
Impact of Community Health Centers and Medicaid on the Use of Health Services

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INCREASINGLY, HEALTH PROFESSIONALS are concerned with problems of access to health care, the effects of unequal access on the use of health services, and higher levels of illness among the poor than the nonpoor. In recent years, two major public health programs addressed the lack of access to care among the poor: (a) financing health care through Medicaid and (b) organizing community health centers (CHCs) in areas where low-income people live. Recent studies (1-3) of urban dwellers' health and health care indicate gradually diminishing income differentials in the use of health services. Some reductions have been attributed to these public programs. There is still a dearth of empirical information about the impact of the public programs aimed at improving health care for the urban poor; the subject remains largely unexplored.

Davis and Schoen carried out a comprehensive review of CHC and Medicaid programs in the United States (4). Our study is concerned with the effect of CHC and Medicaid programs on health services use as these programs function in small geographic areas. (In this report, Medicaid data were not consistently treated separately from the Medicare data.) The CHC model that provides comprehensive primary care has been evaluated at a number of sites, but there is as yet no conclusive evidence showing that CHCs are efficient

health care providers. Data sources for most CHC studies on utilization have been confined to the centers' records; this limitation can result in problems of inaccurate denominators and the exclusion of the health services obtained outside the CHC that may have been used.

Our purpose was to determine the effects of CHCs on health services' use. The areas to be explored were changes in access to care and changes in health services' use in terms of physician visits, hospitalization, and dental visits. A before and after design, with data collected by baseline and followup surveys, was the method chosen for this evaluation. Since public financing of health care for the poor through Medicaid was developed about the same time as the community health centers, the potential effect of Medicaid on utilization required the evaluation of this program as well.

Source of Data

To evaluate community health centers, baseline surveys were conducted in 10 urban and 2 rural areas. Five areas were selected for followup on the bases of the percentage of the service area's population that was enrolled at the CHCs and the centers' geographic locations. The service areas of the CHCs consisted of a number of contiguous census tracts. The baseline surveys were conducted before the organization of CHCs in 1968-71 and the followup surveys were conducted 4 to 7 years afterwards in 1975, an interval that allowed time to overcome startup problems.

The five areas studied were Southside Atlanta, Ga.; Peninsula Charleston, S.C.; Roxbury in Boston, Mass.; Wayne Miner in Kansas City, Mo.; and East Palo Alto, Calif. Selected population characteristics of these areas are presented in table 1.

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Table 1. Percentage of the population that was poor, black, and had Medicaid coverage, baseline and followup surveys

Area	Percent ¹ poor	Percent black	Percent with Medicaid coverage
Roxbury, Boston, Mass.:			
Baseline	40	74	35
Followup ..	44	77	56
Peninsula Charleston, S.C.:			
Baseline	38	74	4
Followup	45	76	19
Southside Atlanta, Ga.:			
Baseline	36	89	9
Followup	51	78	49
Wayne Miner, Kansas City, Mo.:			
Baseline	24	27	18
Followup	26	17	20
East Palo Alto, Calif.:			
Baseline	10	71	12
Followup	19	68	29
Total:			
Baseline	30	67	16
Followup	40	64	37

¹ Based on the assumption that the proportions poor and nonpoor among persons with incomes not-stated are the same as for persons with reported income.

Households were selected using a standard area probability sampling technique. Details on dates, sample, and population size for both the baseline and followup surveys are presented in table 2. The enlarged service area for the Atlanta CHC more than doubled

its population between the baseline and followup surveys. All measures in this report are based on sample data; since the sample was selected to be self-weighting, these measures can be generalized to the total population in the survey areas.

The poverty level was determined by the national poverty guidelines. The income category poor includes persons in nonfarm families who would be classified by the national poverty guidelines as poor, taking into account size of family (5). For example, an urban family of four with an income of \$5,435 or less was classified as poor in the followup survey of 1975. The 1974 national poverty threshold was multiplied by the provisional January–August 1975 consumer price index factor. (The sex of household head was not taken into account in the classification scheme used in the follow-up surveys.)

Two health status indicators were used in this report: chronic limitation and illness episodes. Chronic limitation refers to conditions which affect performance of usual activity (work, school, or play) and last more than 3 months. Illness episodes are occurrences which keep a person from usual activity at least 2 consecutive days because of illness or accident. Usual source of care is the place where one usually visits a physician for health care. These are classified as private physician, hospital outpatient department or emergency room, community health center, or other (clinic at work or public health clinic). Health insurance coverage relates to third-party payment for health care—private health

Table 2. Total population, number of households and persons interviewed, interview completion rate, and percent of population not reporting income, baseline and followup surveys

Area	Estimated total population	Household interviews completed		Persons in interviewed households	Percent of population not reporting income
		Number	Percent		
Roxbury, Boston, Mass.:					
Baseline, 1971	32,000	1,418	83	5,022	8
Followup, 1975	40,000	1,441	76	4,316	26
Peninsula Charleston, S.C.:					
Baseline, 1969	42,000	1,441	91	4,483	12
Followup, 1975	37,000	1,524	80	4,253	29
Southside Atlanta, Ga.: ¹					
Baseline, 1968	28,000	1,075	92	4,164	1
Followup, 1975	59,000	1,745	92	5,160	15
Wayne Miner, Kansas City, Mo.: ²					
Baseline, 1969–70	4,354	..
Followup, 1975	38,000	1,347	71	3,251	10
East Palo Alto, Calif.:					
Baseline, 1969	23,000	1,503	86	4,731	10
Followup, 1975	20,000	1,538	78	3,869	12

¹ The Atlanta community health center's service area was increased by the time of the followup survey.

² The baseline survey in Kansas City included the Model Cities area, but the followup survey was confined to the Wayne Miner area only.

Baseline figures are not available for the Wayne Miner area alone. All baseline figures for Wayne Miner in other tables exclude data for the Model Cities area.

insurance, publicly financed health programs, Medicaid or Medicare, and no insurance.

The joint effect of several explanatory variables is complex, but it can be summarized by multivariate statistical analysis. Multiple classification analysis (MCA) was performed to determine the relative influence of selected variables on use of physician, hospital, and dental services (6). MCA shows the overall ability of each predictor variable to explain variation in the dependent variable both before and after adjustment for the effects of the other predictors.

Results

Access to care. Persons living in low-income areas are usually at a disadvantage in access to health care. The major health care facility for urban low-income populations has been hospital clinics, long considered an inappropriate source of primary care. Primary health care given at hospital clinics is often fragmented and treatment oriented. Another problem of access in urban low-income areas is the lack of adequate health care facilities; residents often travel long distances to get care.

Evidence is unclear whether type of health care provider affects the frequency of health services' use. Similarly, the relationship between travel time to source of care and frequency of use has not been clearly established. Shorter travel time, however, is an indication of greater access to care, and ambulatory care in private physicians' offices or CHCs is likely to be preferable to care in hospital clinics.

Measures used to observe changes in access attributable to CHC and Medicaid programs were (a) percent of persons reporting hospital clinics as usual source of care and (b) percent of persons traveling 20 or more minutes to usual source of care. A comparison was made of these two access measures between the baseline and followup surveys, and a cross-sectional analysis related changes in access to the CHC and Medicaid programs.

Overall changes in the distribution of the population, expressed in percentages, by usual source of care between the baseline and followup surveys follow.

<i>Usual source of care</i>	<i>Baseline surveys</i>	<i>Followup surveys</i>
Private physician	43	34
Hospital clinic	44	31
Community health center	2	23
Other ¹	2	3
None or not stated	10	9
Total	101	100

¹ Clinic at work or public health clinics. In the baseline surveys, "public clinics" were included with "hospital clinics."

The CHCs were introduced in the survey areas in the late 1960s and, by 1975, 23 percent of the population reported the centers as their usual source of care. The CHCs not only affected the proportion of the population reporting hospital clinics but also the proportion reporting private physicians as their usual source of care; this figure declined for both groups by more than 20 percent between the two survey periods. Most of the reduction in the use of private physicians as the usual source of care, however, did not result from a change from private physicians to CHCs. Data in table 3 represent the last change in source of care made during the 7 years prior to the followup survey. Within this 7-year interval, 36 percent of the population changed the source of care, 42 percent made no change, and the remainder had no previous source of care. The sources of clients for CHCs were primarily hospital clinics and persons who previously had had no source of care. The decline in the proportion of the population using private physicians, therefore, was attributable to the large number of persons in these neighborhoods with no previous source of care in the area (including children born in the past 7 years) who were attracted to CHCs rather than to other sources of care.

There was some improvement between the baseline and followup surveys in the time spent traveling to

Table 3. Distribution of population by current and previous source of care, followup surveys, in percentages

<i>Current source</i>	<i>No change</i> ¹	<i>Previous source</i>				
		<i>Private physician</i>	<i>Hospital clinic</i>	<i>CHC</i>	<i>Other</i>	<i>None</i>
All sources ²	42	12	20	3	1	22
Private physician	49	20	10	3	1	18
Hospital clinic	58	6	7	3	1	25
CHC	9	10	53	3	3	23
Other	37	11	15	2	3	33

¹ Persons who did not change source of care in the past 7 years.

² Excluded persons with no current or not-stated usual source of care,

in-migrants into cities where survey areas were located, and persons who did not report previous source of care.

Table 4. Percentage distribution of the population 0-64 years by usual source of care and health insurance coverage, baseline and followup surveys

<i>Income, race,¹ and insurance coverage</i>	<i>Private physician</i>	<i>Hospital clinics</i>	<i>CHC</i>	<i>Other</i>	<i>None</i>
Baseline surveys					
Poor	21	69	..	2	8
Medicaid	21	72	..	2	5
Private insurance	32	59	..	1	9
No insurance	18	71	..	2	10
Nonpoor	52	37	..	2	10
Medicaid	36	56	..	2	6
Private insurance	65	23	..	1	11
No insurance	36	51	..	2	11
Followup surveys					
Poor	17	39	35	4	5
Medicaid	14	42	38	3	3
Private insurance	41	22	23	8	7
No insurance	14	37	32	6	11
Nonpoor	41	27	19	4	9
Medicaid	18	41	33	4	4
Private insurance	58	18	11	4	9
No insurance	27	32	23	4	14
Black	22	39	31	2	6
Medicaid	14	45	36	3	3
Private insurance	42	28	20	3	7
No insurance	16	39	32	2	11
White	56	18	8	7	11
Medicaid	29	35	21	8	8
Private insurance	72	9	3	6	9
No insurance	35	26	13	9	17

¹ Race by insurance coverage was not tabulated for the baseline surveys.

health care givers. Persons traveling 20 minutes or more to usual source of care decreased from 52 to 42 percent in the combined survey areas, as the following table shows:

<i>Usual source of care</i>	<i>Baseline survey</i>	<i>Followup survey</i>
Private physician	36	41
Hospital clinics	69	55
Community health center	28
Other	43	42
Total	52	42

CHCs may have contributed to the reduction. Travel time among persons reporting CHCs as their usual source of care was far less than that of persons traveling to private physicians and hospital clinics.

One question regarding health care financing which this report on Medicaid may help to answer is: Will there be a reasonable equity in sources of care for the poor when national health insurance becomes operational or will special health care facilities for the poor, such as CHCs, continue to be needed? Medicaid's in-

crease in coverage between the baseline and followup surveys of the low-income population aged 0-64 years in the survey areas was accompanied by a reduction in the proportion of the population without health insurance, as shown in the following data (in percentages):

<i>Population group</i>	<i>Medicaid</i>	<i>Private insurance</i>	<i>No insurance</i>
Baseline surveys ¹	16	44	40
Poor	33	15	52
Nonpoor	10	54	36
Followup surveys ¹	39	37	24
Poor	68	10	22
Nonpoor	25	53	22

¹ Includes those with incomes not stated.

A decrease in the proportion of the population covered by private health insurance was also observed. Medicaid coverage of the population in the survey areas increased from 16 to 39 percent—nearly 2½ times. Persons with private insurance coverage decreased from 44 to 37 percent. Greater financial access to health care for the poor through Medicaid, however, did not have a sig-

Table 5. Average annual physician visits per person by age group, United States, baseline and followup surveys

Area	Total	0-16 years	17-44 years	45-64 years	65 years and older
United States 1969 ¹	4.3	3.6	4.2	4.7	6.1
Baseline surveys	3.6	2.5	4.1	4.8	5.0
Percent difference	-16	-31	-2	2	-18
United States 1975 ¹	5.1	4.2	5.0	5.6	6.6
Followup surveys	4.1	2.7	4.3	5.7	5.9
Percent difference	-20	-36	-14	2	-11

¹ SOURCES: National Center for Health Statistics: "Physician Visits, Volume and Interval Since Last Visit, United States—1969," Vital and Health Statistics, Series 10, No. 75, DHEW Publication No. (HSM) 72-

1066; and "Current Estimates from the Health Interview Survey, United States—1975," Vital and Health Statistics, Series 10, No. 115, DHEW Publication No. (HRA) 77-1543.

nificant effect on existing patterns of separate health care facilities for the poor and blacks (table 4). In general, sources of care for the poor and blacks were hospital clinics and CHCs, while source of care for whites and nonpoor was private physicians. Similarly, persons with Medicaid coverage used primarily hospital clinics and CHCs as source of care, while persons with private insurance obtained care from private physicians. The continued separate health care facilities for poor and blacks under Medicaid implies that these groups in low-income areas will continue to travel long distances to their usual source of care—hospital clinics—even when national health insurance is established. This can be seen in the data from the baseline surveys in table 4; prior to the existence of CHCs, the majority of persons covered by Medicaid reported hospital clinics as usual source of care.

Physician visits. As a result of public support of health care by programs including Medicaid, Medicare, and community health centers (CHCs), it appears that, nationally, some equity in access to health care for the poor has been achieved (7). U.S. statistics show the physician utilization among the poor has surpassed the use rate by the nonpoor. As we know, however, national data often do not accurately reflect local situations and, in fact, they often average out variations across local areas. Numerous pockets of underutilization exist in this country. Greater health problems among the poor have been linked to underutilization of health services, but many families are also poor because of ill health of their members. If health care policymakers regard low use of physicians among the poor as undesirable, then problems of differential use cannot yet be dismissed.

Table 6. Annual physician visits per person by age group, income, and chronic limitation, United States and followup surveys, 1975

Annual family income and chronic limitation	Total	0-16 years	17-44 years	45-64 years	65 years and older
United States¹					
Income less than \$5,000:					
With chronic limitation	9.5	8.9	12.4	10.5	7.9
Without chronic limitation	4.6	4.3	4.8	4.4	5.0
Income \$5,000 or more:					
With chronic limitation	10.7	12.0	10.7	10.8	9.9
Without chronic limitation	4.2	4.0	4.4	4.1	4.7
Followup surveys in 5 areas					
Poor:					
With chronic limitation	9.6	6.4	10.0	11.4	8.1
Without chronic limitation	3.1	2.5	4.0	3.7	3.9
Nonpoor:					
With chronic limitation	9.9	8.7	9.9	13.5	9.1
Without chronic limitation	3.3	2.6	3.8	3.6	4.2

¹ Unpublished data from the 1975 health interview survey, National Center for Health Statistics.

The effect of the two public programs aimed at increasing physician use among the poor was measured by comparing average physician visits before and after the development of CHC and Medicaid programs in the survey areas. Average number of physician visits were compared among persons indicating CHCs, private physician, and hospital clinics as their usual source of care and among persons covered by Medicaid, private health insurance, and no insurance.

The annual physician visit rate for the combined five areas in the baseline period was 3.6 per person, 16 percent below the 1969 national average (table 5). By 1975 this rate was 4.1 for the survey areas compared to 5.1 for the United States, a deficit of 20 percent. Despite the increase in physician utilization between the baseline and followup surveys, the difference in physician visit rates between low-income areas and the national average actually increased. The age-specific rates in table 5 show that the major difference between physician visit rates nationally and the rates in the survey areas was primarily due to low physician utilization for children in these low-income areas.

Illness status is an important variable affecting physician utilization. In the United States, persons with chronic limitation saw a physician twice as often as persons without a limitation. Table 6 shows physician visits by age group, income, and presence of chronic limitation. A comparison of rates between the entire United States and survey areas shows that low use of physicians in the survey areas can be attributed to

children and to persons without chronic limitation. Among persons without chronic limitation, low utilization rates were consistent across every age and income group in the survey areas compared with their counterparts nationally. Low utilization was observed among children both with and without chronic limitation in the survey areas. Since persons without chronic limitation comprised 85 percent of the survey population and children accounted for 38 percent of the population in the areas, these two groups contributed heavily to the low rate of physician visits.

Another factor related to differential physician use was race. Whites saw a physician more frequently than blacks both nationally and in the survey areas, as the following table of annual physician visits shows:

<i>Area and age group</i>	<i>Black</i>	<i>White</i>
United States ¹	4.7	5.1
0-16 years	3.5	4.4
17-44 years	5.1	5.0
45-64 years	6.4	5.6
65 years and older	5.0	6.7
Followup surveys	3.8	4.6
0-16 years	2.4	3.4
17-44 years	4.3	4.4
45-64 years	5.7	5.7
65 years and older	6.3	5.7

¹ Unpublished data from the 1975 health interview survey, National Center for Health Statistics.

This gap is greater between the races in the low-income areas. Again, it is among black children that physician utilization is especially low.

Table 7. Annual physician visit rate per person without chronic limitation by usual source of care, insurance coverage, and age group, followup surveys, 1975

<i>Age group and insurance coverage</i>	<i>Total</i>	<i>Private physician</i>	<i>Hospital clinics</i>	<i>CHC</i>	<i>Other</i>	<i>None or not stated</i>
0-16 years	2.5	3.2	2.0	2.8	2.5	0.8
Medicaid	2.6	3.6	2.1	2.9	2.3	0.9
Private insurance	2.7	3.1	2.3	2.5	2.6	1.1
No insurance	2.1	2.4	1.7	2.5	2.8	0.6
17-44 years	3.6	4.1	3.6	4.4	3.7	1.4
Medicaid	4.7	6.0	4.2	5.0	4.7	1.4
Private insurance	3.7	4.2	3.7	3.9	3.3	1.5
No insurance	2.6	2.6	2.7	3.8	3.4	1.2
45-64 years	3.4	3.6	3.8	4.7	2.5	1.1
Medicaid	5.6	4.7	7.1	4.9	(¹)	(¹)
Private insurance	3.4	3.7	3.4	4.8	2.3	1.1
No insurance	2.7	2.8	2.8	4.6	(¹)	1.1
65 years and older	3.8	4.1	3.9	5.9	(¹)	0.9
Medicaid, Medicare	3.9	4.2	4.1	6.0	(¹)	0.9
Private insurance	2.9	3.7	(¹)	(¹)	(¹)	(¹)
No insurance	1.5	(¹)	(¹)	(¹)	(¹)	(¹)

¹ Weighted sample size was less than 200.

Table 8. Average annual bed disability days per person by health insurance coverage and usual source of care, followup surveys

Age group	With health insurance	Without health insurance	With usual source of care	Without usual source of care
0-16 years	1.3	0.7	1.2	0.4
17-44 years	3.5	2.2	3.5	0.9
45-64 years	8.2	5.4	8.1	1.3
65 years and older	10.5	8.1	10.8	7.0

In table 7, we focus directly on the impact that CHCs and Medicaid have had on physician use by comparing visit rates between persons associated and not associated with these two programs. Controlling for differences in illness status was handled by eliminating persons with chronic limitation from the table. (Persons with chronic limitations were too few for detailed analysis.) The effects of CHCs and Medicaid are clear-cut in table 7. In practically every group by age, health insurance coverage, and source of care, persons covered by Medicaid or Medicare had substantially higher physician visit rates than persons with private or no health insurance coverage. CHC users had higher physician use rates among all age groups except children.

The community health centers made an additional contribution to physician utilization by providing services to persons without health insurance coverage. One-fourth of persons without health insurance coverage reported CHCs as usual source of care; this group had more frequent physician visits than others without health insurance coverage who went elsewhere for care. CHCs contributed to increased physician visits in these areas in another way. That is, without CHCs available, many who used the centers would very likely have gone to hospital clinics for care, thereby resulting in lower physician use rate.

The low rates in table 7 among persons with no health insurance and no usual source of care require comment. Lack of health insurance was not confined disproportionately to the poor or blacks. This lack was rather evenly distributed in the study population irrespective of race, poverty, and illness status. In terms of persons with no usual source of care, only 6 percent of the poor and blacks were in this category compared with 9 percent among the nonpoor and 11 percent among whites. Low utilization among persons with no insurance coverage or no usual source of care cannot be explained by constraints in access to health care alone. Low use was also due to lack of perceived need to see a physician. Persons without health insurance and persons with no usual source of care probably had less

illness than their counterparts. Table 8 shows that these two groups had considerably fewer average annual bed disability days, for example, than persons with health insurance or persons with a source of care.

The MCA technique is especially useful in comparing physician visit rates since many other variables affecting physician use, such as age, race, income, and illness level, are simultaneously controlled. As the MCA-adjusted rates show, persons covered by Medicaid or Medicare had a higher physician visit rate than persons with private insurance or no insurance. Persons who reported CHCs as usual source of care had a higher physician visit rate than persons using private physicians and hospital clinics as usual source of care (table 9). The adjusted rate for persons with Medicaid or Medicare coverage was 15 percent higher than persons covered by private insurance and 36 percent

Table 9. Unadjusted(M) and adjusted(M') means of physician visits per person per year and the relative importance of factors affecting physician visits, followup surveys

Variable	Unadjusted mean M	Adjusted mean M'	Gross effect Eta ²	Net effect Beta ²
All persons (grand mean)	4.04			
Age group			2.9	1.0
Under 15 years	2.60	3.06		
15-44 years	4.05	4.38		
45-64 years	5.75	5.01		
65 and older	5.77	4.21		
Race-income			0.4	1.0.2
Black poor	4.00	3.91		
Black nonpoor	3.83	4.05		
Black (income unknown)	3.48	3.69		
White poor	5.50	4.77		
White nonpoor	4.38	4.37		
White (income unknown)	3.26	3.16		
Health insurance status			1.4	1.1.0
Medicaid or Medicare	4.54	4.54		
Private insurance	3.96	3.89		
None	3.18	3.32		
Usual source of care			0.6	1.0.5
Private physician	4.60	4.33		
Hospital ambulatory service	4.06	3.82		
Neighborhood health center	4.36	4.74		
Other clinics	3.86	4.12		
No usual source	1.19	1.86		
Illness level			14.4	1.11.6
Chronic and episodic	11.56	10.96		
Chronic only	8.18	7.57		
Episodic only	5.15	5.08		
No illness reported	2.54	2.69		
R ² (multiple coefficient of determination)				16.5

¹ Main effect is significant at the 0.05 level. The significance test is based on unweighted data.

NOTE: M and M' are based upon weighted data. The table excludes telephone calls to physician's offices; all preceding tables on visits to physicians include telephone calls.

higher than persons without health insurance. Among persons who reported CHCs as usual source of care, the physician visit rate was 9 percent higher than persons who used private physicians, 24 percent higher than persons reporting hospital clinics, and 13 percent higher than persons who reported "Other" as usual source of care.

But health insurance coverage had only a minor effect on physician use, and usual source of care had even less (table 9, Beta²). The independent variables included in the MCA accounted for only 17 percent of the variance in physician visits, with illness status explaining most of this variance. The low physician use among children, blacks, and persons without chronic limitation is evidence that, for some groups, the perceived need for physician services is defined at a relatively low level.

The greatly increased access to health care through CHCs and Medicaid did not raise the level of physician use in these low-income areas to comparable national levels. The fact that pockets of underutilization persisted in spite of increased access to physician services indicates that financing and improved access to health services are not the only answer to problems of underutilization.

Short-term hospitalization. A great deal of attention has been focused on hospital rates because of the high cost of hospital care. From another point of view, interest in hospital use arose out of concern for equal access to care. As Anderson has pointed out, hospital care is primarily a nondiscretionary health service (8). In his model for health services utilization, need or illness accounts for most of the variation in hospital rates.

Notwithstanding the overwhelming influence of illness on hospital rates, our primary interest was to determine if the centers had had any effect on hospital rates. More specifically, it was hypothesized that users of CHCs would have lower hospital utilization than persons reporting private physicians or hospital clinics as their usual source of care. Similar to the experience of prepaid group practices (or health maintenance organizations) (9), it was postulated that the CHCs' provision of comprehensive primary care in an ambulatory setting should result in lower hospital rates compared to groups with other sources of care. Because physicians at CHCs are salaried, incentives to hospitalize are reduced. Further, CHCs are able to avoid minor hospitalizations by providing a broad range of services on an ambulatory basis as a result of concentrations of health technology, specialists, and manpower within the CHCs. Determining the effect of Medicaid or Medicare financing on hospital visit rates was another study objective.

No comparison will be presented of hospital rates between the baseline and followup surveys except for the following figures on the percentages of the population with hospital admissions for the United States and the survey areas:

<i>Area</i>	<i>Percent</i>
United States, 1969 ¹	10.3
United States, 1975 ²	10.6
Baseline surveys	9.6
Followup surveys	10.5

¹ Source, reference 10.

² Source, reference 11.

These figures show that the differences between the nation and the neighborhoods were minor and that the hospital rates for both showed a slight increase over time. All statistics on hospital rates in this report exclude hospitalizations for deliveries. In the following table, however, maternal hospitalizations are included:

<i>Factor</i>	<i>United States</i>	<i>Followup surveys</i>
Percent of population hospitalized . . .	10.6	10.5
Hospital admissions per 100 population	14.1	12.2
Hospital days per person	1.0	1.4
Hospital days per admission	7.3	11.2

When hospital rates for the United States and the survey areas were compared, the striking feature was the lengthy stay for low-income areas. Although the percent of persons hospitalized was similar, there were more admissions per 100 population for the nation, but the number of hospital days per person was 40 percent higher in the survey areas. Additionally, the average length of stay per admission was 53 percent longer in the survey areas than for the nation.

Hospital rates were compared by selected demographic characteristics in table 10. Again, the admission rates were generally lower and hospital stays were generally much longer for the population residing in the low-income areas compared with the national experience. It would be interesting to look more closely at the lengthy hospital stays in the survey areas. Unusually long stays occur most frequently among persons reporting hospital clinics as their usual source of care, possibly because some hospitals serving urban low-income populations are teaching hospitals. Long stays may also be caused by more serious illnesses among the survey area residents than for the U.S. population.

Next, we considered the influence of usual source of care and health insurance coverage on hospital rates. Age-specific hospital rates (0-16, 17-44, and 45-64 years) by usual source of care and health insurance coverage were multiplied by the population of the survey areas according to age to determine the age-adjusted

Table 10. Hospital admissions per 100 population, hospital days per person, and hospital days per admission, United States¹ and followup surveys, 1975

Population characteristics	Hospital admissions per 100 population		Hospital days per person		Average length of hospital stay	
	United States	Followup	United States	Followup	United States	Followup
Race:						
Black	11.8	12.8	1.1	1.2	9.8	9.1
White	12.8	14.8	1.1	1.7	8.3	11.8
Income:²						
Poor	18.1	11.5	2.0	1.5	10.8	13.1
Nonpoor	11.6	10.6	0.9	1.2	7.7	11.7
Health status:						
With chronic limitations	35.9	34.2	4.2	5.7	11.7	16.7
Without chronic limitations ...	8.8	6.8	0.5	0.6	6.2	8.2
Age:						
0-16 years	6.9	4.6	0.4	0.4	5.6	7.7
17-44 years	11.3	12.2	0.8	1.2	6.8	9.8
45-64 years	17.5	16.5	1.7	2.8	9.7	16.7
65 years and older	25.0	20.7	3.0	3.0	12.0	14.7

¹ Unpublished data from the 1975 health interview survey, National Center for Health Statistics.

² Income categories for the United States are annual family income of less than \$5,000 and \$5,000 or more instead of "poor" and "nonpoor".

rates. Persons with chronic limitation and persons 65 years and older were excluded from the computation to eliminate differences in illness level between the groups (table 11). Persons reporting a private physician as usual source of care had the highest hospital rates, followed by users of hospital clinics, and then users of CHCs. For example, the percent hospitalized among persons using private physicians was 59 percent above the rate for persons using CHCs. The percent hospitalized among persons using hospital clinics was 45 percent higher than the rate for persons indicating CHCs as usual source of care.

When health insurance coverage was examined, persons with Medicaid coverage generally had the highest hospital rates, regardless of source of care. The exception was among users of hospital clinics with private insurance (table 11). Unusually high hospital rates were noted among persons using private physicians as usual source of care and covered by Medicaid when one considers that these rates are for persons without chronic limitation and exclude the elderly. Persons without health insurance coverage had the lowest rates, regardless of source of care.

The MCA technique that was used to compute hospital rates takes into account the effect of several independent variables such as age, race-income, and illness status. The MCA-adjusted rates (table 12) show that persons reporting the health centers as usual source of care had a lower percent of persons hospitalized than users of other sources of care. Those with Medicaid or Medicare coverage had more hospitalizations than did persons covered by private insurance or persons with no insurance.

The MCA-adjusted 10.3 percent for hospital admissions among users of hospital clinics was 39 percent above the 7.4 percent for users of CHCs, and the 9.5 percent for private physician users was 28 percent above that for users of CHCs. For persons covered by Medicaid or Medicare, the MCA-adjusted 9.9 percent with hospital admissions was 16 percent higher than the 8.5 percent for persons with private health insurance and 34 percent higher than for persons without health insurance coverage. There was a direct relationship between increase in age and increased percentage hospitalized, and a greater percentage of whites than blacks, and the poor than the nonpoor were hospitalized.

The MCA-adjusted figures relating average hospital days to usual source of care in table 12 show that per-

Table 11. Age-adjusted hospital rates by usual source of care and health insurance coverage in the followup surveys for persons 0-64 years without chronic limitations

Usual source of care, by health insurance coverage	Percent of population hospitalized	Hospital admissions per 100 population	Hospital days per person
Private physician	7.8	8.8	0.6
Medicaid	12.6	14.6	0.9
Private insurance	6.4	7.2	0.5
None	4.5	4.7	0.3
Hospital clinics	7.1	7.8	0.8
Medicaid	7.6	8.3	0.6
Private insurance	7.9	8.8	1.0
None	5.8	6.2	0.9
Community health centers	4.9	5.7	0.4
Medicaid	6.3	7.4	0.5
Private insurance	5.1	6.1	0.4
None	3.4	3.6	0.2

Table 12. Unadjusted (P) and adjusted (P') percentage hospitalized and unadjusted (M) and adjusted (M') mean numbers of days in short-stay hospitals, relative importance of factors affecting hospital admissions and hospital days (Eta² and Beta²), followup surveys

Variable	Percent hospitalized				Hospital days			
	Unadjusted P	Adjusted P'	Gross effect Eta ²	Net effect Beta ²	Unadjusted mean M	Adjusted mean M'	Gross effect Eta ²	Net effect Beta ²
All persons	8.8				1.21			
Age group			2.0	¹ 0.5			1.7	¹ 0.4
Under 15 years	3.8	5.9			0.31	0.76		
15-44 years	9.3	9.7			0.96	1.06		
45-64 years	13.3	10.6			2.37	1.77		
65 and older	15.7	11.7			3.13	2.29		
Race-income status			0.4	¹ 0.1			0.2	0.0
Black-poor	7.8	8.5			1.12	1.16		
Black-nonpoor	6.9	7.8			0.85	1.02		
Black-income not reported	8.1	8.7			1.12	1.14		
White-poor	13.6	10.9			1.76	1.19		
White-nonpoor	10.5	9.6			1.47	1.44		
White-income not reported	10.9	10.0			1.72	1.56		
Health insurance status			0.2	0.1			0.0	0.0
Medicaid-Medicare	9.6	9.9			1.36	1.28		
Private	9.2	8.5			1.17	1.18		
None	6.5	7.4			0.98	1.12		
Usual source of care			1.0	¹ 0.3			0.4	0.3
Private physician	11.0	9.5			1.33	0.99		
Hospital ambulatory service	10.8	10.3			1.82	1.74		
Community health center	5.8	7.4			0.64	0.97		
Other clinics	6.8	7.3			0.60	0.85		
No usual source	3.5	6.1			0.51	0.92		
Illness level			13.7	¹ 12.3			6.8	¹ 5.8
Chronic and episodic	39.0	37.0			7.50	7.02		
Chronic only	14.6	12.5			2.87	2.32		
Episodic only	21.0	21.1			2.09	2.19		
No illness reported	2.5	2.9			1.01	0.29		
R ² (multiple coefficient of determination)				14.6				7.3

¹ Main effect is significant at 0.05 level. The significance test is based on unweighted data.

NOTE: Percents and means were adjusted for the effects of all other independent variables by multiple classification analysis. Adjusted per-

cents and means were calculated by the sum of the grand mean (average number of persons at risk and average number of days in short-stay hospitals per person per year) and deviations from the grand mean for each subclass of independent variable.

persons reporting hospital clinics as source of care had unusually high number of hospital days in the year. Persons reporting private physician and CHCs as sources of care had, for the most part, the same number of hospital days, but 41 percent less than persons with hospital clinics reported as source of care. There was, however, little relationship between health insurance coverage and hospital days. Persons with Medicaid or Medicare coverage averaged 1.3 days per year compared with 1.2 days among persons with private insurance and 1.1 days among persons without health insurance coverage.

Two factors investigated for their relationship to hospitalization—usual source of care and health insurance coverage—had little explanatory value. The MCA (Beta columns in table 12) shows that variations in hospital rates and hospital days are explained almost

entirely by illness level; usual source of care and health insurance contributed only marginally.

Our finding that roughly one-quarter fewer CHC users were hospitalized compared with users of hospital clinics or private physicians tends to confirm findings of other studies on the effect of HMOs as primary source of care on hospitalization (9). The reduction of hospitalization for CHC users might have been larger if CHC physicians were as highly motivated to reduce hospitalizations as are physicians connected with HMOs. In terms of cost-effectiveness, the reduction in hospitalization among users of CHCs was offset somewhat by increased use of ambulatory services.

Dental care utilization. Disparity in use of dental care between income and race groups has been and remains

a significant health care delivery issue. In the United States, a long-standing gap in use of dental services exists between blacks and whites and between poor and nonpoor (3). A partial explanation of these continued inequities was lack of access to dental care.

Between 1969 and 1975, the dental visit rate among black Americans increased 43 percent compared with a 6 percent increase among whites. Similarly, among families with annual incomes of less than \$5,000, there was an increase in this rate of 22 percent compared to a 6 percent increase among persons in higher income families (table 13). Despite recent increased use of dental services by blacks and low-income groups nationally, the average dental visit rates among blacks and the poor remain far below rates for whites and the nonpoor.

An opportunity to examine changes in use in relation to increased access to dental care resulted from the introduction of a dental care facility (CHCs) and a dental financing program (Medicaid) in the five urban low-income study areas. This section presents data on dental utilization before and after the introduction of CHC and Medicaid programs, on the use of CHCs and Medicaid for dental care, and a multiple classification analysis (MCA) showing the possible effect of CHCs and Medicaid on dental care use.

Between 1969 and 1975 there was a slight rise (7 percent) in average dental visits in the United States (table 13). In the five low-income areas the increase between the baseline and followup surveys was even greater (25 percent). By 1975, however, the 1.0 average dental visit in the survey areas was still 38 percent below the 1.6 that was the national average. The survey areas were also below the national average in the percent of population seeing a dentist during the year. By

1975 the gap between the national and survey areas narrowed somewhat.

In comparing income groups (table 14), dental care utilization showed greater increases for the poor compared with nonpoor, both nationally and in the survey areas. Both the poor and nonpoor in the survey areas made greater gains in dental care than their counterparts nationally. In the survey areas, differences in dental care between the poor and nonpoor have practically disappeared, but at the national level a substantial difference between income groups remains.

Many segments of the population in the five low-income areas experienced a much greater rise in dental visit rates than would be expected based on national figures (table 14). The greatest increases were generally observed among poor blacks, children, and elderly. There was no change in the rates for whites in the survey areas. When differences in income is accounted for, there is little difference in the dental visit rate between blacks nationally and in the survey areas and between blacks and whites residing in the low-income areas. In contrast, large differences in dental visit rates were observed among whites nationally compared to whites in the low-income areas.

Because the CHC and Medicaid programs were designed to benefit the poor, blacks, and children more than other subsets of the population, we may be tempted to conclude that a major portion of increased dental care in these low-income areas can be attributed to these two health programs. Although the study design and survey data preclude drawing such causal inferences, the limited evidence serves to strengthen the possibility that the two health programs may have helped to improve dental care in these areas. One reason is that the introduction of CHCs added substantially to dental resources in these areas (table 15).

Table 13. Average annual dental visits per person and percent of population seeing a dentist in the past year by poverty level, United States, baseline and followup surveys

Area	Total			Poor			Nonpoor		
	Base-line	Followup	Percent change	Base-line	Followup	Percent change	Base-line	Followup	Percent change
Average annual dental visits									
United States ¹	1.5	1.6	7	0.9	1.1	22	1.7	1.8	6
Five low-income areas	0.8	1.0	25	0.7	1.0	43	0.9	1.1	22
Percentage seeing dentist within a year									
United States ¹	45	50	11	29	35	21	50	54	8
Five low-income areas	31	37	19	27	36	33	32	38	19

¹ National Center for Health Statistics, "Dental Visits, Volume and Interval Since Last Visit, United States—1969," Vital and Health Statistics, Series 10, No. 76, DHEW Publication No. (HSM) 72-1066, and unpublished data. Comparison years are 1969 and 1975.

tics, Series 10, No. 76, DHEW Publication No. (HSM) 72-1066, and unpublished data. Comparison years are 1969 and 1975.

Table 14. Annual average dental visits per person by age and by race and income, United States, baseline and followup surveys

Age, race, and income	United States ¹			Five areas combined		
	1969	1975	Percent change	Baseline	Followup	Percent change
Age ²:						
0-16 years	1.4	1.6	14	0.6	1.0	67
17-44 years	1.7	1.7	0	1.0	1.2	20
45-64 years	1.6	1.8	11	0.8	0.9	13
65 years and over	1.0	1.2	17	0.4	0.7	75
Race and income:						
Black, less than \$5,000	0.6	0.8	33	0.6	0.9	50
Black, \$5,000 or more	0.8	1.1	38	0.8	1.1	38
White, less than \$5,000	1.0	1.2	20	0.8	0.8	0
White, \$5,000 or more	1.7	1.8	6	1.2	1.2	0

¹ National Center for Health Statistics, Vital and Health Statistics, "Dental Visits, Volume and Interval Since Last Visit, United States—1969," Series 10, No. 76, DHEW Publication No. (HSM) 72-1066, and unpublished data. In the United States figures, the category "black"

includes other nonwhite races.

² Age: age groups in 1969 for United States were 0-14, 15-44, 45-64 years, and 65 and over.

The proportion of the population in the combined five areas who reported CHCs as usual source of dental care was only 16 percent. Considering that only slightly more than one-third of the population in these areas saw a dentist in a year, the importance of CHCs in the provision of dental care to the population becomes more significant. One-fourth of the population of the combined areas who saw a dentist in the year reported CHCs as usual source of dental care, and the centers were the usual source of dental care for more than one-third of the poor, blacks, and children who made a dental visit during the year.

The significance of the CHCs and Medicaid in financing dental care is also presented in table 15. Dental care costs for 17 percent of the total population of the combined five areas were paid by Medicaid and CHCs, but these programs covered the cost of dental care for 46 percent of the persons who saw a dentist during the year. Although Medicaid paid for dental care for the majority of persons who received public support for dental care in these areas, in the Charleston area where Medicaid coverage of the population was low, the CHC provided free dental care equal to the number of persons who received Medicaid-paid dental care. These two programs were the source of payments for dental care among 75 percent of the poor in the combined five areas who saw a dentist in the year. Comparable figures were 61 percent for blacks and 62 percent for children.

Groups other than the poor, blacks, and children in these areas benefited from CHC and Medicaid programs as indicated by table 15. Considering the extent of additional dental visits and financial aid for dental care in these areas, there is a strong possibility that

CHC and Medicaid programs were in large part responsible for increased use of dental services.

To determine if dental utilization was influenced by CHCs as the usual source of dental care or by Medicaid coverage, a MCA analysis that adjusted for the joint effect of several explanatory variables on the dependent variable was conducted. The dependent variables were (a) percent of persons seeing a dentist in the year and (b) average annual number of dental visits. Age, race, income, geographic areas, usual source of dental care, Medicaid coverage, and payment source were used as independent variables (table 16).

The adjusted percent (59) visiting a dentist in the year was highest among persons who considered private

Table 15. Persons reporting CHC as usual source of dental care and persons with dental care paid by Medicaid and community health centers (CHC), followup surveys

Age, race, and income	Percent with CHCs as usual source of dental care		Percent with Medicaid or CHC-paid dental care	
	Total population	Persons who saw a dentist within a year	Total population	Persons who saw a dentist within a year
Income:				
Poor	22	35	27	75
Nonpoor	13	21	12	33
Race:				
Black	22	34	22	61
White	5	8	6	17
Age:				
0-16 years	21	32	24	62
17 or more years	13	21	12	35
Total	16	25	17	46

dentists as usual source of dental care. This was followed very closely by persons with CHCs as usual source of dental care—58 percent. This proportion was only slightly less among users of other sources of dental care. The percent seeing a dentist in the year was somewhat higher among persons with Medicaid coverage than persons without it.

The CHCs were not only relatively successful in placing their user population under dental care, but as table 16 shows, the average annual dental visits per

person among this group was 1.1, almost as high as among users of private dentists (1.2). Although users of hospital clinics for dental care had a higher rate of 1.4 visits per year, hospital clinics were a minor source of dental care in these areas.

The adjusted dental visit rate by payment source in table 16 shows that persons with private insurance had the highest visit rate per year of 3.1. (The average visit in relation to payment source in table 16 is high since persons who made no visit in the year are excluded.)

Table 16. Multiple classification analyses of probability of seeing a dentist and annual average number of dental visits per person, by social and health characteristics, followup surveys

Independent variable	Probability of seeing a dentist in the year				Annual average number of dental visits per person			
	Unadjusted percent P	Adjusted percent P'	Gross effect Eta ²	Net effect Beta ²	Unadjusted mean M	Adjusted mean M'	Gross effect Eta ²	Net effect Beta ²
Total	37				1.0			
Age			2.0	1.2			0.4	0.0
0-16 years	40	42			1.0	1.0		
17-44 years	42	38			1.2	1.1		
45-64 years	30	29			0.9	1.1		
65 years and older	21	28			0.7	1.1		
Race and income			0.3	0.8			0.1	0.0
Black, poor	38	35			1.0	1.0		
Black, nonpoor	37	34			1.1	1.0		
Black, income not stated	34	34			1.0	1.0		
White, poor	32	39			0.9	1.0		
White, nonpoor	38	43			1.1	1.1		
White, income not stated	41	47			1.1	1.1		
Geographic area			0.6	0.5		1.1	0.5	0.2
Roxbury, Boston	42	40			1.3	1.4		
Peninsula, Charleston	37	35			0.9	1.0		
Southside, Atlanta	36	38			0.9	0.9		
Wayne Miner, Kansas City	33	32			0.9	1.0		
East Palo Alto	45	42			1.2	1.0		
Usual source of dental care			27.0	27.0			6.8	0.6
Private dentist	59	59			1.7	1.2		
Hospital clinic	51	52			1.6	1.4		
CHC	59	58			1.5	1.1		
Public health clinic	55	53			1.2	1.1		
No regular source ¹	6	6			0.2	0.8		
Medicaid coverage			0.4	0.1				
With Medicaid	41	39						
Without Medicaid	35	36						
Source of payment:								
No dental visit ²					0.2	0.3	17.4	14.4
Medicaid					2.7	2.6		
CHC					2.2	2.2		
Private insurance					3.3	3.1		
Self					2.7	2.5		
Other					2.4	2.3		
R ² (multiple coefficient of determination)			29.2					18.0

¹ Includes not stated source of dental care.

² Includes not stated sources of payment.

NOTES: The independent variable Medicaid coverage was not included in the MCA for annual number of dental visits in the year; the independent variable source of payment was not included in the MCA for

probability of seeing a dentist in the year.

Percents and means were adjusted for the effects of all other independent variables by multiple classification analysis. Adjusted percents and means were calculated by the sum of the grand mean and deviations from the grand mean for each subclass of independent variables.

The next highest rate was among persons whose dental care was paid by Medicaid (2.6). Private insurance paid for dental care costs for only 7 percent of those who had a dental visit in the year. On the other hand, Medicaid was responsible for the payment for 37 percent of those who had a dental visit in the year.

The relative effect of usual source of dental care on percent of persons seeing a dentist in the year (Beta² columns, table 16) is high. The importance of this explanatory variable, however, is an artifact. After all, persons who had no regular source of dental care rarely saw a dentist because of the absence of perceived need rather than the implied assumption that a dentist was not seen because of lack of a source of care. Similarly, the importance of payment source for dental care was also exaggerated due to the fact that the category "no dental visit" under "source of payment" consists primarily of persons who made no dental visit in the year. This happened not because of lack of payment source, but more likely as a result of no perceived need. It is worth noting that there was considerable variance unaccounted for, and future analyses need to develop better predictors of dental care utilization, such as dental health status or perceived need for dental care.

With the infusion of both financial (Medicaid) and dental service resources (CHCs), the five low-income areas experienced greatly increased dental services utilization over a relatively short period. Because of the high concentration of low-income population in these neighborhoods, programs directed to the poor had a much greater impact in these areas than can be discerned at the national level. The continued gaps in dental utilization rates between national and the low-income areas, however, indicate that ready access to dental care increased use of services only to a limited extent in the low-income areas. The generally low dental utilization levels among persons covered by Medicaid or served by CHCs may indicate that much of the increased dental utilization which occurred in these areas was limited to taking care of existing dental problems while neglecting preventive dental care. If such is the case, unless more preventive dental care is practiced, dental utilization in low-income areas will remain far below the national average. It may be that preventive care behavior is an attribute of higher socioeconomic class and that elimination of access barriers will not completely remove inequities in dental care use. As Carlos points out, "it is unreasonable, for example, to expect people living in poverty . . . to develop sustained enthusiasm for a dental caries prevention program. They might, however, readily accept a program designed to prevent continued pain from infected teeth" (12).

It is also possible that use of dental services in these areas is low because much of the dentists' time is taken up with emergencies and the fact that, in some areas, Medicaid did not pay for preventive dental care may have affected preventive dental care use among both patients and dental practitioners in low-income areas.

Conclusions

In assessing the effects of CHCs and the Medicaid program on health services utilization among the urban low-income populations, current findings are summarized as follows:

1. CHCs are serving a large proportion of the population in these areas. The CHC program is reaching the subsets of the population for which it was planned—the poor and blacks. CHCs attracted a disproportionately high number of children among the age groups.

2. CHCs in the five low-income areas contributed to increased access to care for the population. There was a major shift of the population from hospital clinics to CHCs as source of care. This shift resulted in a more appropriate source of primary care for CHC users. CHCs also attracted persons with no previous source of care. Travel time to source of care was considerably shortened by the central location of CHC facilities in heretofore resource-scarce areas.

3. The extensive Medicaid coverage of the population in the five low-income areas is an indication of the increased access to health care. Medicaid coverage of the population 0–64 years of age increased from 16 to 39 percent between the baseline and followup surveys. A high proportion of children, blacks, and poor in these areas were covered by Medicaid (13). In general, Medicaid coverage was associated with increased health services utilization.

4. Considering the traditional lack of success in improving utilization of medical and dental care among hospital clinic users, the performance of CHCs in increasing health services utilization in the low-income areas in this study is creditable. Furthermore, in keeping with the national health policy of reducing hospital admissions, CHCs were successful in lowering hospital admissions compared with other major providers of primary care in these areas.

5. Although CHC users and persons covered by Medicaid did show greater physician utilization in relation to persons with other sources of care, persons with private health insurance coverage, or those with no health insurance, physician utilization in the low-income areas was below the national average. The elimination of barriers to health care by the introduction of a major health care facility (CHCs) and by

extensive Medicaid coverage did little to reduce the gap in physician utilization when compared to national rates. It is apparent that among low-income populations, perceived need for health care is more closely defined as need for illness care while other groups define health services needs in terms of both illness and preventive care. This implies that a lower utilization rate should not necessarily be interpreted as "unmet needs." It is more likely a reflection of need for care as defined by the low-income population.

6. Both Medicaid and CHCs were sources of payments for dental care among a large proportion of the population who received dental care. It is possible that, without the additional dental resources provided by CHCs, increases in dental visits which occurred between the baseline and followup surveys could not easily have been accomplished. Despite large increases in use of dental care services, there remains a wide gap in the dental visit rate, as reflected by national data and low-income area data. In order to equalize utilization, special emphasis on preventive dental care may be required among the low-income populations.

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SYNOPSIS

OKADA, LOUISE M. (National Center for Health Statistics, Public Health Service), and WAN, THOMAS T. H.: *Impact of community health centers and Medicaid on the use of health services. Public Health Reports, Vol. 95, November-December 1980, pp. 520-534.*

The impact of improved access to health care through the Federal community health center (CHC) and Medicaid programs was examined in five urban low-income areas. Data on access to care and physician, hospital, and dental services utilization were collected by baseline and followup health surveys in the CHCs'

service areas. There was a shift in use from hospital clinics to CHCs. Followup surveys indicated that 23 percent of the population reported CHCs as usual source of care. Travel time to source of care was reduced for users of CHCs. Medicaid coverage of the population in the survey areas increased from 16 to 37 percent between the baseline and followup surveys, an interval of 4 to 7 years.

Increases occurred in the use of physicians and dental care between the baseline and followup surveys, but the rates scarcely kept pace with the national rates. Respondents who reported CHCs as their usual

source of care, however, had a higher rate of physician visits and a lower rate of hospitalization compared with those using private physicians or hospital clinics as the usual source of care. Respondents with Medicaid coverage usually had higher physician and hospital use, irrespective of usual source of care. Both CHC and Medicaid programs contributed to increased use of dental care by providing financing and dental care resources. Although these two programs greatly facilitated the use of health services, disparity in physician and dental utilization remains between the five low-income areas and the averages for the nation.