

AGENCY FOR INTERNATIONAL DEVELOPMENT WASHINGTON, D. C. 20523 BIBLIOGRAPHIC INPUT SHEET	FOR AID USE ONLY <i>Batch 81</i>
---	-------------------------------------

1. SUBJECT CLASSIFICATION	A. PRIMARY	Health	ND00-0000-G218
	B. SECONDARY	Health delivery--Senegal	

2. TITLE AND SUBTITLE
 Senegal rural health services development project; final report

3. AUTHOR(S)
 (101) Westinghouse Health Systems, Columbia, Md.

4. DOCUMENT DATE	5. NUMBER OF PAGES	6. ARC NUMBER
1976	37p.	ARC SG614.09663.W529

7. REFERENCE ORGANIZATION NAME AND ADDRESS
 Westinghouse

8. SUPPLEMENTARY NOTES (*Sponsoring Organization, Publishers, Availability*)

9. ABSTRACT

10. CONTROL NUMBER PN-AAF-421	11. PRICE OF DOCUMENT
12. DESCRIPTORS Health delivery Health services Rural areas Senegal	13. PROJECT NUMBER
	14. CONTRACT NUMBER AID/afr-C-1145 GTS
	15. TYPE OF DOCUMENT

AJ/1/01
1. -
PN 2-11-4/21

FINAL REPORT

Contract No. AID/afr-C-1145

Work Order No. 3

July 13, 1976

Prepared by:

**Westinghouse Health Systems
P. O. Box 866 - American City Building
Columbia, Maryland 21044**

AID Project Title

**Program Development in Support
(Senegal Rural Health Services Development)
Project No. 698-11-999-135**

Reference Center
Room 1656 NS

I. STATEMENT OF WORK

Westinghouse Health Systems (WHS) assisted in conducting an on-site review of the rural health services in Sine-Saloum and in assessing and preparing, in cooperation with the Regional Development Office/Dakar, a Project Paper (PP) on the rural health services development project. WHS also contributed to a final team report under the direction of Dr. Marc Vincent, the team leader and Area Health Advisor based in Dakar.

II. DESCRIPTION

At the request of the African Bureau, Office of Development Services, (Dr. Edward Cross and Ms. Marie Kirby) WHS provided the services of two technicians to assist in the preparation of the Project Paper. The two advisors had been previously selected by the Africa Bureau and had agreed to undertake the assignment. WHS provided the administrative and logistical support for their activities. They were:

1. Health Education Planner -- Laura H. Yergan, M.A., Professor and Director of Baccalaureate Nursing Program, College of the Virgin Islands, and
2. Health Economist -- Anita Mackie, Ph.D., Associate Director of Data and Evaluation, Health Delivery Systems, Inc., St. Louis, Missouri.

Since the technical aspects of the assignment had been discussed directly between AID/Washington and the specialists, WHS did not prepare background or briefing documents. A review of administrative procedures was held on Thursday, May 20. This was followed by a briefing with the AID Africa Bureau personnel. Dr. Mackie and Ms. Yergan departed the United States on Thursday, May 20. Dr. Mackie returned on Sunday, June 20. Ms. Yergan did not return to the United States but continued on to Swaziland for another assignment for AID and then back to the Virgin Islands.

III. RESULTS

Dr. Mackie and Ms. Yergan arrived in Dakar on Friday, May 21. The nature of the assignment was such that they worked essentially on an

independent basis. Dr. Gene Lerner, a sociologist working in the Rural Development Agency (Promotion Humane) was a third member of the team looking at the sociological aspects of the project.

Ms. Yergan worked with the Reconnaissance Geographique and with the Ministry of Health in the development of training programs and courses for the training of sanitarians and Peace Corps volunteers. Her work was provided directly to the Regional Development Office/Dakar and a copy has not been received by WHS.

Dr. Mackie made a review of the general economic development trends in Senegal and studied the costs/benefits of the project, including an analysis of rural health expenditures. A copy of her draft report is included with this final report. The work of Ms. Yergan and Dr. Mackie will be assimilated into the final Project Paper which will be submitted to AID/Washington.

IV. SUMMARY ITINERARY

May 20, Washington, D. C., briefing with AID/Washington and departure for Dakar.

May 21 through June 19, field work and report preparation in Dakar (Ms. Yergan left for Swaziland approximately June 10).

June 21 through June 23, Washington, D. C., Dr. Mackie had informal discussions regarding the project with Dr. Cross, Marie Kirby and Jim Kelly of the Africa Bureau. No formal debriefing was scheduled, however, a review of both the Senegal and Swaziland projects may be held at some later date.

V. COMMENTS

This was an unusual work order assignment in that the specialists had been selected and the work statement developed prior to WHS involvement. There were also pressures to get the two specialists in the field as quickly as possible. As a result, WHS was not able to prepare the unusual background information and project documentation. The continuation of one of the specialists to the other assignment also precluded a thorough debriefing and project review.

Logistical support including secretarial services and local transportation provided by the Regional Development Office/Dakar were excellent. Rapport with the Mission Director and host country officials was also good. Both the Ministry of Health and the Ministry of Promotion Humane were very interested in the project. The Ministry of Promotion Humane has excellent ties directly to the village level, however, their role in the project is at a relatively low level and thus their participation and support may be somewhat diminished.

HEALTH INFRASTRUCTURE IN SENEGAL

1. National Health Expenditures and Financing

It is not possible to aggregate total national health expenditures in Senegal due to the fragmented nature of services rendered by both the public and private sector. However, the largest item is clearly the public health expenditures made by the GOS. These have varied somewhat between 7.5 and 9.2 percent of the total regular national budget being allocated to health over the past 10 years. The health budget rose as a percent of the national budget during the 5 year period from 1965 to 1970, reaching a peak of 9.2 percent. It has since declined and has now reached its lowest value of 7.1 percent. The projected budget for the health services in the most recent year amounted to slightly over 5 billion CFA or \$21.6 million. Based on an estimated population in 1975 of 4.32 million, this budget amounts to about \$5.00 per capita (Table 1).

These estimates underreport total health expenditures since they exclude Government allocations to other Ministries which are involved in health and health-related activities such as the Ministry of Education, of Agriculture, and of Community Development and the Armed Services.

Overall, Government Allocations to the health sector have been losing ground relative to a growth rate in the population of about 2.25 percent and an inflation rate of about 10 percent in recent years.

The percent of the Ministry of Health budget which is allocated to personnel salaries has been increasing at about 2 percent per annum in recent years. In the most recent projections for the budget year 1975/76,

personnel got 71 percent of the health dollar, leaving only 25 percent for materials and 4 percent as transfer payments. (Table 2).

This breakdown has led to deterioration in permanent health facilities, equipment and supplies, and a low rate of construction of new facilities to expand the population coverage of health services.

As in many developing countries, the hospitals received a disproportionate share of the health budget. The two hospitals in the capital, Dakar, received slightly over one quarter of the entire government health expenditures. During the 1975/76 budget year, the 7 hospitals in the country, two in Dakar and the others in Thiaroye, Saint-Louis, Diourbel, Kaolack and Ziguinchor were scheduled to receive 24 percent of the entire health budget. (Table 2).

The disparity between regions in health expenditures is striking. The concentration of the two largest hospitals, most of the professional health manpower and the teaching and research facilities in Dakar have led to the Cap Vert Region receiving 45 percent of the health budget, though it has about 19 percent of the population. The Region of Sine-Saloum with about 20 percent of the population receives 9 percent of the health budget.

2. Health in the Fourth Plan

The Fourth Plan for Economic and Social Development, 1973-77, states two primary objectives for the health sector:

Maintenance of the present coverage of the population in the rural areas by making every existing health post operational.

Increasing coverage to 200,000 additional inhabitants per year. This expansion can take place only by yearly stages at the rural level while at the intermediate regional level, it will take place at an accelerated pace.

The Plan's goals in the health field are:

1. To give priority to rural over urban areas.
2. To favor medicine for the masses over medicine for the individual.
3. To emphasize preventive rather than curative medicine.
4. To give priority to health education.
5. To develop network of integrated services capable of supporting massive attacks against transmissible diseases while providing the population with a basic health system which meets their essential needs.

Investments for social purposes for the four year period 1975 to 1977, or the period covered by the Fourth four year Plan, were initially scheduled to be 3.0 billion CFA. Of this amount, the largest portion was allocated for city planning and housing, urban and rural hydraulics was allocated the second largest portion, education and training was the third largest, and health was fourth with about 9 percent or 3.6 billion CFA of the investment in the social sector. Only cultural activities

received a smaller share of the plan budget.

While the stated goals give priority to rural health and preventive medicine, there is no evidence that they indicate anything more than good intentions. The listed projects concentrate mainly on hospital construction financed by bilateral aid. The highest priority was placed by the GOS on the central reorganization of the Ministry of Health. This item has appeared in the last four Plans, but money has never been set aside to achieve it. Reorganization is necessary if there is to be any relationship between stated policies and priorities, and implementation of these goals in the health delivery sector.

The Fourth Plan budget was recently readjusted with the social sector being allocated 86.4 billion CFA or more than double the original amount. However, when the ratio of executed projects of the readjusted plan was worked out, the social sector had the poorest performance with only 12.4 percent achieved, compared with 40 percent in the tertiary sector, and 20 to 30 percent in all other sectors. In the readjusted Fourth Plan, health was allocated only 8 percent or 7.3 billion CFA of the doubled social sector budget. Within the social sector, health performed relatively better than the other sectors (except for water projects) and realized 21 percent of its financial plan.

When the individual projects are listed, the largest consist of hospital related activities. The hospital complex for the Fleuve Region

was almost completed, a pediatric Pavillion at Fann Hospital, and a central laboratory for TB were the largest monetary amounts and all had substantial bilateral aid. Only 10 percent of the money was allocated for miscellaneous health projects, which could contain some rural health projects was actually spent.

Until some linkage is attained between planning with stated goals and priorities and performance in these sectors, it makes it difficult to give much support to such worthwhile activities expanding health services to one million inhabitants in Thies and Sine Saloum by 1977.

3 a. National Health Manpower

Until 1950 the entire corps of physicians in Senegal were Europeans. Under French colonial rule, Africans were trained as subordinate personnel. The ratio of physicians per 10,000 population under French colonial rule was only .72 in 1925. The most recent statistics (as of Dec '74) show a total of 281 physicians of whom 42 percent or 119 were Senegalese. This would give a physician/population ratio of about 1 physician for every 15,000 people.

The national average, however, should be used with caution since most of the physicians practice in Dakar. This gives the Region of Cas-Vert a ratio of one physician for every 3,800 persons, while the

Region of Diourbel had a ratio of only one physician for every 66,700 persons. Of the 7 Regions of Senegal, Sine-Saloum ranked fifth with a ratio of one physician for every 60,500 persons.

Of the 281 physicians, 5% or 19 percent were in private practice, and almost all of these physicians were located in the Dakar area. Two physicians were in private practice in the Sine-Saloum area. Of the total of 11 physicians stated to be in the Sine-Saloum district at the end of 1974, 6 were being paid under Technical Assistance contracts, and 6 were paid by the Administration. In the National Budget for 1975/76, the number of physicians listed for payment by the Ministry of Health in the Sine-Saloum area had declined to 11, only half of those employed the previous year. All the physicians employed on the hospital at Kaolack were paid under technical assistance, no positions were budgeted by the Ministry of Health. If the number of physicians has indeed declined to 11, this would give a ratio of one to every 77,000 persons, making the Sine-Saloum the most underserved of the seven Regions. This situation can not be expected to change markedly, since the output of the Medical School at Dakar is only about 50 students per year, of whom 10 are Senegalese.

The last count of the number of pharmacists gave a total of 91 in the country of whom 72 were in the Cap Vert Region. There were only 4 in the Sine-Saloum, of whom 2 were Senegalese.

There were 29 dentists in Senegal in 1974, of whom 24 worked in the Dakar area. None of the dentists worked in Sine-Saloum. Nor is there hope for any speedy change in the number of dentists, since the Dental

School in Dakar only graduates two or three students per annum.

In 1974 there were a total of 330 midwives in the country. Almost two-thirds of whom were located in the Cap Vert Region. The Sine-Saloum with 20 percent of Senegal's population had only 8 percent of the midwives. Of the midwives in the Sine-Saloum, one source recorded 19 working for the Ministry of Health, of whom 12 worked in the Region, and 7 in the hospital at Kaolack and another source gave 25 as being the number employed by the Administration. In addition, there are three midwives working in private practice. The midwifery school is a three year course given at State School for Midwives in Dakar. The graduating class consisted of 25 students in 1973 and 27 in 1974, all of whom were Senegalese. If a fifth of the students were willing to work in the Sine-Saloum, it would be possible to increase the number employed there by 5 per annum.

Nursing training is fragmented in terms of length of training, location and title. However, there appears to be considerably less differential in types of jobs held after graduation. The School for Health Agents (Agents Sanitaires) is located in Saint-Louis and graduates about 40 nurses per year after a two year program. The State School for Nursing in Dakar is a three year program and graduated between 40 and 50 nurses per annum during the past 5 years. The school at Khombole graduates about 10 male students per annum. Their students were part of the first year class in Saint-Louis, and complete their training as sanitary

8.

agents. (Agents d'assainissement) at Khombole. Another classification of the medical assistant (assistant technique medical) appear to perform similar tasks and is thus included in the nursing category.

The total number of employed nurses in the above categories in Senegal in 1974 was 2,457 of whom 86 were listed as being in private practice. This would give a ratio of about 9 nurses for every physician, or one nurse for every 1,700 persons. The distribution of nurses relative to the population is on a much more equitable basis than that of the higher level personnel. In the Sine-Saloum which has 20 percent of the population, there are 297 or 12 percent of the total number of nurses. Of these 20 are listed as in private practice. Of the 277 nurses employed in the Sine-Saloum in COS budgeted positions, about 175 were employed by the Ministry of Health, 49 in the hospital at Kaolack and another 10 in the Immunization Division.

This brief overview of the health infrastructure has revealed several problems. In both facilities and manpower there exists a severe maldistribution of resources which favors the capital, Dakar, at the expense of the rural areas where the vast majority of the population live. Severe shortages of manpower exist in almost all of the health professions, and these will continue to hamper any major expansion of the health delivery system. The curriculum in the various health training schools appear to be based on the French model and stress curative rather than preventive medicine and the hospital rather than the rural setting. Present wage scales are

not high, and the salary increases do not appear to have kept pace with the recent rise in the cost of living. The cost per student appears to be high in most of the health program, and it would seem desirable to increase enrollment. The nursing sector in particular could benefit from coordination and integration of the existing programs. Neither does there appear to be a career ladder with an adequate salary differential to reward the nurse who goes on for further training.

3 b. Health Manpower in the Sine-Saloum

The only list of personnel employed in the Region of Sine-Saloum appears in the Ministry of Health budget. This probably is an approximate figure since it does not detail vacancies or persons no longer employed. Also it lacks specificity on the exact role filled by certain titles. A nurse could be working in an administrative capacity at Kaolack, as a departmental supervisor, as a dispenser or as a sanitary agent. However, it proves to be the only available list. For the purposes of this paper, the manpower employed in the hospital will be ignored, since they would only play a role in the referral system for those rural patients who are hospitalized.

There are only four physicians employed in the Ministry of Health who are non-hospital based. One of these is employed in the service of hygiene and prophylaxis in the Region. If one makes the assumption that it would be desirable to have a physician to supervise the health delivery

system in each of the departments, six physicians would be required. Since each department has a health center, and they range in population from about 78,000 in Foundiougne to 176,000 in Kaolack Department, this does not seem to be exorbitant. Without a physician in each Department, the local nurse or midwife is responsible for all referrals to hospitals.

There are 15 midwives listed as being employed by the Ministry of Health. There are a total of 9 maternities in the 6 Departments, two in Foundiougne, Gossas and Kaffrine, and one in each of the other Departments. It would be useful to have at least one midwife in an administrative capacity at the Regional headquarters, and highly desirable that she be a graduate of CESSI. In addition, one CESSI midwife graduate would be employed as a trainer and supervisor for this project. If one assumes that two midwives per maternity would be the minimum number desirable, one for supervision of all deliveries on a 24 hour basis taking place at the maternity, and another whose primary responsibility would be the supervision of matrons, this would make the minimum number needed for maternities eighteen midwives. If the current need is for 20 midwives, and current employment is 15, at least 5 more are required. It would be possible to hire 5 more annually, if taking 20 percent of the graduating class were feasible. At the moment 9 midwives are listed as being employed in the role of nurse in the region. Some are listed as "infirmier", some as "agent sanitaire" and some as "agent medical". It could be assumed that of these, 10 could be allocated to regional headquarters in a supervisor capacity. Again it would be desirable that 2 be CESSI graduates. There are 6 health centers, and one could assume that 6 nurses per center would be desirable for 24 hour coverage, particularly given the shortage

of physicians. If there are 83 health posts planned, and two nurses are desired for each, one as "infirmier" and one as "agent sanitaire", then an additional 166 nurses or a total of 212 nurses are needed in the region. This would give an immediate shortfall of 23 nurses, which should not be impossible to fill given the present annual output of the various nursing schools. No consideration has been given here to the staffing of MCH (MIP) centers or for municipal dispensaries, these would be in addition to present requirements. It is unfortunate that no inventory exists of the present staffing of the 58 health posts listed as being in operation by Mr. Roche of WHO. Personal visits to about 16 health posts suggested that about half only had a single person from the Ministry employed there. Technically there are sufficient number of budgeted positions for nurses to ensure coverage of the existing health posts by two persons. However, the number of "agent itinerant" is not known either. Mr. Roche stated that a staffing inventory for the Sine-Saloum Region would be available in July 1976 from the Ministry of Health and Social Affairs in Kaolack.

The cost of educating professional health manpower are given in Table. The extremely high cost of physician training is largely supported by French bilateral aid to the University of Dakar. However, with only 10 graduates per annum, and the strong attraction of the capital, it is difficult to be optimistic about training at least two additional physicians in the Sine-Saloum.

T A B L E 5

Cost per Capita of Educating Selected Health Professionals in Senegal

Cost per Medical Doctor graduated from University of Dakar

(Class of 30 per annum, about 10 of whom are Senegalese)

Total: \$81,000

Cost per CESSI graduate from Dakar

(Estimate of 67,000 CFA/month p. student for 21 months)

Total: \$6,000

Cost per Midwife graduated from State School for Midwives, Dakar

(Budget for school for 1975/76, 30 students per class, 3 years of training)

Total: \$6,300

Cost per Nurse (Infirmier or Infirmier d'Etat) graduated in Dakar

(Budget for school for 1975/76, 110 total students for 1st year,
at \$2,049, 100 students for 2nd yr at \$2,254)

Total: \$4,300

Cost per Sanitary Assistant (Agent d'assainissement) graduated from Khonbole

(Budget for school for 1975/76, 10 students for 1 year at St-Louis
\$2,049, 10 students for 2nd year at \$831)

Total: \$10,400

Source: J. Bryant as supported by the World Bank.

The CESSI post-basic training course offers a cadre of 5 trained persons per annum. They have considerable additional training in administration, and the addition of two graduates to the Sine-Saloum staff should provide a firm basis for both administration and educational programs.

With 15 midwives appearing on the 1975/76 budget of the Region of Sine-Saloum, and possibility of attracting 20 percent of the graduating class of 30 (since the Sine Saloum has 20 percent of the population) this should not be a critical shortage area.

At the moment there are 184 nurses (92 infirmiers and 92 agents sanitaires) on the Regional Budget payroll. This is enough to staff health centers and health posts with 2 persons. More detail is needed on the current activities of these persons. If, as it was reported on personal visits, the "agents itinérants" are not able to cover their territory due to lack of Mobylettes, parts and gasoline, these points should be discussed with the Ministry. Nursing output is not such that a shortage of trained personnel should be a problem.

The school for sanitary assistants at Khonbole currently has a problem with exorbitant costs per annum for the 10 students. These figures may overstate the costs because the budget lists 4 "infirmiers" and 4 "agents sanitaires" on the staff, and there appear to be only one of each on the staff currently. The renovation of the school and the spreading of costs over a more reasonable student load of 40 or so would make good economic sense. The basic facilities could be easily restored to accommodate extra student

4. Pharmacies, Drugs and Supplies

The Central Pharmacy Service which is located in Dakar is responsible for the purchase and distribution of drugs and supplies to the entire health system. It is also charged with the inspection of pharmacies attached to private and public establishments. In addition, it is supposed to implement pharmaceutical legislation and implement the international conventions on narcotic drugs. The funding, organization and manpower available to this unit make it impossible for it to serve any of these functions well.

The provision of drugs and supplies to the Regions, especially to the rural health system is particularly weak. The hospitals, who have physicians to speak for them and strong contacts with the Ministry of Health, are able to obtain a larger allocation of the pharmaceutical budget. The Fourth Plan called for the formation of new regional pharmacies to be located in Kaolack, Ziguinchor, Tambacounda and Diourbel. However, none were built, and this portion of the Plan was not even listed in the recent publication (Feb. 1976) on the execution of the Plan.

Data was obtained from the Central Pharmacy on the budgetary allocations. The total budget for this unit for 1975/76 was 415.7 million CFA. Almost three-quarters of this amount was allocated to hospitals, laboratories (which serve chiefly the hospitals) and the Institute for Hygiene. Of the hospital drug budget, the Kaolack hospital was scheduled to receive 18 million CFA or 6 percent of the 300.7 million CFA allocated to hospitals.

Drugs and Supplies for Health Centers
and Health Posts by Region,
1975-1976

<u>Region</u>	<u>Amount for Drugs, Supplies</u> (000 CFA.)
St. Louis	17,600
Cap Vert	8,000
Sine-Saloum	25,300
Thies	17,500
Senegal-Oriental	6,500
Casamance	20,000
Diourbel	18,100
Misc.: transport etc...	2,000
Total	115,000

Rural areas only received about a third of the amount of money allocated for drugs and supplies given to hospitals. Of the 115 million CFA which was budgeted for health centers and health posts in 1975/76, the Sine-Saloum received the greatest amount, 25.3 million CFA or 15 percent of the total drug budget for essentially rural use.

The health centers, of which there are nine in the Region of Sine-Saloum receive a total of 14,400,000 CFA or 57 percent of the drug and supply budget allocated to the rural health system. This amount to an average of 1,600,000 CFA per medical center. If indeed there are 59 secondary health posts operating in the region, or staffed with appropriate personnel to dispense drugs, then the average drug expenditure per post would be 169,000 CFA or \$715 per health post.

The distribution of drugs to the rural areas through the health centers and secondary health posts is clearly a very weak link in the

health delivery system. First of all, the amount of money allocated is clearly inadequate to meet even the most rudimentary drug needs for the rural population. The best supplied health post seen was located at Touba Toul in the Region of Thies where medical personnel are rotated through during their training. The nurse at that station (infirmier) stated that his supplies rarely lasted longer than 2 months out of the 6 they were supposed to last. In the 8 other secondary health posts personally visited in the Sine-Saloum Region, drugs and supplies were reduced to almost nothing, and the estimates of the length of time for which the drugs lasted were considerably shorter. Several infirmiers stated that people stopped coming after the drugs were all gone.

Another problem was the poor selection of drugs. Many drugs were carried in the injectable form when they could have been given by mouth. The lack of sanitary facilities and the rudimentary facilities for sterilization should encourage the use of pills wherever possible. Injectable vitamin C seems questionable in an area where mangoes are plentiful. Other drugs seemed expensive and sophisticated to serve what is supposed to be a basic rural health system.

It would also seem advisable to have a separate list of drugs and supplies which could be issued directly to maternities in those areas which have them, or a shorter and more basic list which could be issued to matrons.

After visits to several secondary health posts run by the Ministry and a couple which were supported by UNICEF in the Region of Thies, the following comments could be useful in the proposed project:

(1) The term "Pharmacie Villageoise" is not as desirable as "Boite de Secours". The former arouses the anxiety of both the local pharmacists who are not keen on losing business and the physicians who have visions of sophisticated drugs being handled by untrained personnel. In addition, the second term more clearly defines the intended role.

(2) There is little doubt that both the demand for drugs and the willingness to pay for them exists at the village level. Collections of the 10 CFA per visit, the charge made by UNICEF seemed high. At the Ministry health posts when drug supplies were depleted, people were given prescriptions by the infirmier, which they then had to carry to the nearest town with a pharmacy to fill.

(3) The periodic visits of an "agent itinerant" by the Ministry or by UNICEF personnel do not at the moment serve to enforce any uniform standard of cleanliness or orderliness in the building. Neither does ready access to water appear to be related to the degree of cleanliness.

An evaluation scale which includes such items as:

- (a) Are all drugs and injectables kept in a clean cupboard or box when not in use?
- (b) Are all drugs kept in a covered and labelled box?

- (c) Are the tables or flat surfaces kept free of debris, dust and scrubbed?
- (d) Is the floor swept daily?
- (e) Is there a basin, soap, towel and covered water container available for hand washing?
- (f) Is there a container for debris?
- (g) Is debris put in a pit or burned daily? etc.

Some method of reward should be found for high cleanliness scores. Posts observed ranged from filthy to very clean. Visits should be made more frequently, (once a month seemed to be the present frequency for Ministry personnel) and should not be made on an announced schedule.

(4) An improved type of day book should be issued to each post to record information. The date should be entered, patient's name, sex, age by category, complaint and type and amount of medication or service rendered. At present, the number and completeness of the record varied from post to post. The daybook could serve to monitor the depletion of stocks, and also as a tool to record epidemiological data.

(5) A box or cupboard to contain the drugs should be supplied or constructed. The Ministry was supplying metal cabinets, one UNICEF pharmacy observed had a homemade cupboard of cement, cement shelves and a wooden door. A metal treatment table would be easier to keep clean.

5. Regional Health Expenditures in Sine-Saloum

The Region of Sine-Saloum has the largest number of persons of the 7 Regions. However, as can be seen in Table, it does not receive its fair share of health resources, since they are so heavily weighed in favor of Cap-Vert, where Dakar is located. For 20 percent of the population it receives only 9 percent of the health budget.

The Sine-Saloum Region has one hospital located in the administrative capital, Kaolack. It is recorded as having 250 beds, or one for every 3,000 persons if it is assumed to serve the entire region. Infections diseases is noted to have most beds, 94; surgery second with 81 beds and 71 allocated for pediatrics. The hospital is entirely staffed with physicians paid under technical assistance arrangements.

As in other regions, a disproportionately high percentage of the Regional health budget, or about 40 percent is allocated for the hospital. Of this amount 57 percent is budgeted for salaries, lower than the national percent since there are no physician salaries included.

The Region of Sine-Saloum was estimated to have a population of 837,000 in 1972 by the Ministry of Finance and Economic Affairs. The figure arrived at by Mr. Roche, a demographer with WHO was 786,000 in 1972. If these figures are inflated by a growth rate of 2.25 percent per annum, the

estimated national average, then the range of population estimates for Sine-Saloum would be from 791,000 to 843,000. An average of these two figures would be 817,000. The population of the largest town in the Region, Kaolack, was estimated to be 113,500 in 1973 and to have a 4 percent annual growth rate. This would bring the estimated population of Kaolack in 1975 to 122,800. If the population of Kaolack, the only town with a hospital and outpatient department, is subtracted from the 817,000 population estimate for the Region, this leaves an essentially rural population of 694,000. This population has to be served by the health centers and secondary health posts.

The regional budget for services provided to the population of Sine-Saloum in 1975/76 was 194,468,000 CFA. To this can be added the amount budgeted for hygiene and immunization which amounted to 15,003,000 CFA. Total regional expenditures therefore to 209 million CFA.

T A B L E 6

Per Capital Rural Health Expenditures in Sine-Saloum
1975 - 1976

	Amount in CFA	Expenditure (1) p/capita in CFA	Expenditure (2) p/capita in \$
Personnel + related exp.	194,468,000		
Hygiene + immunization	15,003,000		
Total health services	<u>209,471,000</u>	301.8	\$1.28
Drugs and supplies	25,300,000	36.4	\$0.15
Total health expenditures	<u>234,771,000</u>	338.2	<u>\$1.43</u>

(1) Rural population of S.S. assumed to be 694,000
(2) Rate of exchange assumed to be \$1 = 235 CFA

The assumption that the regional capital, Kaolack is served by the hospital is not unreasonable. The population of all the other towns, the largest of which is Fatik is served by health centers which are included in the regional health budget. In that case the per capita rural health budget would amount to \$1.14, of which \$1.08 goes for services and \$0.15 for drugs.

Another possible assumption is that all persons in the region have equal access to the hospital in Kaolack, and therefore the total hospital budget of 2,000,000 CFA should be added to the regional health expenditures. In that case, using a total regional population of 817,000 the total per capita health expenditures would amount to 475.5 CFA or \$ 2.02.

ANALYSIS OF RURAL HEALTH EXPENDITURES

The activities proposed in this project include:

- 1) Building and renovation of health posts.
- 2) Training and supervision of health practitioners.
- 3) Motivation and assistance to villagers to provide the following services through self-help:
 - a) Organization of finances and labor to construct a health hut.
 - b) Organization of finances, selection and training of a person to provide services utilizing a "boite de secours" or basic drug supply.
 - c) Upgrading the traditional obstetrical skills provided by village matrons.
 - d) Raising the standards of village hygiene and sanitation.
 - e) Conducting health education in its broadest sense, including nutrition, improved agricultural practices for vegetable production as well as disease prevention and treatment.

The decision to assist in the provision of health services to the rural dwellers of Sine-Saloum would appear to offer large returns in terms of lives saved, reduction of suffering, increased productivity and improvements in the quality of life. The present cost of health services provided by the Ministry of Health and Social Services only amounts to \$1.28 per rural inhabitant of the Region, clearly this can offer little in the way of a health program.

With the lack of available information, the two most useful questions to examine are probably:

- 1) What are the relative merits of spending resources on the different segments of this health project?

- 2) What kinds of returns or benefits will accrue from a successful program in each of these areas?

It is the personal opinion of the health economist and the engineer consulting on the project that large expenditures on the refurbishing and building of new health posts would have the least health impact and be the most costly part of the project. A few health posts have been recently renovated by the Ministry of Public Works. Funds for this were now said to be exhausted. Those UNICEF projects visited, the villagers themselves had constructed a health post, a block building with a cement floor and metal roof. The villagers desire to have health services provided seems great enough that they are willing to provide some of the labor and financing required. AID could certainly assist by providing materials, and some guidance on the construction, but it is more likely that it will be looked upon as a village resource if the labor is locally supplied. This also reduces the risk of overcharging by local contractors. Neither is there any indication that the quality of health services rendered differs significantly whether offered from a thatched roof hut or a concrete block building. Spotless examples of both were seen on site visits.

Obviously reasonable access to water is desired. Village built huts were constructed within easy carrying distance of an existing well. The Ministry of Health was digging some new wells and refurbishing others in the immediate vicinity of health posts and maternities. Only one post was observed where the nearest well was distant enough to be inconvenient. UNICEF had supplied some village wells with hand pumps and there appeared to be major problems with maintenance and supply of spare parts. The usual method of hand-pulling of water and filling a large clay pot or other vessel which is then covered and stored inside the health post or hut would seem to be the method of choice in most locations.

Those locations with deep wells in the Eastern portion of the Sine Saloum may require a different solution. Hand pumps are impracticable at that depth, and gasoline engines for powering pumps may have to be used. Electricity only extends currently to the towns or largest villages.

Some health posts were originally supplied with a modern sink and/or lavatory, but without running water. Most are damaged and it would not seem desirable to replace them. Most health posts had a dug latrine in the compound. Burning pits for refuse are highly desirable and inexpensive to construct.

The training and supervision of the senior health personnel is a vital part of this program. The utilization of two CESSI graduates and a graduate of Khombole is most desirable. Any additional short term training would also be a wise expenditure. It would provide an additional opportunity to suggest to the Ministry that the staff should receive a salary increment for their post-basic training (which they are not currently being given).

The training of the present personnel staffing the health posts is high priority item. Without well trained and motivated people the program will not be a success. In the past, on-going supervision and training has not received much attention from the Ministry of Health. This should be demanded as part of the project, likewise the provision of an adequate drug supply on a more frequent basis to the health centers should be negotiated with the Ministry. If this does not occur, the situation will arise where the better trained "infirmier" is sitting at the health post with 40 aspirin, while the village "secourist" has an adequate supply of basic drugs in his hut.

There is no doubt that the provision of a basic drug supply to the villagers would result in benefits which far outweigh the cost involved.

To examine a single drug and disease entity, that of malaria: an adult can be protect against the disease for the peak three months during the rainy season for \$0.25. These three months also coincide with poor labor

requirements for planting of his crops. His daily net return on an annual average basis would exceed that. Therefore, one would only have to assume a single day of labor saved to exceed the cost of the malaria prophylaxis.

With children the situation becomes probably more involved. About a-third of the children under one year of age, 60 percent of those from 1 to 4 and 50 percent of those from 5 to 11 were found to have malaria in a recent research project conducted in Kaolack by WHO. Persons, whether children or adults, who contract a febrile disease have an excess caloric requirement, malaria cases are most common when food supplies are almost at their lowest. Children are most apt to suffer from some combination of nutritional deficiency, enteric and dysenteric organisms and malaria. These children suffer from wasting and diarrhea, which may or may not result in death. A forty percent death rate of children prior to age 5 is a commonly quoted figure for Senegal. Again, the expenditure of about \$0.25 for malaria prophylaxis, and a somewhat lower amount for the smallest children would have a major payoff in terms of improved health and savings in caloric requirements.

Malnutrition is common among small children in the Sine Saloum. The WHO study conducted in that area found that 45.5 percent of the children between 0 and 5 years were malnourished utilizing the Jelliffe standards. Sixty-nine percent of the children presented clinical symptoms often associated with malnutrition. The proposed project would or could assist in reducing rates of malnutrition by lowering the rates of intestinal parasites, by lowering the incidence of malarial episodes and thus allowing better utilization of the food consumed, and by giving better nutritional information on desirable post-weaning feeding practices.

It is impossible to do a cost benefit analysis on the results of spending under \$1.50 per capita per annum on basic drug supplies linked with a rudimentary program of improved sanitation, hygiene, and health education. The data do not exist on the morbidity and mortality by specific disease entities, and what reductions can be achieved by utilizing a basic drug kit. And children under 5 in this area suffer from multiple complaints whose interaction is known to be cumulative. However, it is difficult to envision that this per capita cost would not have benefits in excess of that amount. The UNICEF Project has demonstrated the rural dwellers willingness to pay

a similar amount to assure the availability of an almost identical list of drugs.

Three-quarters of all pregnant and lactating mothers were found to be anemic in the WHO study. If the traditional matrons could lower the rate of neo-natal tetanus by improved hygiene, and assist in the provision of iron tablets to pregnant and lactating women, these two measures alone could affect a significant health improvement. In the Touba Toul maternity, in the Thiès region, where UNICEF has provided assistance, and which was staffed by matrons, there had been no cases of neo-natal tetanus in two years.

The WHO study conducted in the Department of Kaolack in the Region of Sine Saloum found that women over 40 said that they had been pregnant on an average of 6.2 times for an average of 3.0 live births. The effects of increasing the survival rate of children under 5, and whether this would decrease women's desire for large families to ensure survival of some children is not known. If fetal wastage is indeed 50 percent, any reduction would increase birth rates significantly.

The attitude of Ministry of Health officials towards birth control or child spacing seems mixed. It would seem questionable whether birth-control measures should be introduced at the inception of a basic rural health program without the complete approval of the Ministry. Without such approval the other portions of the program would be jeopardized.

The addition of a minimal DDT spray program which could be conducted by one of the voluntary village health workers would be extremely beneficial. If the interior walls of all village huts could be sprayed once prior to the rainy season, and areas of stagnant water surrounding the village sprayed at the same time, this would have a considerable residual effect on cutting down disease vectors.

Perceived Priorities in Terms of Net Returns.

If a phased program were conducted with the expectation of minimal participation of the Ministry of Health at the inception of the project, the following priorities are suggested by the economist:

Phase I.

1. Selection and short term training of initial team (2 CESSI + 1 Hochschule graduates). Support for salaries plus vehicle and supplies if GOS unwilling to supply.
2. Selection of health centers and secondary health posts where GOS currently has 2 persons employed for initial program.
3. Training of present staff (1 person/post at a time) by Team 1.
- 4 (a). Sensitization of village personnel in large villages around the selected sites by Promotion Humaine personnel. (b) Formation of village health committee. (c) Decisions on building a health hut, selection of persons to receive "secourist", "matron" and other sanitary or health education programs. (d) Village decision making on financing options available (aided by P.H.) such as collective field, annual assessment at time of groundnut sales, or payment for drugs at time of need.
5. Rehabilitation of present secondary health centers either by provision of materials by USAID or by payment of total cost.
6. Personnel of secondary health posts train voluntary village health

workers. Not more than 5 villages per secondary health post should be selected initially, since the ongoing supervision can be expected to fall on the existing Ministry staff.

7. Setting up a system to issue a drug supply to village health posts. This may have to be done outside the Ministry due to existing logistic problems. UNICEF appears to have made arrangements with local commercial pharmacies.
8. Ongoing supervision and training of personnel at all levels.

Phase II.

Continuation of spread to new areas, depending on GOS participation, Ministry staffing of health posts, and utilizing the experience gained in Phase I.

If no major funding changes for health are envisioned at either the National or Regional level, the above program could be carried out with fairly minimal additional GOS Ministry of Health participation. It depends heavily on existing staff. Most of the basic health program will be carried on in a self-help manner by the villagers and for the villagers. The UNICEF program has demonstrated the feasibility of this approach.

TABLE I

HEALTH BUDGET AS PERCENTAGE OF THE NATIONAL BUDGET

Year	National Budget in '000,000 CFA	Health Budget in '000,000 CFA	Percentage
I965/66	36,049	2,707	7.5
I966/67	35,548	2,834	7.9
I967/68	36,065	3,251	9.0
I968/69	36,750	2,252	9.1
I969/70	37,850	3,491	9.2
I970/71	39,000	3,556	9.1
I971/72	41,440	3,727	9.0
I972/73	44,000	3,794	8.6
I973/74	47,000	3,657	7.8
I974/75	51,00	4,103	7.5
I975/76	43,200	5,067	7.1

Sources. Government of Senegal Statistiques Sanitaires, 1974.
: Budget Général, 1975/76.

TABLE 2

BREAKDOWN OF THE HEALTH BUDGET SINCE 1965/66

<u>Year</u>	<u>Personnel</u> in '000,000 CFA	<u>Materiel</u> in '000,000CFA	<u>Transfers</u> in '000,000 CFA	<u>Total</u> in '000,000 CFA
1965/66	1,665	1,042	-	2,707
1966/67	1,923	911	-	2,834
1967/68	2,000	936	315	3,251
1968/69	2,098	933	320	3,352
1969/70	2,251	917	318	3,491
1970/71	2,291	950	315	3,556
1971/72	2,367	1,042	318	3,727
1972/73	2,520	943	331	3,794
1973/74	2,482	964	210	3,657
1974/75	2,833	1,057	212	4,103
1975/76	3,597	1,258	212	5,067

Sources: Government of Senegal Statistiques Sanitaires, 1974.

: Budget Général, 1975/76.

TABLE 3
HEALTH BUDGET FOR SENEGAL BY REGION AND FUNCTION

1975/1976
 (in 000's CFA)

FUNCTION	Regions								Total	Percent of Total
	Cap-Vert	Casamance	Diourbel	Fleuve	Sen. Orient.	Sine Saloum	Thies	Not attributable		
Central Administ	156,979			11,616					168,595	3.3
Hospitals	1,458,893	58,995	138,810	243,340		172,516		140,000	2,212,554	43.7
Regional Health	326,178	232,172	217,512	177,465	128,740	230,186	259,762	2,000	1,571,014	31.1
Preventive Med. VCH + Immuniz.	232,117	83,343	26,184	55,628	37,847	30,034	96,513	114,470	676,289	13.3
Education	110,143			53,871			19,931	33,993	217,233	4.3
Social work	4,656			80		1,624		91,581	97,941	1.9
Not attributable								120,555	120,555	2.1
Total	2,288,966	374,510	382,505	541,300	166,587	431,109	376,309	502,600	5,087,186	100.0
Percent of total	45.2	7.4	7.5	10.7	3.3	8.6	7.4	9.9	100.0	

TABLE 4
DRUG AND SUPPLY BUDGET FOR 195/56 FOR
THE REGION OF SINE SALOUM

Health Centers = 9 (HC)
 Secondary Health Posts = (SHP)

Location	Amount budgeted ('000 CFA)
H.C. - Kasnack	2,500
S.H.P - " = 12	2,000
H.C. - Fatick	1,800
S.H.P - " = 11	1,800
H.C. - Sokone =	1,500
S.H.P. - " *	1,000
H.C. - Khoungeul	1,000
S.H.P - " = 3	600
H.C. - Niore du Rip	1,800
S.H.P. - " " = 9	1,800
H.C. - Foundiougne	1,300
S.H.P. - " = 3	600
H.C. - Gossas	1,700
S.H.P. - " = 7	1,300
H.C. - Kaffrine	1,800
S.H.P. - " *	1,800
H.C. - Guinguinéo	1,000
Total	25,300

* No figure entered in Report