full-time physician staff of the NMC to conduct private practice outside of the hospital, raises the possibility of significant abuse by the physician staff to the detriment of the Medical Center and the patients who depend upon it. Although certain benefits may accrue to the Center as a result of these policies, risks of abuse are present.

Private practice privileges for physician staff have been necessary as an incentive to attract and keep qualified and scarce physician manpower, particularly in the face of relatively low staff salaries. As salaries improve and as the depth of physician staffing increases, consideration should be given to switching to the "full full-time" or, perhaps more feasibly, the "geographic full-time" arrangements for physician employment which are common for similar institutions in the United States. These arrangements permit some degree of regulation and benefit for the employing institution, and have been found acceptable by physician staff.

6. The Maternity Center, located separately from NMC, has experienced a steady increase in volume of services and has extracted maximum performance out of decrepit and basically inadequate facilities. The vast majority of deliveries are performed by midwives. Supervision of the midwives has improved with the development of the house staff training program at the Center. Patient services, however, suffer from inadequate facilities (three newborn infants per bassinet was observed), and from inadequate presence of fully qualified OB/GYN specialists, anaesthetists, and pediatricians. The distance of the Maternity Center from the JFK Hospital presents very real risks to seriously-ill newborn infants.

7. Finally, we note that the Chief Medical Officer and the department heads demonstrate a remarkable degree of accuracy in their assessment of the problems of the Medical Center and its professional staff. This self awareness has permitted effective solution of past problems, and promises well for the successful attack on existing and future ones

III-B. Physician Staffing and Training

Physician staffing of the NMC changed rapidly from 1972 to 1976. The Chief Medical Officer has exercised energy and ingenuity in piecing together a physician staff and pursuing intermediate- and long-range strategies aimed at increasing the level of training and depth of staffing of the Medical Center--slowly diminishing the Center's dependence on expatriate physician manpower. Physician staffing in 1972 totaled 28. Of the senior physicians, (Board-eligible or Board-qualified in a specialty) six were Liberian and eight were expatriate. Eleven of the "junior physicians" (neither Board-eligible nor qualified) were Liberian.

In 1974, after aggressive advocacy by the Chief Medical Officer--and following the loss of well-qualified Liberian physicians to concession hospitals--the GOL granted salary increases to physicians. This, combined with certain fringe benefits, salary supplements for those holding faculty appointments at the University of Liberia Medical School, and the ability to pursue private practice, has made physician staff incomes competitive with those available in other West African Countries.

At the start of July 1976, physician staff at NMC totaled 51, broken down as follows:

	Liberian	Expatriate
Senior physicians	8	15
Junior physicians	5	2
Residents	3	3
Interns	5	10
	21	30

Three Liberians are completing postgraduate specialty training outside the country on NMC-supported scholarships and have contractual obligations to return to the Medical Center on completion of their training. An additional five Board-eligible/certified Liberians are due to join the NMC staff within the next 12 months. Six Board-eligible/Board-certified expatriate physicians are scheduled to join the staff within the next 12 months. These additions will counterbalance anticipated attrition and a temporary fall-off in the number of house staff.

The role of the NMC as a training center for the production of health manpower for the nation has assumed increasing importance. The Center's role in the production of nursing and allied health manpower is treated in Section V, on TNIMA. Since the early 1970s, the NMC has played a central role as the clinical teaching facility in the education of students at the University of Liberia's Medical School. Since the graduation of the Medical School's first class in 1973, JFK has been actively involved in post-graduate medical education--training of interns and residents. The Medical Center has also been consistently though variably involved in providing clerkships and house staff rotations for medical students and house staff from abroad.

Collaborative efforts between the Medical School and the NMC have served to develop a growing "pipeline" of physician manpower for Liberia. Attendance at the School of Medicine is estimated to cost approximately $2,000 per student per year, though figures were not available to verify

this estimate. Students, both Liberians and expatriates, generally attend without charge on what is essentially a GOL full-tuition and maintenance scholarship. In return, graduates are obligated to serve their internship at the NMC and to one year of service in the rural counties of Liberia, at the discretion of MHSW.

The "pipeline" of physician manpower thus generated is reflected in the following table (the Medical School curriculum is five years):

UNIVERSITY OF LIBERIA MEDICAL SCHOOL GRADUATES/STUDENTS

Class of	Graduates/Students	Liberians
1973	4	2
1974	10	2
1975	12	5
1976	5*	2*
1977	6*	4*
1978	14*	5*
1979	19*	7*
1980	26*	14*
1981	30**	15**
Totals	126	56

* Indicates present enrollment without projection of attrition.
** Indicates projections on capacity and recruitment efforts.

A sustained effort to increase class size and number of Liberian nationals has been particularly successful in the past three years.

The size of the graduating class of the Medical School is not the only determinant of internship or residency class size. The NMC is committed to accept any qualified Liberian national who has received medical training elsewhere but who desires a house staff position at the Center.

Internship figures for the Medical Center show the following:

Year	Internship Class Size
1974	4
1975	10
1976	15
Total	29

Residency training has been initiated in the past year in cooperation with the West African College of Post-Graduate Medical Education, an organization of cooperating hospitals and medical schools in the area. Residents are presently functioning in OB/GYN, internal medicine, and one resident in surgery is anticipated for the present year.

Full utilization of house staff in coverage of hospital patients is compromised by the unavailability of living quarters for the house staff on the grounds of the hospital. Plans for such housing have been promoted by the Chief Medical Officer for the past two years.

The commitment of the medical leadership of NMC and of the Medical School is to the preparation of a General Duty Medical Officer who is intended to function out of a county-hospital base, as the supervisor and support for the non-physician health-care staff in health posts at the village level. For this reason, active recruitment efforts have been directed toward identifying able students from the villages and encouraging them to attend Medical School. The assignment of physicians following completion of internship to MHSW payback service in the rural areas is also aimed at encouraging this career decision on the part of physicians. Only carefully selected medical graduates are encouraged and supported in their pursuit of specialty postgraduate training, and such support is increasingly limited to areas of significant need to the NMC as a training and referral center.

On the basis of present and projected senior physician staffing of the NMC, more emphasis should be placed upon preparing additional qualified Liberian specialists in internal medicine, pediatrics, OB/GYN, psychiatry, pathology, and certain of the surgical sub-specialties such as orthopedics and ophthalmology. For historical reasons, general surgery has been an attractive field for Liberian physicians, and staffing in this area is sound.

III-C. Summary, Conclusions and Recommendations

The JFK Medical Center has achieved success in serving a series of rapidly evolving roles in the context of the health care system in Liberia. From the original idea of a modern general hospital serving Monrovia and Montserrado County, the responsibility of this project was successively expanded to include service as referral center and hub of the entire National Health System, and finally as the major clinical training center for health manpower for Liberia. Evidence of solid achievement in each of these roles is documented.

The medical leadership of the NMC has stimulated the GOL to adopt policies supporting outreach efforts to serve the large rural population of Liberia through such projects as the Lofa County Outreach Project, and development of the General Duty Medical Officer concept. The same medical leadership has developed postgraduate medical education activities (Residency Training) at NMC in association with the Medical School and the West African Post Graduate Medical College, in order to support NMC's role as a referral and training center for West Africa, and to minimize loss to Liberia of physicians who seek advanced specialty training.

These efforts have established a growing "pipeline" of physician manpower, increasingly Liberian Nationals, for both general duty medical work and specialty service for the Nation.

The patient-care staff of the JFK Memorial Hospital and its associated specialty hospitals has contributed significantly to improvement of patient care in Liberia despite stringent limitations in the availability of modern equipment, supplies and support services--most noticeably in the laboratory area.

Recent initiation of policies permitting admission of private patients has made JFK Memorial Hospital attractive to well-trained physician manpower and appeals to the more affluent Liberians. It may also hold significant potential for abuse by physicians at the expense of the general population.

Continued progress in quality and scope of patient services, and in training appropriately prepared health manpower for the National Health System, will be heavily dependent upon the sound basic functioning of the NMC as an institution which attracts rather than discourages talented and highly motivated students and staff.

Recommendations

1. Steps should be taken by GOL, alone or in conjunction with other appropriate support services to assure the continued effective functioning of hospital systems. Maintenance of satisfactory patient care, ability to retain qualified staff, and continued training capacity all depend upon a functioning hospital. Requirements in this regard are delineated in Section IV in this report.

2. A technical advisor should be sought in the area of clinical laboratory development, supervision, operation and training. He would work jointly with the Department of Pathology/Central Laboratory and TNIMA to further develop the laboratory capacity of the Center. A

full-time permanent clinical laboratory specialist should be hired to work in tandem with the advisor.

3. A GOL-supported program of scholarships for post-graduate training of Liberian physicians, with appropriate service payback requirements, should be encouraged to provide needed manpower in selected specialty and sub-specialty areas.

4. At such time as depth of physician staff permits, steps should be taken to clarify and enforce expectations for physician work-load, working hours, service responsibilities and patient chart maintenance policies as suggested in the Bylaws of the Medical Board.

5. At such time as physician staff depth and salary schedules permit, consideration should be given to establishing and enforcing "Full full-time" or "Geographic full-time" arrangements as replacement for present policies regarding private practice for full-time physicians.

6. Steps should be taken by GOL either to expand the morgue capacity, including pathologist staff, at JFK or to establish a separate morgue facility and chief medical examiner's office.

7. Continued efforts should be made to increase the enrollment of qualified Liberian Nationals in the Medical College of the University of Liberia.

8. A cooperative system between the NMC medical staff and administration should be developed to capture accurate data on location of patients' homes, in order to better document NMC's role as a West African and National referral center.

9. As depth of physician staff and laboratory support develop, clinical research on health problems characteristic of the Liberian population should be further encouraged.

10. Cooperative relationships and exchange programs with appropriate health-related institutions abroad should continue to be encouraged and supported.

11. GOL should pursue the construction of housing for intern and resident physician staff on the grounds of the NMC.

IV. ADMINISTRATIVE AND NON-MEDICAL SUPPORTING SERVICES

Our evaluation of the NMC in the area of administrative and non-medical supporting services covered the following:

- o Governance and administration
  - The Board of Directors (Bylaws)
  - Medical Board (Bylaws)
  - Organization Chart
  - Assignments and qualifications of key personnel
  - Fire and safety practices
  - Training programs
  - The role and contributions of advisors
- o Budget and expenditures
- o Division of Fiscal Affairs
- o Personnel Department
- o Engineering and Maintenance
- o Medical Records Department
  - Admitting
  - Record Room
  - Statistics
- o Housekeeping
- o Laundry
- o Pharmacy
- o Dietary
- o Materials Management
  - Procurement
  - Medical Supply Depot
  - Medical Equipment Repair
- o Nursing Service
- o Central Supply
- o The Maternity Center
- o The Catherine Hill Rehabilitation Hospital
- o The John Eugene Roberts Sanatorium

Relevant findings, conclusions and recommendations are found elsewhere in this report and in the subsection immediately following.

IV-A. The NMC's Operating Departments: Major Findings and Recommendations

Delivery of Patient Care

Progress in the delivery of patient care to an increasingly larger segment of the Liberian population and concurrent improvement in the acceptability of the services offered is demonstrated by the growth in the numbers of people served:

- The "Selected Service Volume Indicators" table on page 32 of this report reveals that admissions to the JFK Memorial Hospital increased 45% between 1972 and 1975. Admissions to the NMC, including JFK Memorial, the Maternity Unit and the Psychiatric Unit, increased 35% during the same period.

- A 30% increase in patient-days of care rendered at JFK Memorial took place between 1972 and 1975. An overall increase of 8% for the NMC occurred during the period.

- Because of the trend toward ambulatory treatment and shortened hospital stays for tuberculosis patients, patient days of care declined 40% during the three years at John Eugene Roberts Sanitorium. Admissions to that unit increased 23% during the same time, demonstrating that larger numbers of patients were treated even as the period of inpatient hospitalization was shortened.

- Clinic visits increased 197% between 1972 and 1975. Emergency room visits were 175% greater in 1975 than in 1972.

Funding Levels and their Impact on Availability of Commodities

Total number of employees on the payroll of the NMC has risen 57% since 1972. In that year, the Center had 1,025 employees; in mid-1976 it had 1,611. The increase shows evidence of efforts to meet staffing needs as the volume of patient services increased.

While the overall budget for the NMC increased significantly between 1972 and 1976 -- from about $2.5 million to $4.5 million, an increase of 80% -- the portion of that budget for materials, supplies and equipment is insufficient to meet the

needs of the growing Center. The amount budgeted for materials, supplies and equipment increased from $678,733 in 1972 to $1,472,276 in 1976, a 117% increase. However, commodity support through USAID underwent a concurrent planned reduction from $1,062,256 to zero, reflecting USAID's intention to assist only with initial commodity needs, while leaving the funding of operations and replacements to the GOL.*

By adding together funds of the NMC and USAID, it appears that $1,990,500 was spent for commodities in 1972 and only $1,472,276 budgeted for 1976, a 26% reduction. At the same time, price increases due to the approximately 14% rate of annual inflation have placed an additional strain on an already inadequate budget. Continuing rises in volume of patient services rendered have resulted in increased consumption of most items. And a sampling of prices paid for commodities when purchased directly by the NMC/GOL, as compared to prices paid through USAID sources, indicates that the same items may be far more costly when purchased by the NMC/GOL.

The combined effects of underfunding for commodities and, on the other hand, their escalating prices have been: rejection of requisitions for essential items to avoid over-expenditure; frequent incidents when needed items were "out of stock"; and crises in patient care, because of staff inability to function effectively without needed items: drugs, laboratory and surgical supplies, X-ray film, etc.

Viability of the NMC is being jeopardized by a failure to buy and stock spare parts for the repair of hospital equipment; inadequacies in both quantity and quality of hospital equipment; and failure to replace worn-out or lost equipment. A hospital cannot properly meet its responsibility unless equipment to resuscitate patients, to assist them in breathing, to analyze specimens, and to maintain utilities such as steam and electricity, is available and is maintained in good working order.

In the 15 months which remain, the procurement advisor and the GOL should concentrate on developing procedures whereby the NMC would purchase by bid and in bulk. The options which the GOL might consider include: establish a Liberian procurement office

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*We note elsewhere that $130,000 of USAID commodities are still in the supply pipeline.

in the U.S. or Europe; join in establishing a hospital group purchasing association; establish a trust fund to procure commodities through USAID channels; and/or obtain competitive bids whenever possible. An example of the potential savings involved in the last-cited option can be noted from the drug purchase in November 1974, which resulted in a single saving of $482,519 (49%) in the routine purchase of drugs to establish opening inventory for the medical supply depot.

Physical Plant and Major Equipment

Numerous deficiencies in physical plant and major equipment require the investment of significant amounts of money in the immediate future for renovation, repair and/or replacement, to ensure the continued capability of JFK Memorial and its sister institutions to provide patient-care services. This subject is reviewed in some detail in Section IV-B, following.

Advisory Services, Training and Administration

There is ample evidence of progress in the gradual development of an effective administrative organization for the overall governance of the NMC. Most of the services which were evaluated showed significant advances in the development of systems and procedures required for the effective and efficient operation of the various segments of the Center. It was difficult to find an operational area in which the joint efforts of the USAID/IHS advisors and recently trained Liberian counterparts had not had a positive impact on the overall development and management of the Center.

However, after mid-August 1976, only four USAID/IHS technical advisors remain at the NMC; and they are scheduled to be phased out at the end of FY 1977. There is a compelling need for continuation of training assistance on the part of technical advisors if the Center is to remain capable of maintaining its present level of services, let alone accomplish necessary upgrading of services and permit the NMC to function properly in its crucial role as hub of the National Health System.

In Section I-B-1, "Technical Assistance," (see pages 8 through 10 of this report), we identify 10 areas of continuing technical advisor need: Engineering, Maintenance Training, Laboratory Management, Hospital Administration, Medical Records, Procurement,

Nursing, Personnel (Training Coordinator), Housekeeping, and Dietary...and suggest alternatives for procurement of the advisors.

Participant training has been another significant factor in the progress made to date. Most returned participant trainees have stayed on at the NMC and/or in the health services of the GOL; there has only been a 10% attrition of NMC staff following their return from the U.S. This program also deserves continuing support. (Section VI discusses the subject in greater detail.)

The NMC's administrative staff should increase its role in the direction and coordination of all departments. There is need for a more continuous, detailed assessment of the activities and functions carried out by all the supporting services which the team evaluated, as well as a need for increasing involvement of administration in setting goals and objectives, problem-solving, decision-making, and planning with department heads on a day-to-day basis.

Communication should be improved between NMC's administration and all levels of the medical staff. Many incidents occur daily in the care of patients which should receive closer attention by the administration. There is evidence that such involvement and constructive follow-through can bring tangible results in improvement of the Center's operation.

The team urges the administration to thoroughly investigate every incident where needed items are reported "out of stock," to determine whether the shortages are caused by solvable intra-hospital problems, and to document the impact of those which result from cash management problems or are due to under-funding for such needs. The documentation should be of assistance in future discussions with higher officials and would put the administration in a more effective problem-solving mode.

Fiscal Services

The Center's fiscal services appear well-developed. Effective systems result in timely and accurate reports and firm control over the fiscal management of the Center.

There is need for an improved "cash flow" procedure from the GOL to the NMC. The present method of quarterly cash allotments causes undesirable delays and/or rejections of purchases as cash availability during the quarter becomes short. While economies

can often be made over the course of a year's operation, it is disruptive and may be dangerous to force haphazard cutbacks when cash runs low. Better methods can be developed to permit the NMC's fiscal managers and top administration to exercise sound fiscal control.

The GOL could alleviate the cash flow problem by requiring NMC's administration and fiscal staff to exercise necessary vigilance over expenditures, thereby effecting rationally planned economies over the course of the year. Progress toward this objective can be monitored by the use of the monthly expense/encumbrance reports already prepared for department heads and the administration. The reports will have to be more timely (submitted within 10 days after the close of the month), in order to serve as an aid to management.

While we encourage responsible control over hospital expenditures, we reiterate the primary problem involving materials, supplies, and equipment is the fact that they are under-budgeted. The NMC cannot be expected to continue to care properly for the present patient load unless funds for commodities are adequate to meet needs.

IV-B. Deficiencies in Physical Plant and Major Equipment

Examples of these deficiencies are:

Roofs: Repairs and replacement now under way on all buildings will be completed this year through joint funding by USAID and GOL. Leaks have caused severe problems which add to the overall costs of maintaining the physical plant.

Air Conditioning: Repairs are now under way to put the "chiller" in the JFK Memorial boiler room back into operation. It has been non-functional since November 1975. Repairs were delayed for six months while the institution waited for needed parts. Both existing "chillers" should be replaced because they are unreliable and almost impossible to repair. Replacement is justified by the condition of existing chillers and the difficulties in obtaining parts, as well as the imminent danger of complete interruption of air conditioning in vital areas such

as the operating rooms, should both "chillers" cease functioning at the same time.

Air conditioning equipment and ducts throughout JFK Memorial have been troublesome ever since they were originally installed. The necessary work should be completed to remedy these problems.

Boilers: With only two boilers at JFK Memorial, the margin of safety is too slim. Good procedure requires that one be under maintenance at all times (cleaning, etc.). If a defect developed in the other boiler, steam power would be lost, interrupting cooking, sterilizing, and production of hot water for the laundry. A third boiler is needed.

Emergency Generators: Electrical power interruptions are a daily occurrence. There are two 250 kw generators which provide only one-third of the power required to operate the hospital when the outside source fails. A third generator should be obtained -- probably 300 kw "Caterpillar" generator, purchased on specifications provided by engineering personnel at the Center -- because parts for that type of generator can be more easily obtained in Monrovia. The NMC and its patients are dependent upon continuous electrical power for life-saving activities.

(Many of the items covered in this section on the NMC's physical plant and major equipment have been repeatedly included in previous budget requests by the hospital staff, but have been denied.)

Other Generators: The Maternity Center and the Psychiatric Unit also require emergency generators. A generator has been obtained and is scheduled to be installed at the Psychiatric Hospital. If the new building for the Maternity Center is to be constructed in the near future, extensive and expensive renovations and repairs to the older obsolete building can be avoided. No further electrical demand presently can be met at the Maternity Center because the electrical capacity and wiring does not permit it.

Water and Steam Lines: Unfortunately, much of the original piping was buried in sea sand under buildings in some areas. These circumstances have resulted in early deterioration; about 10% of the pipes have already been replaced as corrosion and rust have

taken their toll. Much of the plumbing was installed without protective conduit or sleeves. It is anticipated that these pipe lines will continue to cause problems and will necessarily have to be replaced, to ensure continuing operation at JFK Memorial.

Kitchen Refrigeration: Four walk-in refrigerators in the main kitchen need replacement.

The Morgue presently serves as the County Mortuary.* Unless another morgue is built at another location, the JFK Memorial Morgue should be expanded to meet demands. The morgue's existing refrigeration equipment requires replacement. The morgue's capacity is inadequate to handle its current dual function as morgue for the Hospital and the County.* Bodies must often be left on the floor. This is a health hazard and is undesirable for many other reasons. Morgue refrigeration is also needed at the Tuberculosis Unit.

Telephone Equipment: Defects in original installation have caused repeated interruptions and poor service. The air conditioning system in the telephone equipment room is not sufficient to prevent the development of problems resulting from salt air and high humidity. Additional equipment, thorough cleaning and repair of existing equipment, and renovation and repair of the air conditioning -- all are needed to prevent future problems in the telephone room.

Manufacturing and Quality Control - Pharmacy:

Construction, renovation and placement of proper equipment in areas adjacent to the hospital pharmacy would enable it to perform manufacturing, prepackaging and quality-control functions in conjunction with the medical supply depot. This could result in further significant savings on medications for the NMC and other health care facilities throughout Liberia that are served by the medical supply depot.

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* No AID documentation reviewed by the evaluation team suggests that the morgue was intended for any other use than to serve JFK Memorial and the NMC.

Floor - Operating Room: Defects in the installation of original flooring have resulted in hazardous eruption of tiles. The holes in this floor are a potential source of contamination and of serious accidents. The flooring must be replaced.

The Maternity Center: The age and general condition of the present physical facility justifies speedy replacement. However, plans which have been developed to construct a facility near JFK Memorial should be reconsidered. Such a facility should be contiguous with the JFK Memorial building. It should be constructed so that supporting services such as housekeeping, maintenance, food service, laundry, personnel and security can be provided from JFK Memorial. Savings and efficiency can be realized if it is joined to the existing hospital. Better patient care for mothers and infants will also result from immediate access to the general clinical and pediatric services at JFK Memorial.

Central Sterile Supply: The existing work area should be divided into separate "clean" and "dirty" areas. The initial arrival and cleaning of contaminated used instruments and equipment in the same room where clean items are sterilized and stored presents too many opportunities for cross-contamination and the spread of infection. The area should be partitioned or additional space provided to completely separate the "dirty" and "clean" functions.

X-ray - X-ray equipment has a normal lifespan of six to 10 years. All the diagnostic X-ray equipment at JFK Memorial was purchased and installed in 1971. It should therefore, be anticipated that all X-ray equipment will have to be replaced between 1977 and 1981. Repairs to X-ray equipment have been accomplished with considerable difficulty and undesirable delays. Prompt payments of vendors would help to minimize such difficulties.

Transportation: Equipment for the adequate maintenance of vehicles is lacking. Spare parts must be purchased and stocked. Additional vehicles and equipment are needed for the more effective operation of the materials management division.

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The above list includes a number of serious physical plant and equipment deficiencies at the JFK Memorial Hospital. It is

apparent from our review of Engineering and Maintenance capability that hospital staff are able to perform some major construction and renovation. For example, they have installed storm drains and dental equipment, are presently replacing roofs on all of the buildings, and have developed a plan for badly needed expansion of the Medical Records Department. All of this work can and should be accomplished using local labor and purchased materials. Continued development of this kind of capability at the hospital is economically sound as well as necessary in light of the difficulty in obtaining contract renovations at reasonable prices.

The Engineering Department has ten men assigned to continuous maintenance on all windows in the building. The windows have a complicated mechanism which requires continuous repair and service to counteract corrosion and rust, due largely to the climate. Most of the screens on these windows have been replaced and a program of continual replacement is required.

There is need for installation of an audio paging system throughout JFK Memorial. With the limited number of medical staff, its installation would save much time and delay in patient care.

IV-C. The Medical Center: A Functional Review of Various Aspects*

Administration and Governance: The autonomous charter of the NMC from its inception and its separation from the MHSW and the University has been beneficial, if not critical, to its internal achievement and success. Its autonomy also has permitted a greater contribution to the development of the design of the National Health Plan. The nature and organization of the MHSW: its division into preventive and curative departments; its lack of coordination and planning capability; and the bureaucratic process through which projects are developed and proposed to the Planning Ministry would have deterred the establishment and growth of the NMC, had it operated within the budget of the MHSW. In that case, it would have drawn attention to the overlapping nature of their respective budgets. On all counts, therefore, the autonomous nature of the NMC

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* This subsection generally comments briefly, if at all, upon technical advisory and participant training needs of the discussed entities; those subjects are covered elsewhere in the report in more detail.

has established an operational framework within which it has been able to make significant progress.*

The complicated problems and needs of a medical institution like the NMC can be better understood and dealt with by its separate Board of Directors than through the regular, remote channels of governmental authority. The Board can offer reliable and helpful advice to the GOL concerning the health care needs and services provided by the Center for the people of Liberia.

The Medical Staff Bylaws provide a sound structure for carrying the responsibilities of the medical staff of the NMC. However, we recommend that representatives of the administration and certain key departments of the hospital be included on appropriate committees of the medical staff. Such representation is not provided for in the Bylaws and should include such individuals as the Hospital Pharmacist, the Director of Nursing, the Medical Records Librarian and others.

The NMC's organization chart should be revised to indicate the role and relationship of all key managerial and supervisory personnel, and it should be distributed and discussed so that each individual knows what is expected of him and can identify the person to report to with day-to-day problems and needs. The chart would then provide stronger structure for accountability.

Fire and Safety Controls:

There is need for increased staff awareness of physical hazards and safety. Safety-consciousness can be improved by an active program, under the aegis of the Safety Committee, for accident prevention, accident investigation, identification of hazards and completion of necessary repairs. The Safety Committee should hold more frequent meetings, document a review of accidents occurring in the hospital, identify the causes of accidents, and document follow-up actions to eliminate hazardous conditions.

There is a critical need for proper storage facilities to protect the hospital, its patients and staff, from the hazards of oxygen, alcohol, and other explosive and/or inflammable substances. Areas where such items are now stored do not meet acceptable standards.

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* See page 16 for more on the autonomous status of the NMC and its relationship with the MHSW.

In the absence of national or local standards for fire and safety, the NMC and its Safety Committee should develop a set of written standards of their own and conduct and document routine inspections, indicating corrective actions taken.

A fire prevention manual has been developed and should be widely distributed. Indoctrination sessions should be held with department heads and supervisors to review its content, and they, in turn, should conduct sessions for rank-and-file employees. Such sessions should be documented, showing that rules and regulations for dealing with safety, fire prevention and fire drills have been thoroughly discussed and explained. Regular fire drills should be held and should also be documented.

There is no formal Disaster Plan for handling mass casualties. A detailed plan to meet a sudden influx of a large number of casualties should be prepared and widely disseminated.

A formal manual of administrative policies and procedures is needed to guide department heads and supervisors on the appropriate steps and actions to be taken in a wide variety of situations arising in the day-to-day operation of the hospital. The development and implementation of this manual will provide hospital administration an expanded opportunity to exercise its responsibility to direct and coordinate the activities of department heads.

Central Sterile Supply: During our review of this function, we became aware of some basic equipment needs: scissor sharpeners, chest drainage pumps, aspirator pumps, thermotic drainage pumps, oxygen regulators, oxygen tents, oxygen cylinder trucks, and bins for sterilizing glass syringes. These represent additional examples of the shortages of equipment and supplies described elsewhere in this report and which appreciably hamper provision of quality patient care at the NMC.

Nursing Service: The Nursing Service has developed a policy manual, an in-service training program, and issues regular reports to the hospital on its activities. The chief problems appear to be: the difficulty in recruiting professional nurses because of the difference in salary levels between the NMC and some of the concession hospitals with which the Center must compete for nurses; shortages of linen; and difficulty in obtaining drugs, equipment and supplies. Unfortunately there is an attitude of passivity

because staff have become so accustomed to making do with as little as is available. These difficulties in Nursing Service have an adverse impact on the quality of patient care in the hospital. While nurse absenteeism was reported to be high, we were not able to document this from records provided to us by the Nursing Service.

Funds are not available to replace wheelchairs, and sphygmometers which have gone into disrepair because of wear and tear over the past five years. These shortages again emphasize the need to fund at adequate levels materials, supplies and equipment and to make certain that intra-hospital problems in storage and delivery of needed items are resolved on a day-to-day basis by the hospital administration.

Medical Records Department: This department requires additional commodities and training in order to adequately maintain records which are increasing in number and complexity with accelerating speed. JFK Memorial has successfully established a unit record system. However, it is hampered by lack of medical chart folders, space, filing equipment, and sufficient divided shelving for Medical Records.

Patient index cards are stored in narrow open drawers with poor indexing. An automatic index file would speed the process of retrieving medical records. There is only one typewriter in the record room and there is no reliable dictating and transcribing equipment. A Medical Records Procedure Manual has been developed, but has not yet been printed. It should be duplicated, disseminated and discussed with all concerned.

The department lacks copying machines, which could smooth the functioning of its record room. Also lacking are basic stationery supplies including pens, pencils, markers, paper, daily analysis forms and other forms, visible files for sorting, and Kardex for admitting.

Personnel: While progress has been made in the development of policies and procedures by the Personnel Department, implementation has been limited. Technical advisory support is primarily needed for the further development of In-service Training Programs in all departments. Such an advisor should also be qualified to assist the Director of Personnel in solving some of his remaining problems.

A. An evaluation and classification system has been developed and not as yet implemented.

B. Fundamental services in the areas of personnel and labor relations must be provided to the various departments for department heads to properly fulfill their duties.

C. The lack of basic supplies and equipment such as audio-visual aides for training, filing cabinets, and non-operative equipment in the Print Shop.

Personnel records which were reviewed appeared complete and contained considerable documentation about employees' background and job performance. With the low productivity prevalent among the staff at the NMC, more attention must be given to developing an effective training and labor relations program. While employee rights must be upheld and grievances should be heard and resolved fairly, there must also be effective ways of taking disciplinary action if supervisors are to increase productivity to carry out the functions of their various areas.

Pharmacy: Pharmacy Services appear to be effectively organized at the NMC. Operation of the service is dependent upon a trained group of "dispensers," who are trained on-the-job by the Center's Pharmacists. The Pharmacy requires expansion and renovation. Installation of appropriate equipment would make it possible for the Pharmacy to manufacture some of its own medications at considerable savings from purchase prices, and enable it to organize a prepackaging operation. The Pharmacy could then serve the Medical Depot in addition to the Center and, through the Medical Depot, the National Health Care System throughout Liberia. If feasible, and cost effective, a Quality Control Lab might be developed, to enable the Pharmacy to check products purchased under competitive bids, thus assuring the quality of such products while taking advantage of lower prices.

Additional personnel should be educated in Colleges of Pharmacy for future backup of the existing qualified staff. We doubt that technical advisory support is necessary. Many of the complaints which were voiced as a result of the departure of the technical advisor were basically the result of inadequate problem-solving and decision-making at the level of the hospital administration. The Chief of the Advisory Group and the hospital administration should work more closely with the Pharmacists and

support their efforts to organize and coordinate, and to obtain needed drugs and supplies.

Materials Management (Procurement): Some of the problems identified as contributing to "outages" of supplies, materials and equipment are:

(1) The quarterly allotment of cash circumscribes expenditures by the NMC and creates cash-flow problems;
(2) The increase in patient load, causing greater consumption of materials and supplies;
(3) Delays in delivery of USAID commodities;
(4) GOL port delays cause storage charges to be levied against the Center -- a nonproductive expense which is not budgeted. (Delays in processing documents and in securing needed shipping have frequently meant months of inaction before supplies can be moved from the port to the NMC depot);
(5) The 2-1/2-ton truck available to the Materials Management Division is too small and it is often in poor condition;
(6) Inadequate funding;
(7) Pilferage;
(8) High cost of buying in small quantities in order to carry operations over short periods of time, rather than being able to buy large quantities at discount prices.

The Materials Management Division lacks equipment, special racks and pallets for bulk storage, shelving, a tractor for towing the "low boy" and a larger delivery truck. Unless the division is properly staffed and equipped, the essential support functions for hospital care cannot be maintained satisfactorily. The GOL, NMC's administration, and USAID should work cooperatively to resolve the many bottlenecks in the pipeline of supplies and equipment.

The Medical Depot will soon be too small for the storage of supplies and equipment needed by the NMC and other health facilities throughout Liberia. The MHSW is expected to build its own depot in the near future. If so, we recommend that the expanded medical depot be established at the NMC. This will obviate the need to duplicate staff, equipment and facilities. It will also help assure that, through consolidated purchasing, the best prices available will be obtained.

Fiscal Affairs (Finance): We noted earlier that fiscal management seems to be well-organized and that effective systems have been established. The Fiscal Division is divided physically. Part of its operation is in the Administration Building and another is in the main hospital building. An effort should be made to consolidate them for increased efficiency and better control and supervision.

There is also a lack of basic equipment in the finance division. It might be worth while to obtain such items as accounting machines and check signing machines (2,000-3,000 checks are signed each month).

Dietary and Housekeeping: While the Food Service program at the hospital benefitted from the services of two previous technical advisors, a brief evaluation reveals renewed need for an advisor. The nutritional quality of the food served to patients and the lack of planned menus and special diets can be corrected with such outside help. It appears that patients receive poor nutrition in the hospital as well as outside the hospital. Therapeutic special diets are practically impossible to obtain. Continued and expanded participant training as well as technical advisory support are needed to adequately service this area. Housekeeping also requires upgrading.

THE TUBMAN NATIONAL INSTITUTE OF MEDICAL ARTS

V-A. Background

The Tubman National Institute of Medical Arts (TNIMA) was established in 1945 as the result of recommendations by a team of advisors from the U.S. Public Health Service. TNIMA functions under the aegis of the National Medical Center. The Institute is supervised by a superintendent who reports to the General Administrator of the NMC. Each of the Institute's three schools is supervised by a director who reports to the superintendent.

TNIMA's educational facilities are temporarily located on the ground- and first-floors of the west wing of the JFK Memorial Hospital.

The Institute offers programs leading to diplomas as registered nurses, practical nurses, public health inspectors, and physician assistants. A program in midwifery was discontinued in 1972 because of the strain on the limited teaching staff, hiring away of the instructors to a concession, and dissatisfaction with the quality of the applicants and graduates.

Specific and effective efforts have been made for several years to recruit students from the rural counties.

Aggregate applicant-to-acceptance ratio is approximately 3 to 1.

Because the most able students are encouraged to attend college or university, and because pay for graduates in the fields in which TNIMA offers programs is low in comparison to other occupations that require less preparation (e.g., secretaries), students have generally been drawn from the lower half of their high school classes. This, combined with poor student preparation at the high school level, has contributed to high and costly attrition rates (approximately 40 percent).

Students attending TNIMA are not charged tuition and are supplied room, board, medical care, books, uniforms, and a monthly stipend of $18.58, all at GOL expense. (An exception is the physician

assistant program in which student stipends, vehicles, and some faculty honoraria are supplied by UNICEF. This support is being phased out, and will fall to GOL to pick up.) Based on aggregate enrollment figures and direct costs assigned to TNIMA (exclusive of UNICEF support) for personnel (including student stipends), material and supplies, and equipment, the cost per student was $1,612 in 1975, and $1,411 in 1976. The figures do not include meals and residence costs.

In return for this Government-subsidized education, the student and a responsible adult are required to sign a contract upon admission obligating the student to a year of payback government service for each year of training received. If the student defaults on the agreement, the adult sponsor is billed for the training costs. Payback placements are assigned and coordinated by the Ministry of Health and Social Welfare. The first year of payback service for nursing graduates is in the JFK Memorial Hospital.

V-B. Components of TNIMA

The School of Nursing

The School of Nursing was established in 1945 and graduated its first class in 1948. The school offers a three-year diploma professional (R.N.) nursing curriculum, and a two-year program for practical nurses (P.N.).

Both curricula are taught by a full-time faculty of 11 nurse-educators (one presently concluding AID participant training at Meharry), supplemented by part-time participation from medical school and other TNIMA staff. The director of the program completed her M.S. (N) at the University of Indiana in Nursing Education and Pediatric Development (Pediatric Nurse Practitioner) as an AID participant trainee. Six of the faculty members hold baccalaureate degrees in nursing. Two of the non-baccalaureate faculty are trained as nurse-midwifes.

Salaries for nursing faculty at TNIMA are generally better than those for members of the nursing service staff at JFK, but are reportedly lower than salaries for comparably qualified nurses in concession facilities.

At present, 94 students are enrolled in the School of Nursing:

	First Year	Second Year	Third Year	Total
R.N.	35	20	21	76
P.N.	10	8		18
				94

Only high school graduates are eligible for admission to nursing. Unlike the other programs offered by TNIMA, approximately 25% of the students enrolled in the R.N. curriculum are considered capable of good performance in a collegiate setting, according to officials of the School of Nursing. This is explained by the fact that nursing is seen as a way to upward mobility by gifted but impoverished students. Several graduates are reported to have left the field of nursing after their payback service, to attend college and to pursue other health-related professions including medicine. Approximately one-third of the students enrolled in the TNIMA nursing programs are men.

It was reported, though figures were not available, that many Liberians previously went abroad to prepare as R.N.s. This tendency is reported to be diminishing. R.N.s wishing advanced specialized training must still go abroad.

Data on graduates of the TNIMA School of Nursing obtained from school files and the registry of the Liberian Board of Nurse Examiners follow:

TOTAL GRADUATES 1948-1975

Area	Number of Graduates
Professional Nursing	239
Practical Nursing	109
Midwifery	80
Total	428

GEOGRAPHIC DISTRIBUTION OF GRADUATES WORKING AS NURSES IN LIBERIA

Monrovia	130
Montserrado Co. exclusive of Monrovia	12
Outside Montserrado Co.	55
Total	197

WORK SETTING OF GRADUATES EMPLOYED IN LIBERIA

JFK Memorial Hospital	71
Maternity Hospital	13
T.B. Hospital	8
Catherine Mills Rehab. Hospital	7
County Hospitals	38
MCH Clinics/MHSW	38
Concession Hospitals	12
Mission Hospitals	3
Other	7
Total	197

Although some discrepancies exist between the records of the Liberian Board of Nursing Examiners and those of TNIMA, the general pattern is the same. The preponderance of TNIMA nursing and midwifery graduates who are employed in Liberia are in GOL service (89%) and work in Montserrado County (72%). Fully 54% of the 231 graduates are no longer employed as nurses in Liberia. Information was not readily available concerning the current activities of these graduates. A useful survey of the graduates could be conducted to ascertain their reasons for leaving the practice of nursing in Liberia.

Other nursing programs in Liberia are reported as follows:

INSTITUTION	TYPE PROGRAM	ESTIMATED YEARLY GRADUATES
Cuttington College/ Phebe Hospital	B.S. (N.)	15
Ganta Hospital	R.N. Diploma	8
Firestone Hospital	R.N. Diploma	20
Phebe Hospital	P.N.	12
Firestone Hospital	P.N.	10
Total		65

TNIMA graduates therefore represent some 30% of the annual R.N. graduates and 26% of the annual P.N. graduates in Liberia. The Firestone programs have recently suspended new admissions and some consideration has been given to consolidation of these programs with those of TNIMA.

In view of the fact that the only B.S.(N) program in Liberia is offered at Cuttington-Phebe, it would seem advisable to explore

arrangements to permit the best qualified students from TMINA to complete the B.S.(N) requirements at Cuttington under GOL sponsorship, with appropriate adjustments in payback service requirements.

For about two years, the School of Nursing has considered the development of a post-R.N. program in Nurse Midwifery. In view of the dearth of qualified obstetricians in Liberia and the nation's heavy reliance upon non-nurse midwifes with varying degrees of training, this would seem to be a highly desirable program which could provide an intermediate level of expertise, supervision and referral support. Additional qualified faculty would be required to launch such a program, however.

The School of Environmental Health

The School was established in 1952 in cooperation with the World Health Organization (WHO).

The two-year curriculum is conducted by a full-time faculty of five, only one of whom holds a bachelor's degree. Part-time faculty and field supervisors are drawn from appropriate health-related agencies. Graduates are prepared to serve as sanitary inspectors and health educators.

An expanded three-year curriculum has been proposed to improve the capabilities of the graduates in health education and to provide a firmer scientific base for understanding environmental problems which will accompany progressive industrialization in Liberia. The proposed curriculum and the rationale appear sound.

Approximately 20 students are admitted each year. Present enrollment stands at 36 -- 22 first-year students and 14 second-year students. From 1952 to 1975, the program has had 179 graduates, of whom 109 are still working in the field of environmental health and 70 have left the field, principally because of low pay. Of the 109 still working in environmental health, 73 (or 67%) work for the MHSW outside of Monrovia in rural health centers and posts, and 35 work in Monrovia either with the NMC or the MHSW. One individual is employed as an environmental inspector by a concession. The loss from the field of some 39% of the graduates because of poor government salaries represents a significant loss to the GOL of important manpower trained at GOL expense. The majority of those retained serve in the rural communities in support of the National Health Plan's emphasis on the rural population.

The School of Physician Assistants (P.A.s)

The program was initiated in 1965 as the result of recommendations from WHO and UNICEF, aimed at improving rural health. UNICEF support presently amounts to about one-third of the program's budget and is scheduled for phase-out.

Recruitment for students is aimed at the rural areas. A high school diploma is required for admission. Twenty students are admitted each year and approximately 12 students graduate annually. Enrollment is limited chiefly by the availability of suitable clinical training facilities (JFK, Maternity Center, Zorzor and Firestone).

The original two-year curriculum has been extended with a one-year required preceptorship with a practicing physician. The program is taught by five full-time faculty and heavily supplemented by part-time faculty, including practicing physicians whose efforts are coordinated by the director. The emphasis of the curriculum is on prevention of illness and on health education.

From 1965 to 1975 the program produced 107 graduates. Of these 90 are working in health posts in rural areas; eight have received additional training for supervisory positions and work out of rural Health Centers; four have been dismissed; three have resigned; one has died; and one has retired.

A USPHS team of experts in schistosomiasis studying aspects of this disease in Lofa County in June-July 1976 commented positively to the evaluation team regarding the intelligence, ability, and effectiveness of the P.A.s whom they encountered in their survey work.

After some four years of appeals, the pay for P.A.s was scheduled to be raised from less than $100/month to just less than $200/month in July 1976. This figure is still less than the salary earned by many secretaries in Monrovia.

V-C. General Issues

Salaries - Despite substantial progress in the past few years on upgrading salaries for nurses and other allied health personnel, pay still lags behind several occupations requiring less training. Continued effort will be required to correct this situation which

discourages the able student and forces competent graduates out of government service.

Location of TNIMA - After passage of legislation in 1974 authorizing transfer of TNIMA to the Medical School of the University of Liberia, the President convened a panel to review the status of TNIMA and make recommendations regarding the transfer. The panel advised that a three-phase approach be adopted.

> Phase 1 - Development of faculty, facilities, and curricula within TNIMA to a level permitting it to become a College of Medical Sciences.
>
> Phase II - Organizational transfer to the University of Liberia as a free-standing college on an experimental basis.
>
> Phase III - Evaluation of the performance of the augmented and realigned institution.

The proposed approach is sound. Considerable time, effort, and money will be required to augment the TNIMA faculty so that it can fit comfortably into a university setting. Physical dissociation from the hospital campus would pose major transportation and logistical problems and frustrate access to the major clinical facility (which is central to the entire educational effort regardless of organizational affiliation). Experience in the U.S. indicates that nursing and allied health programs frequently suffer when they are slotted organizationally below or within a college of medicine. The much-desired team-orientation may be effectively provided by careful coordination of selected clinical experiences. In the meantime, TNIMA will continue to prepare qualified graduates who are much-needed by Liberia.

Rural Health Training Center - The National Socio-Economic Development Plan for Liberia, 1976-1980, projects the establishment at Kpain (Nimba County) of "a special center...for training and orientation of paramedical and medical personnel earmarked for work in rural areas." Discussion has indicated plans to relocate the School of Physician Assistants from TNIMA to this rural training center. Since all of the TNIMA-prepared P.A.s functioning as P.A.s are already working in rural areas, no rationale for such a relocation is apparent. In view of the negative impact that such a move could be expected to have on both TNIMA and the School of Physician Assistants, it must be considered ill-advised.

The proposed rural training center appears to have a valuable potential role to play in the curriculum of the Medical School and the various programs of TNIMA. It would also serve as an orientation center for expatriate health workers and a focus for continuing education for rural health workers. It is appropriate, however, to view it as an adjunct rather than a replacement for existing health related training efforts.

V-D. Summary, Conclusions and Recommendations

TNIMA may appropriately be viewed as the GOL's focus for the preparation of nursing and allied health manpower. It benefits significantly from its direct physical and organizational association with the JFK.

TNIMA functions as an effective training unit for Professional and Practical Nurses, Public Health Inspectors, and Physician Assistants. Each of the programs has been successful in recruiting students from, and returning graduates to, rural areas of Liberia in support of the National Health Plan's emphasis on care for rural population. The GOL payback mechanism is an effective means of deploying trained manpower in areas of need.

Low salaries paid by GOL in the positions for which TNIMA prepares graduates have: (a) discouraged well-qualified applicants, thereby contributing to high and costly attrition; (b) driven well-qualified graduates from their fields of preparation (particularly marked among Public Health Inspectors); and (c) forced qualified graduates to seek employment outside GOL service where salaries, benefits, and work settings are more attractive.

Dissociation of TNIMA or its programs from the NMC either physically or organizationally appear ill-advised for the foreseeable future.

Recommendations

1. GOL should continue efforts to upgrade and regularize salaries and benefits for nurses, physician assistants, and instructional staff in health related programs, to minimize the loss of qualified candidates, graduates, and staff from public service in Liberia.

2. Enrollment size and new program-development at TNIMA should be closely coordinated with MHSW and the Ministry of Planning and Economic Affairs in order to ensure continued support of the evolving National Health Plan with trained manpower.

3. The role of the proposed rural training center should be further clarified. Care should be taken to ensure that it not duplicate programs already performed effectively by TNIMA.

4. The payback mechanism should be maintained.

5. The leadership of TNIMA should begin work with the University of Liberia and Cuttington College to develop mechanisms for establishing advanced collegiate standing for students and graduates of TNIMA programs who have the desire for and are capable of college-level work.

6. The GOL should consider awarding scholarships to able TNIMA nursing students who wish and are capable of pursuing the B.S.(N) at Cuttington College, providing appropriate adjustments in service payback requirements.

7. Continuing consideration should be given to associating formally the existing program for X-ray technicians at JFK Memorial Hospital with TNIMA.

8. Continued effort in conjunction with the AID participant training program should be made to improve the preparation of TNIMA faculty.

9. Consideration should be given to establishing a program for laboratory technicians/technologists at TNIMA.

10. Continued effort should be supported to enrich the scientific and professional content of the TNIMA curricula.

11. The recommendations of the advisory panel regarding the transfer of TNIMA to the University of Liberia should be followed. No transfer of TNIMA should be made until faculty and curriculum development would permit comfortable association in a university setting. The central importance of the JFK as the clinical educational facility should not be downgraded.

12. Efforts should be made to improve library and teaching materials available to students and faculty.

13. The GOL should prepare to assume the costs of the Physician Assistant program which have been borne by UNICEF.

VI. PARTICIPANT TRAINING

Since 1967, the USAID participant training program operated in conjunction with the GOL/NMC has provided training for 92 individuals. According to records maintained by USAID, corroborated by records of the NMC personnel office, the total cost to USAID for this training has been $1,010,603, including expenditures through FY 1976. Based on these figures, the average cost per trainee to USAID is $10,985.

Breakdown of number of individuals trained by field/discipline is indicated below:

Trainees by Field/Discipline

Medical Records (all levels)	11
Nursing Administration	9
Nursing Education	6
Nursing (clinical specialties)	4
Nursing, Public Health	5
Nursing Service Supply	2
Central Supply	1
Stores Management	2
Hospital Administration	7
Dietetics/Food Service	3
Pharmacy	2
Environmental Health/Sanitation	4
Housekeeping	3
Health Education	1
Laboratory Technology and Specialties	4
X-ray Technician/Technologist	4
Personnel Administration	4
Procurement and Supply	1
Accounting/Business Administration	2
Dental Hygiene	1
Inhalation Therapy	1
Librarian	1
Air Conditioning/Refrigeration	1
Hospital Maintenance	2
Plant Operation	1
Electrical Operation	1

Trainees by Field/Discipline (cont'd)

Hospital Engineering	1
Opthalmic Education	1
Blood Banking/Serology	2
Medical Equipment Maintenance	1
Accounting Machines	1
Multigraph/Varitype	1
Unspecified	2
	92

Attrition - Of the 92 individuals trained under USAID auspices since 1967, one is recorded as deceased and 10 have left the employ of the NMC. The overall attrition rate, exclusive of the deceased individual is, therefore,12%. Actual dollar value of USAID contribution to training of the individuals who left is $95,200, or 9.4% of the total. Of the 10 no longer employed at the NMC four are employed by one or another branch of the GOL. Net loss to public service GOL employment of USAID participant trainees since 1967 is, therefore, 6.5%. These individuals represent 6.9% of the cost of the USAID portion of the training expenses.

Attrition from the ranks of participant-trained individuals is surprisingly low overall. Losses are particularly marked from the ranks of the TNIMA faculty, however, and may reflect the ready availability elsewhere of positions for well-prepared environmentalists and nurse-educators. One individual trained as an X-ray Engineering Technician under U.N. funding also left NMC service for employment in the private sector, and is not included in the above table.

Distribution of Traineeships - Review of the distribution of traineeships indicates heavy emphasis in the areas of medical records (particularly at the levels of transcription and technician), various areas of nursing, and various aspects of hospital administration. Relatively little in-depth training appears to have been offered in the technical maintenance and engineering areas. This lack of depth is reflected in other sections of this report which deal with the vulnerability of the NMC with regard to physical maintenance and operation.

Other administrative and non-medical support services have been neglected. Only one participant has been trained in procurement and supply; yet the operation of the hospital is directly affected

by the availability of materials, supplies and equipment. The accounting and business management division had only two participants during the nine-year period; and hospital administration two.

Conclusions and Recommendations - The USAID participant training program has been generally successful in providing Liberian Nationals with training in a wide variety of fields essential to the functioning of a medical center. Attrition has been low.

In a continuing program, additional emphasis should be placed on providing training in the technical areas of plant operation (including electrical repairmen and an X-ray repairman*); modern hospital operation (including housekeeping, pharmacy, hospital administration, procurement and supply, accounting and business management, and inhalation therapy); and nursing (emergency-room nursing, cancer nursing, and intensive-care-unit nursing).

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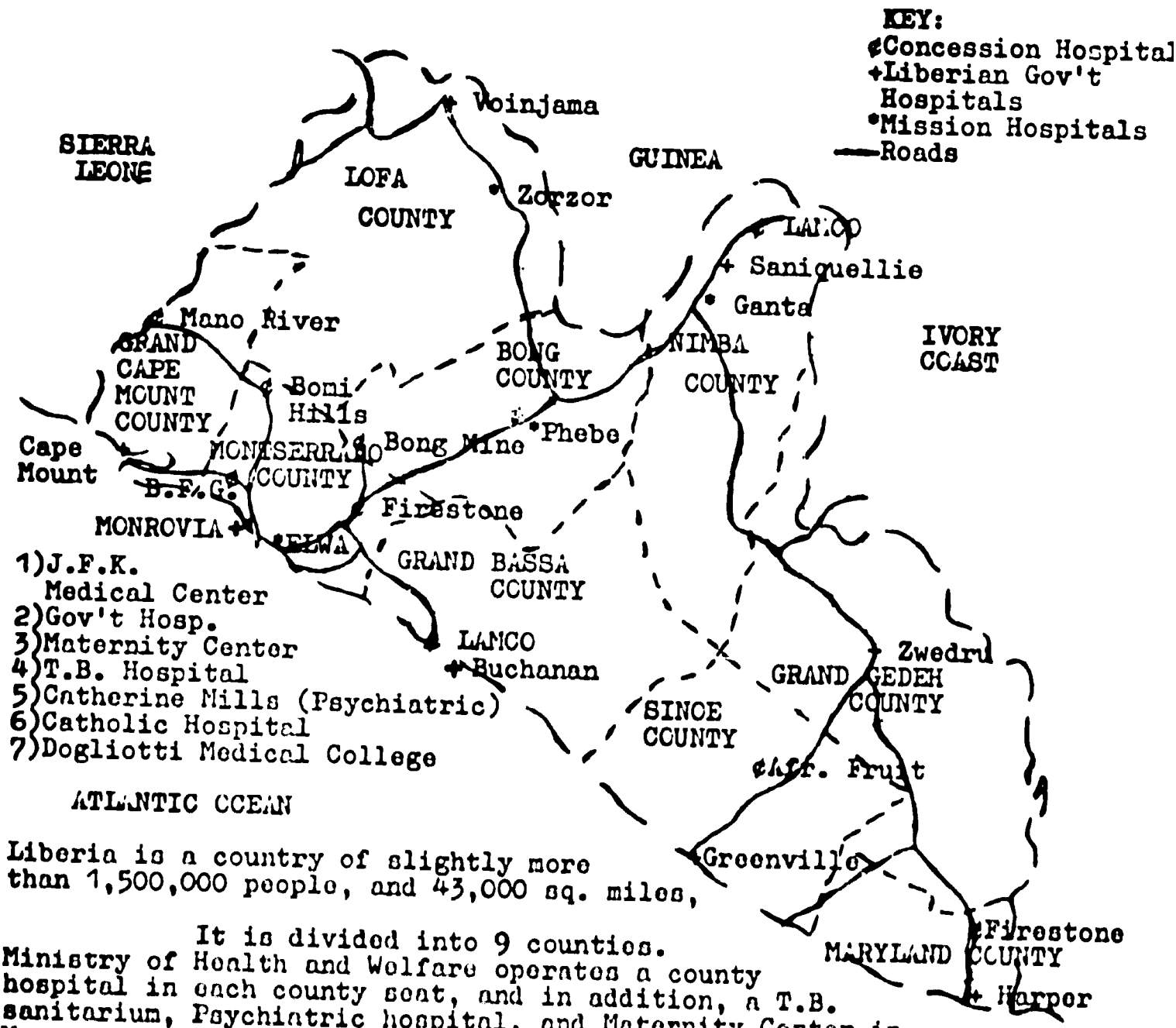
*Contracting for this specialized skill -- a person to make necessary repairs to X-ray machines, dental machines and the cobalt unit -- can be so costly and difficult, that a trained technician on staff could generate a saving to the NMC while ensuring X-ray capability.

APPENDIX 1. MAP OF LIBERIA, SHOWING COUNTIES

APPENDIX 2.

LIBERIAN MEDICAL FACILITIES



Liberia is a country of slightly more than 1,500,000 people, and 43,000 sq. miles,

It is divided into 9 counties. Ministry of Health and Welfare operates a county hospital in each county seat, and in addition, a T.B. sanitarium, Psychiatric hospital, and Maternity Center in Monrovia.

J.F.K., the national medical center, became operational in 1971. The mining and plantation concessions operate hospitals as indicated. There are 5 mission hospitals:

Catholic Hospital
ELWA--Sudan Interior Mission
Phebe--Lutheran, Methodist, Episcopal
Zorzor--Lutheran
Ganta--Methodist

The country has a well-thought-out health plan which is not yet fully operational. It calls for a network of clinics in all strategic villages manned by health assistants. Five such clinics are supervised by a medical assistant located in a health center in the district headquarters. Health centers in turn are supervised by a county health officer (M.D.) located in the county seat. The Lofa Co. Rural Health Project is a joint effort by the Ministry of Health and U.S.A.I.D. to fully develop such a health network in Lofa County as a pilot project.

APPENDIX 3. PARTIAL LIST OF PERSONS INTERVIEWED

Mary Agee, Advisor, Medical Records, IHS
Richard Ainsworth, Program Director, Peace Corps/Liberia
E. David Allen, Director, Maintenance Department, NMC
Reubell Brewer MD, Chief of Pathology, JFK Memorial
Mr. Bright, Minister of Health and Social Welfare
Kate Bryant MD, Chief of Pediatrics, JFK Memorial
William Clay, Peace Corps Volunteer, Nutrition
H. Nehemiah Cooper MD, Chief Medical Officer, NMC
Agnes Dagbe, Director, School of Physician Assistants, TNIMA
T. Daramola MD, Dean, Medical College, University of Liberia
Sakor Dean, Controller & Assistant Administrator, Fiscal Services, NMC
C. Augustus Dundas, Hospital Administrator, JFK
Wilkins Engmann, Supervisor, Central Supply
Fred Gordon, Administrator, Pharmacy Services, NMC
Harvey Gutman, Acting Director, USAID/Liberia
Henry D. Hoff, Sr., Administrator, Fiscal Services
Emery Johnson MD, Chief, Indian Health Service, Rockville, Md.
Cecilia Kennedy, Assist. Minister of Health and Social Welfare
Gertrude Kennedy, Acting Administrator, Nursing Services
Joseph W. Kiggs, Administrator, Materials Management Service
Alered J. Kroma, Director, School of Environmental Health, TNIMA
Anthony Maycole, Administrator, Katherine Mills Rehabilitation Instit.
Paul Mertens MD, Training Advisor, Lofa County Project
Adelaide E. Morris, Administrator, Maternity Hospital
Kenneth Nelson, Advisor/Administration, NMC
T. Zahi Oulahi, Assistant Executive Housekeeper
Godfrey Padayao, Advisor, Materials Management Services
Z. Moulai E. Reeves, Assistant Minister for Sectoral Planning, Ministry of Planning
Alston Safery, Deputy Controller and Budget Officer, NMC
Benedict Sannoh, Administrator, Medical Records
D. Satyanarayana MD, Chief of Medicine, JFK Memorial Hospital
Wvannie Mae Scott RN MS, Director, School of Nursing, TNIMA
Perry Tennison, Engineering Advisor, NMC
Hal Thompson, Indian Health Service, Rockville, Md.
Joseph N. Togba MD MPH, Chairman, Department of Public Health and Community Medicine, Medical College, University of Liberia
Kronyanh M. Weefur, General Administrator, NMC
MacArthur Wolo, Assist. Administrator, Pharmacy Services, NMC
C. Torbor Won, Director of Personnel, NMC
Samuel Woto, Chief Accountant, NMC
Beatrice Wreh, Executive Housekeeper
Mr. Young MD, Medical Director, ELWA Hospital

APPENDIX 4. BIBLIOGRAPHY

A. N.M.C. Reports and Documents

Nelson, K. POSITION PAPER ON J.F.K., 1976.

Weefur, M.K., POSITION PAPER ON J.F.K., July 1975.

The Board of Drectors, J.F.K. Medical Center. POLICIES AND PROCEDURES RELATING TO SERVICES FOR PRIVATE PATIENTS, August 1975.

Weefur, Kronyanh M. BED COMPLEMENTS OF THE J.F.K. MEDICAL CENTER, September 1975.

Agee, Mary L. FUTURE PLANS AND NEEDS FOR THE J.F.K. MEDICAL CENTER, April 1972-April 1976.

Weefur, Kronyanh M. ANNUAL REPORT OF THE J.F.K. MEDICAL CENTER, January 1975-December 1975.

Patton, Robert D. ASSESSMENT OF PROGRESS - 1971-1972, August 1972.

Cooper, Nehemiah H. MEMORANDUM ON THE HEALTH CARE DELIVERY SYSTEM IN LIBERIA - AN ANALYSIS AND A PROPOSITION FOR IMPROVEMENT, October 1971.

Cooper, Nehemiah H. THE NEW ROLE OF THE JOHN F. KENNEDY MEDICAL CENTER IN HEALTH DELIVERY SERVICES FOR LIBERIA,

Cooper, Nehemiah H. BACKGROUND PAPER ON THE PROPOSED HEALTH CARE PLAN, 1971.

B. General Economy and Health-Liberia

National Public Health Service, TEN YEAR NATIONAL HEALTH PLAN-1967-1976, 1967.

National Planning Council. NATIONAL SOCIO-ECONOMIC DEVELOPMENT PLAN-July 1976-June 1980, March 1976.

U.S.DHEW, Office of International Health. SYNCRISIS: THE DYNAMICS OF HEALTH - VII - LIBERIA, November 1973.

AID/CWA/Liberia. HEALTH MANAGEMENT PLANNING ASSISTANCE TO GOL (Project Paper), December 1975.

Ministry of Planning and Economic Affairs. ECONOMIC SURVEY OF LIBERIA-1974, May 1975.

A.M. Dogliotti College of Medicine, University of Liberia. ANNUAL REPORT OF THE DEAN-January-November 1975, November 1975.

Peace Corps. LIBERIA: JFK/PROFESSIONAL SERVICES (Project Paper), 1973-74.

Ministry of Planning and Economic Affairs, LIST OF PROJECTS 1976-1979, Annexes III and IV

World Bank, HEALTH, March 1975, Annexes 2 and 3

C. N.M.C. Project (054) Documents

Keeve, J.P. REVISED HEALTH SECTOR ASSESSMENT DRAFT FOR LIBERIA DAP - VI - A, March 1976.

USAID/Liberia:
Report U-520, 14 September 1967
PROP, 15 April 1968
Report of Study Team, 15 October 1969
PROP, 19 January 1973
PROP, 17 January 1975

AID/Washington, Fiscal Year 1977 Submission to Congress, Liberia

Indian Health Service, USPHS, unpublished data