

NEIGHBORHOOD HEALTH CENTERS:

PART OF A SYSTEM

BY

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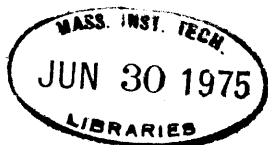
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ABSTRACT

This study proposed and investigated three hypotheses concerning neighborhood health centers (N.H.C.'s) as a form of ambulatory care delivery. The first hypothesis states that a system involving neighborhood health centers of independent and/or satellite licensure, with an outpatient department providing back-up services, can generate a lower cost per visit than a system serving the same number of people but not including the decentralized neighborhood health centers.

The second hypothesis postulates that small decentralized neighborhood health centers can introduce more people into the health system than would be possible with a large centralized facility.

The third hypothesis states that a system of small decentralized health centers is better designed for the convenience and thus satisfaction of the patients than a large centralized facility.

After investigating the cost differentials between an existing system (small decentralized health centers with an outpatient department back-up) and a proposed organization of services (centralized outpatient department with no utilization of N.H.C.'s), a cost savings of \$4.48 per visit was found.

To substantiate the second hypothesis the relationship between distance and the utilization of these types of facilities as well as the effective range of service delivery were measured. For facilities offering "specialty" services visit rates increase as distance increases to 1.5 miles straight line distance and thereafter decreases rapidly as distance increases. These facilities draw patients from more localities and longer distances than the neighborhood centers offering comprehensive primary care. The small neighborhood health centers draw the majority of their patient population from areas immediately surrounding the center - within $\frac{1}{2}$ mile (main road distance). The small centers were found to penetrate or service individual localities better than the larger facility, servicing as much as 30 per cent of the populations of the census tracts in which they are located and those immediately adjacent.

The third hypothesis indirectly assesses patient satisfaction with system operation and system efficiency through broken appointment rates, visit rates and referral rates. The data show that broken appointment rates are much lower than those reported in the literature. Visit rates per capita are also lower than others reported, due either

to the length of operation or the kinds of services offered. The referral rates for both pediatric and adult populations are extremely small - less than 2 per cent - for all centers, showing that the centers are equipped to handle nearly all of the complaints presented.

These results do tend to support the proposed hypotheses. This study found the character of the smaller neighborhood health centers to be substantially different from the larger HEW supported centers. Several of the findings, especially those concerning the relationship between utilization and distance, visit rates, broken appointment rates and referral rates, require further investigation before an accurate description of the characteristics of the small decentralized neighborhood health centers can be obtained.

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NEIGHBORHOOD HEALTH CENTERS: PART OF A SYSTEM

CHAPTER I

INTRODUCTION

The cost of medical care in the United States is a subject that has received wide attention in the past five years. While there is a recognized need for medical care among the poor and medically indigent, most authorities feel that not enough progress is being made for the amount of money being spent. The situation creates the need to discover a more cost effective method of delivering medical care.

This research was motivated by a desire to discover a method of delivering ambulatory care that was of low cost and high quality. At the same time, the method must be compatible with the best interests of the patient in terms of cost to the patient, convenience, and community demand as well as need. This study was designed to incorporate three areas - cost, ability to deliver services and best interests of the patient - in evaluating the cost effectiveness of a method of ambulatory care delivery. The method consists primarily of a rearrangement of existing resources. The research available to date on neighborhood health centers, Health Maintenance Organizations, outpatient departments, and other delivery forms makes little effort to evaluate merit

on the basis of a combination of factors - cost to the patient, cost of delivery, quality of care, and compatibility with patient interests.

Cost studies deal with costs alone and make no attempt to deal with the level of services offered or the method's compatibility with patient interests. Studies of utilization and patient satisfaction do not deal with the costs of the services with which patients are satisfied or dissatisfied. Studies of quality of care or quality assessment do not deal with the expenditures necessary to attain that quality or whether such quality can be attained at a lower cost in another setting.

Most of the literature available deals with the larger centers funded by OEO and HEW. Virtually nothing has been written about the small free standing clinics with less than 10,000 visits per year. When considering ways and means for making health centers fiscally responsible and finding alternative sources of financing, little attention is focused on those centers which operate without federal funding. Very little information is available on the types of services available in these centers. Little or no information exists on the funding sources available to these types of centers. Little or no information exists on the quality of services delivered, their adequacy or organization. Other areas such as staffing patterns, cost and types of populations serviced have also been neglected.

None of the studies available on the different aspects of various methods of delivering ambulatory care provide alternative solutions or consider the possibility of a reduction in cost by a rearrangement of existing resources rather than the creation of totally new ones. The delivery system studied in this paper is in the nature of an alternative to the present relatively high cost delivery mechanisms - large centralized outpatient departments, public health clinics and neighborhood health centers - for some types of populations.

This thesis attempts to document the existence of a low-cost, cost-efficient, alternative to large, centralized facilities. This alternative consists of a series of small neighborhood centers delivering primary care in decentralized locations, sharing the services of a centrally located comprehensive facility - in this case, a hospital outpatient department. The parts of the system - that is, neighborhood health centers and outpatient departments, are related by license or contract. Not only does this system save in costs (both direct and indirect), it also provides greater convenience to the patient in time and money saved. It also becomes easier to fulfill the goals of community control and participation.

Recent History of NHCs

The neighborhood health center movement developed as part of a larger socio-political phenomena - a "war on poverty", a break in the cycle of poverty. Bullough and Bullough give an exposition of the theories and assumptions relating poverty and health care that formed the basis of approaches to health care for the poor characteristic of the 1960's: neighborhood health centers, family care centers, and other community-based programs.¹ Other authors have developed theories to rationally explain the rise and probable demise of the OEO health center phenomenon. Hollister, Kramer and Bellin discuss the centers as part of the reform movements of the 1960's.² From a slightly different perspective, Schorr and English describe the evolution of the centers in the context of the confluence of political factors in the "war on poverty"³ administration. Since the beginning of the movement, there have been two changes in presidential administration, a major shift in emphasis in terms of the underlying philosophies and assumptions in dealing with poverty and the realistic role of the health sector in ending poverty.^{4,5,6} As such, much political, professional and popular support has been shifted to designs reflecting current and emerging philosophies and concerns: health maintenance organizations, national health insurance, quality review, and cost containment. Health centers were designed to treat a specific population - those on the lower

end of the economic scale, Now that the emphasis has shifted to health issues and institutions affecting the general populace, the centers are in serious financial difficulties - similar to other anti-poverty programs of the sixties. Funding for neighborhood health centers is being curtailed at the federal level, and state and local governments are hesitant to assume funding responsibility. The Department of Health, Education and Welfare is demanding that the surviving centers become self-supporting and cost effective.⁷ This paper examines the costs and benefits of this delivery apparatus (one inclusive of small neighborhood health centers) in relation to the more traditional form of primary care delivery based in a hospital outpatient department.

Hypotheses to be Tested

The analysis of a system using small health centers compared to one without involves a specific definition of "System". It is here defined as the major elements in a coordinated apparatus designed to deliver comprehensive care to all segments of a population in a given geographic area. It involves the sharing of many cost factors and a non-duplication of services through formal contractual arrangements.

This analysis revolves around three hypotheses. The first involves the economics or cost of the system: A system involving neighborhood health centers of independent and/or

satellite licensure, with an outpatient department providing back-up services, serving a given number of people will generate a lower cost than a system serving the same number of people without the neighborhood health centers. The outpatient department was chosen to complete the system for several reasons. In trying to provide comprehensive care for a given area, with limited funding, it is extremely advantageous to start with an existing facility, thus eliminating the need for large amounts of start-up money. It is also advantageous to have a facility that is an established part of the community and has sound financial backing. It facilitates the recruitment of qualified personnel as well as grant monies for the small centers, simplifies processes such as incorporation, licensure, and certificate of need. It also gains them access to expertise in areas such as billing and collections.

The second hypothesis deals with one of the major benefits of a decentralized facility. It has been demonstrated that the closer one is to a facility the more likely one is to use that facility. With major emphasis currently being placed on preventive medicine - introducing people to health care early to avoid serious developments at a later stage - a major concern for any delivery system is its ability to convert need into demand. It is felt that a network of small centers, each located within walking distance of

most of its target population, is in a better position to accomplish this than a single facility. Walking distance is here defined as one mile or less. In essence, this hypothesis states that a number of small neighborhood centers draw more people from a defined population into the system than would be reached with a single centralized facility.

The third hypothesis postulates that there are definite benefits to the patient in a decentralized system of small neighborhood health centers. These benefits accrue to the patient in areas such as greater convenience to the patient in time and money spent receiving health care, greater responsiveness to community needs and greater scope for community participation and control. More specifically this hypothesis states that there are conditions or operations embodied in this system which permit greater ease of use and thus satisfaction for the patient.

None of the three hypotheses is independent of the other. In providing a delivery system with low costs, one has to be careful not to forget the purpose of the project - to provide comprehensive health services that will be used by the target population. Comprehensive health services as used here includes pediatrics, adult medicine, ob/gyn, podiatry, dentistry, nutrition, social services and psychiatric counseling. But the term also connotes a wider meaning. It defines a system which provides, either in-house or through formally established policies, procedures, agreements

and contracts with other facilities, access to appropriate services for all medical problems. The term, as defined in the system under study, also encompasses continuity of care, that is, one primary care doctor-patient relationship for hospitalization as well as all ambulatory care, 24-hour, 7 day a week physician availability and 24-hour, 7 day a week emergency care availability within the system by the primary care physician or his substitute. On the other hand, in providing services that are needed and/or demanded by the target population, one has to be aware not only of the costs of the proposed project but also of patterns of utilization. In effect, the costs of a system cannot be studied without paying attention to the kinds, quality and appropriateness of services delivered as well as factors which affect the utilization of those services. There are a series of tradeoffs that must be made between what the population most needs and/or wants and what benefit one is best able to provide with the limited resources available. The question then becomes one of which systems or institutions provide the most and best of what is needed by a given population for a given expenditure.

Literature Review

At this point, it is desirable to provide some background data or information on those aspects of neighborhood health centers which are particularly pertinent to the above hypotheses - costs, utilization patterns and convenience

for the population being served.

In reviewing the literature on neighborhood health centers, the majority of the studies on cost can be divided into two distinct categories: 1) those studies which compare the cost of the health centers as a form of delivery with other primary care delivery forms, such as private physicians, pre-paid group practices, and hospital outpatient departments; 2) those that deal with cost variations among centers generated by internal differences such as size, staffing patterns and service organizations. As health care costs are increasing rapidly,^{8,9,10} a major concern for any delivery system is that it deliver health care comparable to other delivery forms at similar or lower costs. In consequence, the above avenues of research become extremely important on two levels. On a national level, it promotes the responsibility to develop and support those institutions which will contain and/or decrease health care costs while providing an acceptable level of service. For individual centers, the information gathered provides direct benefits in dollar savings through more efficient operation.

A comparative study by Sparer and Andersonⁱⁱ offers convincing evidence that neighborhood health centers are competitive with other primary care institutions in terms of cost, and are no more inefficient than any other part of the health industry. After an examination of six centers ranging in size from 5,800 registrants to 35,000, the authors conclude

that the per capita costs of comprehensive primary care in neighborhood health centers are competitive with those of pre-paid group practices. The cost per capita for primary coverage in the centers ranges from \$144 to \$270 per year, with the cost advantage belonging to the larger centers. Sparer and Anderson conclude: "from the standpoint of the quality of services, volume and use of services and costs, the neighborhood health center is viable and cost efficient as compared with other providers."

Anderson, Sparer, Weines and Crosby,¹² in an analysis of neighborhood health centers serving low-income and high risk populations, have isolated what they feel to be a major source of inefficiency or cost variation in health centers. They postulate that staffing patterns are a key factor in containing costs and producing an efficient operation. They classify projects as efficient if they 1) were below the average for both per capita costs and quarterly unit costs for all centers studied, and 2) had "reasonable" productivity or, preferably, productivity significantly higher than average. Based on the efficient projects, a model was then developed to "help in the staffing of new projects as well as to aid operational projects in improving their cost and/or productivity picture through change in staffing."¹³ The authors relate the following findings:

"Based on the data, no relationship could be found between total cost and the staffing patterns when measured by the percentage of staff workers who are physicians, nurses, home health workers, mental health workers, social and community services workers, family health workers or transportation staff. Moreover, no urban or rural effect on those staffing patterns and total cost could be found. It seems that there is a strong influence on cost, both unit and per capita, related to the productivity of the providers serving the population and the level of providers..... Those centers that made use of nurses, nurse practitioners, and dental hygienists, generally had a lower unit cost for physician visits. This may have direct influence on increasing the productivity of the physicians. This, in turn, reduced the physician cost.... Based on the data analyzed for this study, it would be questionable to assert that a specific common staffing pattern was found that was related to high productivity, low total cost, and low per capita cost. Furthermore, the setting of a health center, be it urban or rural, was a negligible factor."¹⁴

Data were also presented that are particularly pertinent to this analysis. Cost per medical physician encounter by size of center was reported as well as per capita costs.¹⁵

<u>Size</u> (1)	<u>Cost per Encounter</u> (2)	<u>Annual Per Capita Costs</u>
Large Urban	\$ 38	\$ 334
Medium Urban	25	223
Small Urban	36	343
Rural	26	236
All Projects	31	288

(1) Center size is determined for urban centers only and is based upon total physician encounters over a six-month

period. (Large - greater than 18,000, medium - 10,000 to 18,000 and small - less than 10,000)¹⁶

- (2) Data based on costs reported as of December 1972, from Comprehensive Health Services Project Reports. Costs include both direct and indirect items.

Statistics available on ninety projects funded by the Department of Health, Education and Welfare, for the calendar year 1973,¹⁷ show a sharp decrease in the per capita and unit costs compared to those reported by Anderson, Weines and Crosby for 1972. There are several reasons for this decline: 1. The reduced funding available for expenditure and thus streamlined services, 2. the provision of technical assistance to the projects to help institute more efficient management techniques 3. the closing down of the more costly health centers through withdrawal of funding, and 4. the effects of increased demand for services at individual centers. The following data were reported for comprehensive health services projects, January 1973 to December 1973.

	<u>Total Cost Per Registrant</u>	<u>Total Cost Per Medical Encounter</u>
All Projects	\$ 167	\$ 24
All urban	168	26
All rural	153	19
These costs include the overhead		

To analyze the utilization patterns of neighborhood health centers, one must be aware of several intervening

variables - the quality of services delivered and the distance traveled to those services.

The quality of services delivered as well as their cost have been subject to a considerable amount of national attention. The mandatory review of the quality of services was legislated recently in the form of Professional Standard Review Organizations causing much concern within the medical profession.¹⁸ Most of the literature consists of diverse quality review schemes with some actual quality assessment, e.g., "Evaluating Quality of Patient Care - A Strategy Relating Outcome and Process Assessment", John D. Williamson, M.D.¹⁹

Critics have suggested²⁰ that the quality of services delivered in neighborhood health centers is below standard - one reason being the inability of centers to recruit qualified personnel in adequate numbers. Others believe that decentralization of services do not improve care and may, in fact, be detrimental. Hollister, Kramer and Bellin,²¹ in reply to the critics, suggest that "critics of the quality of care at the centers have failed to level the same criticisms or apply the same standards of quality to other providers - hospital outpatient departments, private physicians, group practices - or they tacitly assume the quality of the care delivered in those settings."

Providing an actual assessment of quality of care, Morehead, Konaldson and Seravalli²² conducted a study of 3,040 patient records, 1,700 of which were from OEO neighborhood

health centers. Of the other records, 46% were from medical school affiliated hospital outpatient departments, 23% from group practices, 18% from health departments and 13% from Children's Bureau programs. The major finding of the study was that "with the exception of the few small, highly organized and richly staffed Children's Bureau programs, the neighborhood health center program performance is generally equal to and, in some instances, superior to that of other established providers of care."

In documenting the effect of distance on the utilization of ambulatory services, several studies have been conducted controlling for various factors. Shannon, Skinner and Bashshur, in consideration of time and distance (opportunity costs), use correlation and regression analysis to obtain results about the relative accessibility of health care facilities for selected sub-population groups.²³ The results and conclusions are as follows:

"...considering travel time and linear distance independently of each other as measures of accessibility of health care facilities produces differing results... There is an apparent difference between travel patterns to hospitals and travel patterns to physicians and dentists.

Conclusions based on the present distribution of facilities and the journey for health care when measured only by linear distance would inevitably be that those persons living at a greater distance from the central city must travel farther for medical care than those living near or in the inner city and therefore, that the suburban dwellers are placed at a disadvantage in seeking medical care. If the measure is travel time, however, it is evident that

persons living within the central city are at a distinct disadvantage in the journey for health care, expending more time in travel though going shorter distances than their counterparts living in the suburbs. Therefore, inner city residents are at a disadvantage when seeking medical care.

Clearly, the meaning of time varies for different people. This analysis reveals that poor who reside in the inner city are at a disadvantage as compared to the more affluent suburban residents in terms of the time it takes to obtain individual treatment. This is probably even more true if waiting time at the clinics and physicians offices is considered. Indeed, time may be more significant for the less affluent, especially when it means loss of income."²⁴

While Shannon, Skinner and Bashshur point out a very important qualification - a time factor - in the simple correlation of distance and utilization, Charles Brooks, in a study of the "Associations Among Distance, Patient Satisfaction, and Utilization of Two Types of Inner City Clinics" - "small neighborhood centers and large bureaucratic" ones - presents data that have particular relevance for the study at hand. The present thesis advocates the use of small neighborhood health centers over large, "bureaucratic" ones for reasons of patient convenience and ability to attract those people who, for one reason or another, do not use large facilities in appropriate ways. Brooks' study was based on a random sample of users of inner-city clinics. Brooks found that the size and administrative structure of the clinic are correlated with the distance a patient will travel to it.

The proportion of patients using the large clinics increased as distance increased. The smaller neighborhood clinics, though, drew the majority of their patients from within half a mile, and did not seem to attract many patients from a greater distance.

Brooks believes that patient referral patterns provide some explanations for the difference. For the large centers, the proportion of patients formally referred increases as distance increases, while small centers serve a local population attracted through informal means.

Brooks also investigated utilization measured by frequency of attendance of patients who had used a clinic's facilities at least twice during a six month period - January to June 1968. He discovered that if utilization is measured by frequency of attendance, there is no obvious relationship between distance and utilization, i.e., patients attend both large and small clinics with the same average frequency regardless of distance.²⁵

A study conducted by Simon and Smith views the problem from yet another perspective.²⁶ They discuss the relationship between distance and type of care - primary vs more specialized. The results show a decline in utilization - number of people using services - with increasing distance, but more so in primary care. Specialized services seem to be less affected by the increase in distance between the

facility and population served. The authors feel that the results may suggest "that people will travel greater distances for more specialized health services. Such a possibility suggests that definitions of service areas should take into account the nature of the health services provided. More specialized services, perhaps, could be more centralized encompassing a wider area. Perhaps primary and preventive services, however, need to be more spatially diffused to be effective." These suggestions have been implemented in the system being studied for this thesis. An attempt will be made to substantiate the findings of the Simon and Smith study with relation to the effect of distance.

CHAPTER II

PROFILES

To test the hypotheses delineated in Chapter I, Carney Hospital's out-patient department and its four affiliated neighborhood health centers - Avenue, Neponset, Bowdoin Street and Littlehouse - were chosen as the system to be studied. The system is characterized by approximately 34,000 primary care visits with a total of 69,000 visits for primary, specialty and sub-specialty care for the fiscal year October 1973 to September 1974. None of the neighborhood health centers have been in operation for more than four years and three of them have been in operation for less than two. As such, they are still in the process of expanding to a full range of services and coordinating programs. The following profiles of the individual centers will give the current status of the centers, some of their developmental history and a general idea of the character of the system in terms of contractual relationships, financial arrangements and staffing patterns.

Bowdoin Street Health Center - Pat Edraus, Director

The Bowdoin Street Health Center was initiated in response to the community's felt need to have physicians and health care brought back into the neighborhood. Serious planning for the facility began early in 1972. The community held

a series of meetings with various speakers to educate themselves in the concepts, advantages and workings of neighborhood health centers. Community fund raising projects were held, grants from private foundations applied for and purchasers for a building found. Although Bowdoin Street is not a part of the Federated Dorchester Houses, the center is housed on the first floor of a building belonging to them. The Federated Dorchester Houses agreed to purchase the building to house their own offices and to rent the health center space in the building.

Relationship With Back-Up Facility

The Bowdoin Street Health Center is a satellite clinic of the Carney Hospital, i.e., it operates under Carney Hospital licensure. One of the main features of this arrangement is that the hospital underwrites or assumes responsibility for all budget deficits of the center. This, in effect, allows the center unlimited time in paying its bills and eases the problems engendered by a limited cash flow usually experienced by centers in the early phases of operation.

Another significant feature of the system is the savings produced by a sharing of personnel, supply ordering and effective referral practices. The Bowdoin Street Health Center purchases thirty hours of a pediatrician's services from Carney for medical and administrative work. The physician

will spent the rest of his time at Carney or another clinic, and receive the remainder of his salary from Carney or another clinic. Similar arrangements exist for adult medicine, podiatry, nutrition and social services. The center pays the salary of one full-time registered nurse and purchases one-third of the services of a licensed practical nurse. The LPN is shared with the Littlehouse and Avenue Health Centers. The center also pays the salaries of all its administrative staff - the director, receptionist, and billing clerk. The hospital provides coverage for vacations and sick leave of doctors and nurses. The health center also shares its personnel with the hospital if the need arises. The director of the center views it as extremely advantageous to be able to move personnel around in the system. As the center relies so closely upon neighborhood interest and support, it is important to provide services that the community can depend upon. The system operates in a manner similar to that of a group practice. Twenty-four hour availability of service is maintained through a twenty-four hour answering service - with the doctors within the system sharing in the on-call relation.

The center orders its supplies through the hospital, thus procuring a savings through ordering in larger bulk. The hospital also provides posting and collection services for the center as well as accounting services at no cost.

Laboratory, x-ray, EKG and other ancillary

services are provided by the hospital on a contractual basis to the center. At Bowdoin Street, some laboratory services are provided at the center with analysis being done by a private lab as well. In other cases, patients are sent to the out-patient department of the hospital.

The center has experienced other cost savings, especially in the initial phases by making substantial use of volunteer help. For the first few months, the administrator and receptionist donated their time. Most of the renovations to the building prior to opening was accomplished through volunteers. Volunteers also operated a thrift shop in the back of the health center to raise money for the center. It was estimated that through these and other efforts, over \$5,000 was saved in the first months of operation. The director, though, did sound a note of warning in making use of volunteer help. While many people are willing, few are actually qualified, and ways must be found to make use of them as continued community involvement, interest and support are necessary for the success of the small neighborhood facility.

Financing

The initial funding for the center came from several different sources. The Campaign for Human Development contributed \$5,000. The American Loan Association contributed \$1,000; the bank and businessmen in the community raised

\$1,500 and approximately \$1,200 was raised by various community functions - auction, bingo benefits, etc. The center also received monies from a fund set up by pediatricians at Carney Hospital.

The center operation is currently being subsidized by a \$15,750 matching grant from Boston Health and Hospitals, \$1,200 from the Campaign for Human Development but with the majority of financing being through reimbursement for services rendered. The center is solvent and does not anticipate a deficit for the coming fiscal year.

Services Offered

Bowdoin Street opened in March of 1973 with two morning sessions of pediatrics. By September of 1974, the center was offering 20 hours of pediatrics (12pm - 4pm Mondays, 12pm - 4pm Tuesdays, 9am - 1pm Wednesdays, 1pm - 4pm Thursdays, 9am - 1pm Fridays), 20 hours of adult medicine (4pm - 7pm Mondays, 9am - 1pm Tuesdays, 1pm - 4pm Wednesdays, 9:30am - 12:30pm Thursdays, 9am - 5pm Fridays), nutrition services (2pm - 4pm Mondays), Veterans administration counseling (by appointment), podiatry (9am - 1pm Fridays), and social services (by special appointment). The center is currently negotiating for mental health and gynecological services. The center maintains immunization services as well as screening programs in TB, lead poisoning, sickle cell, V.D., and other diseases.

Another service offered by the center is in the form of monetary savings to its clients. For any patient not covered by a third party reimbursement scheme, that is the self payers, services can be obtained at a lower than standard cost. The health center's board of directors or health committee will make up the difference between the standard cost and what the patient is asked to pay. The cost of services is a major deterrent to some people in seeking medical care when they need it and is an effective barrier to seeking routine preventive or health maintenance care. As such, each of the centers has chosen to reduce out of pocket costs to self payers. Bowdoin Street's fee schedule is as follows:

<u>Type of Visit</u>	<u>Cost</u>
1. Adult Medicine	
first visit	\$ 8
follow-up visit for same complaint	6
Routine visit for any other complaint	8
2. Pediatrics	
first visit	6
follow-up visit for same complaint	4
routine visit for any other complaint	6
3. Podiatry	6
4. Nurse Visit	2
5. Ear Piercing	8

Little House Neighborhood Health Center

Geraldine Dunne - Director

The Littlehouse Health Center was opened in response to overcrowding at the Dorchester House Health Center and in anticipation of the lack of physicians practicing in the area. There were five doctors in the area - general practitioners and a gynecologist. In 1969, all were over 60. As there was no evidence of younger physicians moving into the community, health professionals and community leaders agreed that a need existed. Planning for the health center began in January of 1972. The center is a member of the Federated Dorchester Houses, which holds the mortgage of the building purchased by the Health Committee.

Relationships with Back-Up Facilities

Littlehouse, like Bowdoin Street, is a satellite clinic of the Carney Hospital though somewhat different arrangements exist with back-up facilities. The center is associated with three hospitals. Carney Hospital provides pediatrics, St. Margaret's Hospital provides obstetrics and gynecology and New England Medical Center provides adult medicine and ear, nose and throat services. Each of the hospitals agreed to provide the first year's services free of charge. The center has subsequently entered into a four-month agreement

to reimburse the hospitals for services rendered with monies received in excess of operating expenses. The hospitals were to be reimbursed on the basis of the percentage of time each facility contributed to the health center. Preliminary calculations show that each hospital is being reimbursed for 69% of its services to the center.

The Littlehouse Center experiences some of the same cost saving options as the Bowdoin Street Center - sharing of personnel, central ordering of supplies, posting and collection services for bills, accounting services and consulting services on management and administrative matters. The center pays the salaries of the administrator, office manager, full-time secretary, podiatrist and part-time housekeeper. The full-time receptionist is volunteer and prior to June 30, 1974, all medical staff time was donated. The center's professional staff now includes a pediatrician, internist, obstetrician/gynecologist, ear, nose and throat specialist, podiatrist, nutritionist, community outreach worker, a pediatric nurse practitioner and a nurse practitioner in gynecology and a licensed practical nurse. Twenty-four hour availability of service is maintained through a 24-hour answering service with the doctors within the system sharing in the on-call rotation. Some laboratory services are provided at the center with others being referred to the hospital.

Self-payers pay only half of any laboratory and x-ray costs.

Financing

The health center received \$10,000 through the Jacob Ziskind Laboratory of New England Medical Center to apply to the cost of a building. A relative of a board member contributed \$5,000 towards the cost of a building and was left with a mortgage of only \$6,000. It received small grants from foundations and businessmen and \$3,000 from the Pediatric Fund at Carney Hospital. The center received a grant of \$20,000 from New England Medical Center for the salaries of the administrator and office manager for January through December of 1974.

For the current fiscal year, the director estimates that 50 per cent of the income will come from third party and self-payers, 25 percent from the three institutions - Carney, New England Medical Center and St. Margaret's - and 25 percent will come as a matching grant from Boston's Department of Health and Hospitals.

Services Offered

Littlehouse opened in June of 1973. The center offers 16 1/2 hours of adult medicine (1pm - 5pm and 5:30pm - 9pm Tuesdays, 1pm - 5pm Fridays), OB/GYN services (9am - 12pm Wednesdays), 3 hours of ENT, 4 hours of podiatry, nutrition,

pediatrics (1pm to 4pm Mondays, 1pm to 4pm Wednesdays, 10pm to 4pm Thursdays), diet counseling, veterans administration counseling and mental health.

Screening programs for cancer, T.B., lead paint poisoning, VD, and other diseases are also provided.

Littlehouse's fee schedule differs from that of Bowdoin Street in that it does not distinguish between services or type of visit, i.e., first or second visit. Clients are charged \$5 for all physician visits and \$2 for all nurse visits.

Satellite Licensure

There are some distinct advantages and disadvantages to being under Carney Hospital licensure. The most striking advantages are financial. As the hospital makes itself responsible for all budget deficits, the centers are given considerable stability and more freedom in serving the best interests of the community in terms of services offered. The center can also look forward to a larger income from third party payers. Under Carney's licensure, the centers are eligible for reimbursement at outpatient department rates - which are higher than health center rates under Medicaid and Medicare. Having outpatient status, the centers are also eligible for reimbursement from Blue Cross and other insurances. Health centers are not usually eligible for reimbursement from Blue Cross and private companies except for

laboratory services.

Other advantages accrue to the community committees or agencies which govern the centers. To gain independent licensure, the group must be incorporated and have financial backing. The process is time consuming and requires a technical sophistication not possessed by or available to many small community groups.

The one disadvantage, perceived by some, of satellite status under Carney, a Catholic hospital, is that it prohibits the inclusion of contraceptives in family planning programs in facilities for which it is responsible. Littlehouse has not experienced strong community demand for this service and refers such requests to Uphams Corner, Dorchester House and Neponset Health Centers. The Bowdoin Street Health Center is beginning to feel community pressure and is currently investigating ways to provide this service for the community without violating its contract with Carney Hospital.

A potential source of disagreement under this arrangement is the issue of community control and/or participation. Thus far in the program, this has not been a problem - principally because of the nature of the agreements between the centers and the hospital. The hospital comes to the fore in two areas: 1) it is responsible for the quality of care delivered under its licensure and thus employs

a medical director for the centers; and 2) the board of directors must approve final budget allocations for the fiscal year. Other than this, the community boards and health center directors are responsible for approval of all programs offered in the center, all monies spent and personnel hired. Health committee board membership is open to anyone who wishes to join. To give credit where credit is due, the large amount of community participation and control now existing is in large part due to the efforts of the Directors of the Department of Ambulatory and Community Services at Carney Hospital rather than any innate ability of the satellite arrangement to foster it.

The two centers which complete the system have obtained independent licensure but share in the cost saving options available to the satellite clinics, though not to the same extent.

Avenue Neighborhood Health Center

Greg Bolger - Director

The Avenue Health Center has a somewhat different history of development. It was initially the headquarters of the Boston Family Planning Project. The center was inspired more by these and other health professionals in the area than community concern or pressure. Boston City Hospital was first approached as a possible provider of primary services, but replied that Mattapan was outside of its jurisdiction. Carney initially refused to provide services

in pediatrics and internal medicine because of the center's affiliation with the Family Planning Project. Before Carney would provide services, the center had to become a separate and independent entity with a community board, incorporated and licensed. The hospital did provide one session of pediatrics before the center was fully licensed.

Relationship with Back-Up Facilities

The Avenue Health Center contracts with Carney Hospital for pediatrics and adult medicine. According to the contract, no family planning services can be offered while Carney physicians are on the premises. The director feels that the growth of the center has been somewhat impeded by its inability to provide a reliable source of care for its patrons prior to licensure in April of 1974. Avenue Inc. pays for the services of a dentist, podiatrist, nutritionist, dental assistant, one part-time licensed practical nurse (LPN), the contracted services of the pediatrician, internist and Carney nurse, the administrator and maintenance. The Boston Family Planning Project pays all other expenses for administrative staff - receptionist, secretaries, data management, bookkeeping, billing clerks, accountants, etc. The project also pays for one full-time registered nurse and part-time social worker. It provides office space and supplies.

The center is currently negotiating with Boston State Hospital for mental health services and is planning to

hire another dentist to expand its dental program. Boston City Hospital provides prenatal and gynecological services free of charge.

The center contracts with Roxbury Medical Laboratory for lab services for which it can obtain third party reimbursement. Patients are referred to Carney Hospital for x-rays and special procedures. Difficult dental cases are referred to Harvard School of Dental Medicine. The director was careful to point out that, though Harvard provides the service, it is not to be considered a back-up facility for the health center.

Financing

The center, in its developing stages, received no seed money. The dental equipment was donated, the office and supplies provided by the Family Planning Project and the hospital did not collect its bills for the pediatrician's services until the center had an income. The center has only been operational under license for six months and still has a problem with cash flow.

The center receives \$22,300 in services from Carney Hospital and the Boston City Health and Hospitals provides a matching grant in that amount. For the current fiscal year, the director estimates that 60 percent of the expenses will be

covered by the Family Planning Project, 20 percent by the city's matching grant and 20 percent by patient revenues. Patient revenues will form such a small part because the center is eligible for reimbursement only under Medicaid. Approximately 50 percent of its population are receiving Medicaid benefits, the other 50 percent being self-payers. From past experience, the director estimates that only 1/3 of this 50 percent can or will pay their bills. The center is moving towards financial independence of the Family Planning Project but it will be a long process. The center's fee schedule follows:

	<u>First Visit</u>	<u>Second Visit</u>
Adult Medicine	\$ 11	\$ 7
Pediatrics	8	5
Podiatry	8	5
Family Planning	10	5
Dentistry	Uses Medicaid reimbursement schedule	

Services Offered

The center offers three sessions per week of pediatrics, i.e., 9am - 12pm Monday, Wednesday and Friday; one session per week of podiatry and three days per week of dental medicine. The center also offers family planning, gynecology and prenatal services, social services (1pm - 4pm Tuesdays, 9am - 12pm Fridays), and screening programs for sickle cell, lead poisoning and

other diseases. Negotiations are in process for mental health services. The center is in the process of expanding its pediatrics and adult medicine programs and is planning to offer evening sessions as do the other three centers.

The center has not grown as fast as the other centers, possibly because of the limited nature of its services for such an extended period. This could also be a result of the limited nature of the community involvement in starting the center. The fund raising and volunteer involvement of the community which characterized the other centers is lacking in this instance.

Neponset Neighborhood Health Center

Jack Cross, Director

Neponset was the first center to become affiliated with Carney Hospital. The planning for the center was initiated by a group of community residents concerned with the absence of primary care physicians in the neighborhood. At the time of Carney's initial affiliation with the center, its outpatient department was not operating at capacity but it was concerned with providing care for those who did not have access to it and therefore participated in an effort to decentralize health services.

The health committee responsible for the Neponset center opted for independent licensure, which meant incorporation,

and the acquisition of assets. After a number of setbacks, Neponset became the first community owned health center in the state to attain independent licensure. The governing board owns and operates the center through a director. They plan and institute all programs, budget allocations and hiring and firing of all personnel. In effect, they have sole control.

Relationship with Back-Up Facilities

The center employs its own medical personnel for some services and contracts with the hospital for others. The center participates in the cost sharing options available to other members of the system in the sharing of personnel, consultant services and on-call coverage. The center receives free mental health services from Boston State Hospital. The center employs, full or part-time, an internist, pediatrician, obstetrician/gynecologist, podiatrist, social worker, nutritionist, family planning counselor, two full-time nurses, an administrator, administrative assistant, receptionist and part-time bookkeeper and billing clerk.

Financing

Neponset receives approximately 29 percent of its income from patient revenues, 53 percent from the Department of Health, Education and Welfare in 314(e) monies, 7 percent

from Boston Health and Hospitals and 11 percent in donated services.

Services Offered

The center opened late in 1971. It is operating close to capacity with existing physical space and service levels. It is planning both physical and service expansion. Currently, the center offers 33 1/2 hours of adult medicine, (9am to 5pm Mondays, 9am to 12pm and 1pm to 5pm Tuesdays, 10:30am to 12pm and 1pm to 5pm Wednesdays, 9am to 12pm and 5pm to 6pm Thursdays, 9am to 12pm and 1pm to 5pm Fridays.), 19 hours of pediatrics (1pm to 5 pm Mondays, 9am to 12pm Tuesdays, 1pm to 5pm Wednesdays, 1pm to 5pm Thursdays and 1pm to 5pm Fridays), 6 hours of OB/GYN and 4 hours of psychiatry services. The center also offers dermatology, family planning, dietary counseling, well-baby clinics and mental health services. Since its opening date, the center has serviced nearly half of its original target population of 20,000. The center has approximately 9,000 registrants.

The fee schedule for self payers at Neponset is similar to that of Littlehouse in that it does not distinguish between services. Self - payers are assessed \$10 for initial visits, \$6 for any routine visit thereafter and \$4 for a nurse visit.

PROFILE

Department of Ambulatory and Community Services
The Outpatient Department
Carney Hospital

Director: Dr. J.S. Coldiron

Carney Hospital's outpatient department began its present operational policies by its involvement in the planning of and subsequent contractual relationships with the Neponset Health Center. At the time of the hospital's initial involvement, its concern was to provide primary medical care comparable to that of a general practitioner in areas from which doctors had moved or were planning to move. The outpatient department was not operating at capacity when initially affiliated.

The hospital is firmly committed to providing decentralized services for the community. The Department of Ambulatory and Community Services includes a comprehensive emergency room, home care, outreach and social services, as well as the outpatient department. It extends admitting privileges to the physicians employed to work in the system - the health centers and the hospital, provides teaching opportunities at the hospital, benefit packages, educational benefits, an annuity and security.

In the years since Neponset was established the hospital has become involved with three other health centers and is itself currently running at capacity. The outpatient

department also added more specialty and support services and increased the level of primary care services offered.

The success of the arrangement between the outpatient department and the health centers is due in part to the management techniques employed for the overall system operation and in part due to the dedication of the directors of the programs. The director of the Department of Ambulatory and Community Services outlined what he felt to be the distinguishing characteristics of this system and the essential ingredients for making such a system work. The characteristics setting it apart from other operations in the city were: 1. its commitment to 24 hour - seven day a week coverage and 2. its commitment to employ full time rather than part time people. In operation these management techniques combine to accrue substantial personnel savings. For example, when a health center is first opened no new physicians or nursing staff are hired. The physicians and nurses already employed in the system are used to cover the opening sessions of the center. This does create discontinuity of care in the opening phases of the program as a number of doctors are rotated through the center. When demand for services has been built (a fairly rapid process) at the center a full time physician for that center is hired and possibly shared with other facilities experiencing an increase in demand for services. The physicians employed in a full time capacity bring to the job a full time commitment and dedication to the

job, thus facilitating the establishment and maintenance of 24 hour, seven day a week availability.

Though the system does pay a higher hourly rate to physicians for participation in this decentralized system, there is a somewhat serious drawback for physicians hoping to establish private practices. The patient population is somewhat biased in that the people using the system are likely to be poor, medically indigent or bad credit risks - just because the hospital is obligated not to turn patients away. This is not a desirable group for any enterprise, especially a small one.

As mentioned earlier an important segment of the determination of the availability of medical care is whether the patient can afford to seek such care. The outpatient department bases its fees on a categorization scheme of the amount of work involved in different types of visits - i.e., category 1 includes a comprehensive history, physical examination and initiation of a diagnostic and treatment program for a new adult patient; category 2 includes an extended or comprehensive re-examination or re-evaluation of an established adult patient, routine annual physical for a new adult patient and a comprehensive evaluation of a new pediatric patient. A schedule of charges for each category follows:

<u>Category</u>	<u>Description</u>	<u>Charge</u>
Class 1	Includes an extensive history, physical examination and initiation of a diagnostic and treatment program for a new adult patient. This category (in contrast with #2) would include patients who require a lengthy interview with the physician because of multiple or complex problems.	\$30.00
Class 2	Includes an initial complete history and physical examination and initiation of diagnostic and treatment program of a new adult patient, as well as an extended or comprehensive re-examination or re-evaluation of an established patient. An extensive (as in #1) evaluation of a new pediatric patient would be included.	25.00
Class 3	Includes established adult patients who have a limited evaluation and examination including initiation of a diagnostic or treatment program for a new illness. Initial complete history and physical with initiation of diagnostic and treatment program of a new pediatric patient.	17.50
Class 4	Includes established patients who have evaluation and/or treatment of the same illness. Includes Well Baby Clinic visits.	10.00
Class 5	Includes minimal services without examination or re-evaluation, (e.g., injection, immunization, minimal dressings).	5.00

Supplemental Charges - Subspecialty Clinics

1. Podiatry	\$12.50
2. Ophthalmology	20.00
3. Psychiatry	20.00
4. Optometrist	17.50
5. Nutritional Clinic	10.00 First visit 5.00 all other visits

The outpatient department then uses a sliding scale to determine what proportion of the costs the self-payer will be responsible for. A copy of the income chart used is presented below.

Income Chart

	<u>Gross Salary per Week</u>				
Single - (or Married) with no dependents	\$75.00 to 100.00	-51	Financial Class		
	100.00 to 125.00	-52	"	"	
	125.00 +	-53	"	"	
Single - (or Married) one dependent	100.00 to 125.00	-51	Financial Class		
	125.00 to 150.00	-52	Financial Class		
	150.00 +	-53	"	"	
two dependents	125.00 to 150.00	-51	"	"	
	150.00 to 175.00	-52	"	"	
	175.00 +	-53	"	"	
three dependents	150.00 to 175.00	-51	"	"	
	175.00 to 200.00	-52	"	"	
	200.00 +	-53	"	"	
four dependents	175.00 to 200.00	-51	"	"	
	200.00 to 225.00	-52	"	"	
	225.00 +	-53	"	"	

Financial class designates proportion of bill to be paid by patient. They are 50%, 75% and 100% respectively.

The system provides for all phases of ambulatory care including emergency medical services. The facilities of the Emergency Department at the Carney Hospital are available 24 hours a day, seven days a week for use by center and outpatient department registrants.

Other features offered by the system include the

availability of the support services of the hospital to the health centers. Though the centers contract with the hospital for most of these services, they have the advantage of having them immediately available and centrally located; e.g., the hospital employs a full staff of maintenance and engineering personnel, covering all the mechanical and building trades. This staff provides the same level of service for all the contracting health centers as it does for the hospital.

In addition to the managerial techniques employed, the success of the system depends on the dedication and involvement of the administrative and medical staff. Dr. Coldiron, director of the outpatient department, and Sister Kathleen Natwin, the nursing director for ambulatory services, are involved or have been involved with the health centers on four levels concurrently: 1. a provider of medical services, 2. medical director and nursing director for the center, 3. from their respective positions at the hospital, consultants for intra- and inter-institutional problems and 4. members of the board of directors of the health center corporations.

The last level mentioned above is considered the most crucial factor in the smooth running and growth of the center. At least one and no more than two or three representatives of the hospital must be present at this level. This serves several functions: 1. The dissemination of information, 2. communication and 3. education. Education was felt to

be the most important reason for being on the board of directors - especially in the budgeting process. Another reason for involvement at the board level - actual attendance of meetings - is to provide proof of the true commitment of the hospital. Dr. Coldiron, during the interview, described the attitude of most consumers of health care as institutional paranoia resulting from numerous bad experiences with the health industry and institutions in general. This paranoia coupled with a feeling of powerlessness and sometimes inferiority creates a situation which demands very tactful handling.

On site involvement at the second level is felt to be necessary for effective monitoring of the quality of the facility and the care delivered. It is also needed in order to understand and particularize the problems of each health center. First hand observation and knowledge is essential in any system is to be administered effectively.

In summary, there are two aspects to the successful operation of this system: one is the managerial techniques employed to save money (discussed in more detail in the profiles of the individual centers), and the second is the intense involvement of the hospitals with the health centers, administratively as well as medically.

As such, incorporation of such a system is not recommended if those involved are unable or unwilling to commit themselves to the second aspect.

Chapter III

METHODOLOGY AND RESULTS

In demonstrating the first hypothesis - that a system involving neighborhood health centers of independent and/or satellite licensure, with an outpatient department providing back-up services, can generate a lower cost per visit than a system serving the same number of people but not including neighborhood health centers - the present costs of the system were compared with the estimated costs necessary to deliver the same level of service to the same number at Carney Hospital's outpatient department. In making the comparison, two assumptions are necessary.

The first assumption is in relation to the behavior of patients within the system. It is assumed that all patients now being seen at the health center would be seen at the hospital outpatient department for the same services. This is not necessarily the case, as some people would not travel the necessary distance for care, either going elsewhere for services or not going at all. Others would not use the institution simply because they do not feel they receive fair and equal treatment. As the hospital is Catholic and has the image of being responsive primarily to upper income residents, a certain amount of prejudice does exist. As this comparison is one of dollar benefits rather than

utilization, it was felt that the assumption was justifiably made. It is a conservative assumption, biased against the hypothesis.

The second assumption is that it would be more appropriate to compare the costs of the existing system with an expanded program at Carney's outpatient department than to compare it with an existing facility in another locale because of the difficulties in controlling variables that would directly and indirectly affect cost considerations. Differences in the racial mix of the populations and thus utilization patterns, differences in the cost of living, differences in hospital policies, differences in the characteristics of the population - age distribution, sex, education and income distribution - would interfere with an accurate comparison of the two systems.

Zwick, in "Some Accomplishments and Findings of Neighborhood Health Centers," mentions another problem with comparisons of different delivery types.²⁷ Not only may the population and geographic area differ unaccountably, but the facility itself may offer some services at different levels as well as different services altogether. It is hoped that most of these difficulties will be circumvented by using the same population, geographic area, facility and services for the comparison.

For the purposes of this study, a clear distinction

is made between primary and comprehensive care. The neighborhood health centers are seen as providing primary care for their target populations and with the addition of Carney's outpatient department, the system is seen as providing comprehensive care for most of North Dorchester and South Dorchester.

Primary care is defined as pediatrics, adult medicine, obstetrics/gynecology, podiatry, well baby, nutrition, mental health and social services. Primary care visits, as reported in this study, only include visits to these clinics from October 1973 to September 1974.

Comprehensive services include all other specialty services offered by the outpatient department at Carney Hospital - allergy, arthritis, audiology, cardiology, dental, dermatology, diabetic, endocrinology, ear, nose and throat, gastro-enterology, genito-urinary, gyn tumor, hematology, minor surgery, neurology, neuro-surgery, ophthalmology, orthopedic-pediatric, orthopedic-adult, plastic, refractions, sigmoidoscopy, surgical, thoracic and tumor - as well as the features discussed on pages 7 and 8.

The Current System

To obtain the cost of the existing system, all costs incurred in the delivery of services by the member institutions, including overhead, were summed. All data gathered regarding current costs, visit and utilization statistics are for the

fiscal year October 1973 to September 1974, with the exception of the Avenue Health Center. As the center has only been fully operational for little more than six months, data were gathered only for the period April 1974 to September 1974, then multiplied by two to convert to an estimated yearly rate.

The total system cost for the fiscal year October 1973 to September 1974 is \$1,318,705.90. The component costs of the system are as follows:

(1). The total cost of running Carney's outpatient department was added to the overhead allocated by the hospital to the outpatient department to obtain the total cost of service delivery at the facility. This cost includes the delivery of all specialty services as well as the primary care segment. In advocating the use of an outpatient department as the backup facility in the system, one is also advocating the availability of its specialty services as part of a comprehensive package. The total direct cost for Carney includes:

A. Payroll Expense

Executive	Secretary
Supervisor	Clerical
Ass't Head Nurse	Typist
Professional	FICA
LPN	Group Life Insurance
Aides and Orderlies	Pension
Medical Technician	Health Office

B. Supply Expense

Printing and Office	Med/Surg. non-billable
Operating and general	Drugs non-billable
Uniforms	

C. General Expenses

Travel	Repairs-Maintenance
Dues - Membership/Educ.	Service Contracts
Consultants Fees	Miscellaneous Expense
Physician Expense	

D. Depreciation

Building
Moveable fixtures

The overhead allocated to the outpatient department includes:

- | | |
|--------------------------------|-------------------------------|
| 1. administrative and general | 10. maintenance of personnel |
| 2. employee health and welfare | 11. nursing service |
| 3. operation of plant | 12. medical supps. & expenses |
| 4. maintenance | 13. pharmacy |
| 5. laundry and linen | 14. medical records |
| 6. housekeeping | 15. social service |
| 7. dietary raw food | 16. nursing school |
| 8. dietary other | 17. interns and residents |
| 9. cafeteria | |

The total direct and overhead costs for these items were obtained directly from the hospitals financial records and amounted to \$1,041,276.

(2) The total cost of operation at Bowdoin Street was \$44,970. This figure was obtained from records kept by Carney Hospital, which provide all accounting services for the health center. These costs include :

A. Payroll Expense

As listed above for direct costs to Carney
Hospital

B. Supply Expense

As listed above for direct costs to Carney
Hospital

C. General Expense

Service Contracts	Advertising & Publicity
Telephone	Rent
Leased Equipment	Electricity
Misc. general expenses	Answering service
Physician expense	

D. Depreciation

As listed above for direct costs to Carney OPD

(3) The costs incurred by Littlehouse amounted to \$37,213.4. This figure includes donated services from New England Medical Center and St. Margaret's Hospital. The number was adjusted to exclude those costs for donated services already counted as part of Carney's expenses. The cost categories for this figure are the same as those used for Bowdoin Street.

(4) Avenue's expenditures were estimated at \$32,400. The figure was adjusted to exclude those costs for donated services already counted as part of Carney's expenses and to reflect a year's expenditures rather than only the six months since licensure. As costs tend to increase towards the end of the first year of operation - most services offered are

being expanded and new ones offered thereby creating more expense - the estimated cost is slightly more than twice the six month figure. The data were obtained from the director of the health center.

(5) Service delivery costs for Neponset were reported as being \$185,321.6 for fiscal year October 1973 to September 1974. Neponset's fiscal year runs from June to June so that the first three months for 1973 were subtracted from the total while July, August and September of 1974 were added to obtain comparable data. The figure was then adjusted to exclude the cost of donated services already included in Carney's expenditures.

Visit data for each of the centers were collected in terms of total number of visits for October 1973 to September 1974. The total number of primary care visits for the system was 39,801 Primary care visits were distributed as follows:

1. Carney OPD contributed 17,061 visits. These visits amount to only 37 percent of the outpatient department's total operation. The other visits are subsumed under the title 'total comprehensive care'.

2. Bowdoin Street received 5,001 visits during the past fiscal year.

3. Littlehouse followed Bowdoin Street closely with 4,934 visits.

4. Avenue is estimated to have received 2,350 during the fiscal year. This is an extrapolation of the six month figure reported by the director. It amounts to a little more than twice the six month figure. Comparisons were made with Bowdoin Street and Littlehouse's growth records for the extrapolation. As the centers expand services, they increase the volume of patients and visits beyond what would be expected from a constant number of hours of operation and services over time. Figures 1 and 2 show the growth patterns of Bowdoin Street and Littlehouse from their first month of operation to the present time.

5. Neponset reports 10,455 visits for October 1973 to September 1974.

Summary Table of Visits and Costs

	<u>Total Costs</u>	<u>Primary Care Visits</u>	<u>Specialty Visits</u>	<u>Cost per Visit</u>
Carney	\$1,041,276	17,061	29,669	22.28
Bowdoin Street	44,970	5,001		8.99
Littlehouse	37,213	4,934		7.54
Avenue	32,400	2,350		13.79
Neponset	185,321.6	10,455		17.73
	<hr/>	<hr/>	<hr/>	<hr/>
Total System	1,341,180.6	39,801	29,669	19.31

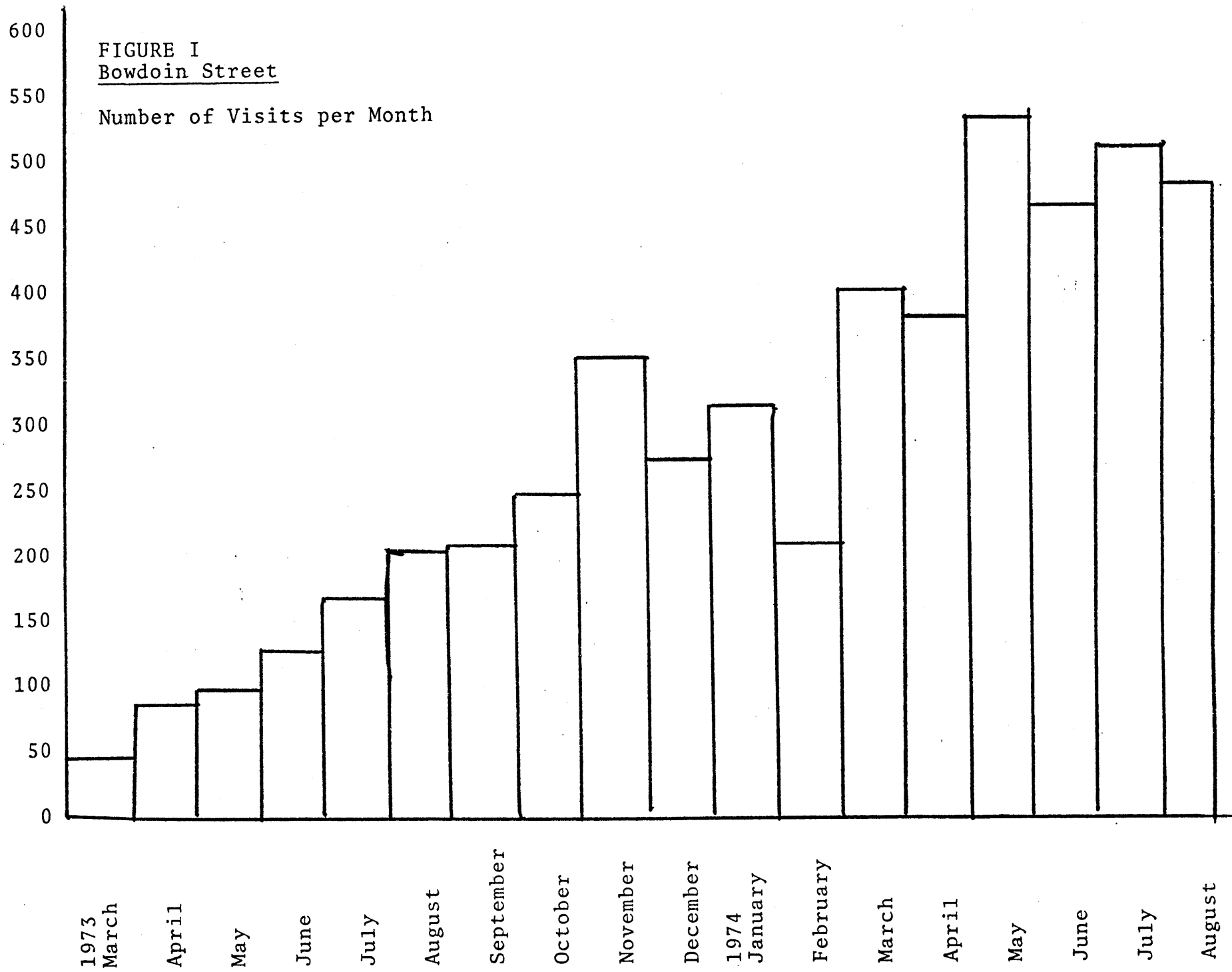
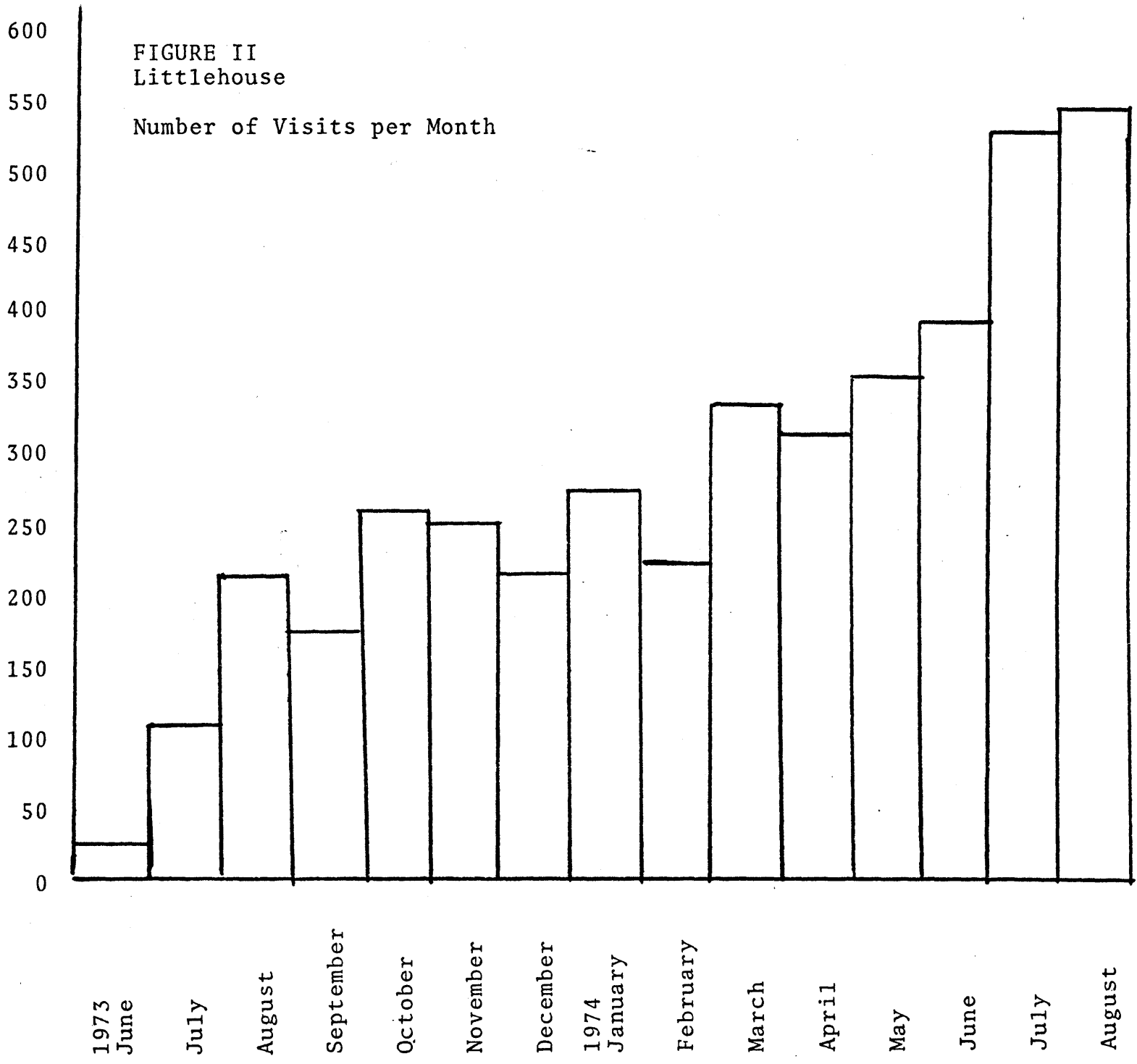


FIGURE II
Littlehouse
Number of Visits per Month



Costs Encountered by Nonuse
of Neighborhood Health Centers

To obtain the cost of a system using, instead of neighborhood health centers, an expanded Carney outpatient department, a formula was developed to estimate all components of an expanded cost: direct cost and overhead.

Direct Costs

To estimate the costs to be incurred by treating an expanded number of patients, the current direct costs \$594,745 were added to the incremental costs for serving additional patients. The incremental costs were obtained by multiplying the dollar cost per primary visit by the number of extra primary care visits that Carney would have to provide with the elimination of health centers. The dollar cost per primary visit was obtained by using Neponset's cost per visit - \$17.73 - as a representative estimate of the cost of delivering primary care. Neponset offers a range of services that comes closest to being illustrative of what has been described as comprehensive primary care. The center has been in operation for more than three years and is thus more developed than the other centers. It pays directly for 90 percent of all services received. This is not the average cost per visit for centers within the system (which is \$13.2), but a reasonable estimate of the cost of providing comprehensive primary care, after most programs have been fully developed. Carney's cost per visit was not used because the

$$\begin{aligned}
 &= \$446,531 + (\$446,531/5,749 \text{ sq. ft.}) \times \\
 &\quad (2016 \text{ sq. ft.}/17,061 \text{ visits}) \times (22,710 \text{ visits}) \\
 &= \qquad \qquad \qquad \$654,959.13
 \end{aligned}$$

Additional Cost Considerations

In providing expanded services for additional visits there are several options open to a facility. The alternative chosen would depend on such things as present physical capacity, work load, hours of operation and may or may not cost the center additional expense to implement.

Facilities operating at less than capacity could possibly absorb the additional visits with few adjustments.

For a facility currently operating at capacity one course of action would be to reorganize its service delivery, e.g., expanded hours of operation, use or increased use of paramedical personnel. Another alternative would be to construct the additional space. Choosing this alternative would necessitate a capital expenditure. If this particular alternative were pursued by Carney's outpatient department, it is estimated that construction costs for the additional space would be approximately \$59,000. This figure was obtained by calculating the additional square footage needed and obtaining an estimate of the cost per square foot of hospital construction.²⁸ This cost would be approximately 2 percent of the total cost of delivering services, i.e., direct cost + construction, so the item is ignored.

Summary of variables and values:

total direct cost	\$594,745
-------------------	-----------

cost per visit for primary care	\$17.73
the number of extra primary care visits that Carney would have to see	22,710 visits
total overhead allocated to the outpatient department for the fiscal year 1973 to 1974	\$446,531
total number of square feet occupied by the outpatient department	5,749 sq. ft.
total number of square feet occupied by primary care services in the outpatient department	2,016 sq. ft.
total number of visits at outpatient department for primary care rather than specialty care	17,061 visits

Total Cost

The total cost of a system not incorporating neighborhood health centers is obtained by simply adding direct cost, and overhead. The cost of adapting a particular facility to accommodate an increased patient load, i.e., re-organization or construction, is not included in this formulation, since it would represent a very minor cost component.

Total Cost = direct cost + overhead

$$\begin{aligned}
 \text{Total Cost} &= (\text{current direct costs} + \text{the dollar cost per primary care visit} \times \text{the number of extra primary care visits}) \\
 &+ (\text{current overhead} + \text{overhead per square foot} \times \text{primary care square footage per primary care visit} \times \text{the number of extra primary care visits}) \\
 &= \$997,393.30 + \$654,959.13 \\
 &= \$1,652,352.43
 \end{aligned}$$

<u>Cost Component</u>	<u>% of Total Cost</u>
Direct Costs	59
Overhead	39
Construction (If selected)	2
Total	<u>100</u>

Cost Differentials

The cost of the current system including direct cost, overhead and all donated services for each component of the system is \$1,341,180.60

The cost, including direct cost, and overhead of the system not using neighborhood health centers is estimated at \$1,652,352.40.

The difference between the two costs is 311,171.80 per annum.

The cost per visit for delivering the system's total range of care is obtained by dividing the above costs by the total number of visits to the system - 69,470. The present system delivers its services at a cost of \$19.31 per visit. The proposed comparison would deliver the care at \$23.79 per visit. The cost per visit difference between the methods is \$4.48.

	<u>Cost per visit</u>
Carney OPD*	\$ 22.28
Bowdoin Street	8.99
Littlehouse	7.54
Neponset	17.73
Entire System (includes all visits and all costs)	18.98

*includes overhead

To compare the cost per visit values obtained above, the system is taken as a whole - as representing one facility. In effect, the comparisons made in this study and with any other study are comparisons of organizational methods.

Comparing these results to those centers reporting in 1973 provides evidence in support of Sparer and Anderson's contention that "the neighborhood health center is viable and cost efficient as compared with other providers."²⁹ To make an exact comparison an inflation factor would have to be applied to the results presented in the 1973 report. This is not necessary for a clear understanding of the significant differences. One only needs to be aware of the fact that costs have risen substantially since 1973. In 1973 the median cost per medical encounter (including overhead) for those urban centers receiving 314 (e) monies was \$26.00, while the current system reports a figure of only \$18.98 per visit for all services rendered. It should be

noted that, though the gap is widened by the application of an inflation factor it must be qualified somewhat by the fact that the comprehensive health services projects place more emphasis and monies into some non-revenue producing areas than does the current system.

"Community Health Centers Program Status and Management Plan" Social Security Administration, July 1974³⁰ gives comparative statistics for other provider settings, and suggests reasons for the differences.

	Physician Office Visit-1973	Comprehensive Health Center Median - 1973	Kaiser - GHA 1972
Unit Cost Per Medical Encounter	\$13	\$24	\$22

As one would expect the unit costs are higher for the comprehensive health centers than for the private physician or the prepaid group practice - Kaiser. There are several reported reasons for these differences: 1. broader ambulatory health care services, 2. greater health needs requiring more service per visit, 3. higher indirect costs, and 4. low M.D. productivity. The exact contribution of each of these to the increased cost is not known.

A comparison of the cost per medical encounter of the physician office visit with that of the Carney System

shows, as expected, a lower cost for the physician office visit: \$13 per physician office visit vs. \$19.31 for the Carney System.

A comparison of the entire system with Kaiser (most nearly comparable) shows an advantage to the system. These differences are increased with the application of inflation factors.

II

To determine the validity of the second hypothesis - that small decentralized neighborhood health centers introduce more people into the health system than would be possible with a large centralized facility - patient origin studies were conducted for Carney Hospital OPD, Bowdoin Street, Littlehouse and Avenue Neighborhood Health Centers.

In formulating this hypothesis several value judgements were made. It was assumed that it is desirable to have more people enter the health system and that this entry should take place as soon as possible. It was also postulated that distance and time, moderated by some socio-cultural, political and economic factors were the major variables in utilization of health services for this population. The moderating variables were felt to be: 1. the availability of alternative sources of care - private physicians, other outpatient departments and health centers, 2. the availability of convenient public transportation to distant sources of care, 3. the ability to afford private transportation, cabs, or public transport, and 4. personal prejudices against individual facilities. The registrants of each facility were located by census tract and the main road distance from the center of each tract to the facility was computed. Figures 3,4,5 and 6 show the results of these computations. Figures 9,10,11 and

12 show the percentage of the population of the area/tracts serviced by a facility graphed in order of increasing distance from the facility. The percentage of the population serviced from the centers' opening date by tract, in conjunction with other socioeconomic characteristics of the tract was used to determine the kinds of people attracted to these centers, the centers' range of effectiveness in miles, and the penetration of the facility into an area. Although there are no comparisons available for these statistics, they do give an estimate of the amount of intervention that can be expected in existing patterns of utilization or nonutilization.

The data for Carney Hospital consisted of new outpatient department registrants for 1973 and 1974. Fifty-three per cent of the total number of registrants from Avenue, 72 per cent of the registrants from Bowdoin Street and 86 per cent from Littlehouse were used in the analysis. The data in Figures 3,4,5, and 6 do support some of the findings of other researchers in relation to the effect of distance upon utilization.

A comparison between these results and those observed by Brooks³¹ regarding the behavior of registrants in using "large bureaucratic vs. small neighborhood health centers" is handicapped because there were no large "bureaucratic" NHC's available for comparison. The utilization

patterns for the largest component of the system, Carney Hospital's outpatient department, give partial support to Brooks' findings. As mentioned earlier (page 15-16) Brooks observed that the proportion of patients using the large clinics increased as distance increased, while the proportion of patients using the smaller neighborhood health centers decreased as distance increased. Brooks used three discrete categories in measuring straight line distance from residence to center - 0-1/2 miles, 1/2 to 1 1/2 miles, and greater than 1 1/2 miles. Using Brooks' categories the proportion of patients using the outpatient department does increase to 1.5 miles straight line distance but does not continue to increase thereafter. The present study uses main road distance rather than straight line. Road distance here is, on average, approximately 1.8 times straight line distance, e.g., one and one half miles straight line distance is a little less than 2.5 miles main road distance. Figures 3 and 4 show that after 2.5 miles main road distance or 1.47 miles straight line distance the same phenomenon is observed that obtained with Bowdoin Street and Littlehouse, that is, the number of registrants drops off rapidly with increased distance.

No satisfactory explanation of this phenomenon was offered. Brooks postulated that referral patterns may have been responsible for the occurrence, that is, doctors and smaller centers referring patients to the larger facility.

FIGURE 3
% of Center Population (registrants in sample) By
Distance (road distance)

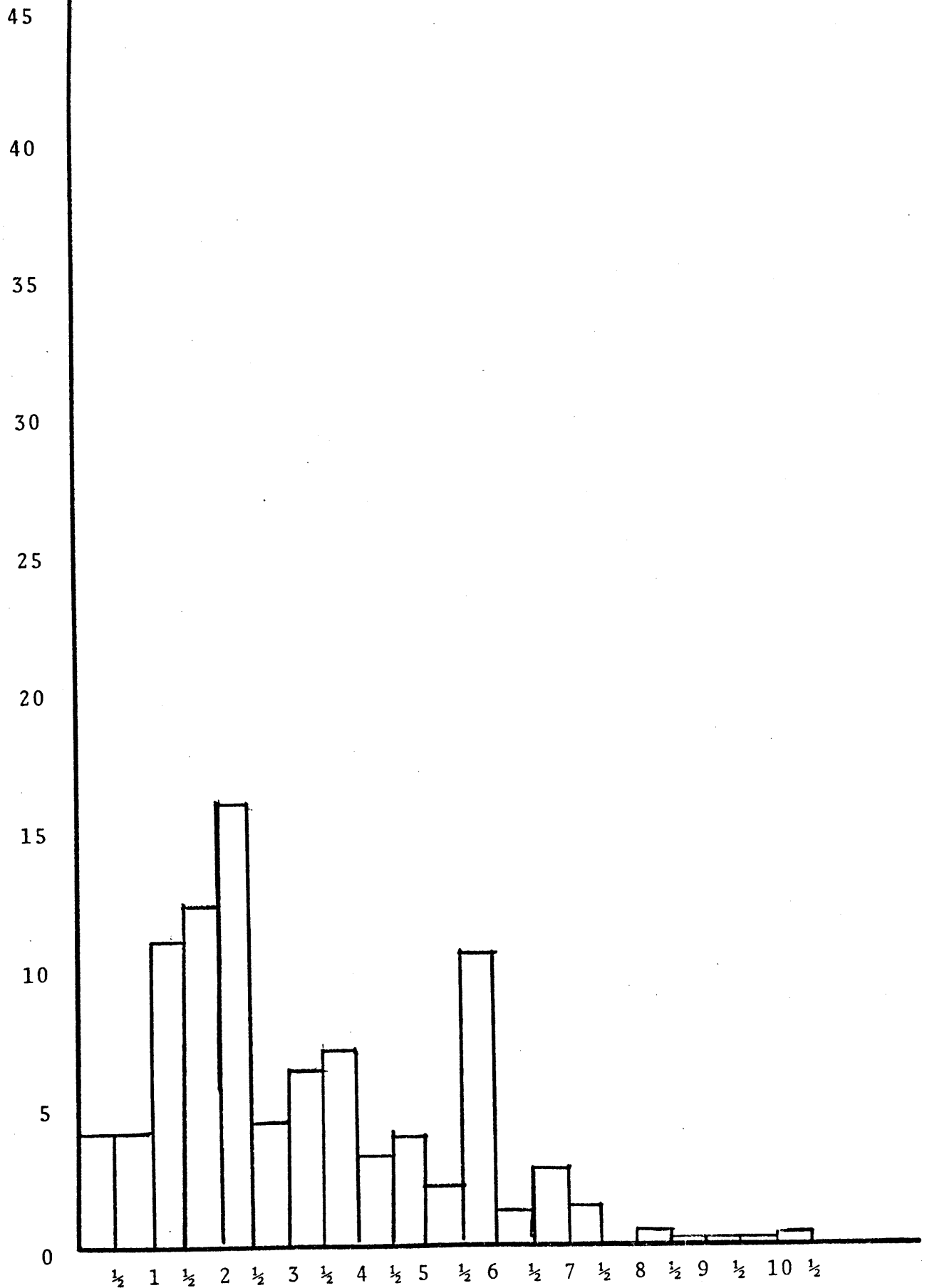


FIGURE 4
Bowdoin Street Neighborhood Health Center

% of Center Population (registrants in sample) By
Distance (road distance)

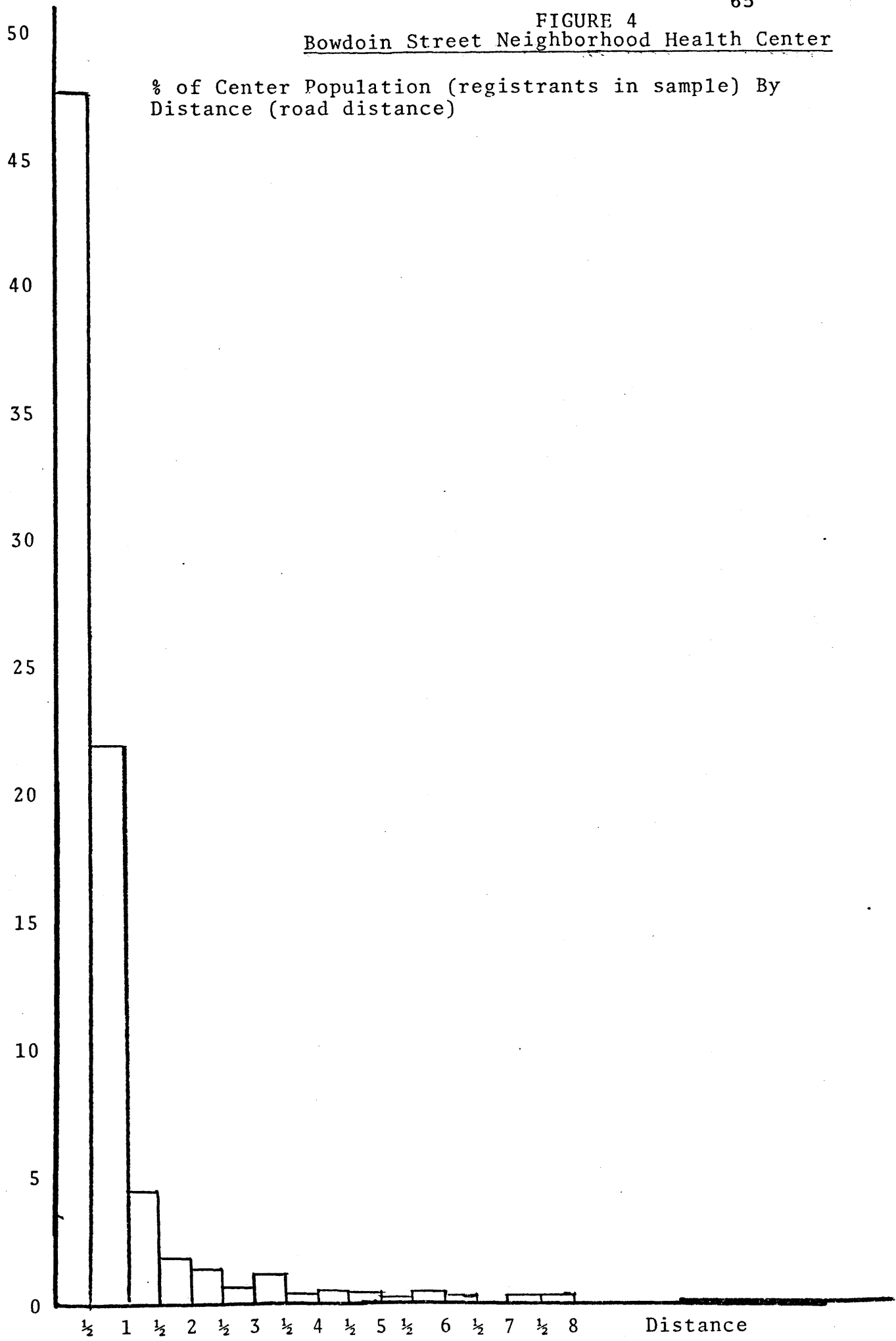


FIGURE 5
Littlehouse Neighborhood Health Center

% of Center Population (registrants in sample) By
Distance (road distance)

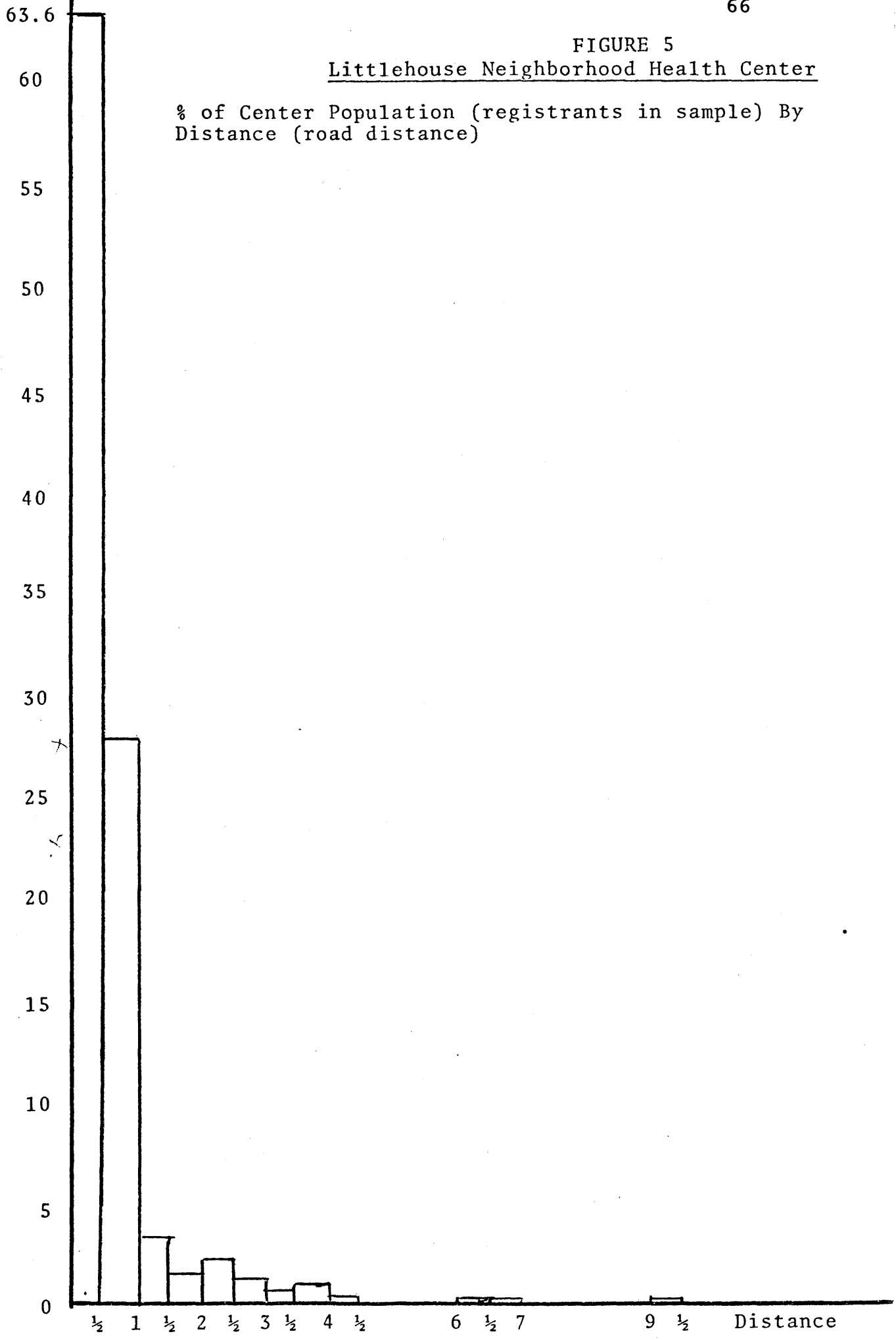
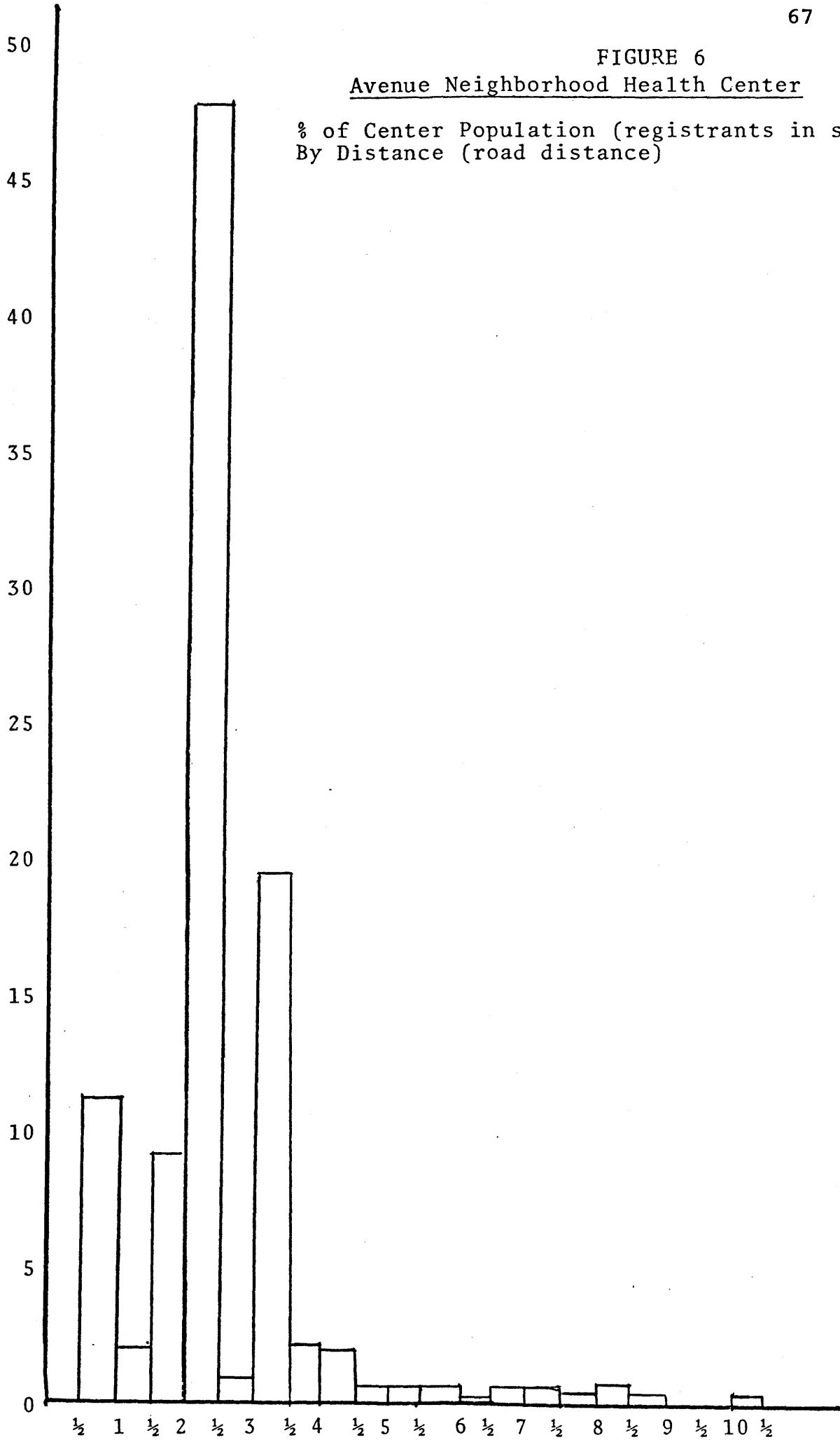


FIGURE 6

Avenue Neighborhood Health Center

% of Center Population (registrants in sample)
By Distance (road distance)



There is another possible explanation for this phenomenon. As distance from the center increases so does the radius. This increasing radius incorporates more localities, census tracts, etc., thus increasing the overall number of people, at a particular distance, using the facility, i.e., the sum of many localities at a particular distance from the center. At the same time the proportion of people living in each locality using the center decreases as distance increases. This trend continues until a point is reached whereby the percentage of patients coming from each locality is so small that the overall number of patients coming from a particular distance begins to decrease. In addition, as distance increases beyond a given point the number of different locations from which patients are drawn begins to decrease. The following Table demonstrates these findings.

TABLE 1

Comparison of Percent of Carney OPD Registrants, Distance and Number of Localities

<u>Percent of Users of Facility</u>	<u>Distance from Center</u>	<u>Number of Localities/Tracts</u>
5.0	0 to 1/2 mile	1
8.4	1/2 to 1 "	2
11.1	1 to 1 1/2 miles	3
12.5	1 1/2 to 2 "	5
16.2	2 to 2 1/2 "	7
4.2	4 1/2 to 5 "	11
.3	10 to 10 1/2 "	6

As the facilities in this study are located on the edge of the city, and serve a working to middle class population rather than the inner city location and residents studied by Brooks, direct comparison may not be valid.

Similar to other results obtained by Brooks, the small neighborhood centers draw the majority of their patients from within half a mile. For Littlehouse 90.2 % of the patients live within half a mile of the center; 94.2 % live one mile of the center and only 5.8 % live over a mile from the center. These distances are straight line rather than main road distances. Main road distances are computed to allow for time considerations in getting to and from the center. These are the distances one would probably travel if coming by car or public transport. With this scheme, 63% of the patients traveled less than one half mile to get to the center, 80.4% traveled less than a mile and 19.6% traveled over a mile. (Figure 5) Similar results were obtained from Bowdoin Street - 87.4 per cent live within one half mile, 93.0 per cent within one mile and 7 per cent over one mile. Considering main road distance 60% travel half a mile or less to the center; 88% travel less than a mile and 12% over one mile. (Figure 4) The Avenue Health Center shows different results in that it draws patients from a wider area because of the family planning services offered. It is the headquarters of Boston's family planning project. Only 11.3% of its registrants live within one half mile,

and 22.5% within one mile; 45% of its population lives just over one mile away. In terms of main road distances only 11.3% of the center's population travels less than one mile. (Figure 6) Carney Hospital's outpatient department, because of the large number of specialty services offered, shows a greater disbursement of its population than the health centers. No more than 5% of its population comes from any one census tract.

This dispersal of patient populations over greater distances experienced by the Carney outpatient department and Avenue health center support the results reported by Simon and Smith.³² Patients, though not in large numbers, are coming from greater distances to those facilities offering specialty services, while Littlehouse and Bowdoin Street draw patients from fewer census tracts as well as shorter distances. This indicates that patients will travel further for specialty services than primary care. This phenomenon, though, may be indicative of the nature and seriousness of the complaint - people will travel farther to alleviate those things which hurt or worry them most. It is also confounded by the organization of the delivery system. Specialty services are offered in fewer locations than primary care, thus necessitating greater travel distances.³³

In an attempt to ascertain whether or not the presence of specialty services is responsible for the dis-

bursal rather than concentration of center registrants in geographical locations, the location of the pediatric populations of the samples from the Carney OPD and Avenue Health Center were graphed. (Figures 7 and 8) As the pediatric populations principally obtain primary care at these facilities it was felt that this would provide a reasonable estimate of the behavior of the primary care segment of the registrants. As can be observed (Figures 3, 6, 7, and 8) the pediatric populations of both Avenue and the Carney OPD exhibit the same initial dispersal patterns as the total population, that is, the proportion of patients using the facility increases as distance increases to 2 1/2 miles main road distance.. The pediatric populations are much more concentrated than the total groups thus approximating the results for Littlehouse and Bowdoin Street. A much higher percentage of patients are located closer to the outpatient department (Figure 7) with a rapid decrease after 2 1/2 miles. The pediatric populations are drawn from fewer locations and for Avenue at much shorter distances - 5 1/2 miles for pediatric population vs. 10 1/2 miles for the total population. The following tables of comparisons will more clearly indicate the differences.

FIGURE 7

Carney Outpatient Department

% of Pediatric Population of Center (registrants in sample) By Distance (road distance)

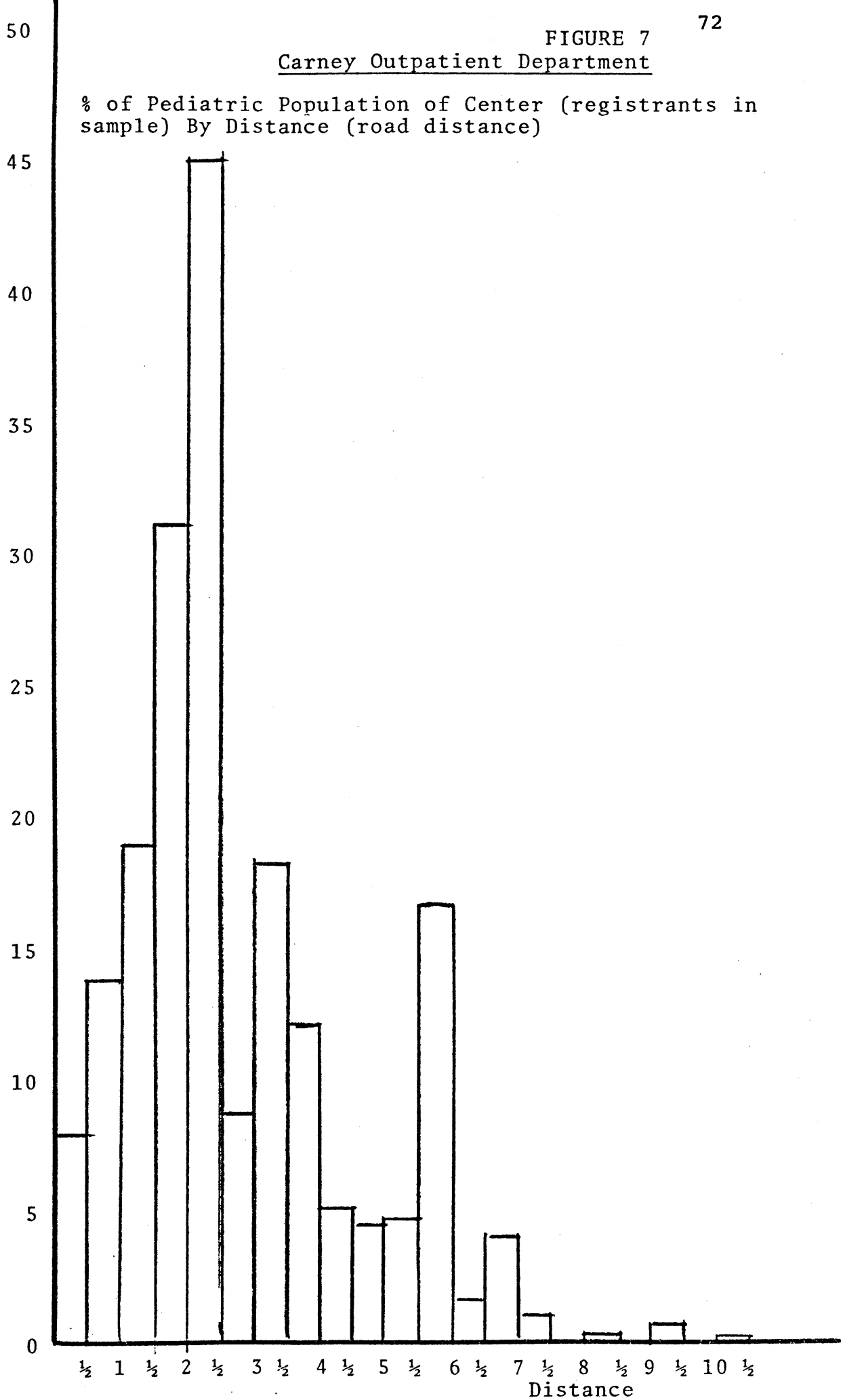


Figure 8
Avenue Neighborhood Health Center

% of Pediatric Population of Center
(registrants in sample) By Distance
(road distance)

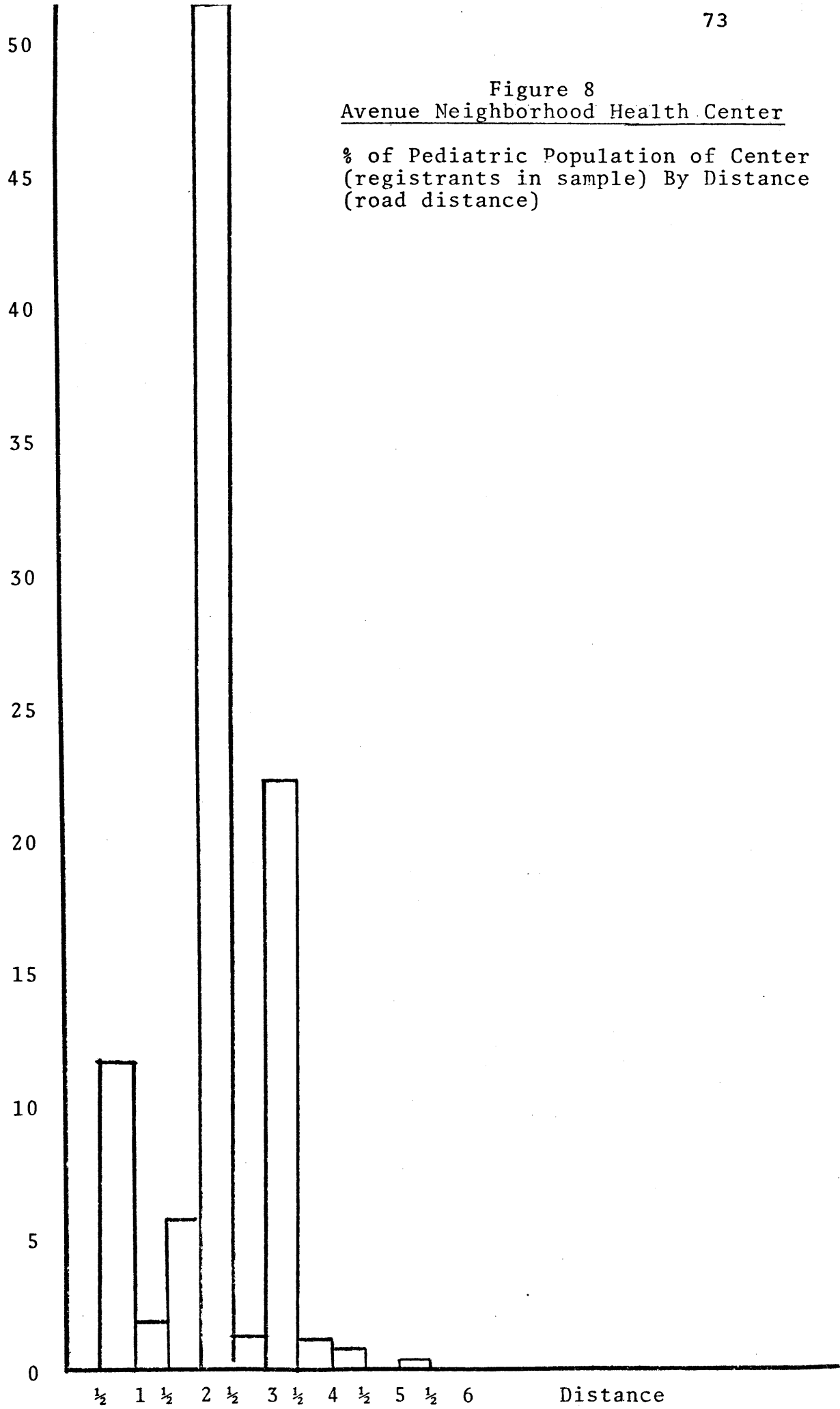


TABLE 2
 Comparison of Percent of Carney OPD Pediatric Registrants, Total Registrants and Distance

<u>Distance</u>	<u>% of Pediatric Registrants</u>	<u>% of Total Registrants</u>
0 - $\frac{1}{2}$	7.93	4.2
$\frac{1}{2}$ - 1	13.73	8.4
1 - $1\frac{1}{2}$	18.91	11.1
$1\frac{1}{2}$ - 2	32.05	12.5
2 - $2\frac{1}{2}$	45.19	16.2
$2\frac{1}{2}$ - 3	8.51	4.6
3 - $3\frac{1}{2}$	18.11	6.5
$3\frac{1}{2}$ - 4	12.04	7.2
4 - $4\frac{1}{2}$	5.15	3.3
$4\frac{1}{2}$ - 5	4.53	4.2
5 - $5\frac{1}{2}$	4.57	2.3
$5\frac{1}{2}$ - 6	16.68	10.7
6 - $6\frac{1}{2}$	1.51	1.4
$6\frac{1}{2}$ - 7	4.14	2.8
7 - $7\frac{1}{2}$	1.11	1.5
$7\frac{1}{2}$ - 8	0	0
8 - $8\frac{1}{2}$	.4	.5
$8\frac{1}{2}$ - 9	0	.2
9 - $9\frac{1}{2}$	.71	.2
$9\frac{1}{2}$ - 10	0	.2
10 - $10\frac{1}{2}$	.20	.3

TABLE 3

Comparison of Percent of Avenue N.H.C. Pediatric Registrants, Total Registrants, and Distance

<u>Distance</u>	<u>% of Pediatric Registrants</u>	<u>% of Total Registrants</u>
0 - $\frac{1}{2}$	0	0
$\frac{1}{2}$ - 1	11.74	11.2
1 - $1\frac{1}{2}$	1.90	2.2
$1\frac{1}{2}$ - 2	5.65	9.0
2 - $2\frac{1}{2}$	54.26	47.7
$2\frac{1}{2}$ - 3	1.25	.9
3 - $3\frac{1}{2}$	22.47	19.4
$3\frac{1}{2}$ - 4	1.25	2.0
4 - $4\frac{1}{2}$	.70	1.9
$4\frac{1}{2}$ - 5	0	.5
5 - $5\frac{1}{2}$	.30	.5
$5\frac{1}{2}$ - 6	0	.5
6 - $6\frac{1}{2}$	0	.3
$6\frac{1}{2}$ - 7	0	.5
7 - $7\frac{1}{2}$	0	.5
$7\frac{1}{2}$ - 8	0	.4
8 - $8\frac{1}{2}$	0	.7
$8\frac{1}{2}$ - 9	0	.3
9 - $9\frac{1}{2}$	0	.1
$9\frac{1}{2}$ - 10	0	.1
10 - $10\frac{1}{2}$	0	.2

The figures indicate that the presence or absence of specialty services only partially accounts for the observed differences between Littlehouse, Bowdoin Street and Avenue and the Carney OPD.

This study was not designed to explicitly account for the interaction of time and linear distance in the utilization of ambulatory health services as did that of Shannon, Skinner and Bashshur.³⁴ By taking the main road distance from the center of the tract to the facility some consideration was given to the time factor. For those patients who must wait for buses and trains the opportunity cost is much greater. As each clinic is located within walking distance of most of its target population, an explicit time consideration was felt not to be necessary.

In considering the effect of the facility on its ability to convert need to demand, attention is directed to the per cent of the population in the geographic area actually utilizing the facility. Figures 9, 10, 11, and 12 show that the small neighborhood health centers are most effective in their immediate areas. Bowdoin Street is located on the border of two census tracts and serves 14.5 per cent of the population of each of those census tracts and 9.29 per cent of the populations of two nearby tracts. Littlehouse serves 14.5 per cent of the population of the tract in which it is located and 28.24 per cent of the

FIGURE 9
Carney Outpatient Department

% of Area Population Serviced at OPD By Distance (road distance)

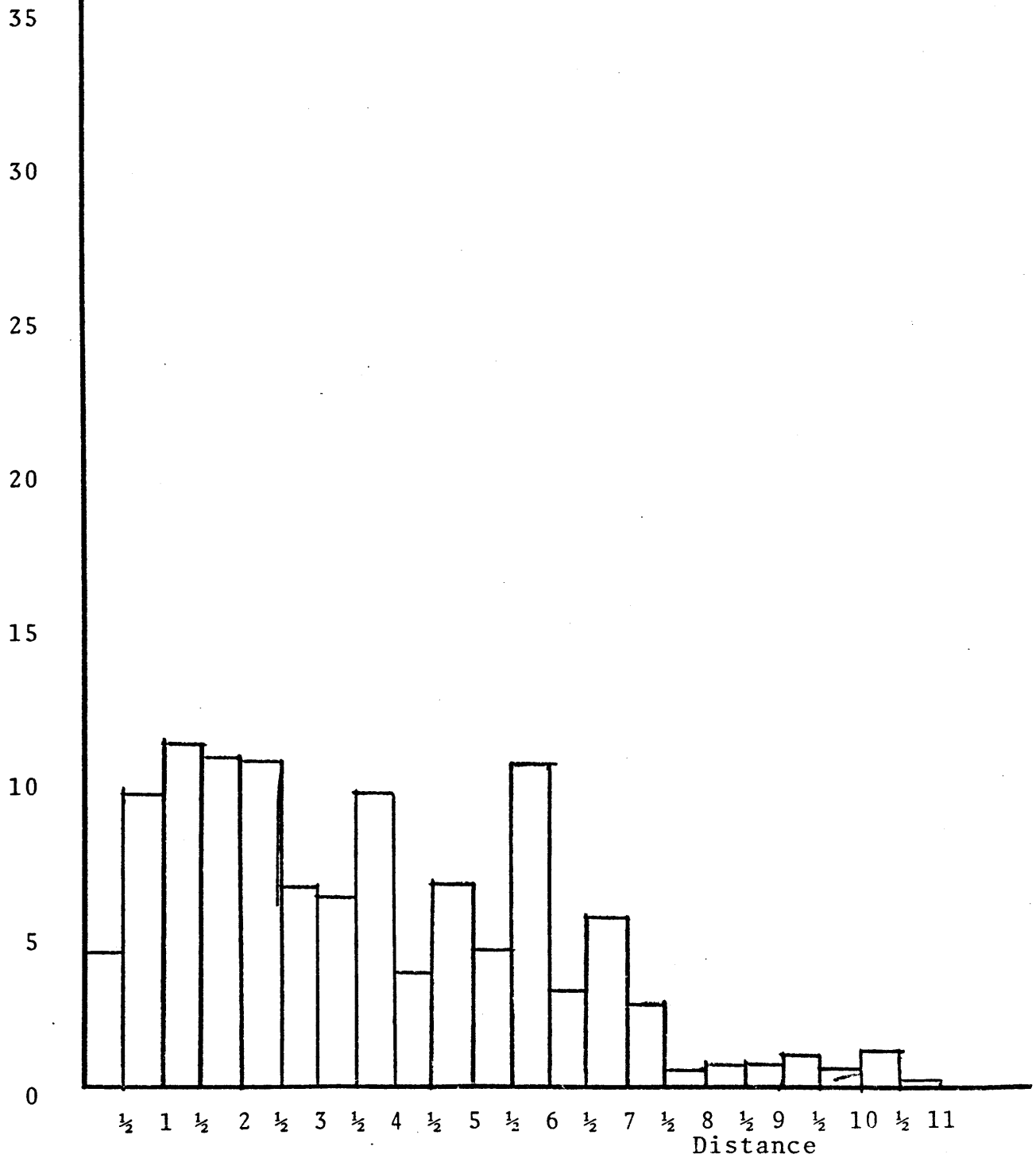


FIGURE 10
Bowdoin Street Neighborhood Health Center

% of Area Population Serviced at Center By Distance
(road distance)

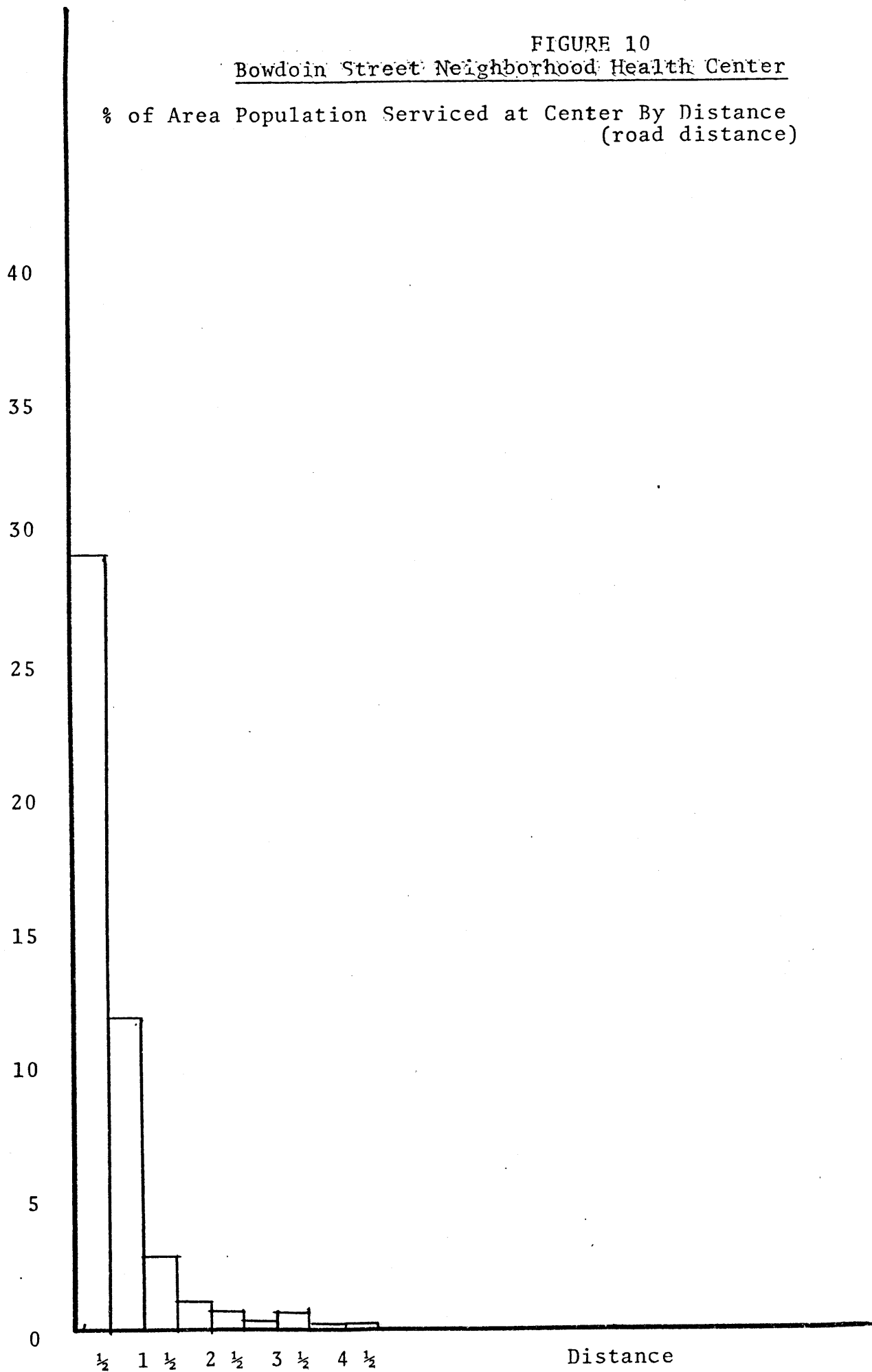


FIGURE 11
Littlehouse Neighborhood Health Center

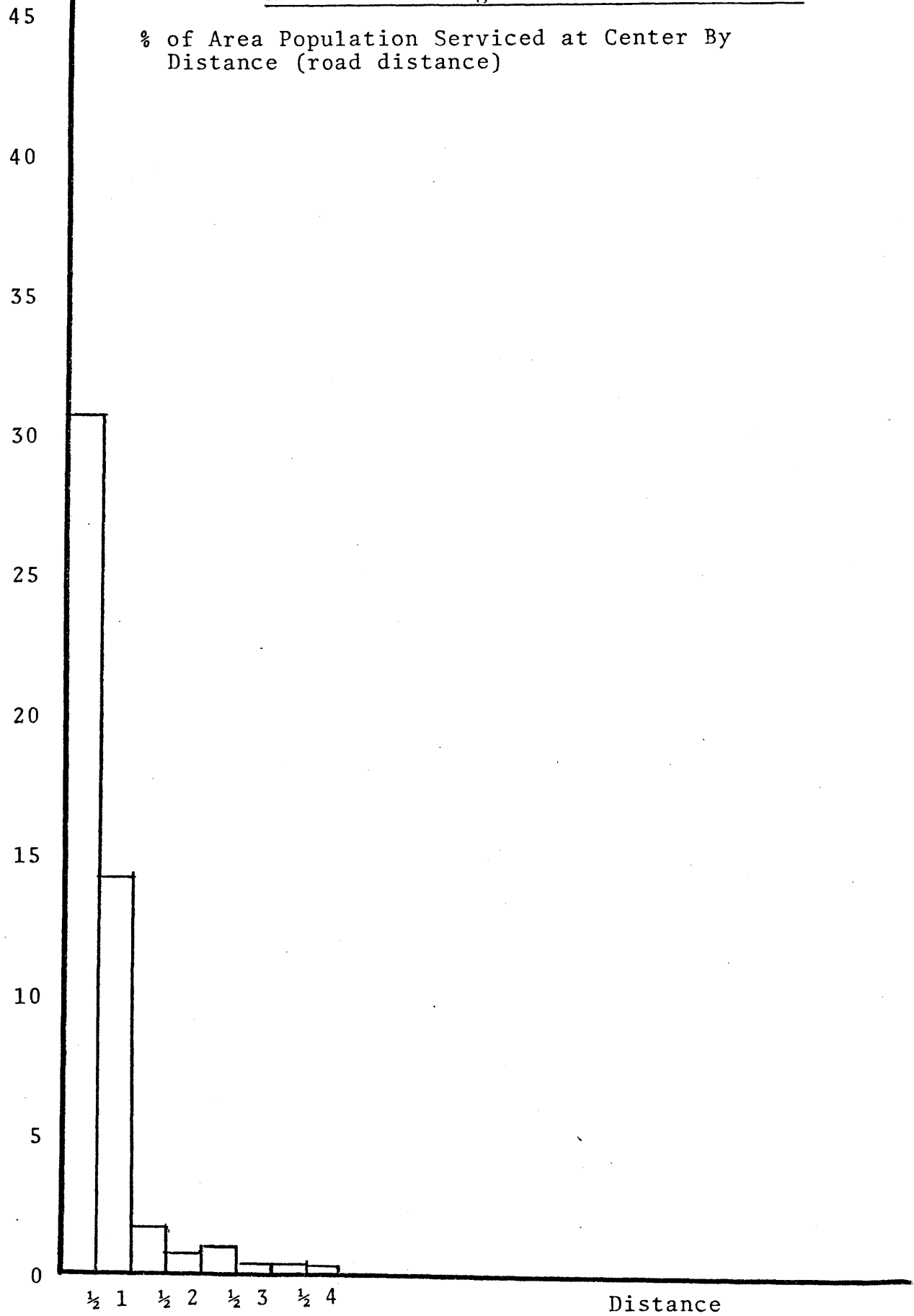
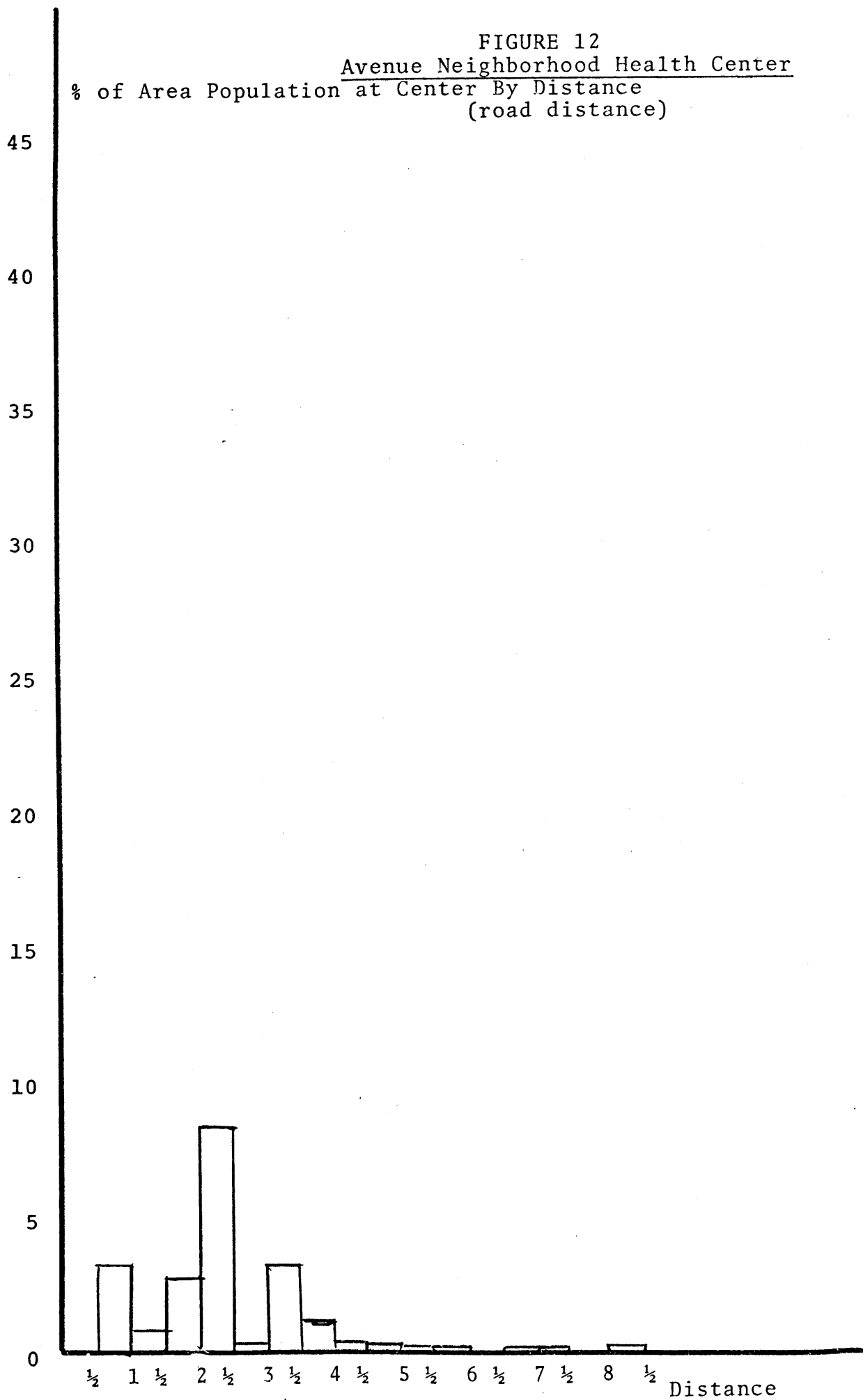


FIGURE 12
Avenue Neighborhood Health Center
% of Area Population at Center By Distance
(road distance)



populations of adjacent tracts. The results for Avenue display a similar, though weaker, trend serving 7.89 per cent of the population of the census tract in which it is located and approximately 6.52 per cent of the population of the census tract adjacent. As mentioned earlier Carney Hospital's patients are disbursed over a much wider area, providing a large amount of specialty care; only 17,000 of their 46,000 visits during the last fiscal year were for primary care. Only 4.52 per cent of the patients come from the census tract in which it is located. Again, the only comparison possible is between Carney and the health centers. The comparison demonstrated that the smaller primary care centers do indeed have the advantage in drawing people into the system. It should be noted that Avenue after only six months of licensed operation still offers limited primary care services.

III

In supporting the third hypothesis - that this system is better designed for the greater convenience and thus satisfaction of the patients - several indicators were used: 1. broken appointment rates, 2. rates of utilization, and 3. referral patterns. Full treatment of all the ramifications of this hypothesis was impossible because of lack of time, money and readily available data. An attempt was made to measure some "indications" of the adequacy of service delivery and thus patient satisfaction. As 90 per cent of all business conducted within the entire system (neighborhood health centers and outpatient department) is conducted by appointment arrangement, broken appointment rates were used to gather some indication of patient satisfaction with service delivery in each facility. The rationale for this decision was that patients were so satisfied or dissatisfied with services - number and type available, waiting periods for appointments and medical attention after entering, hours of operation, treatment, continuity, organization, personnel, etc. - that they would make greater or lesser efforts to keep appointments.

The number of visits per patient per facility and average number per system are presented more as a point of information and comparison of the internal quality of care. As one of the major concerns is the adequacy of service

delivery, some basis must be used for comparisons across systems in ascertaining the more economical or cost - efficient alternative for the patient. The utilization patterns discovered may be characteristic of centers of this type and their desirability must be evaluated in terms of the health status of the population and the availability of alternative sources of medical resources. (See attached maps for location of other neighborhood health centers and outpatient departments.)

To obtain a more complete indication of the centers' ability to deliver comparable care the referral patterns from the centers to the outpatient department were assessed. It was felt that the probability of referral from the centers' to the back-up facility, in conjunction with the amount of disparity between the visit rates of the centers' and outpatient department, would provide some answers to the question of greater convenience to the patient.

To obtain the broken appointment rates for Carney and Littlehouse, samples were taken. The sample from Carney OPD was taken during the two week period of Christmas and New Year's. Samples from Littlehouse were taken over a two week period during the summer. The Neponset Health Center keeps statistics on broken appointments for the entire year. To obtain utilization rates for Carney, Bowdoin Street and Neponset systematic samples were taken.

Boston, Mass.



5,000 FEET

3.36% from Carney, 38% from Bowdoin Street and 12% from Neponset. For Littlehouse the entire population was used. To investigate referral patterns Carney Hospital statistics for the fiscal year October 1973 to September 1974 were used. These consisted of referrals to the outpatient department from each of the centers and pediatric referral and treatment data kept as part of a program for the Department of Public Welfare.

Schroder,³⁵ in studying broken appointments in a medical clinic, reports that broken appointment rates documented by other researchers vary from 19 to 51 percent in such settings. The results presented in Table 4 show that the various components of the present system are operating well below this, with Neponset experiencing a low of 8.31 and Littlehouse a high of 14.93 per cent. The fact that the data for Littlehouse and Neponset were collected for summer months only is felt not to be misleading in terms of overall system performance because of the results obtained from Carney, in winter and over Christmas and New Year holidays, - 11.08 percent. There are many problems with this methodology. Comparable data, in terms of time periods, were not obtained for each of the centers. Ideally one would have liked to sample comparable periods in each season for each center. The data obtained from Carney does not include broken appointments for all of the primary care services offered - only adult medicine and pediatrics. It is conceivable that there are differentials by service which affect the total rate.

TABLE 4

Percent of Broken Appointments for the Carney OPD Pediatric Registrants, Total Registrants and Distance

	Total Number of Appointments	Failed Appointments		Standard Error	Source
		Number	Percent		
Carney Outpatient Department Pediatrics and Adult Medicine	361	40	11.08	.017	Two week Survey*
Littlehouse All Services	375	56	14.93	.024	Two week Sample**
Neponset All Services	5045	419	8.31	.006	Health Center Statistics

*The survey was taken during Christmas and New Year weeks of 1974 - '75. It was felt that this was possibly the worse time of year for people not showing and would therefore give a good estimate of operations over time.

**The sample was taken from records kept by the center for one week in July of 1974 and one week in August of 1974.

The number of visits per user for each of the centers is presented in Table 5. In advocating the use of neighborhood health centers over other delivery forms one of the major considerations, as mentioned earlier, is convenience to the patient. If a patient must make more trips to the health center to solve his problem, than to an outpatient department, other things being equal, he may have been better off going to the outpatient department or clinic. The present study does not adequately deal with this issue as no information was obtained on how many of any one patient's visits were for the same complaint. In making such a comparison, with only total number of visits per patient and no diagnostic data, the results of the three health centers were averaged and compared to Carney's utilization experience. A chi square test was performed to test for association between two distributions. A chi square of 13.81 with 11 degrees of freedom was obtained. There was no demonstrable association between the distribution of visit rates for Carney and the health centers' average, either at the .05 or .01 level.

The results presented in Table 5 show very low rates of utilization for Bowdoin Street and Littlehouse while Neponset's rate of utilization is nearly double that of the others. When the results from Littlehouse and Bowdoin

TABLE 5

Number of Visits per Patient for the Carney OPD, Bowdoin Street, Littlehouse and Avenue N.H.C.s

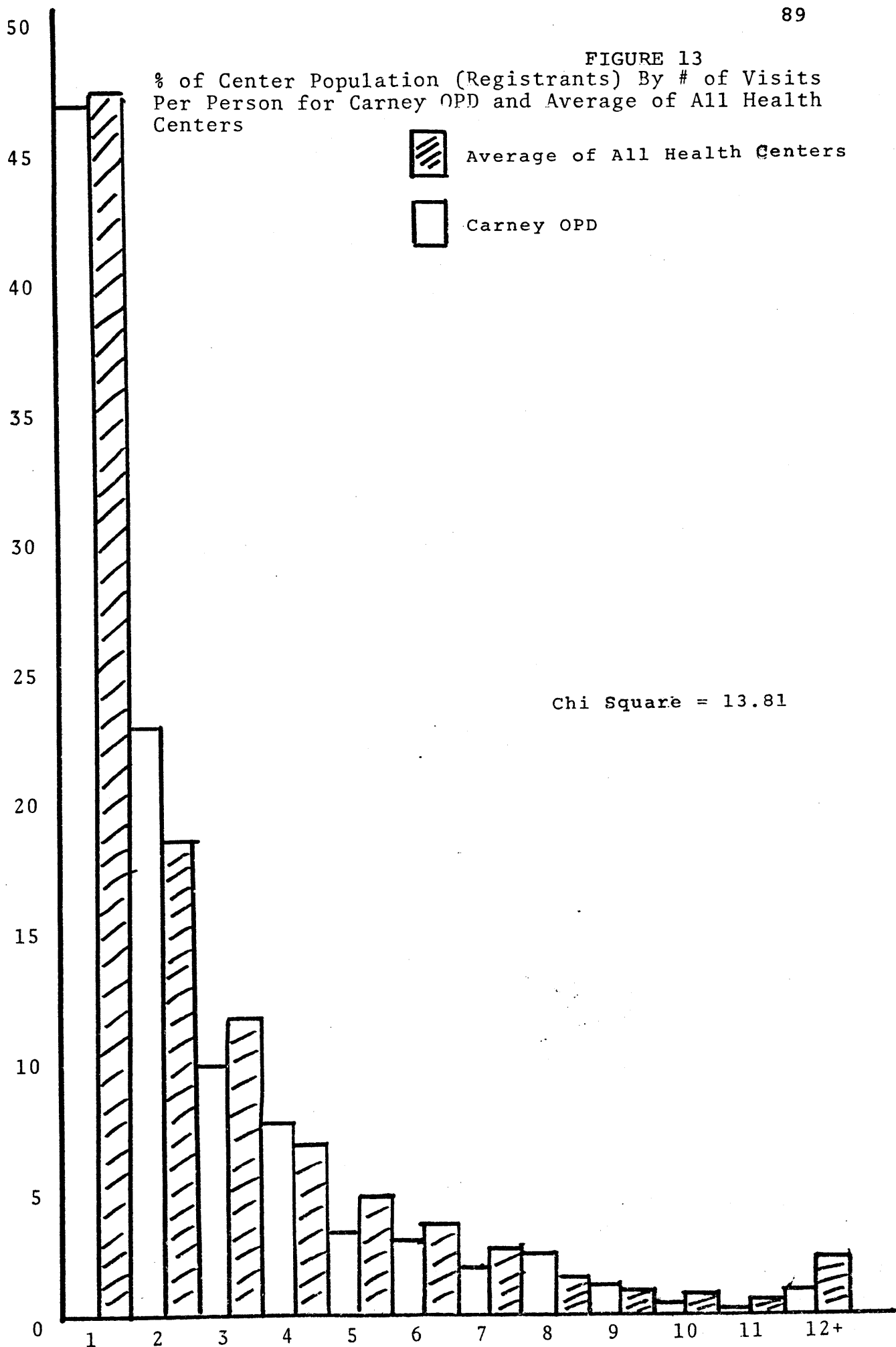
Visits per pt.	Carney* OPD	Bowdoin* Street	Littlehouse+ -	Neponset* -	Average of Health Centers
1	298	325	909	61	432
%	46.78	46.90	51.00	23.37	47.42
2	146	124	330	49	168
%	22.92	17.89	19.00	18.77	18.44
3	63	71	185	31	96
%	9.89	10.25	10.40	11.88	10.54
4	48	46	114	23	61
%	7.54	6.64	6.40	8.81	6.70
5	21	37	61	27	42
%	3.30	5.34	3.4	10.34	4.61
6	19	28	49	19	32
%	2.98	4.04	2.80	7.30	3.51
7	12	19	41	9	23
%	1.88	2.74	2.30	3.40	2.52
8	13	6	28	9	14
%	2.04	.86	1.60	3.40	1.54
9	7	10	15	2	9
%	1.10	1.44	.80	.77	.99
10	3	8	11	5	8
%	.47	1.15	.60	.19	.88
11	1	5	6	5	5
%	.16	.72	.30	.19	.55
12+	6	12	31	20	21
%	.94	1.73	1.74	7.66	2.31

*Systematic samples of populations; 3%, 38% and 12% respectively

+Entire population

	Carney OPD	Bowdoin Street	Littlehouse	Neponset
Sample Size	637	693	-	262
Standard Error	.0198	.0190	-	.0309
Source of Sample	Ledger Cards	Encounter Forms	-	Ledger Cards
Average # of visits	2.47	2.77	2.50	4.61

FIGURE 13
 % of Center Population (Registrants) By # of Visits
 Per Person for Carney OPD and Average of All Health
 Centers



Street are compared to those of a center of approximately the same size and age the visit rates are found to be similar.³⁶ These rates are presented below.

No. of Visits	No. of Patients	% of Total (patients)	Total Visits	% of Total (visits)
1	443	60.27	443	31.5
2	146	19.86	292	20.7
3	60	8.16	180	12.8
4	35	4.74	140	9.9
5	16	2.18	80	5.7
6	20	2.72	120	8.5
7	6	.82	42	3.0
8	4	.54	32	2.3
9	2	.27	18	1.3
10	2	.27	20	1.4
11	2	.27	22	1.6
19	1	.14	19	1.3

Strauss and Sparer conducted a study of eight comprehensive health centers receiving OEO grants and reported an average of 6.8 encounters per year for center users.³⁷ These findings suggest that the differences between Neponset, Littlehouse, Bowdoin Street and the eight OEO centers are a function of the age of the centers. Neponset has been in existence two to three years longer than any of the other centers, and the centers reported by Strauss and Sparer serve much larger populations and have been in existence two to three years longer than Neponset. With age the size of the center increases in terms of service hours, and type of services offered and in many cases the physical capacity.

The low utilization rate at the outpatient department is attributed to the large volume of specialty services that they deliver. Sixty-three percent of the patients seen in the department are treated in specialty services and clinics, usually requiring only one or two consultations.

The referral data show that very few of the patients coming into the health centers are referred to any other institution. If the probability of a patient being referred to a back-up facility is reasonably low, then the interposition of neighborhood health centers between more sophisticated forms of treatment - the emergency room and the specialties and sub-specialties of the outpatient department - is the more cost - efficient route for the patient. Table 7 gives the number and percent of referrals for the pediatric populations of Avenue, Bowdoin Street and Littlehouse for October 1973 to September 1974. The pediatric referrals include referrals to E.N.T. , minor surgery, pediatric orthopedics, x-ray, dietary, hospitalization, dermatology, podiatry, dentistry, neurology, general surgery, refraction, eye, and social services. Table 8 shows the breakdown of referrals among these services.

TABLE 7

Pediatric Referral Rates for Avenue, Littlehouse and Bowdoin Street

	# of Pediatric visits ending in Referrals	% of Pediatric visits ending in Referrals
Avenue	2	.20*
Bowdoin Street	24	.76
Littlehouse	27	1.34

*For six month period only

TABLE 8

Percent of all Pediatric Referrals to each Medical Destination

Destination	# of Referrals Per Destination	% of Referrals Per Destination
E.N.T.	6	11.32
Minor Surgery	3	5.66
Pediatric Orthopedics	6	11.32
X-ray	5	9.43
Dietary	7	13.21
Hematology	1	1.89
Hospitalization		
Carney	4	7.55
Boston City Hospital	1	1.89
Dermatology	6	11.32
Podiatry	2	3.77
Dentistry	3	5.66
Neurology	1	1.89
General Surgery	4	7.55
Refraction	1	1.89
Eye	2	3.77
Social Services	1	1.89
TOTAL	53	100

Information obtained for period October 1973 to September 1974

The referral patterns for the total population are similar to those for the pediatric populations. These tabulations are presented in Table 9.

Referral Rates of Total Patient Populations for Avenue, Littlehouse, Bowdoin Street and Neponset

	# of Total Visits	# of Referrals	% of Total Visits
Avenue	997	1*	.10
Littlehouse	4,709	57	1.21
Bowdoin Street	4,761	89	1.87
Neponset	10,455	147	1.41

*For six month period only

Other data obtained for period October 1973 to September 1974

These figures are only as accurate as the centers are in reporting the data. The referrals for the total population include the pediatric referrals. No accurate information was available on referrals to facilities other than Carney for the total patient population. Nor was information available on the number of referrals for laboratory and x-ray and other special services. In order to thoroughly assess the cost - efficiencies of the options available to the patient a number of questions would have to be answered. One would need to know the average number of visits per diagnosis at the health centers and the outpatient department. One would also need to know the referral rates for such ser-

vices as x-ray and laboratory. Out of pocket costs such as transportation and direct medical costs for each facility would need to be considered. Attention must also be given to the fact that patients do triage themselves in choosing a facility appropriate to their complaint or injury. This phenomenon could bias the results of any analysis of referral rates in that the more serious cases may bypass the neighborhood health center as a treatment facility.

CHAPTER IV

SUMMARY AND CONCLUSIONS

This paper has presented a model of ambulatory care delivery and proposed three hypotheses concerning its operation. The mode of delivery consisted of a network of small neighborhood health centers providing primary care for their target populations, using an outpatient department as backup. The centers and the outpatient department are related through contractual agreements. This system is seen as providing comprehensive care for the residents of an area. The hypotheses were as follows:

1. A system involving neighborhood health centers of independent and/or satellite licensure, with an outpatient department providing back-up services, serving a given number of people will generate a lower cost than a system serving the same number of people without the health centers.
2. The system as described above is in a better position than large centralized facilities to convert need into demand, that is , a network of small centers, each located within walking distance of most of its target population will draw more people into the health system.
3. This mode of delivery is better designed for the convenience of the patient in terms of time spent in the system, time getting to the system, and actual dollar costs.

An analysis of the data collected tends to support these hypotheses. In terms of cost, a comparison of a system using small neighborhood health centers with an outpatient department having no health center affiliates reveals that the cost advantage belongs to the system using the small neighborhood health centers. The predicted cost saving was very substantial - \$311,171.80 or \$4.48 per visit per annum.

A patient origin study was conducted to collect data in support of the second hypothesis. The results show that utilization declines with distance, though for those facilities offering specialty services, utilization increased as distance increased for the first 1.5 miles straight line distance or 2.5 miles main road distance. The small centers draw most of their population from locations within one half mile of the center, and the small centers have an advantage over the larger, more specialized outpatient department in converting need to demand. An additional consideration, when looking at these results, is that the centers and to some extent Carney Hospital serve a largely white population. The black population is serviced primarily by two other nearby health centers.

A rather indirect method was taken in dealing with the third hypothesis, because of time and money constraints. Three indicators were used as indirect measures of patient satisfaction with system operation for the

convenience of the patients. Broken appointment rates, the number of visits per patient and the referral rates for the pediatric and total populations were used as indices of system efficiency. Based on sample data it was found that the broken appointment rates experienced by different facilities in the system were well below those reported in the literature for other ambulatory care settings. The results of the utilization data were somewhat ambiguous in that the newness of the centers and the volume of specialty services delivered at Carney interfered with an accurate analysis of the data. There are several possible interpretations of the results: 1. The health status of the population is such that a larger number of visits is not necessary. 2. The multiplicity of social services offered in the larger comprehensive health centers generate different (higher) visit rates, and what the smaller health centers and the outpatient department exhibit is typical of centers offering services of that type and scope. 3. The availability of other sources of medical care - other neighborhood health centers, outpatient departments, and private physicians - in the community disburse the patients' visits for medical and social care. 4. The center has not been in operation long enough to have developed fully in relation to number and types of services offered and subsequently the number of patient visits.

A combination of all of the above alternatives is most likely responsible for the observed findings.

To deal with the ability of a center to deliver services to its target population, the quality of those services or the appropriateness of those services for the population, a list of priorities must be set. This list of priorities involves deciding the value or relative emphasis of medical vs. social services such as employment or housing counseling. The system evaluated in this paper assumes that the first priority is the delivery of health services. In creating and maintaining a low cost option - to patient and provider - the system studied has not provided extensive support in social services. Though the centers are small and provide such social services as they can support, the overall volume of service provided is not high. Patients needing social services are usually referred to existing resources.

In terms of service organization the system does not provide the "one stop" convenience of the large neighborhood health centers. The organization of services assumes that the kinds of services most needed or demanded by the target population are primary in nature - adult medicine, pediatrics, podiatry, OB/GYN, nutrition, screenings, immunization, laboratory services - and that the demand or need for consulting back-up and specialty services is comparatively small.

The above assumptions are not valid for all populations. The health status of the population, the existence or non-existence of multiple sources of treatment, the socioeconomic status of the population, the race and the level of education will combine to affect the kinds of and the extent of services needed and demanded by a particular population. As such, no one system of delivery or organization of services can be advocated over another without extensive reference to the population to be served. Though low - cost options, in the form of the system evaluated in this study, may exist for certain populations, there will be other populations for whom the provision of decentralized primary medical services is not sufficient. These populations require a certain level of service in the social as well as medical areas, and while these services can probably be delivered more efficiently there is a minimal level of expenditure required for their provision.

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