

## AN AUDIT OF THE QUALITY OF CARE IN SOCIAL MEDICINE

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Auditing the quality of medicine in an agency devoted to the comprehensive care of a community of 45,000 people poses questions and difficulties not usually encountered in evaluating the care given by an individual, group or hospital practice. The Neighborhood Medical Care Demonstration is geared to reducing morbidity in an economically depressed area and has relatively meager medical resources to apply to the task. Program policy establishes that the agency will attempt to effect changes in the social, cultural, economic, environmental and emotional as well as the traditional health patterns of community life as the key to elevating the population's health status. The medical audit established by the Neighborhood Medical Care Demonstration will seek to evaluate the quality of activity in all those areas as well as many of the audit measures more normally undertaken, such as those reviewed by Donabedian<sup>1</sup> and Shapiro.<sup>2</sup> In short, the medical evaluation attempts to view function and dysfunction of the operation as related to its stated goal and to serve as an in-service education tool.

The broad operational goals of the Neighborhood Medical Care Demonstration may be summarized as high-quality, comprehensive, continuous care delivered by a medical team<sup>3</sup> with an orientation to the patient as he lives in a household and community milieu. This care must be rendered in a manner acceptable to the family. Among

the secondary objectives are: to demonstrate new, economically feasible, and replicable means of delivering medical care; to insure the community involvement in shaping the medical services; to stress health education and preventive medicine; to demonstrate that community residents can be trained to function on a high level in traditional and innovative professional and subprofessional roles, and to develop the community's resources to facilitate a reduction in morbidity.

It is convenient to divide an audit of "social" medicine into four gross areas:

1. Input, or the existing health level of the community and the subcultural attitudes toward health and folk-patterns of seeking professional and informal medical care.
2. Treatment process, or evaluating the quality of care rendered by each medical team, each professional and subprofessional.
3. Output, or end results of the treatment process.
4. The interrelations of input, treatment and output to help point out possible means to more efficient use of input and treatment to achieve maximum output.

The medical audit is conducted by medical staff (a rotating audit committee comprised of a member of each professional specialty, a pediatrician, an obstetrician-gynecologist and an internist, plus a public health nurse and a family health worker with permanent positions held by the project director, the chief of medical services, the administrator, the research director and a physician-consultant to program) and an independent audit team provided by the Office of Economic Opportunity. Additional information is provided by an ethnographic and sociologic study of the community conducted by the research department; and a statistical audit based on medical records.<sup>4</sup> Each of these activities plays a role in evaluating the quality of care rendered in the four areas of social medicine and in elevating standards and performance of care. The activities are as yet limited, being newly born. This paper details the areas as they are planned to function and some of the prototypes of information possible.

It is not necessary nor is it possible except at great expense to conduct all aspects of a social medicine audit simultaneously. The auditors may concentrate on studies of the input, the treatment process or the output as they choose, or as circumstances dictate. A community's input, for example, will remain relatively constant except as the community itself changes as a result of the passage of time or, hopefully, as a result of the agency's efforts to change it. This relative stability enables one to view an audit in theory as a series of still pictures taken over a period of time and viewed as if they were exposed at the same instant.

The Neighborhood Medical Care Demonstration audit is presently concentrating on statistical views of the treatment process and is tooling up for ethnographic studies of input and output. A great deal is yet to be done in these areas; very little as yet has been done by the staff in interrelating the data obtained to date.

## INPUT

By and large, medicine has traditionally played a passive role in providing care; that is, the patient almost always initiates the contact with the provider of care. Indeed, medical ethics frowns at practitioners who "case-find." A few exceptions to this rule apply in public health practice, which traces venereal disease and tuberculosis contacts and implements large-scale immunization programs, but never for a direct fee.

An attempt to reduce community-wide morbidity demands large-scale case-finding techniques. That segment of the population that avoids professional medical outlets through fear, apathy, ignorance or a preference for folk medical care systems may well be the group most in need of medical care. Certainly this group contributes heavily to pathology such as perinatal mortality, infant mortality, retardation, birth defects, lead poisoning, cervical carcinoma, glaucoma, and so on.

The Neighborhood Medical Care Demonstration must be interested in answers to questions such as: When do given groups feel they are sick? When they do, what do they do for various illnesses

—who relies on home remedies? Which people make use of neighbors or pharmacists for medical advice? What factors predispose various sectors of the community to use specific medical providers? How can these patterns be changed to achieve maximum input to the agency?

On the other side of the coin, when do subgroups of people feel they are well when they are in fact ill? Which people refuse to present themselves for care even when they suspect or know they are ill, and why? How may health education, preventive medicine and community development be implemented with the least resultant social strain and culture shock?

The Neighborhood Medical Care Demonstration is currently undertaking two basic interrelated research activities to provide data such as the above to the medical audit:

1. A total census of the population, which provides demographic and basic medical data on the tenement population<sup>5</sup> of 7,300 households. Sixty per cent of these households have been surveyed at an average cost of \$1.50 each by using specially trained and supervised community residents. The technique appears economically feasible for community health projects. The data, including the name and address, are now being processed.

Medical diagnoses of the patient population are also being computerized and will be correlated with demographic factors, which should provide predictors of various pathological conditions. The stored demographic data on the censused population not presenting at the center will elicit the specific names and addresses of those individuals likely to have similar pathology.<sup>6</sup>

2. A community ethnography. In the view of the staff, the questions posed in analysis of “input” are not answerable by sociological methods alone. It is felt that traditional anthropological participant-observer techniques must be used to complement and broaden the insights provided by self-report surveys.

An ethnographic survey is being directed by an anthropologist and will be expanded to encompass four apartment buildings,<sup>7</sup> chosen because they are representative of the community as determined by statistics supplied by the census. This systematic ethnography, based on trained, direct observation will, hopefully, provide many answers to the riddle of input.

#### THE TREATMENT PROCESS

Measuring the quality of care given by the Neighborhood Medical Care Demonstration requires a somewhat broader view than is normally provided by estimating the thoroughness and accuracy of a physical examination, laboratory and x-ray work, diagnosis and treatment and medical end-result. This is because the agency is concerned with the social milieu of the patient, and, as a result, various diagnoses and treatments not usual to the practice of medicine will be undertaken by team members. Furthermore, team practice itself must be evaluated: Do the team members communicate well? Is care well coordinated? Is continuity of care achieved?<sup>8</sup> Does the patient find it acceptable? Also (since part of the function of each team is to supervise and educate nurse-practitioners and family health workers) what is the quality of in-service education and supervision?

In this and the following evaluative areas it is useful to contrast a team to another team, one specialist to a like specialist, public health nurse practitioner to her colleagues and family health worker to her peers to mitigate differences among the various specialized practitioners.<sup>9</sup>

For comprehensive care, is the patient followed by Medical Center personnel through all phases of treatment? If not, what communication exists with referral sources?<sup>10</sup> Are all the possible medical resources available and used when appropriate? Are x-ray and laboratory facilities convenient, adequate and properly used? Must the patient wade through a maze of appointments or travel to obtain complete service?

In evaluating continuity, are reappointments scheduled as necessary? What is the difference in broken appointments between teams and between like specialists, nurses, family health workers? As with broken appointments, what is the rate of walk-in presentations expressed as percentage of total patient load?

In evaluating household and community orientation, in what percentage of each team's case-load has each resident of the household been examined at the center? Which households have not presented totally? Are these variations correlated with such factors as ethnicity, geographic area, income, educational level, tenure of residence, area of origin and so on? Can one depict those people not presenting by age, sex, household status, employment status and so on?

High-quality medical care evaluation is concerned with more traditional areas such as appropriateness of diagnosis to laboratory and x-ray orders and findings, relationship of diagnoses and prescriptions, completeness of physical examination and recording notations, eliciting in-depth medical and social histories and tissue studies. In addition, such areas as cervical smears, completed immunization series, electrocardiograms, chest x-rays, urinalyses, parasite screenings, and hematocrit determinations are viewed comparatively.

In evaluating social treatment, one must examine those activities of the agency that are designed to influence clients' income, school dropout rates, narcotics and alcohol usage, crime and juvenile delinquency, unemployment, crowding, welfare payments and allowances, household conditions and educational advancement.

The treatment process is viewed by:

1. A medical audit committee, which reviews techniques and establishes goals and medical and social procedure guidelines. The review proceeds from selected case records. A physician consultant will, in addition, observe each practitioner to evaluate treatment technique.
2. A statistical audit conducted from medical case records. The statistical audit has the capacity to generate comparative fig-

ures in the above-mentioned areas. It can be used, in addition, to select specific case records that appear to be “irregular.”

3. An independent audit group from the Office of Economic Opportunity and an evaluative team, which view many of these indices both in Washington and on-site.
4. The weekly team conference, which is used not only to solve problems identified in specific households, but also to review, coordinate and criticize the various regimens in effect and to suggest areas of activity that may have been overlooked. It serves, in addition, to broaden the team’s view of problem identification. It is an important audit and inservice education tool.

## OUTPUT

This type of evaluation will serve primarily to focus on questions such as: Is a recommended regimen (diet, exercise, medication routine, child-care, social procedure and home nursing care) being followed, and if not, why? What was the patient’s view of his treatment? Did he feel he was handled courteously and efficiently? Was he able to present all his questions, fears, misgivings and ailments? Did he feel uncomfortable at any stage? Was he dissatisfied with the treatments rendered?<sup>11</sup> Did he want or get a return appointment, and if so, will he keep it? What did he learn about preventive medicine as it may apply to his household and how will he implement this knowledge? Which persons on his team does he relate to best, respect most, in which ways? If he received a medical referral, does he know why? Does he know how to get to the place of the appointment? Was the appointment scheduled at a convenient time for the patient?

In short, the end result analysis focuses on the patient’s perception of the treatment system, with the assumption that if the patient is dissatisfied, the maximum delivery of the system is reduced.

At present, three primary research tools are envisioned for measuring end result:

1. Family health worker daily home visit reports. These will serve primarily as a check on such technical aspects of the delivery system as compliance with medication dosage or diet schedules, compliance with exercise schedules, improvement in child-care routines and home nursing use. Home visit reports will serve to supply measures for much of the agency effectiveness in the social sphere of activity as well—school conferences, legal resource referral and outcome, changes in income (also being monitored at the center) and job or training referral.
2. Community ethnography. This will include a random selection of the patient population to supply independent measures of the patient's perception of the care rendered at the center, detailed information relative to his understanding of the disease process, preventive medical uses and level of health education.
3. The Community Advisory Council. This body currently receives and processes patient complaints and grievances, presenting them to the Neighborhood Medical Care Demonstration for redress. It is hoped that the council will conduct systematic sample surveys of the patients seen in the agency to present a more inclusive view.

#### INTERRELATIONS OF INPUT, TREATMENT AND END RESULT

This phase of the audit concentrates on inservice education in which the data applicable to a given health condition or set of circumstances are presented to the practitioners for review and adjustment of techniques. For example, it was noted that many Latin American infants presented with diarrhea. Standard treatment was effective, but the cause was unknown. It was discovered that many Latin mothers felt that canned milk was "bad" (i.e., "hot") for the child and they took out the "badness" ("cooled it") by mixing the milk with an additive that had a laxative effect. In this case the pediatricians responded by prescribing whole milk in preference to formula feedings rather than attempting to change the folk pattern that was the input responsible for the pathology.



Another example is that of lead poisoning. Affected children were detoxified and the apartment in which they resided was replastered and painted through the cooperation of the Neighborhood Medical Care Demonstration and other agencies active in the area and concerned with renovation. The audit committee recommended that this treatment be broadened so that all apartments in the deteriorated building be renovated as a more effective primary preventive measure.

Input, treatment and output views are applied by the agency via the medical audit committee, in team conferences and through formal inservice training courses. The agency also projects a formal orientation program for newly hired medical staff, to begin June, 1968. The key to successful use of the audit as an inservice educational tool is that it be presented in the context of a device to raise questions concerning treatment instituted as it relates to the goals of the agency and not viewed as a yardstick to administer rebukes or punishment.

## APPENDIX

### AUDIT OF MEDICAL CENTER

*Month Ending July 31, 1967*

The audit for the month of July contains revised and broadened tabulations. New tabulations depict sex and age of the patients serviced by the Neighborhood Medical Care Demonstration, laboratory requests as a function of professional classification and detailed comparative analyses of the activities in selected areas of the three medical teams.

It will be difficult to broaden and deepen these tabulations in the future without computer availability. Previous audits touched on issues of quality of care only peripherally and contain information much more valuable to the medical administrator than to the individual practitioner. This month's audit begins to touch on some of the issues related to the quality of care being rendered by the agency. It is anticipated that these tabulations will be broadened in the near future with separate detailed tabulations listing each professional by name distributed to medical and administrative staff and the more general classifications distributed publicly.

It will take a considerable amount of time before reporting systems, tabular presentations and case-load "N's" are either effective or sizable enough to lend significant insight into an audit of the quality of care. These interim reports serve only a limited use in this respect. They do, however, serve as useful broad guidelines for administration, and moreover, help to prepare staff for the eventual depth audit.

#### TOTAL PATIENTS

As shown in Table 1, a total of 2,310 patients were treated in the month of July, resulting in 2,375 professional contacts. Of the 2,310 patients, 558 (24 per cent) were treated in the home by family health workers. Physicians or public health nurses treated 1,752 (76 per cent) in the center, public health nurses accounting for 11 per cent (244) of the total.

TABLE I. TOTAL PATIENTS

	Professional Contacts*			Net Patients		
	Month of July		Weekly Average	Month of July		Weekly Average
	N	%	N	%	N	%
Physicians, center	1,416	59	354	63	1,416	61
Public health nurses, center	293	12	73	12	244	11
Undetermined, center	92	4	23	5	92	4
Family health worker, group 1						
Home	466	20	116	20	466	20
Center	16	1	4			
Family health worker, group 2						
Home	92	4	92**		92	4
Center						
<b>Total</b>	<b>2,375</b>	<b>100</b>	<b>570</b>	<b>100</b>	<b>2,310</b>	<b>100</b>
					<b>554</b>	<b>21</b>

\* In team medical practice, patients may be exposed to more than one professional in the course of a single visit (for example, he may be treated or examined by a physician, public health nurse or family health worker). The multiple exposure is reflected in "Professional Contacts." "Net Patients" demonstrates total visits to the center or total visits to the home regardless of the number of professionals involved.

\*\* The 92 patients seen by the new family health workers represents one week's work; therefore, this figure is not included in weekly averages (derived using monthly total as base).

TABLE IA. TOTAL PATIENTS MONTHLY

	<i>Professional Contacts Through July 31</i>		<i>Professional Contacts, July</i>		<i>Professional Contacts, June</i>		<i>July Increase</i>
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	
Physicians, center	2,305	64	1,416	59	889	73	+527
Public health nurses, center	352	10	293	12	59	5	+234
Undetermined, center	113	3	92	4	21	2	+71
Family health workers group 1							
Home	711	20	466	20	245	20	+221
Center	18	1	16	1	2		+14
Family health workers group 2							
Home	92	2	92	4			+92
Center							
Total	3,591	100	2,375	100	1,216	100	+1,159

The mean weekly net patient load totaled 554 excluding the 92 patients seen by the second group of family health workers, who were assigned to duty only on the last five working days of the month. Projecting these 92 extra patients as an average for the month of August, indicates a 17 per cent increase in mean weekly net patient contacts even should this group of family health workers not increase in efficiency and no other category of professionals increase contacts.

TOTAL PATIENTS MONTHLY

Table 1A depicts activity of the professionals for June and July.

The Neighborhood Medical Care Demonstration had 3,591 professional contacts in the first two months of operation, 64 per cent of which were physicians, ten per cent public health nurses, 23 per cent family health workers and three per cent undetermined. In July, 1,159 more professional contacts were made than in June, an increase of almost 100 per cent.

Each group of professionals shared in this July increase, with the public health nurses showing the most marked rise in professional contacts (from 59 in June, to 293 in July, almost 500 per cent). Much of this startling increase in activity is due to increased understanding of the use of disposition sheets and is therefore illusory. Although the public health nurses did see more patients in July than in June, even aside from inconsistencies in reporting from one month to the next, the absolute magnitude of the increase is impossible to

determine. It is interesting to note that no nurse reported making a home visit during this two-month period. Perhaps they made none. Also, no physician reported making a home visit.

Physicians accounted for 64 per cent (2,305 of 3,591) of cumulative professional contacts, public health nurses for ten per cent (352) and family health workers for 23 per cent (821). The proportion of patient contacts for the latter two categories will probably increase in succeeding months owing to the addition of six family health workers and more complete reporting by the public health nurses.

Daily center visits in July averaged 87.6—an increase of 38 (76 per cent) over June. July daily family health worker home visits averaged 27.2—an increase of 14 (106 per cent) compared to June. On the basis of a projected visiting capacity at the center of 150 per day, the facility was operating at 59 per cent of capacity for July.

The Neighborhood Medical Care Demonstration has registered approximately 1,400 families to date and will continue to add roughly 75 families per month in the course of treating new postpartum and prenatal patients. Only an estimated one-third (500) of the registered households have used the services to date. The onset of fall, with a normally higher incidence of illness than the summer months, may well find the Bathgate center operating at total capacity. It thus appears that the original estimate of being able to serve 1,500 families was in error because it failed to appreciate that families aggressive enough to register would also be significantly higher users than the average household. This should be noted by other medical projects.

TABLE 2. PATIENTS BY SPECIALTY OF PRACTICE

	<i>Professional Contacts</i>			<i>Net Patients</i>		
	<i>July</i>	<i>Weekly</i>		<i>July</i>	<i>Weekly</i>	
	<i>Total</i>	<i>Average</i>		<i>Total</i>	<i>Average</i>	
	<i>N</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>N</i>	<i>%</i>
Internist	368	92	21	368	92	21
Obstetrician	100	25	6	100	25	6
Pediatrician	671	167	37	671	167	39
Triage	277	69	15	277	69	16
Public health nurse	283	71	16	244	59	13
Undetermined	92	23	5	92	23	5
Subtotal	1,801	447	100	1,752	435	100
Family health worker	482	117	84	466	113	83
Family health worker, new group	92	23	16	92	23	17
Subtotal	574	140	100	558	136	100
Total	2,375	587		2,310	571	

## PATIENTS BY SPECIALTY OF PRACTICE

Internists accounted for 21 per cent (368) of the 1,752 net patient center visits, pediatricians for 39 per cent (671), triage for 16 per cent (277) and obstetricians-gynecologists for only six per cent (100). Public health nurses accounted for 13 per cent (244) and five per cent (92) were undetermined (no professional's name appeared on the disposition sheet) (Table 2).

The first groups of eight family health workers averaged 14.13 home patient contacts in July (113 per week); the second group of six family health workers averaged 15.33 in their first week of practice (92 total for the last week in July), or a somewhat more efficient rating. It might be argued that four of the six new workers were assigned to a new team with a backlog of patients waiting for home visits and this might have yielded the extra efficiency. However, this does not take into account the fact that policy changes required that all families receive home visits by family health workers.<sup>12</sup>

Further analysis of family health worker activity reveals that Negro workers continue to contact more patients than do Latin American workers—64.6 per month compared to 57.6, respectively. It is no longer possible to account for this disparity in terms of the use of Latin American family health workers as translators since the Neighborhood Medical Care Demonstration employed people (in combined roles as medical assistants, medical records clerks and so on) for this role during July. Contributing factors are unclear.

The two family health workers who have contacted the most patients consistently to date work with one of the nurses on Team B. Further analysis of family health worker activity by team indicates that the four workers on Team B rank 1, 2, 3 and 5. Clearly that team uses its workers more efficiently as a function of total patient contacts than does Team A.

Comparison of "Professional Contacts" and "Net Patients" totals reveals that public health nurses reported seeing 49 center patients with a physician (the difference between 293 and 244). This figure would be expected to be considerably higher since public health nurses are in pediatric inservice training and should not, at this point, be seeing many children without physician contacts also.

## PATIENT CONTACT

As shown in Table 2A, of 1,752 center visits, only 38 per cent (666) were male patients and 62 per cent were females—clearly the center was attracting females to a considerably greater degree. Furthermore, one-half of the male patient total (335) was seen by pediatricians, compared to 31 per cent (336) of the female patients. Thus, the bulk of male patients seen were children. Further analysis of age groupings by sex will be undertaken in Table 2C.

TABLE 2A. TOTAL PATIENT CONTACTS BY PROFESSIONAL AND BY SEX

			<i>Net Patients for Month of July</i>			
	<i>N</i>	<i>%</i>	<i>Male</i>		<i>Female</i>	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
Internist	368	21	118	18	250	23
Obstetrician	100	6	7	1	93	9
Pediatrician	671	38	335	50	336	31
Triage	277	16	100	15	177	16
Public health nurse	244	14	65	10	179	16
Undetermined	92	5	41	6	51	5
Subtotal	1,752	100	666 (38%)	100	1,086 (62%)	100
Family health workers	466	84	164	82	302	84
Family health workers, new group	92	16	35	18	57	16
Subtotal	558	100	199 (36%)	100	359 (64%)	100
Total	2,310		865 (38%)		1,445 (62%)	

TABLE 2B. PATIENTS BY AGE GROUPING

<i>Age Categories</i>	<i>Center</i>		<i>Home Visits</i>		<i>Total Center and Home</i>		<i>Per-centage of Total</i>
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	
Less than 6 years	421	28	88	19	509		26
6-10	271	18	73	15	344		17
11-15	98	6	38	8	136		7
16-20	66	4	44	9	110		6
21-40	395	27	146	31	541		27
41-60	145	10	40	8	185		9
61-80	74	5	38	8	112		6
81-100	23	2	7	2	30		2
Mean age	22		25		22		
Total ages known	1,493	85	474	85	1,967	85	100
Total ages unknown	259	15	84	15	343	15	
Total patients	1,752	100	558	100	2,310	100	

Similar disparities between males and females contacted in the home are reflected in family health worker statistics. Of the total home contacts, 64 per cent (359 of 558) of the patients were female.

This selectivity by sex poses a real problem to an agency undertaking total community care. It would appear that sizable fragments of the community's male population are being overlooked in the course of giving household care.

#### PATIENTS BY AGE GROUPING

The mean age of the patient visiting the center is 22, contrasted to 25 years of age for patients visited in the home, as shown in Table 2B. Family health workers contact an older population group than the group that visits the center. Thus, patients 61 years of age and older account for seven per cent of center visits, compared to ten per cent of family health worker home contacts. Family health workers also contact proportionately more patients in the 16 to 40 year group than come to the center (40 per cent compared to 31 per cent).

Of the total population contacted in the center or in the home, 15 per cent have not had their ages noted on the disposition sheets. Presumably, these patients are distributed equally through the various age categories. The center began to use an addressograph card system in August, which lists the patient's birth date. The August audit, therefore, should reflect a substantial decrease in the "undetermined" category.

#### PATIENT AGE AND SEX, BY PROFESSIONAL

Table 2C demonstrates that the selectivity by virtue of sex, demonstrated earlier in Table 2B, is also related to age. The population under 15 years of age accounted for 55 per cent (810 of 1,485) of the total net patient visits to the center. Females constituted 53 per cent (429) of the patients under 15 years of age and 79 per cent (533 of 675) of patients over 15 years of age. A total of 343 patients were of indeterminate age and were not included in tabulations, which accounts for the discrepancy between Table 2C and the preceding tables.

The majority of the population visiting the center is pediatric in nature and the pediatric population shows a slight bias toward females (a six per cent difference). The picture changes significantly when the adult population is viewed as a function of sex. Far fewer male adults pay center visits than do females (a 58 per cent difference).

Family health workers home visit activity shows a different picture: 59 per cent (278 of 472) are adult patients. Family health worker activity in the home reaches proportionately more adults than is reflected in center visit activity (59 per cent compared to 45 per cent). An analysis of the adult



TABLE 2C. BREAKDOWN OF PATIENT AGE AND SEX, BY PROFESSIONAL

	Under 15 Years				Over 15 Years				Total Less Missing Ages
	Male		Female		Male		Female		
	N	%	N	%	N	%	N	%	
Internist	6	1	3		100	44	212	29	321
Obstetrician			3		2	1	83	11	88
Pediatrician	281	60	302	57	2	1			585
Triage	24	5	14	3	19	8	177	24	234
Public health nurse	47	10	86	17	10	4	57	7	200
Undetermined	23	5	21	4	9	4	14	2	67
Subtotal	381 (47%)		429 (53%)		142 (21%)		533 (79%)		1,485 (45%)
Family health worker	75	16	87	16	81	35	164	23	407
Family health worker, new group	16	3	16	3	6	3	27	4	65
Subtotal	91 (47%)		103 (53%)		87 (31%)		191 (69%)		278 (59%)
Total	472 (47%)	100	532 (53%)	1,004	229 (24%)	100	734 (76%)	100	963
Males	701			Females		1,266		Total	1,967
Missing ages	164			Missing ages		179			343
Subtotal	865 (37%)			Subtotal		1,445 (63%)			2,310

population visited at home demonstrates slightly less bias toward females than is the case with center activity. Of patients visited at home, 69 per cent (191 of 278) are female, and the proportion visiting center is 79 per cent female, or ten per cent more females and a corresponding decrease of ten per cent in the male population.

It may be argued that since the center is open only two nights a week, the working male cannot readily visit a physician during the day, and that the bias toward females is a result of this. However, family health workers are in the field only during the day. They do not pay house calls on the Tuesday and Thursday nights when the center is open, yet they contact a higher proportion of adult males. It is clear that family health workers may be used more efficiently than they are at present to attract males to pay physician visits at the center. Even were they to operate at 100 per cent efficiency in this respect, however, considerably higher attendance by female patients would still be demonstrated. Further action in attracting males to the center is necessary.

It is recommended that the Neighborhood Medical Care Demonstration should start to address this problem, at least initially, in two ways: 1. the center should operate more frequently on evenings and weekends to attract the adult working population, and 2. the family health workers (safety permitting) should spend a portion of their hours making evening home visits, and/or work weekends. An ambulatory care facility, as if it were a hospital, may have problems with split or rotating shifts.

#### LABORATORY SERVICE

A total of 2,354 laboratory tests were performed in July, on 524 different patients, an average of 4.49 laboratory tests for each patient who had laboratory work. It is impossible to determine the number of patients who did not receive requisitions until the research department has computer flexibility. (The total number of patients visiting the center, 2,310, is not an unduplicated count. In the future indices will be computed by professional of percent of patients seen who did not receive laboratory work-ups.) The research department monitors laboratory activity from the disposition sheet. Laboratory work cannot be done unless the disposition sheet is checked, since the medical assistant fills out the necessary laboratory requisitions from the disposition sheet. These figures are therefore accurate in all categories except that of Papanicolaou smear, which is done by either the physician or the public health nurse without the need to check the disposition sheet. It is quite probable that the 28 smears shown in July are a significant under-report, since 217 female patients 35 years of age and over were seen in July, and it is medical staff policy to do Papanicolaou smears routinely on every patient in this category (see Table 3).

TABLE 3. LABORATORY SERVICE BY CATEGORY

<i>Type of Service</i>	<i>N</i>	<i>%</i>
Hematocrit	351	15
Leukocyte count	355	15
Differential	341	14
Urinalysis	374	16
Sodium	59	2
Potassium	49	2
Color index (blood)	48	2
Carbon dioxide	48	2
Total protein albumin	27	1
Calcium	35	2
Alkaline phosphatase	35	2
Total bilirubin	12	
Blood urea nitrogen	101	4
Fasting blood sugar	117	5
Serum glutamicoxalacetictransaminase	38	2
Two hours postprandial blood sugar	53	2
Cephalin flocculation	17	1
Thymol	16	1
Uric acid	62	3
Electrocardiogram	61	2
Urine culture	18	1
Serology	109	5
Papanicolaou smear	28	1
Total	2,354	100

TABLE 3A. LABORATORY TESTS\*

	<i>Total Patients</i>	<i>Laboratory Appointments</i>	<i>%**</i>
Internist	368	188	51
Obstetrician	100	16	16
Pediatrician	671	185	27
Triage	277	71	26
Public health nurse	244	45	110
Undetermined	92	19	21
Total	1,752	524	30

\* Includes Papanicolaou smears. Figures indicate number of patients for which at least one test was ordered, but does not indicate total number of tests ordered.

\*\* Percentage shown is based on total patients divided into the number of patients receiving laboratory appointments for each class of professional. It will not total 100 percent reading down.

Of all laboratory procedures performed in July, 60 per cent were in the first four categories listed. Only 61 electrocardiograms were undertaken. It would be expected that two to three times this number would be undertaken as a function of the number of adult patients being treated.

The analysis of laboratory requisitions by professional and by diagnoses should in the future prove to be one of the most rewarding indices of the quality of medical care performed by staff members.

Table 3A demonstrates the percentage of patients seen by each class of professionals in the center for whom at least one laboratory test was requisitioned. The totals may be misleading because the total patient column does not represent an unduplicated count. The variation in percentage distribution may therefore be a result of differences by professional class in revisits rather than a meaningful index of activity in this area.

Physicians scheduled from 16 per cent (Obstetrician) to 51 per cent (internist) of the laboratory appointments as a function of total patients seen. It is difficult to account for this variation solely on the basis of significantly higher revisits for Obstetrics. It seems probable that internists did schedule a higher percentage of their patients for laboratory work-ups than is true of the Obstetrics staff. Further corroboration that this indeed occurred is found below in Table 4, which shows that only 41 per cent of the internists' patient visits were devoted to patients who appeared for the first time at the center, compared to 62 per cent of the Obstetric patient load. On this basis a much higher proportion of obstetric-gynecological laboratory requests would be expected. Sixty per cent of all pediatric patients were first-time presentations and this resulted in only 27 per cent laboratory request rate.

The variation in public health nurses' activity in scheduling laboratory appointments is from eight per cent to 43 per cent. In this case, too, it is doubtful whether a range of such magnitude can be explained solely as a

TABLE 4. TYPE OF PATIENT VISIT (NET)

	<i>Walk-ins Known</i>		<i>Walk-ins First Time</i>		<i>Appoint- ments First Time</i>		<i>Appoint- ments Known</i>		<i>Total</i>	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
Internist	40	11	29	8	122	33	177	48	368	100
Obstetrician	13	13	18	18	44	44	25	25	100	100
Pediatrician	36	6	122	18	283	42	230	34	671	100
Triage	37	13	122	44	56	20	62	23	277	100
Public health nurse	2	3	35	76	148	298	59	123	244	100
Undetermined	30	33	14	15	31	34	17	18	92	100
Total	158	9	340	20	684	39	570	32	1,752	100

function of percentage of first-time patient treatments, since 75 per cent (183 of 244) of the total patients treated by public health nurses at the center (see Table 4) were first-time presentations.

It seems clear that laboratory requests are a function of an individual professional's preferences and exhibit a wide range of variability. It will be interesting to contrast each professional's activity of class of patient (all prenatal, for example) over a period of time since it may be assumed that variation between patients will even out over the course of a long period.

## TYPE OF PATIENT VISIT

Of all patients seen during the month of July, 29 per cent were walk-ins, contrasted to 51 per cent in the month of June. This 22 per cent reduction in walk-in presentations, if maintained, should result in greater continuity of care, as it is easier to maintain continuity on an appointment basis. The most marked reduction occurred for the internists, who treated 51 per cent of the walk-ins in June, compared to only 19 per cent in July. More than half (40 of 69) of the total internists' walk-in presentations were known walk-ins. The internists' caseload of known walk-ins accounted for 25 per cent of all known walk-ins.

Only 25 per cent of the obstetrics-gynecology caseload in July were known appointments. Prenatal and postpartum care generally necessitate repeat visits; as a result, the percentage would be expected to rise. It is unclear whether the low known-appointment presentation percentage is due to a great number of broken appointments or to the relatively low number of patients seen in obstetrics-gynecology through June. Internists and pediatricians together accounted for 71 per cent of all known appointments treated (407 of 570). Of the internists' caseload, 48 per cent were known appointment patients—almost twice that of the obstetrician-gynecologists'.

Known appointments for the public health nurses ranged from 13 per cent to 56 per cent. One public health nurse has been working on a team for a relatively short time, a factor which would account for her low appointment ratio. In the absence of systematically reported broken appointments (a procedure to account for these will be implemented shortly), the percentage of known appointments may be used as an indirect, rough measure of the relative continuity of care being given by each nurse. On this basis, it is clear that a considerable variation exists among public health nurses relative to the degree of attention each places on the continuity of care.

Table 4A demonstrates type of patient visits by team. Team C, formed in late July, accounted for only 22 per cent (300 of 1,383) of the total patient visits to teams at the center, due to their shorter term of operation. (This does not include triage visits and "undetermined" visits.) Team B treated 581

TABLE 4A. TYPE OF PATIENT VISIT (NET) BY TEAMS

	<i>Walk-ins</i> <i>Known</i>		<i>Walk-ins</i> <i>First Time</i>		<i>Appointments</i> <i>First Time</i>		<i>Appointments</i> <i>Known</i>		<i>Total</i>	
	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>	<i>N</i>	<i>%</i>
Triage (not on team)	37	14	122	44	56	20	62	22	277	100
Team A										
Internist	36	17	15	8	61	29	96	46	208	100
Obstetrician	12	34	3	8	8	22	13	36	36	100
Pediatrician	12	6	50	25	80	41	55	28	197	100
Public health nurse			15	25	22	36	24	39	61	100
Total	60	12	83	17	171	34	188	37	502	100
	(66%)		(41%)		(29%)		(38%)		(38%)	
Team B										
Internist	2	2	9	9	36	33	59	56	106	100
Obstetrician	1	3	7	22	18	56	6	19	32	100
Pediatrician	14	5	56	20	120	42	93	33	283	100
Public health nurse	2	1	20	13	106	66	32	20	160	100
Total	19	3	92	16	280	48	190	33	581	100
	(20%)		(45%)		(47%)		(38%)		(42%)	
Team C										
Internist	2	4	5	9	25	46	22	41	54	100
Obstetrician			8	25	18	56	6	19	32	100
Pediatrician	10	5	16	8	83	44	82	43	191	100
Public health nurse			20	87	20	87	3	13	23	100
Total	12	4	29	9	146	49	113	38	300	100
	(14%)		(14%)		(24%)		(24%)		(22%)	
Subtotal	91		204		597		491		1388	
	(100%)		(100%)		(100%)		(100%)		(100%)	
Undetermined	30	33	14	15	31	34	17	18	92	100
Total (including triage & undetermined)	158	9	340	19	684	39	570	33	1752	100

TABLE 4B. HOME VISITS BY FAMILY HEALTH WORKERS, BY TEAM

	<i>N</i>	%
Team A	131	41%
Team B	164	51%
Team C	26	8%
Total	321	100%

TABLE 5. RETURN APPOINTMENTS BY PROFESSIONAL

	<i>Total Patients</i>	<i>Scheduled Return Appointments</i>	
	<i>N</i>	<i>N</i>	%
Internist	368	300	81
Obstetrician	100	84	84
Pediatrician	671	543	80
Triage	277	205	74
Public health nurse	224	197	88
Undetermined	92	20	22
Total	1,752	1,349	76

TABLE 5A. RETURN APPOINTMENTS BY MEDICAL TEAMS

	<i>Total Patients</i>	<i>Scheduled Return Appointments</i>	
	<i>N</i>	<i>N</i>	%
Team A			
Internist	204	170	83
Obstetrician	36	25	69
Pediatrician	197	160	81
Public health nurse	61	43	70
Total	498	398	79
Team B			
Internist	110	87	79
Obstetrician	32	29	90
Pediatrician	283	222	78
Public health nurse	160	136	85
Total	585	474	81
Team C			
Internist	54	43	79
Obstetrician	32	30	93
Pediatrician	191	161	84
Public health nurse	23	18	78
Total	300	252	84
Triage (not on team)	277	205	74
Undetermined	92	20	21
Total	1,752	1,349	76

patients (42 per cent of total) and Team A treated 502 (36 per cent of total). Two classes of professional activity account for this discrepancy: 86 extra pediatric visits and 99 extra public health nurse visits by Team B. Extra Team B public health nurse and pediatric activity lies predominantly in first-time appointment presentations. (Team B pediatricians treated 40 more first-time appointment patients than did those on Team A, and Team B public health nurses treated 84 more first-time appointment patients than did the public health nurses on Team A.) This difference was only partially compensated by 102 extra internist visits undertaken by Team A. (The Team A internist saw almost twice as many patients as the Team B internist, but this was not enough to compensate for the extra public health nurse and pediatric activity of Team B.)

Table 4B demonstrates the total number of home visits by family health workers by team. Family health workers made 321 home visits (resulting in 558 patient contacts, an average of 1.74 per visit); 41 per cent by Team A, 51 per cent by Team B and eight per cent by Team C. Team B family health workers are more active than those of Team A, perhaps because of the extra activity of the other professionals on Team B in the center, as shown in Table 4A above.

#### RETURN APPOINTMENTS BY PROFESSIONAL

Table 5 demonstrates return appointments for center visits for July, 1967. Of the patients seen in the center, 75 per cent (1,349 of 1,752) were given return appointments, an increase of three per cent from June. The internist, the obstetrician-gynecologist and the pediatrician showed no substantial variation among them on the return appointment figures, which ranged from 80 to 84 per cent. Obstetric-gynecology appointments dropped seven per cent from the previous month, pediatric appointments increased five per cent and the internists' increased nine per cent. The triage remained constant.

Public health nurses as a group scheduled an average of 81 per cent return appointments. The July average was this high primarily because the nurse who saw the majority of the patients seen by this group, scheduled 87 per cent of her patients for return visits.

#### RETURN APPOINTMENTS BY TEAM

Table 5A demonstrates scheduled return appointments by team. Team C scheduled 84 per cent of its patients to return, compared to 81 per cent for Team B and 79 per cent for Team A. The most marked variation between different classes of team professionals is shown among obstetricians. The same obstetrician practices on Teams B and C and scheduled 92 per cent of his



patients for return visits, contrasted to 69 per cent of scheduled return appointments for the Team A obstetrician. This may be due to the fact that the Team A obstetrician has been associated with the project for a longer time than has the Team B obstetrician and may have finished his treatment course with a greater percentage of patients.

It is interesting to note that the "undetermined" category resulted in only 21 per cent of the total being scheduled for return appointments—a considerably lower ratio than is to be found in any subclass of professional activity. One suspects that the professional who is too rushed to put his name on a disposition sheet is also too rushed to schedule a return appointment for his patient.

## REFERENCES

<sup>1</sup> Donabedian, A., Evaluating the Quality of Medical Care, *Milbank Memorial Fund Quarterly*, 44, 166–206, July, 1966, Part 2.

<sup>2</sup> Shapiro, S., End Result Measurements of Quality of Medical Care, *Milbank Memorial Fund Quarterly*, 45, 7–30, April, 1967.

<sup>3</sup> Comprising an internist, a pediatrician, a public health nurse practitioner and a family health worker.

<sup>4</sup> See Appendix for example of the statistical audit.

<sup>5</sup> Claremont Village is a government-funded housing project in which 16,700 people live. Data comparable to the census information are stored in housing project source documents.

<sup>6</sup> This type of pin-pointed statistical case-finding may well be innovative. Even should the theory not prove itself in practice, the cost and effort of the census has been justified since it was used as a community development tool to describe the agency. Also, it proved valuable in attracting applicants to the training program, forms a part of the medical record and is, in addition, useful in facilitating registration.

<sup>7</sup> The building has been chosen as it is felt to represent the smallest-scale social unit that can provide information concerning factors such as mobility patterns, personal interaction, family composition, attitudes toward health, and so on, which can be generalized to the total population, and the building is preeminently a convenient size for anthropological techniques of investigation. The Neighborhood Medical Care Demonstration will test whether this synthesis of sociological sampling and anthropology is effective in facilitating anthropological research in an urban area.

<sup>8</sup> This is no small issue in team practice. It is difficult to schedule entire households for appointments with the same team members. Moreover, the various professional specialties sometimes "pick-up" patients from each other, thereby disrupting the course of a regimen.

<sup>9</sup> This also enables one to draw a conservative baseline for a rough evaluation of the impact of the agency since it may be assumed that the lowest team rating in many of the following areas is representative of the condition of the service community had the agency not interceded at all. The net increases shown by all teams above that mark indicate the impact of the program on the patient community. This assumes, of course, that the patient population is not selectively distributed by given teams.

<sup>10</sup> The desirability in the use of outside medical resources and continuity is graded on the following descending scale: 1. Patient followed directly by team member. Good communication with team. 2. Patient not followed by team member, but good team communication exists with referral source. 3. Patient followed by team member. Poor team communication. 4. Patient not followed by team member. Poor communication exists between team and referral source.

<sup>11</sup> It is not unheard of for a patient to present at an agency with a sore throat, be diagnosed by a highly competent physician as presenting an interesting or life-threatening syndrome and never receive treatment for his presenting complaint. The probability that the patient will never return is much higher than if his sore throat had been treated as well.

<sup>12</sup> Prior to this, only prenatal and postpartum patients and families with observed social or medical problems received home visits. The rationale was that the Neighborhood Medical Care Demonstration necessarily must invest its slender resources where they would obtain the highest yield. These families were felt to represent households that would obtain maximum benefit from home visits because the majority had many children. Another benefit of the family health worker home visits to these households was the possibility of reducing infant mortality. It was observed, however, that the family health workers had almost no chance to use their home nursing skills while servicing these types of households.