



State of Minnesota
Department of Human Services

Human Services Building
444 Lafayette Road N
St. Paul, Minnesota 55155

February 18, 1994

Mr. Adam Marsnik
Minnesota State Legislature
645 State Office Building
St. Paul, Minnesota 55155

Dear Mr. Marsnik:

The attached draft report is the result of a study comparing the health care provided to Medical Assistance recipients by fee-for-service providers and the health care provided to recipients enrolled in managed health care programs. Considerable effort was expended to make this study as accurate as possible. Both DHS staff and staff of the various health plans under contract with DHS through its Prepaid Medical Assistance Programs (PMAP) strove to provide as much information as possible in order to gain a better understanding of the utilization patterns under each of these programs.

Great efforts were made to create two comparable groups for review. To the extent possible, these groups were matched for age, sex, length of time in receipt of health care as well as many other factors. The specific areas investigated during the course of the study included such critically important elements as the use of health care services by elderly people, C-section rates and hospitalization rates.

The study found some differences between the fee-for-service and managed health care groups in rates of utilization for several of the health care services studied. In some cases the utilization patterns pointed to higher rates of utilization by fee-for-service recipients; in other instances the reverse appeared to be the case. Very few of the differences discovered by the study were statistically significant.

The participating HMO's have questioned the accuracy of the study. DHS staff acknowledges that problems with the data collected and the short timeframes utilized in the study led to several shortcomings in the data and methodology employed by the study. Among the problems were:

- The use of broad groupings of data which may have masked important similarities or differences between the health plans enrollees and fee-for-service recipients.

Mr. Joe Rigert
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- The absence of Hennepin County data from the control group.
- The accuracy of the Medicare crossover claims data.
- The use of claims data which may be incomplete by comparison to actual usage rates and which differ between health plan and fee-for-service settings.
- The use of claims data from several different data systems which may have resulted in classifying the same services differently based upon the system utilized.
- The lagging methodology employed in the study which may have resulted in skewed obstetrical use rates.

The data for this study were gathered from health plan claims data, submitted in summary form. The limitations of such data are clearly described in the attached report. The department has taken steps to ensure that in the future, it will receive person-specific service encounter data from the health plans in the same format as the fee-for-service data themselves. The use of such data will facilitate a more thorough and accurate comparison of utilization patterns.

The Department will be devoting resources to the improvement of the tools used to study managed care in order to accurately evaluate the health care services provided for the Medicaid population. A data study team has already been formed, and will work within the guidelines established by the Minnesota Health Care Commission's Data Institute.

If you have any questions regarding this letter or the draft, internal report, please contact me at (612) 296-2741.

Sincerely,



Gary M. Miles
Director
Coordinated Care Division

Department of Human Services

State of Minnesota

OFFICE MEMORANDUM

TO: Natalie Haas Steffen
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DATE: 3 June 93

FROM: Steven Foldes *SSE*

PHONE: 296-5504

SUBJECT: Report Comparing Utilization in Health Plans and Fee-for-Service

I am pleased to send you a draft of our report comparing utilization patterns of selected health services during CY 1991 by M.A. enrollees in the health plans and in fee-for-service arrangements in the seven county metropolitan area. This report is based on data submitted to this department in January of this year by the participating health plans in response to a special request by Helen Yates.

This draft is actually the fourth draft of this report, and it has benefited from previous readings by some of you. This revised version is being sent at this time to the participating health plans for their review and comment, and will be discussed at a regularly scheduled meeting with the health plans on 16 June at 1:30 in room 4A/B at DHS. I hope to finalize it soon after that meeting for publication and wider distribution.

Perhaps the most disturbing and controversial finding is the comparatively much higher rate of medical admissions to the hospital and lower use rate of outpatient office visits among the elderly enrolled in the health plans. This finding suggests the possibility of reduced access to outpatient services, leading to "rescues" in the hospital. Work continues at this time to rule out the possible presence of a confounding factor, a substantially higher percentage of nursing home residents in the health plans, and on other concerns mentioned in the report.

The report remains in draft form and I welcome any questions or comments you may have which would clarify our findings or improve their presentation.

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MINNESOTA
DEPARTMENT OF HUMAN SERVICES

Research and Evaluation

**Health Plan and Fee-for-Service Utilization Patterns:
A Comparison of Use by Medicaid Enrollees in the Twin Cities Metropolitan Area
in 1991**

by

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Minnesota Department of Human Services
and
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May, 1993

Acknowledgments: The author expresses his appreciation to Esther G. Mazurek for superb programming support, and to Kenneth Kaminsky, Ph.D. for statistical consulting. Several people made substantial contributions to this report at important points, including Gunnar Nelson, Munna Yasiri, Barbara Hollerung, Suzi Cobic-Ivkovic, Barbara Hahn and Deborah Bachrach. Others who contributed in important ways include Nicole Lurie, M.D., M.S.P.H., Tom Tophen, Kathleen Schuler, Gary Miles, George Hoffman, Bill Novak and Carole Aszmann. The study could not have been conducted without the timely cooperation of the health plans which participate in the Medical Assistance Program. Any remaining errors are the responsibility of the author.

Executive Summary

This study examines selected inpatient and outpatient utilization indicators for Medicaid eligibles in the Twin Cities metropolitan area enrolled in participating health plans during calendar year 1991, and compares them against indicators for a similar group of Medicaid eligibles enrolled during the same period in fee-for-service arrangements. This report details the experience of 98,578 persons with 710,571 member months enrolled in participating health plans and 121,402 persons with 819,678 member months enrolled in fee-for-service arrangements. All persons were eligible in the AFDC, AFDC Related, Needy Children, MA-PW, and Aged Medicaid eligibility groups. Readers are directed to the "Methods" section for a full discussion of the study populations, the creation of the comparison group, data limitations and selection of service categories examined. The investigation is limited to a comparison of utilization rates, but some of the categories of service investigated were selected to help focus on the question of access to services, a particularly important utilization issue in a low income Medicaid eligible population. Generally, comparisons were performed within three broad age groupings (0 to 19, 20 to 64, and 65 and above), and certain service areas specific to females were examined in five year age cohorts.

This comparison of utilization patterns by Medicaid eligibles in the health plans and fee-for-service arrangements indicates that considerable differences exist in the patterns of health services use under these two types of arrangements. The study documents substantial and significant differences in utilization of inpatient medical, surgical and obstetric services, outpatient care in the emergency department, professional care in offices and clinics, and in the use of Pap smears and mammograms in the two groups. Because many comparisons were performed for each age group within each service area, and the results are not consistent with a single, simple interpretation, readers are directed to the "Results" and "Discussion" sections for a full description of the differences found.

Unfortunately, it is impossible to know with certainty what the observed differences imply about the appropriateness of care or access to services in the two groups. It is equally impossible to know exactly what organizational features in the two settings contributed to the observed differences in use. Only additional research using more detailed data and other research approaches can begin to answer the many questions raised by this report. But the apparent existence of the differences in use rates documented in this report suggests the following conclusions and recommendations:

- DHS should design methods to routinely monitor the rates of use, the appropriateness of services, access to care and outcomes for Medicaid eligibles enrolled in both the health plans and fee-for-service settings. Program managers cannot assume that the patterns of care under these two payment arrangements are similar or, where different, all differences point to "better" care in the health plans. The situation is undoubtedly more complex, and only ongoing monitoring of the many facets of care can assure the existence in both settings of appropriate care and access to services for Medicaid eligibles.
- Of the many differences observed in this utilization comparison, it is most important to investigate further the differences in inpatient admission and use rates for all age groups, and the pattern of differences found for persons aged 65

and above. Of particular concern for the aged is the observed pattern in the health plans of comparatively higher inpatient, and especially medical, admissions coupled with lower rates of use of outpatient office visits. Since the aged are an especially vulnerable population, it is important to establish that these differences do not imply inadequate access to outpatient services or inappropriate utilization in either payment setting, or deleterious disruptions in established doctor-patient relationships as persons are enrolled in health plans.

- In the youngest and middle age groups, the results suggest an overall impression of increased utilization of both inpatient medical services and outpatient office visits by health plan eligibles, accompanied by generally lower rates of use by users of the emergency department. This overall pattern is generally consistent with an interpretation of comparatively similar or improved access to services for health plan eligibles, although it may also mean higher rates of inappropriate use of health services.

- The health plans had more pregnant women enrollees in this time period, but use of hospital services by pregnant women and their babies in both payment settings was virtually identical. Also identical was the low rate in both groups of deliveries by Cesarean section, which was approximately half of the state wide rate. This low rate in both settings raises questions about the influence of social class on medical decisions in this area, but this report offers no evidence that there were any adverse consequences to either mothers or babies.

- The observed rates of use of Pap smears and mammograms indicate the need to increase their use in the Medicaid population, particularly among those enrolled in the health plans.

- DHS should obtain access to health plan claims data to facilitate further investigation of utilization rates and costs. The use of summary data on the experience of Medicaid eligibles in the health plans, while useful, as this report demonstrates, limits investigation of important measures of utilization and cost. Not only are important service areas such as mental health, chemical dependency, and dental care not examined in this report due to the lack of useful data from the health plans, possible differences in case mix could not be investigated due to the lack of person level data from the health plans.

- The limitations and difficulties encountered in this study point to the importance of efforts, such as those of the Minnesota Utilization Data Definitions Committee, to establish common definitions of service areas which facilitate appropriate comparison of utilization data across different data systems. Additional effort is needed to extend the work of this group to define many more outpatient services and add greater detail to all service areas.

- The existence of substantial differences in utilization rates in these two settings raises questions about what DHS is buying in terms of services from both the health plans and fee-for-service providers, and the value of these services. One implication of these differences bears on rate setting in the prepaid program. Health plan payment rates are based on utilization in the fee-for-service setting but, as this study indicates, patterns of care appear quite different in the two settings. This indicates the need to further examine rate setting strategies to assure appropriate reimbursement for services from the health plans.

**Health Plan and Fee-for-Service Utilization Patterns:
A Comparison of Use by Medicaid Enrollees in the Twin Cities Metropolitan Area
in 1991**

Introduction

When it was implemented in 1985, the Minnesota Medicaid Demonstration Project was a unique attempt to test the capability of managed care to control costs and assure access to services for a Medicaid population. The project was designed as a randomized controlled trial -- the only such design among several managed care demonstration projects nationally -- in which 35 percent of eligibles in an urban county (Hennepin) were enrolled on a mandated basis into participating prepaid health plans while the remainder continued in fee-for-service arrangements. In addition, most of the Medicaid eligibles in one rural county (Itasca) and one suburban county (Dakota) were enrolled into prepaid plans. Originally, seven prepaid health plans in the Twin Cities area participated, and Itasca County acted as its own health plan.

The intent behind this design was to make it possible to directly compare the group placed into managed care with the group continuing in fee-for-service arrangements along several dimensions, such as utilization of services, costs, consumer satisfaction and quality of care. As the demonstration proceeded, several groups investigated some of these dimensions, particularly among the Hennepin County eligibles, where random assignment of eligibles made direct comparisons most valid.¹ However, one important aspect of the comparison could not be investigated adequately: utilization of services.

Measuring utilization of services requires claims data, and for a variety of reasons the health plans found it difficult to supply detailed and comparable claims data on

Medicaid eligibles to the Minnesota Department of Human Services (DHS) or to researchers. Because it has not been possible to compare the utilization patterns of Medicaid eligibles in the health plans with those in the fee-for-service setting, it has proved difficult to assess the comparative value of the services provided to Medicaid eligibles through the health plans. Even though the premium paid to the health plans was designed to save money for the Medicaid program, without knowing the types and quantities of services provided it has not been possible to determine if the plans provide good value. And, beyond the issue of value, little information has been available to judge the effect on utilization of services which capitated care exerts in a low income population.

This report offers such a comparison. It examines selected inpatient and outpatient utilization indicators for Medicaid eligibles in the Twin Cities metropolitan area enrolled in participating health plans during calendar year 1991, and compares them against indicators for a similar group of Medicaid eligibles enrolled during the same period in fee-for-service arrangements. The investigation is limited to a comparison of utilization rates, but some of the categories of service investigated were selected to help focus on the question of access to services, a particularly important utilization issue in a low income Medicaid eligible population.

Circumstances had changed by this point in time, as the "demonstration project" evolved and was adopted as a major component of DHS' approach to purchasing health care services for Medicaid and General Assistance eligibles. By 1991 fewer health plans were involved as providers and more persons were being enrolled in them, and the experimental design in Hennepin County was already history. These developments made the investigation of utilization rates more challenging technically. Nonetheless, this report constitutes the first overall attempt to examine the differences and similarities in the utilization patterns of Minnesota Medicaid eligibles within a fee-for-service and capitated environment.

It was recognized from the start that the results of this project would be limited to comparisons of utilization rates across broad groups and, therefore, may raise more questions than they may answer. Among the questions raised is a basic one: how much can be learned from comparing utilization rates alone since, at best, rates of use only hint at appropriate use of health services or whether the quantity and level of services offered met the need in the population at risk? Similarly, what can be learned about the "value" of these services without detailed information about their cost?

Methods

Study Population

This study was conceived as a cross-sectional analysis of the utilization of two groups; Medicaid eligibles in the Twin Cities metropolitan area enrolled in prepaid arrangements in the participating health plans and Medicaid eligibles in the same geographical area in fee-for-service arrangements. The comparison is based on utilization data from the participating health plans (Medica, Metropolitan Health Plan, UCare and Group Health) and DHS fee-for-service claims files for Medicaid (MA) and General Assistance (GA) eligibles during calendar year 1991. Selected inpatient and outpatient utilization rates are reported and compared on these two groups.

The comparison required special steps to match important characteristics of these two groups. Mandatory enrollment in the health plans in Hennepin County had been expanded beyond the original experimental design beginning in July, 1990, and a transition was underway during the period examined in this study in which additional fee-for-service eligibles were being enrolled into the participating health plans. The selection of eligibles into the health plans during the transition process was generally random, with eligibles selected by Medicaid identification number (MAID) or by date of eligibility review. But by 1991 the direct comparability of the health plan enrolled population and

the fee-for-service population could no longer be assumed, as it could be in Hennepin County at the start of the "demonstration project."

Our approach to the comparison was limited by the unavailability of person-level utilization and cost data on the health plan enrollees. This lack of data ruled out the use of multiple regression or other approaches which require person-level data. Instead, our approach relied on constructing a fee-for-service comparison group which appeared similar in all relevant characteristics to the population on which the health plans reported in summary form. The characteristics of the Medicaid health plans' enrollees were determined from their eligibility information as of December, 1991, which is available in DHS eligibility files.

Creation of the Comparison Group

Five adjustments were made to create the fee-for-service comparison group, four of which reduced the size of the comparison group as it was matched to the characteristics of the health plan population. We began with statewide fee-for-service eligibles during December, 1991. First, we eliminated from the comparison group any persons who could not have been enrolled in the prepaid program due to their eligibility or medical status. This process eliminated from the comparison group all persons in the prepaid program's "excluded groups." The numerically largest of these groups include medically needy spend-down eligibles and blind and disabled eligibles. Also excluded were the seriously and persistently mentally ill, residents of regional treatment centers, refugees, foster children and children involved in subsidized adoptions and children with "special needs." After these exclusions the comparison population included 503,013 persons. Second, we restricted the comparison group to those persons eligible in the seven county metropolitan area (208,094 persons), and separated out Medicaid eligibles (AFDC, AFDC Related, Needy Children, MA-PW, and Aged) from General Assistance (GA) eligibles (which includes GA and GAMC) for separate analysis. This yielded 173,811 persons in the Medicaid group and 34,283 persons in the GA group.

Third, we restricted the months of utilization considered for the comparison population to reflect the average lag time between eligibility determination and enrollment in a health plan for those enrolled in the health plans during CY 1991. In this way we avoid comparing the first month's utilization of health plan enrollees, which is most often the second, third or fourth month of actual Medicaid eligibility, against the utilization resulting from the first month of eligibility for fee-for-service enrollees. This reduces a potential bias in the comparison which might favor the health plans. The source of this potential bias is the recognized phenomenon of pent-up demand for health services among newly eligible Medicaid enrollees, which produces an initial "spike" in utilization which then tends to regress toward the mean. Among those enrolled in the health plans, any initial utilization "spike" may occur immediately after eligibility for Medicaid (and in some cases up to three months before eligibility determination due to "retrospective eligibility") and while the eligible is provided services on a fee-for-service basis, before health plan enrollment can be processed. By "lagging" the fee-for-service data to exclude the initial months of utilization from consideration, we sought to eliminate the differential effect in these two groups of this utilization "spike."

The potential effect of the enrollment lag is substantial because of the high rate of turnover in the Medicaid population, where typically half of the entire population changes each year. Unfortunately, the extent of change introduced into the utilization patterns examined in this report by "lagging" the fee-for-service data is not known at this time. The reports used to generate utilization rates will be reproduced without the "lag" and compared in the future with the "lagged" data. Observed differences in the "lagged" and "unlagged" utilization rates may have implications for rate setting as well as comparisons of utilization.

To identify the appropriate number of months by which to "lag" the fee-for-service data, we examined a random sample of health plan eligibles' eligibility files within each program from this time period to identify the lengths of time between

eligibility determination and enrollment in a participating health plan. The number of initial months of utilization eliminated from consideration in the fee-for-service group was determined to be the number of months by which about 75 percent of eligibles in each program had been enrolled in the health plans. This percentage was reduced to 50 percent for the aged, due to the greater "lag" in this program between eligibility and enrollment into a health plan. The months of initial fee-for-service utilization eliminated by program were: AFDC, 2 months; AFDC Related, 4 months; Needy Children, 3 months; MA Pregnant Women, 4 months; Aged, 6 months; General Assistance, 3 months; General Assistance Medical Care, 3 months. No "lag" was created for newborns. This adjustment further reduced the size of the comparison group, because some very short term eligibles were eliminated altogether. However, in order to limit the impact of these reductions, persons whose eligibility began in CY 1990 and who were continuously enrolled into CY 1991, had their initial months eliminated beginning with their first actual month of eligibility in CY 1990, so that in some cases all twelve months of their CY 1991 utilization could be used in the comparison.

Fourth, we adjusted the proportions of eligibility groups in the comparison population to match that of the health plans in December, 1991. In other words, we reduced the comparison group to produce the same proportion of AFDC eligibles, Needy Children, and so on, as existed in the health plan population, in order to eliminate any bias resulting from a different "mix" of patient types in the two groups. Persons were excluded randomly. The number of persons selected and eliminated from the comparison group is shown in the table below, together with the percentage distribution of the final group.

<u>Program</u>	<u>Selected</u>	<u>% Distrib.</u>	<u>Eliminated</u>
AFDC	97,008	79.9	0
AFDC Related	5,851	4.8	2,752
MA Pregnant Women	905	0.7	452
MA Needy Children	7,054	5.8	6,160
<u>Aged</u>	<u>10,584</u>	<u>8.7</u>	<u>1,440</u>
Total	121,402	99.9	10,804
GA	8,763	69.7	0
<u>GAMC</u>	<u>3,817</u>	<u>30.3</u>	<u>3,817</u>
Total	12,580	100.0	3,817

Finally, the gender distribution in the fee-for-service population was inspected within program. This distribution was found to closely match the gender distribution in the health plan enrolled population as of December, 1991, requiring no further adjustments.

The comparison group was not adjusted for age, because results are reported within three age groupings; ages 0 to 19, 20 to 64, and 65 and above. Where totals are reported across age groups they were weighted by the total combined member months of both groups to minimize distortions due to differences in the age composition of the two groups. These totals are clearly indicated as "weighted totals."

Reporting was restricted to these broad age groupings in order to reduce the reporting burden on the health plans, except in the case of women in the childbearing years, where selected reports were requested by five year cohorts. These broad age groupings have the advantage of summarizing large amounts of information so that they can be more easily analyzed and comprehended. A disadvantage of such large groupings is that they tend to obscure trends for particular age groups. This is especially problematic for the very young (newborns and infants) and the very old (ages 85 and above), groups for which separate utilization patterns are not reported here.

After all adjustments, the Medicaid comparison group consists of 121,402 persons with 819,678 member months. This makes the fee-for-service comparison group larger than the health plan enrolled Medicaid population, which consists of 98,578 persons with 710,571 member months. Of these totals, approximately 50 percent of eligibles aged 10

to 49 in each group are female. Table 1 displays the distribution of health plan and fee-for-service eligibles by age group, and indicates the number of member months and mean months of eligibility per eligible in the two populations. In most cases the mean months of eligibility per eligible is longer in the health plans than in the fee-for-service group. This difference does not affect rates which are calculated on a per 1,000 person year basis, but does affect means calculated per user or per eligible. To deal with this, means per user and means per eligible were annualized on the basis of the mean months of eligibility per eligible in each age group, as reported in Table 1. (Rates could not be annualized on an individual basis because person level data were not available on the health plan enrollees.) This report examines the results for the Medicaid eligibles. The smaller GA/GAMC groups will be examined in a subsequent report.

Data Limitations and the Selection of Service Categories

Severe limitations on both health plan utilization data and fee-for-service utilization data combined to limit the areas which could be examined in this comparison. In the health plan data, long recognized difficulties in classifying claims data into comparable service areas across different data systems required that we rely as much as possible on service categories developed by the Minnesota Utilization Data Definitions Committee (UDDC).² The UDDC service categories have been tested and are considered comparable -- they are the state of the art -- but the service areas are very broad (eg. "medical" and "surgical" inpatient services) and focus primarily on hospital services. The "coordination of benefits pro-rating factor" used by the health plans in reporting utilization rates under the UDDC categories of service to the Minnesota Department of Health was not applied in this study, so that our results are not directly comparable with data reported to this agency.

Some health plans experienced difficulty in providing in a short time frame outpatient data on dental services and mental health and chemical dependency services, because these services were provided during the period of interest by separate vendors

with separate data systems. Since outpatient data were lacking in mental health and chemical dependency, the Council of HMOs chose to withhold inpatient mental health and chemical dependency data out of concern that "reporting inpatient only would skew the report and would inaccurately reflect managed care mental health utilization" (MN Council of HMOs letter of 1/11/93).

On the fee-for-service side, limitations in the claims data also necessitated restrictions in the service areas examined in this comparison. The major limitations in this data set are on outpatient data relating to services for pregnant women and children. Global bills for prenatal services do not contain information on when prenatal care began or how many prenatal care visits were provided, making it impossible to quantify prenatal care services. (Some health plan data sets also have this drawback.) Similarly, the lack of standard diagnosis and procedure codes in the Early, Periodic Screening, Diagnosis and Treatment (EPSDT) data from this time period make it impossible to count accurately well-child visits or immunizations. All that could be done with the EPSDT data was to incorporate each claim as one outpatient visit for established patients without acute conditions. These data limitations, on both health plan and fee-for-service data, combined to stymie investigation of several important and controversial areas, including mental health and chemical dependency services, dental services, and well child visits and immunizations. Thus, both by design and by limitations in the data, the resulting report represents less than a comprehensive overview of all inpatient and outpatient services.

Data and Hypotheses Examined

Faced with these limitations, the selection of categories of service for analysis was guided by a basic hypothesis. Based on existing knowledge about capitated care, we hypothesized that the health plans would reduce both the inpatient rate of admissions and days of care provided by comparison with fee-for-service arrangements.³ Given this

expected result, we selected additional service categories to investigate rates of use of outpatient services, to see if a comparative increase in outpatient use accompanied the anticipated reduction in inpatient utilization. These outpatient service areas were defined by DHS staff, within the limits of both health plan and fee-for-service data, using accepted coding conventions. The data reported by the health plans, and replicated by DHS staff from fee-for-service claims, consist of a series of distributions, such as the number of days of hospital stay per admission for medical services or the number of visits per person for established patients with acute conditions.

Data were sought in these distributions to permit investigation of another presumed effect of managed care. This effect is to reduce the consumption of resources per person by comparison with fee-for-service arrangements of, in this case, inpatient days per admission and outpatient visits. This hypothesis is examined by comparing the cumulative relative frequencies of each set of distributions, using a test statistic, the Kolmogorov-Smirnov test (one tailed), to determine if the health plan distribution examined has a significantly lighter tail than the comparable distribution from the fee-for-service setting. If this is the case, there are more smaller values in the health plan distribution examined and more larger values in the fee-for-service distribution, indicating that overall the health plans constrained resource use per person by comparison with the fee-for-service setting.

Analysis of Data

The results report data on two matched groups, Medicaid eligibles enrolled in the health plans and Medicaid eligibles in fee-for-service arrangements, as these existed in December, 1991. Viewed from this perspective, the data represent two populations and whatever differences or similarities exist can be compared directly, without the use of statistical measures of significance. Viewed from another perspective, however, the fee-for-service group as constituted to match the characteristics of the health plan eligibles is less than the entire population of Medicaid eligibles. And, in any case, the enrollees in

December, 1991 are only a sample of a different and larger population of persons who are eligible at different points in time. Since this is the case, results are presented with statistical measures. Standard deviations are presented when data permitted their calculation and two tests are used as appropriate; two tailed "z" tests are used to compare pairs of statistics and Chi Square tests of significance are used to compare arrays of statistics. Since the groups are large, most differences reported achieve high levels of statistical significance. In examining results, care must be exercised to distinguish differences which are significant statistically from those which have substantive importance.

Further, when interpreting these results it is important to recognize that the results are only comparative rates of utilization, not indicators of appropriateness of services or access to services. Of course, it is possible to hypothesize that some observed differences imply something about appropriateness of or access to services. For example, many observers will agree that comparatively lower use of emergency department services and higher use of outpatient visits in one group would appear to be a preferable pattern of utilization. Yet, nowhere is there any indication from these data that lower utilization rates for emergency department services in one group means that this group received more appropriate care. In fact, a comparatively lower use rate for these services could mean that services were unduly constrained for some persons in that group, or that both appropriate visits as well as inappropriate visits to the emergency department were reduced for the entire group. Appropriateness of services can be assessed only by comparing the services provided against some set of clinical protocols. With limited exceptions, such as rates for Pap smears and mammograms where higher use rates are recognized as "better," interpretation of the results in this study is restricted to a simple comparison of rates, since no information is available from these claims data about the clinical appropriateness of services in either group. Nevertheless, the existence in some

areas of substantial differences in rates of use across large groups does raise questions about appropriateness and access which warrant further investigation by other means.

Results

Inpatient Services: Medical and Surgical Services

Contrary to our hypothesis, the overall rate of admissions for medical and surgical services was similar for the health plan and for the fee-for-service eligibles. Table 2 indicates that the weighted total medical and surgical admissions per 1,000 person years was 94.1 for the health plans and 73.0 for fee-for-service providers. Although the health plan rate is somewhat higher the difference does not achieve statistical significance.

A further unexpected finding is that within the similar rates of combined admissions for medical and surgical services, there is considerable difference in admission rates for medical services and for such services by age group. As Table 2 shows, for all age groups combined, the health plans had a 57 percent higher rate of admissions for medical services. Weighted total admission rates for surgical services were slightly higher in the fee-for-service group, but the difference failed to achieve statistical significance. It is extremely unlikely that the substantial difference in medical services is due to problems in classifying inpatient claims into medical and surgical categories because the definitions of these broad service areas are simple and can be consistently applied within all of the data sets used. Although possible, it is also unlikely that use rates for the aged may be incorrect due to missing Medicare data at either the health plans or at DHS. This possibility is discussed below under "limitations."

When total medical-surgical admission rates are compared within age group, admission rates in the health plans were somewhat (but not significantly) higher for the 0 to 19 age group and for the 20 to 64 age group. However, the admission rate for persons aged 65 and above was 67 percent higher in the health plans by comparison with the fee-for-service setting. Significant differences also exist for medical and surgical services for

this age group. The rate of medical admissions was 125 percent higher in the health plans, while the rate of surgical admissions was 51 percent higher in the fee-for-service group. The possible interpretations of this pattern of significant and substantial differences, particularly for the oldest age group, are explored below.

Table 3 reports additional measures about medical admissions which further detail these results. All measures reported indicate the higher use by the health plans of inpatient medical services for every age group; the health plans admitted a higher percentage of eligibles, had more admissions per 1,000 person years, experienced higher days per 1,000 person years, and also experienced longer lengths of stay. By comparison with the fee-for-service group, admission rates per 1,000 person years were 15 percent higher for ages 0 to 19, 92 percent higher for ages 20 to 64, and 125 percent higher for ages 65 and above. The greater standard deviations for average length of stay in the health plans and lack of significance for the Kolmogorov-Smirnov test in all age groups also point to a more liberal pattern of inpatient utilization once eligibles were admitted compared to the fee-for-service group.

This pattern is distinctly reversed for surgical admissions (Table 4). Most measures indicate higher use in the fee-for-service group (not all differences are statistically significant), and the magnitude of the difference increases with age. In the case of the young age group, a higher proportion of fee-for-service eligibles was admitted and used more hospital days per 1,000 person years. In the middle age group, similar percentages of eligibles were admitted and experienced similar rates of admission per 1,000 person years, but the fee-for-service group used more days per 1,000 person years due to a longer average length of stay. In the old age group, however, more than twice the proportion of the fee-for-service eligibles experienced an admission. Yet, their days per 1,000 person years was only 19 percent higher, because their average length of stay was 27 percent lower (although this latter difference did not achieve statistical significance). The Kolmogorov-Smirnov test indicates that the distribution of days per

surgical stay in the two younger age groups was consistent with the hypothesis that the health plans constrained the use of hospital days by comparison with the fee-for-service patients, but this did not hold in the case of the oldest age group.

Inpatient Services: Obstetric and Newborn Services

Rates of admissions for obstetric services (Table 5) indicate that the health plans experienced a significantly higher percentage of pregnant women in all age groups combined by comparison with the fee-for-service eligibles. Along with the higher rate of admissions, the health plans had significantly higher inpatient days per 1,000 person years. Obviously, capitated care has no influence on the number of women who become pregnant. However, the health plans can influence the use of services by women once they become pregnant. In the best available indicator of inpatient resource use for pregnant women, the average length of stay, the health plans had a slightly (but insignificantly) lower average length of stay by comparison with the fee-for-service setting. The distribution of lengths of stay per admission was not significantly different in the two groups, indicating that the health plans used the inpatient setting in a virtually identical way as the fee-for-service providers.

In the five year age cohort with the highest fertility, women aged 20 to 24, these differences are even more pronounced. Fifty seven percent more health plan eligibles had inpatient obstetric admissions, and the health plan eligibles had 27 percent more days per 1,000 person years. Average length of stay was nearly identical.

Similarly, the health plans experienced a somewhat higher percentage of eligibles with admissions for Cesarean section (Table 6), with correspondingly higher admissions per 1,000 person years and days of stay per 1,000 person years. The health plans also experienced a slightly higher average length of stay for C-section deliveries. However, when examined from the perspective of actual births by Cesarean section, the percentage of deliveries by Cesarean section in both populations was strikingly low, with both groups at 9.61 percent (Table 7).

Data on newborns are summarized in Table 7. The distribution of "well" and "complex" newborns was very similar in the two populations. "Complex" newborns were 8.00 percent of total births in the health plans and 8.88 percent of total births in the fee-for-service group. Average length of stay was somewhat shorter in the fee-for-service group, and the Kolmogorov-Smirnov test statistic confirms that the health plans did not constrain the distribution of hospital days per person for newborns relative to the distribution found in the fee-for-service group. For the "complex" newborns, average length of stay was not substantially or significantly different and the Kolmogorov-Smirnov test statistic was not significant.

Outpatient Services: Persons With No Services

Our hypothesis was that the anticipated limitation by the health plans of utilization of the hospital would be accompanied by higher rates of use of certain outpatient services. Although our hypothesis concerning inpatient utilization was not confirmed, the overall pattern to emerge from the limited set of categories examined in the outpatient setting is that the use of outpatient services was higher in the health plans, at least for younger eligibles.

To begin, we compared the percentage of persons in each group who had no "professional medical services" during their period of eligibility in CY 1991 (Table 8). "Professional medical services" is a category which encompasses all office and clinic visits, including visits for preventive services and eye care, along with visits in the nursing home. Some persons without such visits may have had some emergency department visits, or visits for mental health, chemical dependency, dental or inpatient services, but the count of "professional medical services" appears to be a reasonable indicator of the number of persons who did or did not have routine contact with the health care system for biomedical problems.

Among those aged 0 to 19, in total fully 36 percent fewer eligibles in the health plans had no "professional medical services." Twenty five percent fewer eligibles in the

middle age group received no such services. This pattern of more eligibles in the health plans with one or more "professional medical services" holds when examined by the number of months of eligibility, with comparatively greater use of such services in the health plans beginning at the start of eligibility. However, the difference narrows noticeably over time, suggesting that this difference is greater for shorter term eligibles, and that the observed differences in the totals would diminish if this service was examined over a longer period of time. On the other hand, the frequent turnover of eligibility in the Medicaid population means that many persons are only eligible for a few months, so that the differences in use reported for short term eligibles suggest a very real difference in use of these services for many persons in this population.

This difference in use appears to be much smaller among those aged 65 and above. In total, only four percent fewer health plan eligibles had no "professional medical services" during their periods of eligibility. No clear pattern emerges in comparative use when this age group's experience is examined by the number of months persons were eligible, although there is a consistent tendency toward increased use of these services in the health plans.

Outpatient Services: Emergency Department Services

Another indicator of outpatient services examined is emergency department visits (Table 9). Among the younger age groups, slightly higher percentages of health plan eligibles used the emergency department at least once. But, on average, eligibles in the health plans used significantly fewer visits per user and per eligible in these age groups. Comparison of the distributions of visits per person indicates that the health plans appear to have constrained emergency department use per person more successfully in all age groups than occurred in the fee-for-service setting, as indicated by the significant "p" values on the Kolmogorov-Smirnov test statistic.

However, contrary to the pattern among younger eligibles, in the oldest age group 37 percent more of the fee-for-service eligibles had one or more emergency department

visits, and the health plan eligibles had more visits per user. All this results in significantly different counts of visits per 1,000 person years in the two groups. Eligibles in the health plans had consistently lower emergency department visits per 1,000 person years; 17 percent lower in the 0 to 19 age group and 6 percent lower in the 20 to 64 age group. The rate of emergency department visits per 1,000 person years was 17 percent lower in the 65 and above age group, despite a higher percentage of fee-for-service eligibles with visits and more mean visits per eligible in this group.

Outpatient Services: Office Visits

The counts of total office visits for established and new patients, including preventive services -- a subset of "professional medical services," which also includes home and nursing home visits and eye care -- reveal an interesting pattern by age group (Table 10). For eligibles aged 0 to 19, the health plans showed comparatively higher utilization of services. At 93 percent, the percent of eligibles in the health plans with at least one such visit during their periods of eligibility was 17 percent higher than that of the fee-for-service group, and the health plan enrollees had six percent more visits per eligible on an annualized basis. However, on an annualized basis the fee-for-service group had 11 percent more visits per user. All together, eligibles in the health plans had an overall six percent higher rate of visits per 1,000 person years. This suggests that the higher counts of visits per 1,000 person years in the health plans was due mostly to the higher percentage of persons who used these services. Although fee-for-service enrollees had more visits on average per user of services, the Kolmogorov-Smirnov test statistic indicates that the health plans did not significantly constrain use per person in this age group by comparison with the fee-for-service setting.

For eligibles aged 20 to 64, this pattern changes somewhat. As with the younger age group, a substantially higher proportion (30 percent) of the health plan eligibles had at least one visit during their eligibility and health plan enrollees used 12 percent more visits per eligible. But fee-for-service eligibles used an average of 17 percent more visits

per user of services. However, this increased use per user of services was not sufficiently greater so that the fee-for-service group experienced more visits per 1,000 person years. In fact, the health plan enrollees had a slightly but insignificantly higher rate of visits per 1,000 person years. In contrast to the younger group, the Kolmogorov-Smirnov test statistic indicates that the health plans did constrain the use of services per person by comparison with the fee-for-service setting.

The pattern of use among eligibles aged 65 and above is distinctly different. In both groups, the data indicate that only about half of all eligibles had one or more outpatient visits during their periods of eligibility, considerably lower than in the two younger groups. These low rates of office visits undoubtedly indicate the presence in this age group of large numbers of nursing home residents. The count of office visits in Table 10 does not include visits in the nursing home. As reported, the data reverse the pattern in the two younger age groups. Twenty nine percent more fee-for-service eligibles used one or more office visits, and the annualized mean visits per eligible was 44 percent higher in the fee-for-service group. Among the eligibles who had one or more visits for these services, the annualized average use was 12 percent higher in the fee-for-service group. All this combined to make the total visits per 1,000 person years 44 percent higher in the fee-for-service group, although this difference just failed to achieve statistical significance by the conventional measure ($p=.0847$). Not surprisingly, the Kolmogorov-Smirnov test statistic indicates that the distribution of visits per person in the health plans exhibited a significantly smaller tail by comparison with the fee-for-service setting.

A different perspective on outpatient office visits emerges from two percentage distributions of these visits (Tables 11 and 12). Table 11 compares the percent of established and new patient visits within each age group for the health plan and fee-for-service settings. What emerges uniformly across all age groups is that a significantly higher proportion of the visits in the health plans was new patient visits. In fact, among

those aged 65 and above, although only about one in ten of the health plan eligibles' visits were new patient visits, comparatively the proportion of these visits to the total is about twice as high among the health plan eligibles.

Table 12 distributes these same outpatient office visits according to whether the primary diagnosis was for an acute or non-acute condition. The results indicate that health plan eligibles had comparatively more non-acute visits across all age groups. The highest proportion of such visits was in the 0 to 19 age group, where well child visits are common, and the difference between health plan and fee-for-service enrollees was modest though statistically significant. The proportion of non-acute visits was smallest among the oldest age group, but in this group the health plan enrollees had more than a three times greater percentage of such visits. Over all age groups, the health plan enrollees had six percent more office visits for non-acute diagnoses.

Additional details about outpatient office visits are displayed in Tables 13 through 16, which report age group specific rates separately for established and new patient visits, with and without acute diagnoses. As expected, by far the greatest number of visits occurred by established patients with acute diagnoses (Table 13). In this largest group of visits, when measured by the summary statistic of visits per 1,000 person years, the health plans provided their enrollees with comparatively more visits in the two younger age groups, but provided comparatively fewer visits to the oldest age group. A 56 percent difference exists between the percent of eligibles aged 65 and above who had these types of visits and, equally, the fee-for-service enrollees had 56 percent more visits per eligible. Reversing the result in the two younger age groups, 43 percent more fee-for-service eligibles had one or more of these types of visits and, among those who had at least one visit, the annualized mean visits per user was 9 percent higher. The only age group or category of visits where the Kolmogorov-Smirnov test statistic indicates that the health plans constrained the distribution of visits per person by comparison to the fee-for-service setting is in established patient visits with acute diagnoses for those aged 65 and above.

In the other categories of outpatient office visits (Tables 14 through 16) there is a consistent pattern in all age groups of apparently similar or somewhat increased utilization of services by eligibles in the health plans. These increases are due in part to the higher proportion of new patient visits in the health plan population, as discussed above. But there were also higher percentages in all age groups of visits by established patients without acute diagnoses in the health plan group, and these eligibles had similar or higher visits per 1,000 person years (Table 15). In the oldest age group, visits in these three categories, unlike visits for established patients with acute diagnoses, show a pattern of higher use in the health plans. But these three categories of visits combined represent only six percent of all outpatient office visits in the fee-for-service group, and 14 percent in the health plans population. As Table 10 indicates, for persons aged 65 and above the higher utilization of these types of services in the health plans does not overcome the substantially lower use of visits by established patients with acute diagnoses.

Outpatient Services: Pap Smears and Mammograms

Finally, comparisons are possible of the rates of use of Pap smears and mammograms in the two groups. These comparisons are flawed in that the UDDC categories report rates of these tests per 1,000 person years, not of tests per person per 1,000 person years. Examination of fee-for-service data indicates that, as expected, some persons had multiple tests within a year. However, one would expect that the distribution of multiple tests per person would be similar in the two populations, making this comparison reasonably useful. The UDDC has changed its definition for subsequent periods to eliminate this problem for future reports. Also, incomplete data may be a problem in both data sets for persons dually eligible for Medicare and Medicaid.

Data problems aside, the comparison of these test rates reveals an equivocal result. Overall, the health plans had a comparatively five percent higher rate of Pap smear use, but the fee-for-service setting had a comparatively 35 percent higher rate of mammogram use for the women at risk for these procedures. With a few exceptions, the

differences observed are consistent in each five year age cohort, although many comparisons lack statistical significance. Unfortunately, both sets of rates are lower than desirable and generally lower than comparable rates for employed, middle class populations. These rates are directly comparable with the rates reported by the health plans to the Minnesota Department of Health for their commercially insured populations.⁴ Total rates for both types of tests are compared in Table 19, which reports the composite rate per 1,000 person years for the commercially insured population for the health plans in CY 1991 and the health plans' Medicaid population. In their commercial population the rate of Pap smears per 1,000 person years is 27 percent higher, and the rate of mammograms per 1,000 person years is 180 percent higher.

Discussion

If nothing else, this comparison of utilization patterns by Medicaid eligibles in the health plans and fee-for-service arrangements indicates that considerable differences exist in the patterns of health services use under these two types of arrangements.

Unfortunately, it is impossible to know with certainty what these observed differences imply about the appropriateness of care or access to services in the two groups. It is equally impossible to know exactly what organizational features in the two settings contributed to the observed differences in use. Only additional research using more detailed data and other research approaches can begin to answer the many questions raised by this report.

The findings on inpatient medical and surgical services pose some of the most compelling questions. First is the unexpected result that the weighted total rate of admissions for combined medical and surgical services was somewhat higher in the health plans, though not significantly different in the two groups. This is notable, since it is widely believed that managed care plans succeed by reducing the rate of inpatient admissions by comparison with the fee-for-service setting. However, it is important to

recognize that inpatient services for the fee-for-service Medicaid eligibles in this study were paid on a modified Diagnosis Related Group (DRG) basis rather than on a strictly fee-for-service basis, which may have deflated admission rates and encouraged earlier discharges for this group. In addition, the Department of Human Services conducts an active pre-admission review and certification program for the fee-for-service eligibles, which may also have discouraged some admissions. Further, some health plans carried little or no financial risk for hospital admissions for their Medicare eligibles. Regardless of how one sorts out these various financial and organizational incentives, this finding raises an interesting possibility; the common assumption of lower use rates in prepaid health plans is based on research on middle class, employed populations, and this assumption may not hold in the population group which may be eligible for Medicaid.

The substantially higher rate of admissions for medical services in the health plans, particularly for persons aged 65 and above, is an especially troubling finding. Broadly speaking, there are two possible interpretations of this result, but the data themselves do not indicate which, if either, is correct. The fact that the health plan utilization rate is comparatively higher may indicate that the fee-for-service setting unduly constrained access to services for appropriate admissions, and that the health plans offered improved access to services. Alternately, it may be higher because health plan enrollees may not have received adequate outpatient care by comparison to the fee-for-service setting, leading to comparatively more "rescues" in the inpatient setting. This interpretation is given additional credibility by the finding on outpatient office visits, which indicates that persons in the oldest age group experienced much lower rates of visits, particularly by established patients with acute conditions.

This potentially disturbing finding may be explained by unknown differences in the aged populations enrolled in the health plans and fee-for-service arrangements. Institutional status was not examined and it is possible that the health plans may have a higher percentage of persons in nursing homes, resulting in fewer outpatient office visits

and, possibly, higher admissions to the hospital for medical services. However, there is no cause to believe that the enrollment process, even after the end of the "demonstration project's" experimental design, led to any difference in the two groups in the proportion of institutionalized persons. It may also be possible that there is a greater burden of chronic illness in the health plan enrolled group, although the groups are large and demographically similar and, in any case, the presence of more chronically ill persons in the health plans would likely produce higher rates of outpatient as well as inpatient services use. Access to detailed, person-level claims data could help resolve this enigma by facilitating consideration of differences in case mix and institutional status in the two groups, but health plan person level data were not available for this study.

The greatest differences appear in the oldest age group, and it is worthwhile to summarize the experience of this group in the two payment settings. They experienced:

- Overall higher use of the hospital for medical and surgical services by health plan eligibles:
 - 67 percent higher rate of combined admissions per 1,000 person years.
- Much higher use of inpatient medical services in the health plans:
 - 39 percent more eligibles with admissions.
 - 125 percent more admissions per 1,000 person years.
 - 251 percent more days per 1,000 person years.
 - 56 percent longer average length of stay.
- Much lower use of inpatient surgical services in the health plans:
 - 112 percent fewer eligibles with admissions.
 - 50 percent fewer admissions per 1,000 person years.
 - 19 percent fewer days per 1,000 person years.
 - (But) 27 percent longer average length of stay.
- A slight tendency for more persons in fee-for-service arrangements to have had no "professional medical services:"
 - In total, 26 percent of fee-for-service and 25 percent of health plan enrollees had no such visits.
 - When significant, month by month comparisons all indicate more fee-for-service enrollees without such visits.
- Generally higher emergency department use among fee-for-service eligibles:
 - 37 percent more fee-for-service eligibles had one or more emergency department visits.
 - 19 percent more emergency department visits per eligible in fee-for-service.
 - (But) health plan enrollees had 17 percent more visits per emergency department user.

- Overall, fee-for-service eligibles had 17 percent more emergency department visits per 1,000 person years.
- There were comparatively fewer health plan eligibles with relatively high counts of emergency department visits (the health plan distribution had a shorter tail).

- More office visits (in total) for fee-for-service eligibles :
 - 29 percent more fee-for-service eligibles had one or more office visits.
 - 12 percent more visits per user in fee-for-service.
 - 44 percent more visits per eligible in fee-for-service.
 - 44 percent more visits per 1,000 person years in fee-for-service (ns).
 - (But) health plan distribution of office visits per person had a shorter tail.

- Much higher counts of "new patient" office visits for health plan eligibles:
 - 103 percent more "new patient" office visits in the health plans.

- But more visits for "non-acute" conditions in the office for health plan eligibles:
 - 302 percent more "non-acute" office visits in the health plans (numbers very small).

- Generally higher rates of Pap smear tests per 1,000 person years in the health plans, but higher rates of mammography in the fee-for-service setting.

Assuming these are comparable groups, how might these results be interpreted?

One might begin with the observation that fewer health plan enrollees had office visits and that the proportion of "new patient" office visits was much higher for health plan eligibles. This might suggest that many established patterns of outpatient care were disrupted as eligibles were enrolled into the health plans, and persons in this age group found it comparatively difficult to establish a new link with a physician. As a result, more of these enrollees might have ended up in the hospital, with admissions for medical conditions which otherwise might have been treated in the outpatient setting. Another possible interpretation explaining the observed lower rate of outpatient visits in the health plans is that Medicare eligibles may have continued to see their established physician on an out of plan basis, using their Medicare cards, although these physicians would not have received a co-pay or deductible from the Medicaid program. Even less likely possibilities are that eligibles in the health plans had no previous physician, or that eligibles in the health plans consistently saw more types of specialists than in the fee-for-service setting. It may also have been the case that health plan physicians, long

accustomed to a more middle class clientele, found it more difficult to deal effectively with Medicaid eligibles.

It is important to recognize data suggesting other conclusions. The interpretation of reduced access to outpatient services in the health plans is belied by the fact that somewhat more persons in the fee-for-service setting had no "professional medical services" and that emergency department use was higher in the fee-for-service setting. (Still, among those enrollees who used the emergency department, there were 17 percent more visits per person in the health plan group.) There were more visits in the health plans for "non-acute" conditions, although the numbers of such visits were very small. A higher proportion of visits for "non-acute conditions" suggests the possibility of greater access to preventive health services, although these diagnosis codes are also used in connection with visits for the "worried well."

If, then, the access to outpatient services in the health plans was comparatively similar or better, how might one interpret the lower use of office and clinic visits and the substantially higher rate of admissions for hospital services in the health plan group? One possible explanation considers the economic incentives. The health plans were at risk for the outpatient services but had little or no risk for inpatient services to Medicare eligibles. But it is equally possible to explain these patterns by suggesting that DHS pre-certification review and low reimbursement discouraged admissions more and the lack of management of outpatient services in the fee-for-service setting led to inappropriate use of outpatient visits. Again, it is not possible to offer a definitive interpretation lacking information on the comparative appropriateness of services or direct evidence about comparative access. Only one interpretation appears certain; there were considerable differences in the patterns of care experienced by elderly persons in the two payment settings.

The extent of differences is not as large for the younger age groups. The difference in rates of inpatient admissions for the youngest age group is not significant

and, in the middle age group, only the rate of admission for medical services is significantly higher for health plan eligibles. In addition, a significantly higher percent of health plan eligibles was admitted for medical services and this same group experienced twice as many days per 1,000 person years. Indicators for surgical admissions generally show more use of surgical services in the fee-for-service group. But, unlike the pattern for persons aged 65 and above, in the younger age groups all indicators point to higher use of outpatient services as well, except for the emergency department, where use by health plan enrollees is considerably lower. Higher inpatient admissions for medical services and higher rates of use for office and clinic visits may point to improved access for these age groups or, possibly, higher rates of inappropriate admissions and office visits.

Emergency department service use suggests one area where managed care may have had an effect. Although similar percentages of eligibles in both groups visited the emergency department at least once during their eligibility periods, the health plan enrollees in all age groups had fewer visits per person and per eligible, and fewer visits per 1,000 person years. This finding is consistent with an interpretation that, for these age groups, the health plans provided improved access to outpatient services, or that at a minimum the health plans exerted increased control over possibly inappropriate use of the emergency department. However, if a comparatively lower rate of use of the emergency department suggests improved access in the health plans to non-emergency services for what are often perceived by medical professionals to be non-urgent needs, it is important to recognize that even these lower rates are very substantially higher than those reported to the Minnesota Department of Health by these same health plans for their commercially insured populations.⁴ It is unclear to what extent the higher rates experienced by Medicaid eligibles by comparison with the commercially insured populations in the health plans represent greater difficulty in finding non-emergency services, different perceptions on the part of Medicaid eligibles of what health condition

constitutes an "emergency," less understanding of the availability of and how to access non-emergency medical services, habitual reliance on these facilities for routine outpatient services despite their availability elsewhere, or a higher level of morbidity requiring emergency department care.

The area where utilization rates are almost identical in the two groups is obstetrics. The health plans did have significantly more women who were pregnant in this time period, but the pattern of use of the hospital was virtually the same in the two payment settings. Of particular note is the low, identical rates of deliveries by Cesarean section in the two groups. The observed rates of under ten percent are approximately half of the statewide rates in Minnesota at the same point in time, although the possibility exists of a slight under count of Cesarean sections in the health plan data due to an unresolved problem in health plan maternity counts.⁵ This class-related phenomenon has been observed elsewhere, and it is troubling. While it is recognized that in general Cesarean section rates are higher than optimal, and are declining in the state and nation, the low rates observed for these populations raise questions which are difficult to answer. What factors lead to such low rates among low income women? Are these rates too low? Do these low rates contribute in any way to higher rates of poor birth outcomes for low income women? Both groups experienced similar rates of "complex" newborns and only minor differences existed in the use of the hospital for newborns. But these are very crude indicators of birth outcome, and more subtle differences may have existed.

In this study, there is one area where direct evidence points to clear differences in the appropriateness of patterns of care between both fee-for-service versus health plan eligibles and commercial versus Medicaid eligibles in the health plans. This area is the use of Pap smears and mammograms. Pap smear use was slightly higher but use of mammograms was substantially lower among health plan Medicaid eligibles by comparison with fee-for-service Medicaid eligibles. However, the use of both of these services by health plan Medicaid eligibles was very substantially lower than their use by

commercially insured persons in the same health plans. Reasons for this unfortunate result may include problems in access to care, poor patient compliance with physician recommendations, and unrecognized need. The reasons may only be imagined from the utilization data, but the fact remains that the health plans did not deliver to their Medicaid eligibles the same standard of care in this service area.

Limitations

This study suffers from several limitations, most of which are discussed above as they pertain to specific issues in the methodology. Below is a brief compilation of these limits and possible problems.

- Some limitations in this study are inherent in the use of claims data. Claims data may be incomplete by comparison with actual use, and their completeness may differ between the health plan and fee-for-service settings. Problems in the completeness of data are generally believed to affect outpatient services in the health plans and Medicare claims data in both settings most severely. Incomplete capture of Medicare claims by the health plans or DHS would affect the observed rates of inpatient and outpatient use for the aged in this comparison. However, explaining the substantially higher rates of inpatient medical admissions for the aged enrolled in the health plans by reference to missing data on Medicare eligibles in the DHS data set is not satisfactory for two reasons: First, missing data would likely affect both medical and surgical areas equally, but surgical admissions are higher in the fee-for-service setting. Second, a similar pattern also exists in the middle age group, where Medicare eligibles were excluded by contract from this program. Explaining the observed lower rate of use by the aged in the health plans of outpatient office visits by reference to missing Medicare data may be possible, but these data may be missing because of out of plan use or simply lack of capture.

A second possible problem is the difficulty of using claims data from several different data systems. Problems may exist in how claims were classified into service areas despite the use of categories of service which have been tested by the UDDC, and those categories of service which were defined by the investigator have not been tested across different data systems. Third, important areas for investigation could not be examined due to limitations in, or the absence of, data. These include broad service areas such as mental health, chemical dependency, and dental services, and specific services such as well child care and immunizations. Information on these areas may have changed the overall picture presented by this comparison. Fourth, person level data were not available on health plan eligibles, ruling out the use of valuable analytic approaches and further investigation and confirmation of important findings.

- Several possible problems derive from the nature of the comparison attempted. First, this study concerns a period in time after the random assignment of eligibles in the "demonstration project," and this may bias the comparison. As noted previously, this is unlikely because persons were selected into the health plans largely on the basis of eligibility review or MAID number. Further, the groups are large and were matched on basic demographic and program characteristics. Nevertheless, it is possible that undetected differences exist in the populations enrolled in the health plans and the fee-for-service settings which might affect the results. The unexplained differences in the mean lengths of eligibility in the two groups, and the higher proportion of health plan eligibles who gave birth, may indicate such a bias. Institutional status was not examined in the two groups, and it is possible that some rates observed, particularly for the aged, may have been influenced by undetected differences in the proportion of institutionalized persons in each group.

- Biases may have been introduced in the process of creating the fee-for-service comparison group. One possible bias may have resulted from "lagging" the fee-for-service data based on the average time within each program area between eligibility and enrollment into the health plans. Although performed in order to improve the comparability of the two groups, its effect is not known at this time, and this adjustment may have altered the results inappropriately. Another possible bias may have stemmed from the decision to exclude some persons from the fee-for-service group to produce the same proportion in each group of the various types of program eligibles. An alternative approach, rejected for the sake of simplicity, would have been to use the entire population and weight the results.
- The lack of person level data prevented the use of some types of analytic methods and required certain compromises in quantitative methods. For example, annualized results could not be annualized at the person level based on the actual months of eligibility, but only at an aggregate level based on the average months of eligibility of all persons in an age group.
- Although done to improve the understandability of the results and to reduce the reporting burden on the health plans, important similarities or differences may have been obscured by the use of broad age groupings, particularly among the very young and the very old. Further, the results of some comparisons may appear different when analyzed by sub-groups, such as by gender, marital status, institutionalized status, ethnicity or relative income level. These comparisons could not be pursued due to the absence of person level data on the health plan eligibles.
- This report examines utilization patterns at a single point in time. Patterns of utilization are known to change in response to many influences, and the results from this year may not be representative of previous or subsequent patterns of use. It is known, for example, that the health plans made efforts after this time

period to improve physician performance and patient compliance in some areas, such as the use of mammograms.

- This report is cautious in not reading directly from utilization patterns to conclusions about the appropriateness of or access to services for either group. Although implications may exist in some areas and are raised as possibilities in the text, all readers should be aware that a key limitation of this study is that it is not a study of access to services or appropriateness of care in either setting.

Conclusions and Recommendations

As the above discussion indicates, this study raises more questions than it provides answers. Only one conclusion is supported by the data available for this study: The utilization patterns observed in the health plans differ, in some cases substantially, from those observed in the fee-for-service setting. The implications of these differences for appropriateness of services, access to care, and price paid are speculative. But the apparent existence of these differences in use rates suggests the following conclusions and recommendations:

- DHS should design methods to routinely monitor the rates of use, the appropriateness of services, access to care and outcomes for Medicaid eligibles enrolled in both the health plans and fee-for-service settings. Program managers cannot assume that the patterns of care under these two payment arrangements are similar or, where different, all differences point to "better" care in the health plans. The situation is undoubtedly more complex, and only ongoing monitoring of the many facets of care can assure the existence in both settings of appropriate care and access to services for Medicaid eligibles.
- Of the many differences observed in this utilization comparison, it is most important to investigate further the differences in inpatient admission and use

rates, and the pattern of differences found for persons aged 65 and above. Of particular concern for the aged is the observed pattern in the health plans of comparatively higher inpatient, and especially medical, admissions coupled with lower rates of use of outpatient office visits. Since the aged are an especially vulnerable population, it is important to establish that these differences do not imply inadequate access to services or inappropriate utilization in either payment setting, or deleterious disruptions in established doctor-patient relationships as persons are enrolled in health plans.

- In the youngest and middle age groups, the results suggest an overall impression of increased utilization of both inpatient medical services and outpatient office visits by health plan eligibles, accompanied by generally lower rates of use by users of the emergency department. This overall pattern is generally consistent with an interpretation of comparatively similar or improved access to services for health plan eligibles, although it may also mean higher rates of inappropriate use of these services.
- The health plans had more pregnant women enrollees in this time period, but use of hospital services by pregnant women and their babies in both payment settings was virtually identical. Also identical was the low rate in both groups of deliveries by Cesarean section, which was approximately half of the state wide rate. This low rate in both settings raises questions about the influence of social class on medical decisions in this area, but this report offers no evidence that there were any adverse consequences to either mothers or babies.
- The observed rates of use of Pap smears and mammograms indicate the need to increase their use in the Medicaid population, particularly among those enrolled in the health plans.
- DHS should obtain access to health plan claims data to facilitate further investigation of utilization rates and costs. The use of summary data on the

experience of Medicaid eligibles in the health plans, while useful, as this report demonstrates, limits investigation of important measures of utilization and cost. Not only are important service areas such as mental health, chemical dependency, and dental care not examined in this report due to the lack of useful data from the health plans, possible differences in case mix could not be investigated due to the lack of person level data from the health plans.

- The limitations and difficulties encountered in this study point to the importance of efforts, such as those of the Minnesota Utilization Data Definitions Committee, to establish common definitions of service areas which facilitate appropriate comparison of utilization data across different data systems. Additional effort is needed to extend the work of this group to define many more outpatient services and add greater detail to all service areas.
- The existence of substantial differences in utilization rates in these two settings raises questions about what DHS is buying in terms of services from both the health plans and fee-for-service providers, and the value of these services. One implication of these differences bears on rate setting in the prepaid program. Health plan payment rates are based on utilization in the fee-for-service setting but, as this study indicates, patterns of care appear quite different in the two settings. This indicates the need to further examine rate setting strategies to assure appropriate reimbursement for services from the health plans.

¹Lurie, N., Christianson, J., Finch, M., Moscovice, I. "A Comparison of Capitated versus Fee-for-Service Health Care in Elderly Medicaid Patients," unpublished ms., 1993.

²"Reporting Standards for Health Care Utilization Data," Produced jointly by the Minnesota Department of Human Services, Minnesota Department of Health and Minnesota Health Plans, February, 1992.

³Luft, H. "How Do Health Maintenance Organizations Achieve Their 'Savings'?" *New England Journal of Medicine* 298, no. 23 (15 June 1978):1336-43.

⁴Minnesota Department of Health, Health Care Delivery Systems, HMO Unit. Minnesota Supplement to the 1991 HMO Annual Statement, October, 1992.

⁵Gunnar Nelson, personal communication.

Table 1

Eligibles in the Health Plans and Fee-for-Service Settings
 MA Groups (AFDC, AFDC Related, MA-PW, Needy Children, Aged)
 CY 1991
 FFS Comparison Group is Lagged

	Health Plans	Fee-for-Service
Age 0 to 19		
Unique Eligibles	62,569	77,812
Total Member Months	458,634	518,992
Mean Months of Eligibility per Eligible	7.33	6.67
Age 20 to 64		
Unique Eligibles	30,321	32,972
Total Member Months	218,880	214,268
Mean Months of Eligibility per Eligible	7.22	6.50
Age 65 and Above		
Unique Eligibles	5,688	10,618
Total Member Months	33,057	86,418
Mean Months of Eligibility per Eligible	5.81	8.14
Female Eligibles Age 10 to 49		
Unique Eligibles	31,710	38,399
Total Member Months	246,003	250,683
Mean Months of Eligibility per Eligible	7.76	6.53

Table 2

**Inpatient Medical and Surgical
Admissions per 1,000 Person Years**

MA Groups (AFDC, AFDC Related, MA-PW, Needy Children, Aged)

CY 1991

FFS Comparison Group is Lagged

Age Group	Health Plans			Fee-For-Service					
	Medical	Surgical	Total	Medical	P	Surgical	P	Total	P
0 to 19	48.2	9.7	57.9	42.1	ns	13.6	ns	55.7	ns
20 to 64	55.3	32.4	87.7	28.8	**	35.3	ns	64.1	ns
65 +	353.6	59.5	413.1	157.5	***	89.6	*	247.0	***
Weighted Total	74.1	20.0	94.1	47.3	*	25.6	ns	73.0	ns

Significance:

* $p \leq .05$

** $p \leq .01$

*** $p \leq .001$

ns=not significant

Note: P values for this comparison derive from the asymptotic distribution of the likelihood ratio of each pair of statistics, based on the assumption that the numbers of admissions per 1,000 person years are approximately Poisson distributed.

Table 3

Inpatient Medical Admissions

MA Groups (AFDC, AFDC Related, MA-PW, Needy Children, Aged)

CY 1991

FFS Comparison Group is Lagged

	Health Plans	SD	Fee-for Service	SD	P
Age 0 to 19					
Count of Admissions	1,843		1,821		
Total Days of Stay	6,228		5,555		
Percent of Eligibles with Admissions	2.50%	0.0006	2.02%	0.0005	***
Admits per 1,000 Person Years	48.22		42.10		
Days per 1,000 Person Years	162.95	238.72	128.44	181.23	***
Average Length of Stay	3.38	4.95	3.05	4.30	*
Kolmogorov-Smirnov one tailed: p=					ns
Age 20 to 64					
Count of Admissions	1,009		514		
Total Days of Stay	3,613		1,779		
Percent of Eligibles with Admissions	2.72%	0.0009	1.38%	0.0006	***
Admits per 1,000 Person Years	55.32		28.79		
Days per 1,000 Person Years	198.08	242.65	99.63	106.48	***
Average Length of Stay	3.58	4.39	3.46	3.70	ns
Kolmogorov-Smirnov one tailed: p=					ns
Age 65 and Above					
Count of Admissions	974		1,134		
Total Days of Stay	7,592		5,659		
Percent of Eligibles with Admissions	12.94%	0.0045	9.29%	0.0028	***
Admits per 1,000 Person Years	353.57		157.47		
Days per 1,000 Person Years	2,755.97	4,110.81	785.81	677.33	***
Average Length of Stay	7.79	11.63	4.99	4.30	***
Kolmogorov-Smirnov one tailed: p=					ns

Significance:

* p≤.05

**p≤.01

***p≤.001

ns=not significant

Table 4

Inpatient Surgical Admissions

MA Groups (AFDC, AFDC Related, MA-PW, Needy Children, Aged)

CY 1991

FFS Comparison Group is Lagged

	Health Plans	SD	Fee-for Service	SD	P
Age 0 to 19					
Count of Admissions	372		586		
Total Days of Stay	2,025		3,337		
Percent of Eligibles with Admissions	0.55%	0.0003	0.69%	0.0003	***
Admits per 1,000 Person Years	9.73		13.55		
Days per 1,000 Person Years	52.98	125.61	77.16	171.08	*
Average Length of Stay	5.44	12.91	5.69	12.63	ns
Kolmogorov-Smirnov one tailed:					**
Age 20 to 64					
Count of Admissions	591		630		
Total Days of Stay	2,356		2,870		
Percent of Eligibles with Admissions	1.83%	0.0008	1.74%	0.0007	ns
Admits per 1,000 Person Years	32.40		35.28		
Days per 1,000 Person Years	129.17	141.40	160.73	182.24	***
Average Length of Stay	3.99	4.36	4.56	5.17	*
Kolmogorov-Smirnov one tailed:					**
Age 65 and Above					
Count of Admissions	164		645		
Total Days of Stay	1,480		4,596		
Percent of Eligibles with Admissions	2.67%	0.0021	5.65%	0.0022	***
Admits per 1,000 Person Years	59.53		89.56		
Days per 1,000 Person Years	537.25	758.80	638.20	638.71	ns
Average Length of Stay	9.02	12.75	7.13	7.13	ns
Kolmogorov-Smirnov one tailed:					ns

Significance:

* p≤.05

**p≤.01

***p≤.001

ns=not significant

Table 5

Inpatient Obstetric Admissions

MA Groups (AFDC, AFDC Related, MA-PW, Needy Children, Aged)

CY 1991

FFS Comparison Group is Lagged

	Health Plans	SD	Fee-for Service	SD	P
Age 10 to 49 Weighted Totals					
Count of Admissions	3,706		3,440		
Total Days of Stay	9,629		8,864		
Percent of Eligibles with Admissions	11.04%	0.0018	7.64%	0.0014	***
Admits per 1,000 Person Years	184.62		159.82		
Days per 1,000 Person Years	479.36	323.20	414.41	445.9	***
Average Length of Stay	2.52	1.75	2.71	2.79	ns
Kolmogorov-Smirnov one tailed: p=					ns
Age 10 to 14					
Count of Admissions	13		38		
Total Days of Stay	27		128		
Percent of Eligibles with Admissions	0.25%	0.0007	0.52%	0.0009	*
Admits per 1,000 Person Years	3.67		10.89		
Days per 1,000 Person Years	7.61	1.81	36.68	40.14	***
Average Length of Stay	2.08	0.49	3.37	3.69	*
Kolmogorov-Smirnov one tailed: p=					ns
Age 15 to 19					
Count of Admissions	638		861		
Total Days of Stay	1,653		2,176		
Percent of Eligibles with Admissions	13.92%	0.0053	12.45%	0.0042	*
Admits per 1,000 Person Years	257.74		291.92		
Days per 1,000 Person Years	667.79	444.70	737.77	656.89	*
Average Length of Stay	2.59	1.73	2.53	2.25	ns
Kolmogorov-Smirnov one tailed: p=					ns
Age 20 to 24					
Count of Admissions	1,559		1,296		
Total Days of Stay	4,049		3,394		
Percent of Eligibles with Admissions	23.18%	0.0052	14.79%	0.0040	***
Admits per 1,000 Person Years	400.87		313.31		
Days per 1,000 Person Years	1,040.14	681.21	820.52	912.06	***
Average Length of Stay	2.60	1.70	2.62	2.91	ns
Kolmogorov-Smirnov one tailed: p=					ns

Table 5 (continued)

Age 25 to 29

Count of Admissions	861		703	
Total Days of Stay	2,224		1,732	
Percent of Eligibles with Admissions	14.58%	0.0047	8.86%	0.0034 ***
Admits per 1,000 Person Years	230.90		178.56	
Days per 1,000 Person Years	596.43	451.58	439.93	488.73 ***
Average Length of Stay	2.58	1.96	2.46	2.74 ns
Kolmogorov-Smirnov one tailed: p=				ns

Age 30 to 34

Count of Admissions	425		316	
Total Days of Stay	1,114		835	
Percent of Eligibles with Admissions	8.29%	0.0039	5.15%	0.0029 ***
Admits per 1,000 Person Years	124.44		97.60	
Days per 1,000 Person Years	326.18	181.30	257.90	201.79 ***
Average Length of Stay	2.62	1.46	2.64	2.07 ns
Kolmogorov-Smirnov one tailed: p=				ns

Age 35 to 39

Count of Admissions	163		175	
Total Days of Stay	426		463	
Percent of Eligibles with Admissions	5.31%	0.0041	4.76%	0.0038 ns
Admits per 1,000 Person Years	80.84		92.63	
Days per 1,000 Person Years	211.27	113.02	245.06	202.79 ns
Average Length of Stay	2.61	1.40	2.65	2.19 ns
Kolmogorov-Smirnov one tailed: p=				ns

Age 40 to 44

Count of Admissions	42		36	
Total Days of Stay	125		93	
Percent of Eligibles with Admissions	2.79%	0.0042	2.35%	0.0039 ns
Admits per 1,000 Person Years	40.27		42.08	
Days per 1,000 Person Years	119.84	130.24	108.70	67.75 ns
Average Length of Stay	2.98	3.23	2.58	1.61 ns
Kolmogorov-Smirnov one tailed: p=				ns

Age 45 to 49

Count of Admissions	5		10	
Total Days of Stay	11		28	
Percent of Eligibles with Admissions	0.86%	0.0038	1.45%	0.0045 ns
Admits per 1,000 Person Years	12.94		25.32	
Days per 1,000 Person Years	28.47	21.26	70.90	83.39 ns
Average Length of Stay	2.20	1.64	2.80	3.29 ns
Kolmogorov-Smirnov one tailed: p=				ns

Significance:

*p≤.05

**p≤.01

***p≤.001

ns=not significant

Table 6

Inpatient Admissions for Cesarean Section
MA Groups (AFDC, AFDC Related, MA-PW, Needy Children, Aged)
CY 1991
FFS Comparison Group is Lagged

	Health Plans	SD	Fee-for Service	SD	P
Age 10 to 49					
Count of Admissions	353		303		
Total Days of Stay	1,733		1,360		
Percent of Eligibles with Admissions	1.11%	0.0006	0.79%	0.0005	***
Admits per 1,000 Person Years	17.22		14.50		
Days per 1,000 Person Years	84.54	48.73	65.10	26.99	***
Average Length of Stay	4.91	2.83	4.49	1.86	*
Kolmogorov-Smirnov one tailed: p=					ns

Significance:

* p≤.05

**p≤.01

***p≤.001

ns=not significant

Table 7

"Complex" and "Well" Newborns

MA Groups (AFDC, AFDC Related, MA-PW, Needy Children, Aged)

CY 1991

FFS Comparison Group is Lagged

	Health Plans	SD	Fee-for Service	SD	P
Total Births	3,674		3,153		
Births by C-Section	353		303		
Percent of Total Births	9.61%		9.61%		
"Well" Newborns	3,380		2,873		
Percent of Total Births	92.00%		91.12%		
Average Length of Stay	2.21	1.12	1.98	0.78	***
Kolmogorov-Smirnov one tailed: p=					ns
"Complex" Newborns	294		280		
Percent of Total Births	8.00%		8.88%		
Average Length of Stay	19.16	22.14	21.56	28.81	ns
Kolmogorov-Smirnov one tailed: p=					ns

Significance:

* p≤.05

**p≤.01

***p≤.001

ns=not significant

Note: "Well" and "complex" newborns follows definitions established by the UDDC, and means that "complex" newborns have lengths of stay of five days or more or a cost per day of three times the mean for newborns with stays under five days. All other newborns are "well" newborns.

Table 8

**Unique Persons with No "Professional Medical Services"
by Months of Eligibility per Person**

MA Groups (AFDC, AFDC Related, MA-PW, Needy Children, Aged)

CY 1991

FFS Comparison Group is Lagged

Months Eligible	Age 0 to 19		P	Age 20 to 64		P	Age 65 and Above		P
	Health Plans	Fee-for Service		Health Plans	Fee-for Service		Health Plans	Fee-for Service	
1	66%	82%	***	63%	70%	***	51%	66%	***
2	52%	69%	***	51%	57%	***	41%	40%	ns
3	48%	62%	***	44%	50%	***	29%	33%	ns
4	39%	53%	***	34%	41%	***	29%	29%	ns
5	35%	48%	***	33%	34%	ns	16%	24%	***
6	31%	44%	***	24%	32%	***	16%	36%	***
7	30%	35%	***	24%	26%	ns	17%	20%	ns
8	26%	31%	***	21%	23%	ns	16%	34%	*
9	23%	29%	***	19%	20%	ns	17%	31%	*
10	22%	25%	**	19%	17%	ns	4%	30%	***
11	20%	18%	ns	15%	17%	ns	10%	25%	**
12	19%	23%	***	13%	13%	ns	9%	16%	***
Total	33%	45%	***	28%	35%	***	25%	26%	*

Significance:

* p≤.05

**p≤.01

***p≤.001

ns=not significant

Note: "Professional Medical Services" includes all visits to the office, clinic, home, nursing home, and preventive medicine, ophthalmology and optometry services. Persons with no "professional medical services" may have received services in the emergency department, or mental health, chemical dependency, dental or inpatient services.

Table 9

Emergency Department Use

MA Groups (AFDC, AFDC Related, MA-PW, Needy Children, Aged)

CY 1991

FFS Comparison Group is Lagged

	Health Plans	SD	Fee-for Service	SD	P
Age 0 to 19					
Count of Visits	23,041		30,502		
Percent of Eligibles with Visits	22.47%	0.0017	21.97%	0.0015	*
Mean Visits per User (annualized)	2.68	1.2394	3.21	1.4655	***
Mean Visits per Eligible (annualized)	0.60	0.0023	0.71	0.0025	***
Visits per 1,000 Person Years	602.86	455.95	705.26	579.18	***
Kolmogorov-Smirnov one tailed: p=					***
Age 20 to 64					
Count of Visits	11,832		12,277		
Percent of Eligibles with Visits	22.96%	0.0024	20.40%	0.0022	***
Mean Visits per User (annualized)	2.83	1.4702	3.37	1.5268	***
Mean Visits per Eligible (annualized)	0.65	0.0040	0.69	0.0038	***
Visits per 1,000 Person Years	648.68	561.09	687.57	658.94	***
Kolmogorov-Smirnov one tailed: p=					***
Age 65 and Above					
Count of Visits	744		2,284		
Percent of Eligibles with Visits	10.02%	0.0040	13.73%	0.0033	***
Mean Visits per User (annualized)	2.70	0.6479	2.31	1.4894	***
Mean Visits per Eligible (annualized)	0.27	0.0027	0.32	0.0054	***
Visits per 1,000 Person Years	270.08	134.07	317.16	301.54	***
Kolmogorov-Smirnov one tailed: p=					***

Significance:

* p≤.05

**p≤.01

***p≤.001

ns=not significant

Note: Counts of emergency department visits exclude those resulting in inpatient admissions.

Table 10

Outpatient Office Visits:**New and Established Patients with and without Acute Diagnoses**

MA Groups (AFDC, AFDC Related, MA-PW, Needy Children, Aged)

CY 1991

FFS Comparison Group is Lagged

	Health Plans	SD	Fee-for Service	SD	P
Age 0 to 19					
Count of Visits	127,687		136,074		
Percent of Eligibles with Visits	92.52%	0.0011	78.78%	0.0015	***
Mean Visits per User (annualized)	3.61	2.2721	3.99	2.3237	***
Mean Visits per Eligible (annualized)	3.34	0.0087	3.15	0.0074	***
Visits per 1,000 Person Years	3,340.89	3,441.36	3,146.27	3,293.54	***
Kolmogorov-Smirnov one tailed: p=					ns
Age 20 to 64					
Count of Visits	63,659		55,948		
Percent of Eligibles with Visits	86.79%	0.0019	66.71%	0.0026	***
Mean Visits per User (annualized)	4.02	2.6331	4.70	2.9241	***
Mean Visits per Eligible (annualized)	3.49	0.0141	3.13	0.0132	***
Visits per 1,000 Person Years	3,490.08	3,798.73	3,133.35	3,602.08	ns
Kolmogorov-Smirnov one tailed: p=					**
Age 65 and Above					
Count of Visits	5,703		21,434		
Percent of Eligibles with Visits	41.56%	0.0065	53.48%	0.0048	***
Mean Visits per User (annualized)	4.98	2.6547	5.57	4.4348	***
Mean Visits per Eligible (annualized)	2.07	0.0227	2.98	0.0315	***
Visits per 1,000 Person Years	2,070.24	2,278.13	2,976.32	3,496.61	ns
Kolmogorov-Smirnov one tailed: p=					***

Significance:

* p≤.05

**p≤.01

***p≤.001

ns=not significant

Note: "Percent of Eligibles with Visits" cannot be compared directly with Table 8, because this table does not include visits in the home or nursing home, or ophthalmology or optometry services. Further, this statistic may overcount persons with office visits slightly because this table compiles Tables 13-16 and some persons may have been counted on more than one of these tables. For example, a person with a "new patient" and an "established patient" visit would be counted as two persons in this table, artificially inflating the numerator.

Table 11

**Percentage Distribution of Outpatient Office Visits
by New and Established Patients**

MA Groups (AFDC, AFDC Related, MA-PW, Needy Children, Aged)

CY 1991

FFS Comparison Group is Lagged

Age Group	Health Plan Patients			Fee-for-Service Patients			P
	Established	New	Total	Established	New	Total	
0 to 19	87.93	12.07	100.00	91.07	8.93	100.00	***
20 to 64	83.19	16.82	100.00	88.77	11.23	100.00	***
65 and Above	89.11	10.89	100.00	94.63	5.37	100.00	***
Weighted Total	86.69	13.32	100.00	90.70	9.30	100.00	***

Significance:

* $p \leq .05$

** $p \leq .01$

*** $p \leq .001$

ns=not significant

Table 12

**Percentage Distribution of Outpatient Office Visits
by Acute and Non Acute Diagnoses**

MA Groups (AFDC, AFDC Related, MA-PW, Needy Children, Aged)

CY 1991

FFS Comparison Group is Lagged

Age Group	Health Plan Patients			Fee-for-Service Patients			P
	Acute	Non Acute	Total	Acute	Non Acute	Total	
0 to 19	76.79	23.21	100.00	77.40	22.60	100.00	***
20 to 64	91.22	8.79	100.00	92.49	7.51	100.00	***
65 and Above	96.74	3.26	100.00	99.19	0.81	100.00	***
Weighted Total	82.44	17.57	100.01	83.38	16.63	100.01	***

Significance:

* $p \leq .05$

** $p \leq .01$

*** $p \leq .001$

ns=not significant

Table 13

Outpatient Office Visits:

Established Patients with Acute Diagnoses

MA Groups (AFDC, AFDC Related, MA-PW, Needy Children, Aged)

CY 1991

FFS Comparison Group is Lagged

	Health Plans	SD	Fee-for Service	SD	P
Age 0 to 19					
Count of Visits	86,754		95,586		
Percent of Eligibles with Visits	45.72%	0.0020	41.12%	0.0018	***
Mean Visits per User (annualized)	4.97	2.8967	5.37	2.9147	***
Mean Visits per Eligible (annualized)	2.27	0.0078	2.21	0.0067	***
Visits per 1,000 Person Years	2,269.89	2,168.00	2,210.05	2,156.38	***
Kolmogorov-Smirnov one tailed: p=					ns
Age 20 to 64					
Count of Visits	48,329		46,135		
Percent of Eligibles with Visits	48.24%	0.0029	41.55%	0.0027	***
Mean Visits per User (annualized)	5.49	3.1920	6.22	3.4303	***
Mean Visits per Eligible (annualized)	2.65	0.0127	2.58	0.0122	***
Visits per 1,000 Person Years	2,649.62	2,559.73	2,583.77	2,631.76	***
Kolmogorov-Smirnov one tailed: p=					ns
Age 65 and Above					
Count of Visits	4,921		20,126		
Percent of Eligibles with Visits	30.13%	0.0061	43.18%	0.0048	***
Mean Visits per User (annualized)	5.93	2.9734	6.47	4.7243	***
Mean Visits per Eligible (annualized)	1.79	0.0216	2.79	0.0301	***
Visits per 1,000 Person Years	1,786.37	1,850.02	2,794.70	3,007.86	***
Kolmogorov-Smirnov one tailed: p=					***

Significance:

* p≤.05

**p≤.01

***p≤.001

ns=not significant

Table 14

Outpatient Office Visits:

New Patients with Acute Diagnoses

MA Groups (AFDC, AFDC Related, MA-PW, Needy Children, Aged)

CY 1991

FFS Comparison Group is Lagged

	Health Plans	SD	Fee-for Service	SD	P
Age 0 to 19					
Count of Visits	11,303		9,740		
Percent of Eligibles with Visits	14.18%	0.0014	10.80%	0.0011	***
Mean Visits per User (annualized)	2.08	0.7479	2.09	0.4486	ns
Mean Visits per Eligible (annualized)	0.30	0.0011	0.23	0.0005	***
Visits per 1,000 Person Years	295.74	173.67	225.21	87.16	***
Kolmogorov-Smirnov one tailed: p=					ns
Age 20 to 64					
Count of Visits	9,738		5,609		
Percent of Eligibles with Visits	22.48%	0.0024	13.82%	0.0019	***
Mean Visits per User (annualized)	2.37	0.9611	2.27	0.5637	***
Mean Visits per Eligible (annualized)	0.53	0.0026	0.31	0.0012	***
Visits per 1,000 Person Years	533.88	359.15	314.13	143.84	***
Kolmogorov-Smirnov one tailed: p=					ns
Age 65 and Above					
Count of Visits	596		1,134		
Percent of Eligibles with Visits	8.72%	0.0037	8.84%	0.0028	ns
Mean Visits per User (annualized)	2.48	0.5239	1.78	0.5809	***
Mean Visits per Eligible (annualized)	0.22	0.0021	0.16	0.0017	***
Visits per 1,000 Person Years	216.35	94.32	157.47	75.74	***
Kolmogorov-Smirnov one tailed: p=					ns

Significance:

* p≤.05

**p≤.01

***p≤.001

ns=not significant

Table 15

Outpatient Office Visits:

Established Patients without Acute Diagnoses

MA Groups (AFDC, AFDC Related, MA-PW, Needy Children, Aged)

CY 1991

FFS Comparison Group is Lagged

	Health Plans	SD	Fee-for Service	SD	P
Age 0 to 19					
Count of Visits	25,520		28,342		
Percent of Eligibles with Visits	26.31%	0.0018	23.85%	0.0015	***
Mean Visits per User (annualized)	2.54	0.9223	2.75	0.9536	***
Mean Visits per Eligible (annualized)	0.67	0.0019	0.66	0.0017	***
Visits per 1,000 Person Years	667.72	397.31	655.32	409.25	***
Kolmogorov-Smirnov one tailed: p=					ns
Age 20 to 64					
Count of Visits	4,625		3,530		
Percent of Eligibles with Visits	12.96%	0.0019	9.35%	0.0016	***
Mean Visits per User (annualized)	1.96	0.5185	2.11	0.4790	***
Mean Visits per Eligible (annualized)	0.25	0.0011	0.20	0.0008	***
Visits per 1,000 Person Years	253.56	111.71	197.70	82.74	***
Kolmogorov-Smirnov one tailed: p=					ns
Age 65 and Above					
Count of Visits	161		156		
Percent of Eligibles with Visits	2.29%	0.0020	1.28%	0.0011	***
Mean Visits per User (annualized)	2.56	0.6798	1.69	0.4308	***
Mean Visits per Eligible (annualized)	0.06	0.0014	0.02	0.0005	***
Visits per 1,000 Person Years	58.44	32.08	21.66	8.14	***
Kolmogorov-Smirnov one tailed: p=					ns

Significance:

* p≤.05

**p≤.01

***p≤.001

ns=not significant

Table 16

Outpatient Office Visits:

New Patients without Acute Diagnoses

MA Groups (AFDC, AFDC Related, MA-PW, Needy Children, Aged)

CY 1991

FFS Comparison Group is Lagged

	Health Plans	SD	Fee-for Service	SD	P
Age 0 to 19					
Count of Visits	4,110		2,409		
Percent of Eligibles with Visits	6.30%	0.0010	3.01%	0.0006	***
Mean Visits per User (annualized)	1.71	0.2064	1.85	0.1718	***
Mean Visits per Eligible (annualized)	0.11	0.0002	0.06	0.0001	***
Visits per 1,000 Person Years	107.54	21.29	55.70	9.30	***
Kolmogorov-Smirnov one tailed: p=					ns
Age 20 to 64					
Count of Visits	967		674		
Percent of Eligibles with Visits	3.11%	0.0010	1.99%	0.0008	***
Mean Visits per User (annualized)	1.71	0.1673	1.89	0.1589	***
Mean Visits per Eligible (annualized)	0.05	0.0002	0.04	0.0001	***
Visits per 1,000 Person Years	53.02	8.64	37.75	5.85	***
Kolmogorov-Smirnov one tailed: p=					ns
Age 65 and Above					
Count of Visits	25		18		
Percent of Eligibles with Visits	0.42%	0.0009	0.17%	0.0004	**
Mean Visits per User (annualized)	2.15	0.2041	1.47	0.0000	***
Mean Visits per Eligible (annualized)	0.01	0.0007	0.00	0.0000	***
Visits per 1,000 Person Years	9.08	1.78	2.50	0.00	***
Kolmogorov-Smirnov one tailed: p=					ns

Significance:

* p≤.05

**p≤.01

***p≤.001

ns=not significant

Table 17

**Pap Smear Tests per 1,000 Person Years
by Age Cohort for Women Age 10 and Above**
MA Groups (AFDC, AFDC Related, MA-PW, Needy Children, Aged)
CY 1991
FFS Comparison Group is Lagged

Age Cohort	Health Plans	Fee-for-Service	P
10 to 14	27.23	50.15	***
15 to 19	395.61	447.21	**
20 to 24	671.46	632.19	*
25 to 29	547.90	515.11	*
30 to 34	465.37	413.25	***
35 to 39	385.98	365.74	ns
40 to 44	369.34	310.90	*
45 to 49	327.78	210.17	**
50 to 54	303.39	225.12	ns
55 to 59	168.75	209.37	ns
60 to 64	239.47	161.89	ns
65 to 69	90.69	61.60	ns
70 to 74	77.17	32.58	*
75 to 79	28.25	29.93	ns
80 to 84	24.25	11.44	ns
85 +	9.12	5.26	ns
Weighted Total	362.89	345.34	***

Significance:

* $p \leq .05$

** $p \leq .01$

*** $p \leq .001$

ns=not significant

Note: Rates are calculated on the basis of female eligibles' member months only. Health plan data are derived from reports submitted to the Minnesota Department of Health. Counts exclude Itasca County M.A..

Table 18

**Mammograms per 1,000 Person Years
by Age Cohort for Women Age 35 and Above**
MA Groups (AFDC, AFDC Related, MA-PW, Needy Children, Aged)
CY 1991
FFS Comparison Group is Lagged

Age Cohort	Health Plans	Fee-for-Service	P
35 to 39	142.63	179.43	**
40 to 44	199.52	244.28	*
45 to 49	199.87	248.15	ns
50 to 54	238.37	337.68	ns
55 to 59	187.50	297.52	ns
60 to 64	239.47	303.54	ns
65 to 69	124.70	318.48	***
70 to 74	196.43	244.98	ns
75 to 79	132.77	178.46	*
80 to 84	67.91	93.64	ns
85 +	25.34	23.90	ns
Weighted Total	127.48	172.12	***

Significance:

* $p \leq .05$

** $p \leq .01$

*** $p \leq .001$

ns=not significant

Note: Rates are calculated on the basis of female eligibles' member months only. Health plan data are derived from reports submitted to the Minnesota Department of Health. Counts exclude Itasca County M.A..

Table 19

**Total Pap Smear and Mammogram Tests per 1,000 Person Years
Health Plans Commercially Insured Populations Composite
and Health Plan Medical Assistance Enrollees**

For Women Age 10 and Above (Pap Smears) and 35 and Above (Mammograms)
CY 1991
Statewide

	Test Rate per 1,000 Person Years		P
	Commercial Population	Medicaid Population	
Pap Smears	490.53	385.75	***
Mammograms	386.64	137.86	***

Significance:

* $p \leq .05$

** $p \leq .01$

*** $p \leq .001$

ns = not significant

Notes: Rates are calculated on the basis of female eligibles' member months only. Health plan data are derived from reports submitted to the Minnesota Department of Health.

Medicaid population rates differ from Table 18 because these rates are not weighted.