PN-AAQ-963
ISN-36439

40272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. JDMCG/TR-84/5	2.	3. Recipient's Accession No.
4. Title and Subtitle Private Sector Research Retrieval and Analysis Project: Senegal			5. Report Date June 1, 1984
			6.
7. Author(s) Jonathan D. Meyer			8. Performing Organization Rept. No.
9. Performing Organization Name and Address JDM Consulting Group 12002 Greenleaf Avenue Potomac, MD 20854 (301) 340-7123			10. Project/Task/Work Unit No. 698-0135-3-6134605
			11. Contract(C) or Grant(G) No. (C) AFR-0135-0-00-3061-01 (G)
12. Sponsoring Organization Name and Address Office of Health & Nutrition, Bureau For Africa U.S. Agency For International Development Room 2492, New State, Washington, DC 20523 (202) 632-8174			13. Type of Report & Period Covered Final, 1978 to 1983
			14.

15. Supplementary Notes This paper is one of a series by the author on the topic of private sector financing of primary health services in Africa. The series includes Rwanda, Somalia, Upper Volta, Niger, Senegal, Liberia, Sierra Leone, Swaziland, and an Overview & Recommendations chapter.

16. Abstract (Limit: 200 words)

I. Introduction, II. Major Findings and Conclusions, III. Recommendations for Specific Background Work as Precedent to and Concurrent With Expansion Into the Sine Saloum Rural Health Project II: A. Conduct an Expenditure Survey, B. Collect Utilization Data at the Health Huts and Health Posts, C. Conduct Cost Analyses for Private Sector Initiatives, IV. Discussion: A. Definitions, B. Issues: 1. Willingness to Pay, 2. Consumer Expenditures on Private, Traditional Care, 3. Post and Hut Services as Complements or Substitutes, C. Private Sector Business Opportunities: 1. Production of Medicines, 2. Medicine Distribution, 3. Transportation Maintenance, 4. Facility Maintenance, 5. Survey Collection, 6. Financial Accounting, Appendices: I. Expenditure Survey, II. Senegalese Projects Other Than Sine Saloum: A. Pikine, B. Gossas, C. National Level Research Project (David Rinaldo's Ph.D. dissertation (Economics, U. of Michigan), V. Footnotes, VI. Bibliography, Figure I. Sources of Care: Public and Private (Pikine - Guediawaye, 1979), Figure II. Utilization: Post Visits 1980 - 1981: N'Gayene, Paoscote, and M'bar, Figure III. Utilization: Post Visits 1979 - 1982: N'Gayene and Paoscoto, Table I. Public and Private Care: Episodes of Care, by Type of Provider, Table II. Distribution of Sources of Care, by Type. 19 item bibliography.

17. Document Analysis a. Descriptors

1) Senegal 2) Health 3) Market study 4) Private Sector 5) Primary Health Care 6) Health Services 7) Africa 8) Rural Health 9) Finance 10) Household Expenditure Survey 11) Demand

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement: Release Unlimited	19. Security Class (This Report) UNCLASSIFIED	21. No. of Pages 38
	20. Security Class (This Page) UNCLASSIFIED	22. Price

(See ANSI-Z39.18) See Instructions on Reverse OPTIONAL FORM 272 (4-77) (Formerly NTIS-35) Department of Commerce

PRIVATE SECTOR RESEARCH RETRIEVAL AND ANALYSIS PROJECT
Project No. 698-0135-3-6134605

SENEGAL

Support for this project was provided by the
United States Agency for International Development
Contract No. AFR-0135-0-00-3061-01

NTIS Accession Number JDMCG/TR-84/5

Jonathan D. Meyer
JDM Consulting Group
12002 Greenleaf Avenue
Potomac, MD 20854

June 1, 1984

PLEASE NOTE

This paper is one of a series by the author on the topic of **private sector financing of primary health services in Africa.** The titles in the series are the following:

"Private Sector Research Retrieval and Analysis Project: Somalia," October 18, 1983, NTIS Accession Number JDMCG/TR-83/1

"Private Sector Research Retrieval and Analysis Project: Liberia," November 29, 1983, NTIS Accession Number JDMCG/TR-83/2

"Private Sector Research Retrieval and Analysis Project: Upper Volta," December 20, 1983, NTIS Accession Number JDMCG/TR-83/3

"Private Sector Research Retrieval and Analysis Project: Niger," January 22, 1984, NTIS Accession Number JDMCG/TR-84/1

"Private Sector Research Retrieval and Analysis Project: Zimbabwe and Lesotho: Bibliographies," February 16, 1984, NTIS Accession Number JDMCG/TR-84/2

"Private Sector Research Retrieval and Analysis Project: Rwanda," February 22, 1984, NTIS Accession Number JDMCG/TR-84/3

"Private Sector Research Retrieval and Analysis Project: Swaziland," March 8, 1984, NTIS Accession Number JDMCG/TR-84/4

"Private Sector Research Retrieval and Analysis Project: Senegal," June 1, 1984, NTIS Accession Number JDMCG/TR-84/5

"Private Sector Research Retrieval and Analysis Project: Sierra Leone," June 2, 1984, NTIS Accession Number JDMCG/TR-84/6

"Private Sector Research Retrieval and Analysis Project: Overview and Recommendation - Household Expenditure Survey," June 2, 1984, NTIS Accession Number JDMCG/TR-84/7

TABLE OF CONTENTS

I. Introduction 1

II. Major Findings and Conclusions 2

III. Recommendations for Specific Background Work as Precedent to and Concurrent With Expansion Into SSRHP-II 3

A. Conduct an Expenditure Survey 3

B. Collect Utilization Data at the Health Huts and Health Posts 4

C. Conduct Cost Analyses for Private Sector Initiatives 4

IV. Discussion of Findings, Conclusions, and Recommendations 5

A. Definitions 5

B. Issues 8

1. Willingness to Pay 8

2. Consumer Expenditures on Private, Traditional Sector Care 12

3. Post and Hut Services as Complements or Substitutes 13

C. Private Sector Business Opportunities 18

1. Production of Medicines 18

2. Medicine Distribution 19

3. Transportation Maintenance 20

4. Facility Maintenance 21

5. Survey Collection 21

6. Financial Accounting 22

Appendix I: Expenditure Survey 23

Appendix II: Senegalese Projects Other Than Sine Saloum 26

TABLE OF CONTENTS (Cont.)

A. Pikine 26

B. Gossas 28

C. National Level Research Project (Rinaldo Dissertation) 29

V. Footnotes 32

VI. Bibliography 34

LIST OF TABLES AND FIGURES

Figure I Sources of Care: Public and Private (Pikine - Guediawaye, 1979) 10

Table I Public and Private Care: Episodes of Care, by Type of Provider (Pikine - Guediawaye, 1979) 11

Table II Distribution of Sources of Care, by Type (Pikine - Guediawaye, 1979) 13

Figure II Utilization: Post Visits 1980 - 1981: N'Gayene, Paoscoto, and M'bar (Senegal) 15

Figure III Utilization: Post Visits 1979 - 1982: N'Gayene and Paoscoto (Senegal) 16

I. INTRODUCTION

The purpose of this paper is to review the available evidence which bears on the issue of private and local financing of primary health care (PHC) in Senegal. This paper constitutes one part of the documentation of the Private Sector Research Retrieval and Analysis Project (PSRRAP). The scope of the project spans eleven countries, including Somalia, Rwanda, Niger, Upper Volta, Sierra Leone, Liberia, and Swaziland, in addition to Senegal. Academic and professional literature, along with that available from major donors, was searched. In view of the substantial interest on the part of the Government of Senegal in local management and financing of PHC, a relatively great amount has been written about Senegal.

This paper is a discussion of reasonable and productive areas for further research, as the Sine Saloum Rural Health Project (SSRHP) progresses from Phase I to Phase II. This author did not travel to Senegal to conduct this work, and, thus, it should be viewed as reflective. It is a reflection for the Mission in Dakar of the impressions of Sine Saloum, focusing on only the financing issues. There is no original work presented here. Instead, the author recommends future original work and opportunities in private sector business activities.

The paper is organized as follows: Section II contains the Major Findings and Conclusions. Section III contains the Recommendations, while Section IV contains the Discussion of the Findings, Conclusions, and Recommendations. Appendix I

contains a brief proposal for the conduct of an expenditure survey; Appendix II contains a discussion of findings from other projects. Noteworthy among them is the doctoral dissertation in Economics (University of Michigan) of David Rinaldo. He used national level data from 1974 and achieved results which are both counter to some "prevailing wisdom" and are statistically significant.

II. MAJOR FINDINGS AND CONCLUSIONS

Although there has been a wealth of material written about financing health care in Senegal in the past three years, most of the data derives solely from the budgets and receipts of the health facilities and Ministere du Sante Publique (MSP). These data are important, but without other financial and economic information, decision makers are taking unnecessary risks with the future of the project and, by inference, the availability of health services in the rural areas. The literature contained the following findings of major importance which may require additional testing and validation.

1) A rough estimate of the total amount spent within Senegal, in FY82, is 15 billion CFA (about U.S. $50 million). Of that, about 45% is in the private sector, about 6.7 billion CFA (about U.S. $22 million).

2) Primary Health Care (PHC) delivered in the health huts acts to bring more people into the PHC system, which increases the quantity of services and medicines demanded, and puts a greater demand on supervision at higher levels in the hierarchy. That

is, service delivered in the health hut complements service in the health post and health center; it is not a substitute for it.

3) No data exist regarding the analogous relationship between traditional care and modern care. An interaction between them is assumed, but its nature is unknown. This interaction between traditional and modern care bears directly on the amount of revenues health huts and posts will generate. Most importantly, the information can be collected using methods which are available and inexpensive to use.

4) Recently collected (to May, 1982) data exist which indicate a decline in utilization of health posts over the period 1979 -1982 by 40%. The decline may mean three very different things. It may mean that:

1) Services are being delivered which prevent disease, yielding lower utilization,

or 2) Consumers are turning away from the centres, seeking care elsewhere,

or 3) Recordkeeping in the centres has gotten lax, and the apparent decline is an artifact of the diminished effort in recordkeeping.

This decline was reported in the Jones "End of Project Evaluation" (Jones, et al., 1982) and demands attention. The outcome of research activities conducted as parts of 2 and 3 above are important in interpreting this finding.

III. RECOMMENDATIONS FOR SPECIFIC BACKGROUND WORK AS PRECEDENT TO AND CONCURRENT WITH EXPANSION INTO SSRHP-II

A. Conduct An Expenditure Survey

An expenditure survey provides information on how people

spend their incomes. Econometric analysis of it can be useful in forecasting demand and utilization in advance of costly programmatic changes. For example, response to changes in prices of services can be estimated. Using a portable microcomputer, it can be conducted, analyzed, and documented in the field. Such a survey and analysis can be performed relatively quickly and inexpensively. A brief description of the survey and analysis are contained in Appendix I.(1)

B. Collect Utilization Data at the Health Huts and Health Posts

Utilization data are important because without it the interaction between the hut and the post cannot be determined. To illustrate, if the hut were used as a substitute to the post, greater use of the hut will reduce the demands on the post, bearing directly on the problems of supply and supervision at the hut level. If they are complements, expanding the supply of huts will increase the demands on the posts, exacerbating those problems. Economic and anthropologic theory cannot reasonably predict either condition; it is fundamentally an empirical question.

The collection of these data would best be done at the facility in question, not relying on reports send to the district level. Records at the facilities are purportedly very complete, whereas on the district level, reporting is inconsistent.(2)

C. Conduct Cost Analyses for Private Sector Initiatives

Conduct cost analyses for the following potential Private Sector Rural Initiatives in Health: medicine production and distribution, transportation maintenance service, facility

maintenance services, survey collection service, and financial accounting service. Such cost analyses are prerequisites to establishing a private business. Though relatively inexpensive to do, they serve as barriers to entry for small businesses. Provision of this information to the business community will encourage participation the private sector initiatives.

IV. DISCUSSION OF FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

A. Definitions

1. The private sector is that portion of the economy which is not under governmental authority for purposes of spending. This includes individuals and households, non-governmental employers, associations, and insurance organizations. Although the lines between private and public are not always distinct (as in the case of a government chartered corporation), for the purposes of this discussion, the private sector will be defined liberally, to include all that which is not government.

2. Health sector financing is the process of collecting and paying for health services. It is sometimes direct, as when a consumer visits a clinic and pays a fee, and it is sometimes indirect, as when a deduction from salary is made from an employee's paycheck. Further, it often includes payments made for goods and services which are not in and of themselves health services but are a necessary link in the health service delivery system. For example, fuel and vehicle maintenance are factors of a health system which must be paid.

3. Recurrent costs are those costs of operations,

maintenance, and depreciation. They include also the infrastructure support: transportation, supervision, medicine delivery, communications, and record keeping. Too often projects budget only for the direct operational recurrent costs, such as rent, salaries, and medicines, neglecting the maintenance, depreciation, and infrastructure costs. This budgeting style appears to work in the short term, but inevitably leads to failures in the system over the long term.

4. Willingness to pay and demand are concepts borrowed from economists. Willingness to pay is defined as an individual's voluntary payment for a given good or service at an established price. Demand is defined as that quantity of a good or service that an individual (or society) is willing to pay for, as a function of its price, the prices of other things, the consumer's income, and his tastes.

5. Demand elasticity (or demand responsiveness) is the proportionate change in quantity demanded for a given change in one of the factors influencing demand (prices, income, tastes). The own price elasticity of demand measures the responsiveness of the quantity of a good or service demanded to a change in its price, all else constant. For most goods and services, the own price elasticity of demand is negative; i.e., the quantity demanded declines as the price of the good or service is increased. For most types of health care, the proportionate decline in quantity demanded is less than the proportionate increase in price (referred to as an inelastic demand response). The cross price elasticity is the proportionate change in the

quantity demanded of a good or service for a given change in the price of another good or service. This effect may be either positive (in the case in which the two goods or services are substitutes) or negative (in the case in which the two are complements). The determination of the cross price effects are very important in tracing through the system the effect of a change in the price of one good or service. Unintended consequences are often encountered when these effects are neglected. Income elasticity of demand measures the proportionate change in the quantity demanded of a good or service for a given change in the consumer's income. In developing countries where policies are sometimes directed to increase consumers' incomes, the effects of such policies must be considered on their use of health resources. Similarly, when conditions occur which depress consumers' incomes (e.g., drought, epidemic, etc.), the effects of reductions in income on demand for health care must be considered. A consumer's perceived seriousness of illness or the quality of the care received are often considered as taste parameters in demand analysis. These are difficult to measure and sometimes education is used as a proxy measure for tastes.

6. Traditional practitioners are those health care providers who practice other than western medicine. Their practices, however, may use western medicines and techniques, and are often mixed with practices based on folk beliefs. Sometimes fine lines between western and traditional practitioners are drawn, and the key to the distinction is in their training. Traditional practitioners may have received formal training, but their

training is based on principles different from those of allopathic training. There are specialists (birth attendants, bone setters, fever specialists, stomach ache specialists) and generalists. They often provide services of a wider scope than western practitioners (helping to find lost objects, advice on love, etc.) and thus, are not entirely substitutes to western health care, though there is presumed to be an element of substitutability. Finally, they often charge fees or in kind payments and can be considerably more expensive than western practitioners.(3)

The following discussion focus on policy oriented issues pertinent to the design and operation of SSRHP-II.

B. Issues

1. Willingness to Pay

Though unproved systematically, case study methods have described the health behaviors of rural populations where no modern personnel practice.(4) When people are ill, they seek care, and are willing to pay for it. In 1974, a Belgian team conducting preliminary research for what became the Pikine project, reported

> that people were willing to make predetermined financial contributions in order to receive the right treatment with the necessary drugs. This last point was significant because the free governmental services did not have enough essential drugs available and the Ministry of Health budget was severely limited. (5)

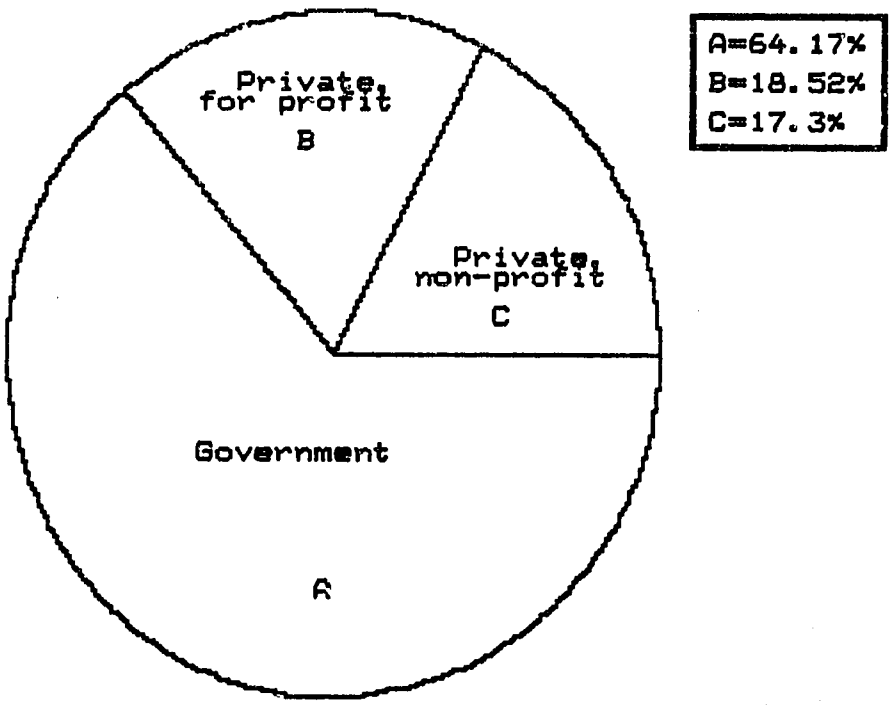
A rough estimate of the total amount spent within Senegal, for the Fiscal Year 1982, is 15 billion CFA (about U.S. $50

million, in 1982 terms), of which about 8.3 billion CFA (about U.S. $28 million) flow through the government(6) and about 6.7 billion CFA (about U.S.$22 million) go to private profit an non-profit, modern and traditional, practitioners.(7) (See Figure I) Much of the public expenditures, about 44%(8), are allocated (or diverted) to the national and regional hospitals. Since the hospitals exist in the urban areas, most rural people receive little of that 44%, or 3.7 billion CFA (about U.S.$12 million). There is ample precedent then for private self-reliance in rural areas for health care. Note, in Table I, the range of private expenditures by type of care - for maternal and child health services 22% of the total is private, whereas for non-curative services, over 50% of the total is private. The bulk of the non-curative services consists of vaccinations provided by a nurse at the home of the village chief.(9)

Simply having evidence that people are willing to pay something for services is insufficient of designing policy. Whether or not consumers will pay the full costs of the VHWs and medicines is still open to verification. However, program costs include things like transportation of medicines and supervisors, which, unless paid, will cause the system to falter. Alternative pricing mechanisms may be tested to ascertain the willingness of individuals and CRs to support these costs. "The design of the Sine Saloum Rural Health II Project is dependent on alternative financing from the rural communities. Without this financing, the project may not be cost effective. For this reason, the Mission proposes that <u>by the end of year (1983) three rural</u>

FIGURE I

SOURCES OF CARE: PUBLIC AND PRIVATE
PIKINE - GUEDIAWAYE, 1979



Source: Seck, p. 23.

Table I

Distribution of Sources of Care, by Type of Care

Pikine - Guediawaye, 1979

Source	All Services	Non-Curative	Maternal & Child
Health Center of the Circonscription	22.5	10.3	18.8
Other Gov't. Units in Circonscription	14.9	22.3	31.8
Gov't. Units Outside Circonscription	26.0	12.6	23.0
Private, non-profit sources in Circon.	17.1	0.1	5.3
Other private sources in Circon.	11.9	0.3	1.2
Private sources outside Circon.	6.4	5.0	15.9
Relatives and Neighbors	1.2		
Houses of Neighborhood Chiefs		45.6	
Other sources outside Circon.	0.1	0.1	
Without care Entirely			4.0
SUBTOTAL PUBLIC	63.4	45.2	73.6
SUBTOTAL PRIVATE	36.7	51.1	22.4

Note: Totals do not sum to 100; unexplained in source.

Source: Seck, pp. 23, 25, 27.

communities must demonstrate through appropriation of funds their willingness and ability to support transport costs for supervision and delivery of PHC services."(emphasis in original)(10) Discussion below in Section B considers inviting the private sector (as manifest by private businesses) to produce the support services for the project.

2. Consumer Expenditures on Private, Traditional Sector Care

> Traditional forms of medical practice continue to play an important role in Sine Saloum. ... No information has been obtained on the interaction between the traditional medical system and primary health care. However, experience elsewhere suggests that people tend to use both systems simultaneously. Factors such as self-diagnosis of illness, perceived effectiveness, cost, distance, and sociocultural acceptability ultimately will determine the 'hierarchy of resort' among alternative medical systems.(11)

These are the same assertions as appeared in the SSRHP-II PID regarding traditional care. Almost no data exist regarding traditional care, though the Seck survey, conducted in Pikine in 1979, contained a few references to traditional care. It indicated that about 7% of all care delivered (as measured by episodes of illness) was delivered by non-Western providers. These included traditional healers, neighbors, relatives, and teachers (see Table II). When one considers that Pikine is semi-urban, relatively close to Dakar, and served by MSP financed nurses, the figure of 7% appears to have little relationship to rural area experience. Indeed, rural areas with fewer western providers are likely to report much higher amounts of traditional care as compared to Pikine. Further, the amount reported is certainly not the amount which exists, the latter being much greater. A rough estimate as to how much traditional care is

Table II
Public and Private Care: Episodes of Care, by Type of Provider
Pikine - Guediawaye, 1979

Provider Type	Number of Episodes	% of Episodes
Nurse	94	52.0
Physician	69	38.1
Traditional Healer	8	4.4
Midwife	5	2.8
Neighbor	2	1.0
Relative	2	1.0
Teacher	1	0.6
TOTAL	141	99.4*

*Difference from 100.0 assumed to be rounding error; unexplained in source.
Source: Seck, p. 24.

delivered in rural areas would be 35% - 60% of the total care delivered. In view of the fact that invariably such services are privately financed, the resources spent on them represent lost opportunities for utilization of the VHWs and Infirmiers Chef de Poste.

3. Post and Hut Services As Substitutes or Complements

The way in which different services are viewed by consumers can critically affect the functioning of system. For example, if VHW services are introduced into rural areas and those services are viewed by consumers as substitutes to services offered at the centres de sante, one can reasonably expect,

assuming all else constant, a reduced quantity demanded for services in the centres upon availability of VHWs. Thus, the demands on the time of the infirmier/chef de poste would likewise be reduced, allowing opportunities for supervision atr the village level. The system works as one would hope it would, if the services are viewed as substitutes. On the other hand, if services are viewed as complements, the introduction of VHWs increases the quantity demanded for services in the centres, all else equal. The opportunity for supervision is diminished, as the volume of services rises in the centres and there is increased pressure on the personnel for service delivery. Furthermore, the medicine supply problem is exacerbated, as demands increase on the centres.

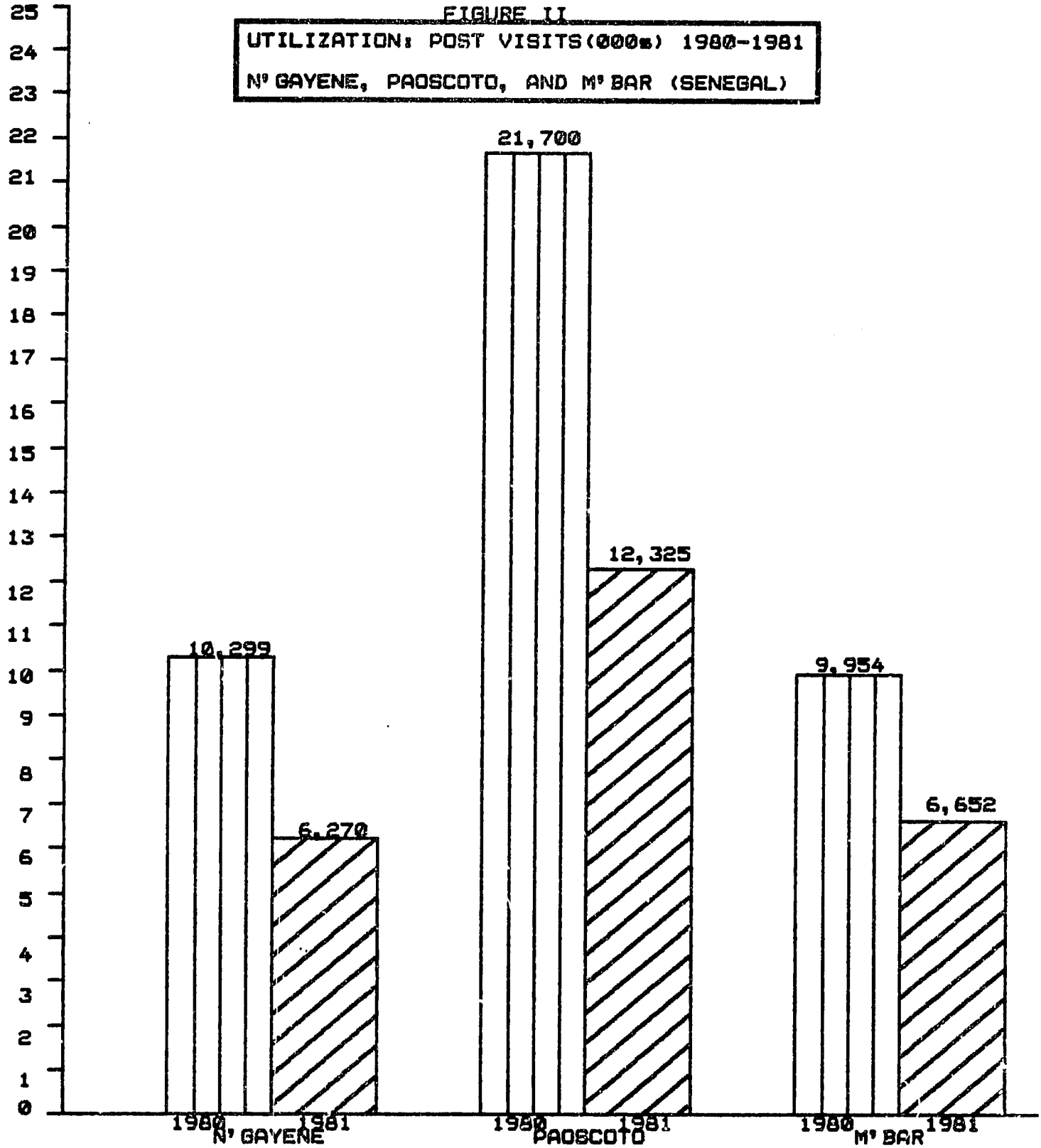
Neither economic, anthropologic, nor sociologic theory can predict how services will be viewed by consumers; it is an empirical matter, but the only empirical evidence bearing on the question is inconclusive. A doctoral dissertation in Economics, completed in 1980, using data from 1974, (12) concluded unequivocally that outpatient care offered through dispensaries and inpatient care offered through centres de sante are complements. More recently, data gathered in the Sine Saloum Region, at centres de sante in N'Gayene, Paoscoto, and M'Bar indicate reduced demand for services in centres by 40% over the period 1979 to 1982 (13). No data were available regarding utilization of VHWs. See Figures II and III for graphical illustrations of the reduced utilization.

The presumption is one of substitutes, but there is no evidence of it. Reduced utilization in the centres alone may

FIGURE II

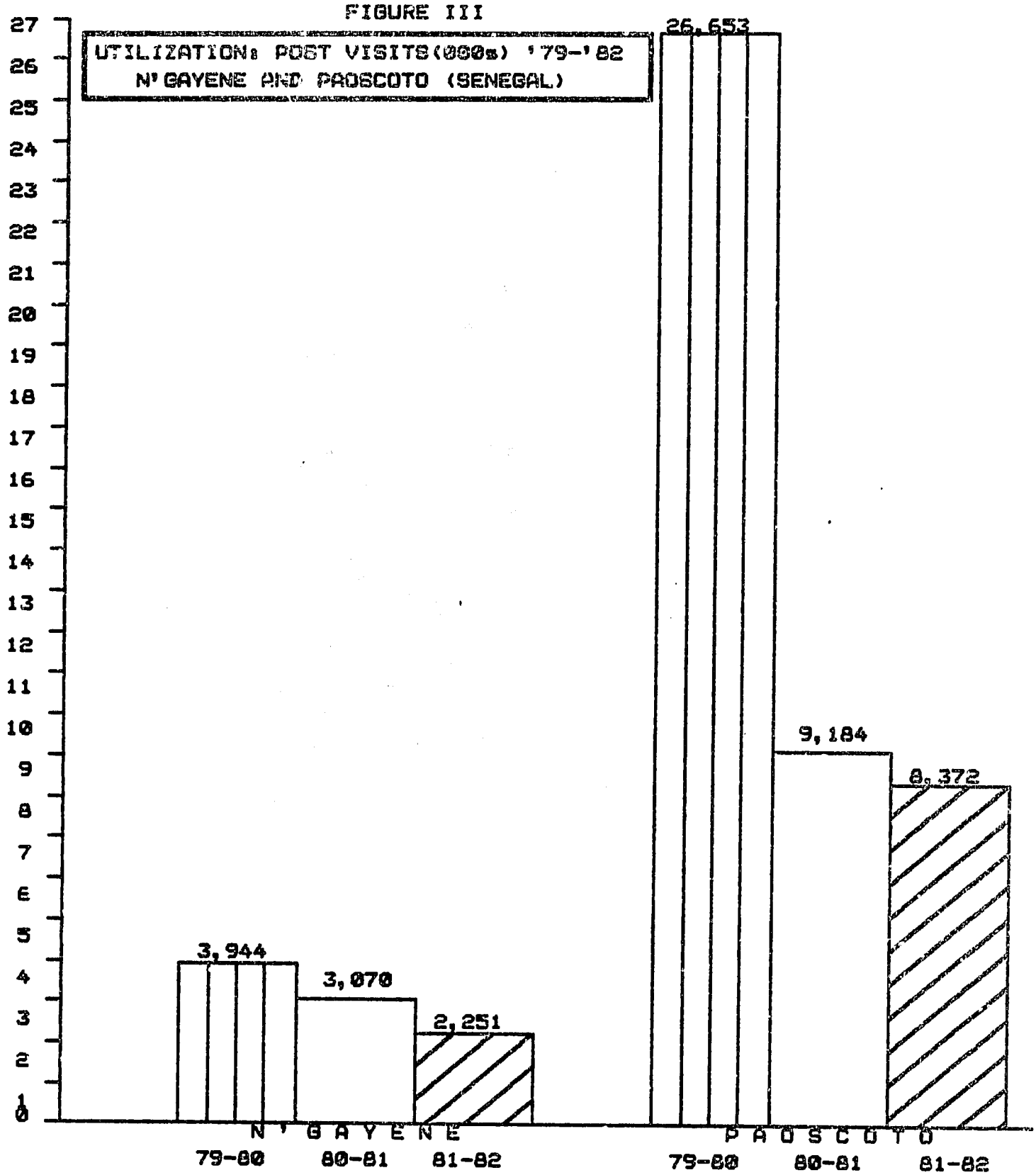
UTILIZATION: POST VISITS(000s) 1980-1981

N' GAYENE, PAOSCOTO, AND M' BAR (SENEGAL)



Source: End of Project Evaluation (Jones, Bethune, Osmanski), July, 1982, p.66.

FIGURE III



Source: End of Project Evaluation: Jones, Bethune, Osmanski, July, 1982, p. 67.

indicate a properly functioning system or it may signal problems. This matter deserves full attention. Such was the recommendation in the SSRHP-II PID ("A more systematic analysis of actual utilization is needed."(14)) Over and Jones both hypothesized the role of substitutes for huts and posts, but Rinaldo tested it. Though Rinaldo's results are old, they remain provocative. **The importance of the Jones recommendation to "compile and analyze available data to assess and measure the relationship between post and hut utilization" (15) cannot be overstated.**

Rinaldo's formal argument and support are discussed in a brief technical digression in Footnote 14. Rinaldo found outpatient visits in dispensaries and inpatient services in centres de sante to be complements; that is, their cross price elasticities of demand were negative and statistically significant at the .01 level. The results showed complementarity in different functional forms of the model (in cross section data sets) and in pooled time series and cross sectional data, as well. Similarly, Rinaldo found centres de sante and hospitals to be substitutes. Thus, as it applies to the types of services available through the Sine Saloum Rural Health Project, the services are complements. For a discussion of some of Rinaldo's tests and other findings, see Appendix II.C. National Level Research. It describes, especially, some of his findings regarding demand elasticities.

There may be potential for private enterprises to by involved in semi-independent, symbiotic relationships with government. For example, the MSP may enter into agreements with private companies to undertake some of its functions. Section C,

below, contains a brief discussion of potential for private sector business opportunities in medicine production and distribution, maintenance of the transport system and the facilities, survey collection, and financial accounting.

C. Private Sector Business Opportunities

In order for a new business to succeed, according to one theory of entrepreneurship, it must produce a good or service for which people are willing to pay. An underlying assumption in private sector financing projects is that "the population would be willing to make up the difference between full costs of a 'reasonable' program and the government's contribution, but is prevented from doing so by lack of institutions and individuals with sufficient training to channel the community resources into an appropriate level of service."(17) If the assumption can be supported empirically, businesses may need seed money or technical assistance in getting started. The question that needs answering is what will the population support, or how little can the government contribute to continue a viable program?

If the pricing policies for medicines and services were altered, making them both more costly, it is hypothesized that the reduction in utilization would be compensated by increases in revenues. (18) Those additional revenues are needed to administer and maintain the system.

1. Production of Medicines

There may be opportunities for involving the private sector

in the manufacture of medicines, and such opportunities may be worth investigating, but the outlook for new opportunities is not terribly positive. First, the Senegalese company, SIPOA, has only 2% ownership by Senegalese private businessmen (19). The availability of private Senegalese capital for additional investment may be severely limited. SIPOA has unused capacity and expansion of its operations may be considered. In a parallel move, the pharmaceutical giant, Warner-Lambert, has started plans for a plant in Senegal. Greater opportunities may exist in the area of distribution described below.

2. Medicine Distribution

There is an evident demand for medicines, with imports totaling about U.S. $20 million per year. The problem of distribution may be viewed, on its fact, as a pricing problem.. The law mandates a price to be charged which does not include the cost of transportation outside of Dakar. Thus, the facilities in Dakar (and generally, in the Cap Vert Region) are unaffected. Unless prices can be charged which better reflect the cost of bringing the medicines to market, official shortages will persist in the rural areas and black markets will develop, siphoning revenues away from the project. This is a particularly serious problem; King asserted that utilization at the health hut is related to the receipt of a tangible good; most likely a medicine (20), and without it, utilization is diminished. There would be some prices at which people would be unwilling to pay, but conventional wisdom holds that people are willing to pay higher prices than those charged, if only the medicines were available.

A simple cost analysis would be very useful in policy discussions with the GOS in attempting to alter the pricing policy for medicines.

Furthermore, as a part of the price of the transportation, the driver may require some completed reporting forms on simply epidemiologic management data. His motivation for collecting them may be that they are included in his price for collecting the medicines from the regional pharmacy.

Soliciting bids for the contract for such services may be done with special attention to taxi fleets, private bus companies, car rental agencies, as well as the public at large. The key to their technical capability is the operation and maintenance of a private transport system.

3. Transportation Maintenance

Another such service which may be supported through the additional revenues is vehicle maintenance. It is a good candidate because the services create a tangible result - an operating vehicle. Furthermore, the business may be supported by demands to service other vehicle than those of the health system. The demand for vehicle maintenance is a worthwhile investigation only if the maintenance facility can operate and maintain a towing vehicle to bring the problem vehicle into the shop. The donation of such towing vehicles may be appropriate so long as a demand for such services exists and the costs do not exceed the willingness to pay on the part of the health posts.

4. Facility Maintenance

If the revenues became available, the maintenance of the facility can be (as it often is informally already) an area wherein private individuals can provide services for the health post of centre de sante. The payment mechanism may be arranged beforehand with the maintenance staff, insuring that the person is paid only when and if the services have been provided. The maintenance can include more than the simply floor cleaning and carpentry - maintenance of the water supply, electricity (if available), simply maintenance of the vehicles, and maintenance of the integrity of the building (including a secure medicine storage cabinet).

5. Survey Collection

The operation of a capability to constantly monitor the program and collect management related data may be a function which can be contracted out to a unit of the University of Senegal Department of Sociology. Such a unit need not be large, consisting of only four to five enumerators and two data entry personnel. Their role in the operation of the SSRHP-II can be to collect data upon which the PRICOR operations research activities can be carried out. There are often simple, potentially useful research activities which can be carried out but for the absence of data on which to rely. The survey team can be charged with collecting the data, and be sufficiently small to be affordable and always busy. With the proliferation of microcomputers, the data can be entered onto minifloppy disks and easily mailed anywhere in the world or, using normal telephone

lines, transmitted from one microcomputer to another instantaneously using modems.

6. Financial Accounting

The provision of a team of technical advisors who would assist the VHW, infirmier/chef de poste, local pharmacist, and other local responsible member of the SSRHP-II team could provide large long-term benefits to the project. Simple principles of cash accounting and business management may well assist the project in its attempt to achieve financial self-sufficiency. The accountant is often the most neglected, but essential, member of the team when a new business is begun. The attempt to amek the SSRHP VHWs and centres de sante financially viable should be considered in terms of business management. It is recommended that Senegalese accountants only be considered for this function. It would assist the providers in their pursuits of financial viability and it would provide employment for Senegalese accountants entering private practice.

APPENDIX I: EXPENDITURE SURVEY(*)

The following assertions and findings lead to the recommendation of an expenditure survey:

1) When people are ill they seek care.

2) The cash price for care has appeared to act less as a deterrent to utilization than heretofore realized.

3) When choices are available, consumers will not always choose the lowest cost nor most modern care available, but appear to factor in a perceived quality dimension into their choice.

4) Cultural and ethnic factors play an important role in determining consumers' behavior, resulting in the need to test otherwise general conclusions in the specific case.

The following three arguments summarize the importance of conducting expenditure surveys.

1. Decisions to expand coverage to underserved (by western trained practitioners) areas can better be made in light of the knowledge of current coverage and payment patterns. An expenditure survey is particularly important in forecasting utilization rates for fully and partially self-sustaining projects.

2. If people who are willing to pay for health services rather than forego those services are asked to pay for them, more resources will flow into the

(*) This section was adapted from a longer discussion of a proposed expenditure survey in Meyer, "Private Sector Research Retrieval and Analysis Project: Overview and Recommendation - Expenditure Survey," June 1, 1984.

health sector. Subsidies, now paid to those who are willing to pay if required to do so, could conceivably be reduced (especially for highly subsidized, high cost urban curative services) and shifted to those too poor or unwilling to pay.

3. The political realities often overshadow the economic facts, especially in policies which redistribute public wealth. The policy initiatives recommended herein involve a redistribution from those able to pay privately to those unable to pay. It is asserted that in the efforts to bring about such change, empirically grounded conclusions are very persuasive. Expenditure surveys can produce such conclusions.

The following questions embody the kinds of information which are policy relevant and available through expenditures surveys.

1. What types of practitioners are used? It is natural for western trained researchers or westerners to turn first to the modern sources of care, but it is well documented that these sources represent only a small fraction of the total.

2. How much do people pay for their care? In modern clinics and dispensaries fees are often charged but there is also often an unofficial charge imposed, rarely documented. Much less is known about how much

people pay traditional practitioners.

3. How do people respond (in terms of their utilization of a given service) to a change in its price (or user charge or fee)? How does health service utilization change when people respond to changes in prices of other related things?

Simple, small household level surveys are needed. The portable computer has made data collection, analysis, and documentation in the field far more practical and less expensive than it ever was before. The costs of data entry, file management, and computation are sufficiently low to justify small (N=200) surveys which are designed for specific tasks. The number of respondents need not be enormous to have statistically valid hypothesis testing. With the cooperation of the Ministry of Health and local community leaders, small teams of two to three people (suggested: anthropologist, and/or a public health advisor, and an accountant) can conduct surveys on market days in marketplaces. Computer software for portable microcomputers exists which permits the same econometric estimation techniques to be applied as are currently available on the large mainframe computers. A considered cross sectional expenditure survey can provide policymakers with important financial and health utilization information which can be applied to problems of making health care projects more financially self-sufficient.

APPENDIX II. SENEGALESE PROJECTS OTHER THAN SINE SALOUM

In recognition of the extensive private expenditures in rural areas for health, numerous assistance projects have been created to improve opportunities for rural people to make their expenditures on either modern care, modern medicines, or retrained traditional providers. In Gossas there was the Canadian project, in Pikine the Belgians, and nationally a Ph.D. candidate from the University of Michigan studied the economics of the health sector. The following section shall briefly describe some of the major findings of this research.

A. Pikine Project (Belgian Support)

The Pikine Project was begun in 1975 after thorough investigation of people's ability to pay and custom of paying. Before the project was begun, financial records of extant health posts were studied and surveys were conducted. It was found, for example, that in 1975 a fee of about 100 CFA (U.S.$0.35) could be paid by more than 90% of the households.(21) The cost of providing care exceeded that amount, and thus the National Government, the community, and the external funding agency together constructed the project's budget. Validation of the amounts the community leaders thought the people would pay was made by examining the records of popular private dispensaries. No household income or expenditure surveys were thought necessary and none were conducted.

The project in Pikine differed from the Sine Saloum Rural

Health Project in a few major respects. First, the health worker in the health post was a nurse, paid by the Government of Senegal. The Belgian Government contributed support for the facilities, supervision, logistics, and technical assistance. In terms of financial technical assistance, the most complex financial problem has been the cost accounting for the community drug store. Periodic intervention from a skilled accountant has been necessary to maintain the financial viability of the drug store. (22)

The payments people made to the posts were divided among resupply of medicines and supplies (65%), incentive payments for health volunteers (15% - 25%), extraordinary expenses (5 - 15%), and miscellaneous (5%). The public subsidy to the Pikine project appears greater, placing a smaller burden on the people. In the modest health center in Old Pikine, the Government of Senegal provides 62% of the financial support necessary to maintain the center. About 12% comes from the local government, and the remaining 26% comes from community participation. (23)

Second, there was a Central Community Drug Store which purchased drugs wholesale, was supervised by the medical director of the Health Association of Pikine, provided no credit (accepted payment only in cash), and made daily deliveries. In fairness to the Sine Saloum Project, it must be pointed out that the geographic area of the Pikine Region is considerably smaller and contains a much higher population density than does Sine Saloum.

Thirdly, the Pikine Project maintained a social worker in the community to work with the committees and motivate community leaders to keep the community involved in avoiding local

conflicts. In sum, important to the continued viability of the Pikine Project are the low level of required contribution by the community, the "insurance" that a nurse will be at the center (provided essentially by the nurse's stable source of compensation, the Ministry of Health), and the active roles of outside technicians, the accountant and the social worker.

B. Gossas Project (Canadian Support)

The Gossas Project was begun in January, 1977 under the sponsorship of the Canadian Government. Its aims were to introduce a self-financing vaccination program operated by the infirmiers chefs de poste, to provide them with laboratory equipment for performing basic lab procedures, to teach village health workers simple diagnosis and prescribing routines for common diseases, and to conduct epidemiologic research. (24)

The following two findings were prominent in reviewing Over's description and evaluation of the Gossas Project:

1) Unless the cost of maintenance of the transportation were subsidized, the project would never become otherwise self supporting. Note: the transportation was horse and buddy, chosen presumably for its low cost and familiarity of maintenance procedures.

2) While the Canadian support continued, the vaccines were delivered to Gossas under the direct supervision of Canadian personnel. Without that continued support, the delivery of the vaccines is put in serious jeopardy.

Over's discussion of whether the Agents de Sante

Communautaire (ASCs) served as substitutes or complements to the infirmier in the poste is, while substantive in theory, devoid of any basis in fact. His conclusion, that they serve as substitutes, was based on a trend line of number of wounds dressed in the health post, before and after the introduction of the project. As the number of wounds declined, over only about a ten month period, Over concluded that the ASCs served as substitutes. Rinaldo's work (see Section 3 below) estimated the effect of the supply of outpatient care on the demand for inpatient care at the level of the centre de sante, controlling for the effects of numerous conditioning variables (25). Rinaldo concluded that the addition of outpatient services tended to increase the demand for services in the centre de sante, or serve as a complement.

C. National level research

A doctoral dissertation in Economics was found which investigated the working of the "market" for health services. (26) It used cross sectional observations in 1974 and all 35 circonscriptions medicales were used. Demographic and area data were taken from the Repertoire des Villages. Income data were used for some models only, (those of pooled cross sectional data used with longitudinal data) due to technical reasons. Health resources and utilization were taken from Ministry of Health records, often followed by personal visits to the field to validate. The results presented below are not recommended to be used in making policy; they are old and have never been cross validated. They do, however, deserve recognition in that they

are the only extant systematic, internally consistent, statistically significant results. Their implications for SSRHP-II are potentially powerful. It is recommended that they be investigated and similar research be performed using newer data.

The hypotheses are presented below, followed by Rinaldo's results.

Hypothesis I. The farther people have to travel for care in a dispensary, the lower will be their demand.

Hypothesis II. Demand is hypothesized to be positively related to the proportion of young and old in the population.

Hypothesis III. The system of dispensaries and centres de sante operates as a referral chain. They are complements to each other, not substitutes.

Rinaldo's findings were not illuminating for the dispensaries, but proved statistically conclusive for the centres de sante. Using the structural form equations in tests of the hypotheses for the dispensaries in which private practitioners were excluded (statistically), there was no statistically significant corroboration for the hypothesis that the dispensaries operate as a referral chain, and none that they act as substitutes. Neither was there any basis statistically (i.e., statistically significant at any reasonable level) that the proportion of population old and young differ in their demand for services. Finally, there was no statistical basis for testing the hypothesized negative relationship between distance and demand.

In similar tests of the hypotheses in the **centres de sante, the results were definitive.** The data supported the hypothesis that the referral system works. The results were significant at the .01 level (99% confidence that the results were not generated randomly). Furthermore, the elasticity (responsiveness) at the mean of outpatient visits per staff to demand was high. That is, if the average outpatient visit to staff ratio declined by 10%, for example, by raising the number of staff by about 11%, the result would be an increase in the demand for inpatient care in the centres de sante by 18%. The proportion of the population young and old appears to raise the demand proportionately (statistically significant at the .1 level). Finally, as hoped, the distance to the centre de sante affects demand negatively (statistically significant at the .05 level). The elasticity at the mean indicates a strong response; reducing travel distance by 10% will increase demand at the centre de sante by almost as much, 9.5%. The reduced form equations gave results consistent with those above (27). The results were, furthermore, insensitive to the functional form of the equations. Linear (additive) forms gave results consistent with logarithmic (multiplicative) forms.(28)

V. FOOTNOTES

1. An in-depth description of the survey and analysis can be found in Meyer, "Private Sector Research Retrieval and Analysis Project: Overview and Recommendations" and Meyer, "Household Expenditure Sample Survey For Health - Mali, Part I: Technical Proposal."

2. Personal communication, Turra Bethune, February 23, 1984).

3. Akin, et al., 1982, p. 102.

4. With regard to Senegal specifically, see: Diop, Moussa: Martino, Paul; Zempleni, Andras; "Les Techniques Therapeutiques Traditionelles des Maladies Mentales au Senegal," Medicine d'Afrique Noire, No. 4, 1966, pp. 115-116; Zempleni, Andras, "La Therapie Traditionelle des Troubles Mentaux Chez les Wolof et les Lebou (Senegal)," Social Science and Medicine, Vol. 3, 1969, pp. 191-205; also, Rinaldo cites: Simmons, William, The Eyes of the Night: Witchcraft Among A Senegalese People, (Boston: Little Brown), 1971; Samb, Amir, "Folklore Wolof du Senegal," Bulletin de l'IFAN, Vol. 37, Ser. B (October, 1975): pp. 817-848; Kerharo, J, "Le Facteur Magico-religieux dans l'Exercise de la Medecine Traditionelle en Milieu Senegalaise," Psychopathologie Africaine, Vol. 5 (1969): pp. 269-284.)

5. Jancloes, 1981, p. 4

6. Health Budget, FY82, Republic of Senegal. It is recognized as an underestimate; it includes only national government expenditures, and of those, only those of the Ministry of Health.

7. Estimated by extrapolating nationally the data from the Seck survey (in Pikine - Guediawaye, 1979).

8. Reported by Rinaldo, p. 249.

9. Seck, pp. 24-25.

10. Daly, et al., p. 23.

11. Ibid., p. C-6-7.

12. Rinaldo, 1980.

13. Jones, et al., 1982.

14. Daly, et al., p. C-15.

15. Jones, et al., p. 69.

16. Rinaldo proposed a model of the demand and supply of

outpatient services (primarily in dispensaries) and inpatient services, in each of centres de sante and hospitals. Two services are considered complementary when an increase in the price of one service reduces the quantity demanded for each service. The two would appear as substitutes were the quantity demanded in one service increased as the price in the other service also increased. Formally stated, the cross price elasticities of demand (cross price effects) are tested for sign. If the cross price effects are positive, the two services are substitutes, otherwise they are complements.

17. Gray, 1983, p.7.

18. Recent work in the Philippines (Akin, et al., 1982, pp. 237 - 262) has indicated that the rural population is not price sensitive for adult outpatient visits (p. 237), child outpatient visits (pp. 242 - 243), well baby care (pp. 257 - 258), and infant immunizations (pp. 261 - 262). They were, however, price sensitive for pre-natal visits (p. 250) and delivery (p. 253).

19. King, p. 35.

20. King, p. 66.

21. de Gaiffier, 1983.

22. Jancloes, 1981, p. 16.

23. Ibid., p. 21.

24. Over, p. 29.

25. Rinaldo, 1980, pp. 187 - 189, 194 - 198.

26. Ibid., 1980.

27. Ibid., pp. 202-206.

28. Ibid., pp. 206-210.

VI. BIBLIOGRAPHY

Akin, John; Griffin, Charles; Guilkey, David; and Popkin, Barry; "The Demand for Primary Health Care Services in Low Income Countries: A Review and Case Study (The Philippines)," USAID, Washington, DC, 1982.

Chernichovsky, Dov, "The Economic Theory of the Household and Impact Measurement of Nutrition and Related Health Programs," World Bank Staff Working Paper No. 302, World Bank, Washington, DC, October, 1978.

Daly, Patricia; et al.,"Sine Saloum Rural Health Project (Phase II), Project Identification Document," USAID/Senegal, Dakar, August 3, 1983.

de Gaiffier, Edmond; Jancloes, Michel; and Harlan, William; "Financial Analysis: A Critical Determinant for the Viability of Health Programs," mimeo, 1983.

Gray, Clive, "Community Financing of Primary Health Care in Rural Areas of Senegal's Sine Saloum Region," Harvard Institute for International Development, Cambridge, MA, October, 1983.

Hall, Robert E., "The Village Health Worker Approach to Rural Health Care: The Case of Senegal," Rural Development Committee, Center for International Studies, Cornell University, Ithaca, NY, 1981.

Jancloes, Michel; Seck, B.; van de Velden, L.; "Balancing Community and Government Financial Responsibilities for Urban Primary Health Services - Pikine, Senegal (1975 - 1981) (Draft)," Medical Belgo-Senegalese Cooperation, Dakar, Senegal, November 24, 1981.

----------;Seck, B.; van de Velden; and Ndiaye, B.: "Primary Health Care in a Senegalese Town: How the Local People Took Part," World Health Forum, Vol. 3, Number 4, 1982, pp. 376-379.

Jones, George, et al; "A Joint Government of Senegal Ministry of Health and Government of the United States Agency for International Development End of Project Evaluation of the Sine Saloum Rural Health Services Development Project - U.S. Team Report," USAID, Washington, DC, November, 1982.

King, Rosalyn, "The Senegal Rural Health Project: Analysis of the Drug Distribution System," USAID/Senegal, Dakar, 1983.

Mashayekhi, A., "A Study of the Financing of the Health Sector in Senegal," Population, Health, and Nutrition Dept., World Bank, Washington, DC, October 17, 1981.

Meyer, Jonathan, "Private Sector Research Retrieval and Analysis Project - Overview and Recommendation: Expenditure Survey," report to USAID, Washington, DC, Contract AFR-0135-0-00-3061-01, June 1, 1984.

_____, ""Household Expenditure Sample Survey For Health - Mali, Part I: Technical Proposal," Proposal to the AID Mission in Bamako, Mali, forthcoming.

Over, Mead, "Five Primary Care Projects in the Sahel and the Issue of Recurrent Costs," Harvard Institute for International Development, Cambridge, MA, February, 1980.

Popkin, Barry M., "Time Allocation of the Mother and Child: Nutrition," Ecology of Food and Nutrition, Vol. 9, 1980, pp. 1-14.

Rinaldo, David, "An Economic Analysis of the Health Care System of Senegal," Ph.D. dissertation (Economics), University of Michigan, Ann Arbor, 1980.

Seck, B.D., and Sarr, B., "Household Sample Survey in the Second Circonscription of Cap-Vert Region: Pikine - Guediawaye (Senegal)," in Study on Measurement of Coverage Effectiveness Efficiency of Health Care, WHO, Geneva, 1980.

Thraen, C.S., Hammond, J.W., and Buxton, B.M.; "Estimating Components of Demand Elasticities From Cross-Sectional Data," American Journal of Agricultural Economics, Vol. 60, No. 4, November, 1978.

Weber, Richard, et al.; "The Sine Saloum Rural Health Care Project in Senegal, Project Evaluation Report", Number 9, USAID, Washington, DC, October, 1980.