A RAND NOTE

Setting Capitations for Medicaid: A Case Study

Arleen Leibowitz, Joan L. Buchanan

November 1990

RAND

The research described in this report was sponsored by the Health Care Financing Administration, U.S. Department of Health and Human Services under Cooperative Agreement No. 99-C-98489/9.

This Note contains an offprint of RAND research originally published in a journal or book. The text is reproduced here, with permission of the original publisher.

The RAND Publication Series: The Report is the principal publication documenting and transmitting RAND's major research findings and final research results. The RAND Note reports other outputs of sponsored research for general distribution. Publications of The RAND Corporation do not necessarily reflect the opinions or policies of the sponsors of RAND research.

Published by The RAND Corporation
1700 Main Street, P.O. Box 2138, Santa Monica, CA 90406-2138

A RAND NOTE

N-3251-HCFA

Setting Capitations for Medicaid: A Case Study

Arleen Leibowitz, Joan L. Buchanan

November 1990

Prepared for the
Health Care Financing Administration,
U.S. Department of Health and Human Services

RAND

RAND/UCLA/HARVARD
Center for Health Care
Financing Policy Research

Setting capitations for Medicaid: A case study

by Arleen Leibowitz and Joan L. Buchanan

This article examines the methodology New York State used to set capitation rates for a Medicaid health maintenance organization. By examining the methods used and the assumptions made in a particular case, some general lessons are drawn about the ratesetting process. Greater reliance on statewide data to assure fair and statistically stable estimates is needed. Although the article focuses on one State and its ratesetting for one particular plan (Health Care Plus), the issues raised have general interest for other plans and for other States concerned with the setting of capitation rates for Medicaid enrollees in prepaid plans.

Introduction

Many States are interested in the potential of prepaid plans to improve access, provide continuity, and control the costs of providing care to Medicaid recipients. The ability of prepaid plans to reduce State expenditures for Medicaid recipients, however, rests importantly on the level of the capitation rate given to the prepaid plan.

From a fiscal point of view, one advantage of the capitated plans is that the monthly cost of providing health care to a given Medicaid population is known in advance. Many States also believe that if the capitation rate is set at 90 or 95 percent of the average Medicaid expenditure, that will reduce their expenditures on Medicaid services. However, this will only be true if the prepaid plans enroll "average" patients. If, on average, the prepaid plan enrollees are lower users of medical care, the State may pay only 95 percent of the average Medicaid cost, and still pay more than they would have paid for those enrollees in the fee-for-service system (FFS).[1] On the other hand, if prepaid enrollees are higher than average users of medical care, the State may save money in the short-run, but the plans may not be financially viable.

Actuarially fair capitation rates for Medicaid enrollees are important from both the health maintenance organization's (HMO's) point of view and from that of the State. Without a capitation that covers the cost of treating Medicaid patients, the HMO's long-run viability could be threatened. Certainly the willingness of plans to participate in the program through time will diminish if capitation rates are not at least actuarially fair.

Ratesetting differences

The Medicaid capitations differ from the HMO capitations for employee groups in several ways. Typically, HMOs have set community-based, rather than experienced-based capitation rates for their commercial enrollees. In this situation, the fee charged for an individual is not a function of that individual's characteristics, or even of the characteristics of that individual's firm. However, States have a mandate not to pay more for Medicaid health care in an HMO than they pay for health care in the FFS system. Consequently, States have negotiated Medicaid-specific rates based on FFS Medicaid experience.

The mechanism for setting Medicaid capitations also differs from the procedure that HMOs usually employ. Whereas the community-based capitations are determined by the HMO and are based on their cost structure, Medicaid rates are often proposed by the States and are based on FFS Medicaid claims, which bear no necessary relationship to HMO costs.

However, the expected costs for a particular Medicaid enrollee can vary in a systematic way with many factors, including age, sex, and aid category. States are becoming increasingly aware of the importance of incorporating these factors into their calculation of capitation rates.

An additional complication States face in setting capitation rates derives from the fact that ratesetting is inherently a forecasting problem. Therefore, estimates of future price trends and usage patterns are necessary. These estimates must often be made with incomplete data, which require adjustment for the purpose of estimating a capitation rate.

Several studies consider the factors that should be included in capitation formulas, by examining what variables best explain medical care expenditures (Newhouse et al., 1989; McClure, 1984; Newhouse, 1986; Lubitz, Beebe, and Riley, 1985; Anderson et al., 1986). Most of these studies examine the adjusted average per capita cost (AAPCC) formula used in setting Medicare capitation rates. There has been little focus on Medicaid ratesetting for HMOs. To our knowledge, no previous study examines how ratesetting is actually implemented.

Ratesetting problem

In this section we describe the calculation of the capitation rate for calendar year 1986 for Health Care Plus (HCP). This discussion draws heavily on materials supplied by the New York State Department of Health (NYS) (Tenan, 1986; New York State Prepaid Health Service Plans Waiver).

NYS attempted to use both HMO cost data and data on FFS equivalent expenditures in setting Medicaid HMO capitation rates. The State proposed a two-stage plan for setting prepaid capitation rates for Medicaid. In the first stage, health plans would calculate their actual costs of

[1]Ellis and McGuire (1987) illustrate that a payer can pay more for health care with even moderate levels of positive selection of patients.

This work was supported by the Health Care Financing Administration under Cooperative Agreement Number 99-C-98489/9 as part of the research program at the RAND/UCLA/Harvard, Center for Health Care Financing Policy Research.

Reprint requests: Arleen Leibowitz, Ph.D., 1700 Main Street, Santa Monica, California 90406-2138.

Reprinted from *Health Care Financing Review*, Summer 1990, Vol. 11, No. 4, pp. 79–85. © Health Care Financing Review. Reprinted by permission.

providing service to Medicaid enrollees. Administrative and marketing costs would be included in these costs, as well as contributions toward a reserve account. However, since the final capitation rate cannot exceed the cost of providing medical care to enrolled Medicaid eligibles in the FFS system, the capitation rate would be set as the minimum of the HMO cost calculation and the FFS equivalent costs. In practice, because plans had little or no experience treating Medicaid recipients and consequently had inadequate information for setting cost estimates, the capitation was based only on the FFS equivalent costs, which were termed the "FFS cap"

Because the State was setting a rate for a future time period based on data from a prior time period, it faced a forecasting problem. A number of adjustments needed to be made in order to estimate the FFS cap for a future period. In particular, the calculation had to:

- Adjust for differences in the population served by the HMO and the general Medicaid population whose claims are used in ratesetting.
- Account for the increase in prices between the time for which claims are available and the time for which rates are set.
- Include only the services that the HMO covered.
- Adjust for any stop-loss protection that the State provides the HMO.

The FFS cap calculation was based on aggregated data of FFS Medicaid use in the HCP service area. Various adjustments were made to the Medicaid claims data to account for populations served, services covered, stop-loss provisions, and incomplete data. Once these adjustments to the historical FFS claims data had been made, the sum of total expenditures for a given eligibility group was divided by the sum of months of eligibility for that group, in order to estimate a group-specific capitation rate. This rate was then adjusted to account for price increases and mandated savings. In the following sections we describe the Medicaid claims data used, the rate groups defined, and the adjustments made for price increases over time, the stop-loss adjustments, the determination of cost savings, and guaranteed eligibility for Medicaid.

Claims data

Area covered

Lutheran Medical Center, which serves Medicaid patients in Brooklyn, sponsors HCP. The service area for HCP covers five ZIP Codes in Brooklyn, which surround the medical center. In its calculation of the FFS cap, NYS relied on data that related specifically to Medicaid use in those five ZIP Codes, as well as on statewide Medicaid data.

Adjustments for time period used

Medicaid's payments to physicians and hospitals depend on the reimbursement rates prevailing at the date of service rather than on the date the claim is paid. Because there are often delays in paying Medicaid claims (particularly large claims), Medicaid payouts in a given month may reflect usage that occurred 6 to 12 months previously.

The FFS cap that formed the basis for setting the Medicaid capitation rate was based on per capita monthly Medicaid use. In order to appropriately estimate per capita use, we need both the value of health care services used in a given month and the number of people eligible for Medicaid in that month. Although the amount of medical services used during a particular period is the conceptually correct measure of Medicaid expenditures for the per capita monthly calculation, it is not an easy number for the Medicaid agency to obtain. Because of the time lag in filing claims, the Medicaid agency must wait between 6 months to 1 year after the last month of the base period in order to have a complete record of health care use. This is particularly important because large claims require the most processing and are the most likely to face payment delays. If the agency does not wait for all claims from a given period to be processed, it should make an adjustment for the as yet unprocessed claims.

Although NYS was calculating the 1986 capitation rates in late 1985 and early 1986, the most recent data available for this purpose were claims data for the period October 1, 1983, to September 30, 1984. NYS used two batches of data. From September 1984 claims files, they collected data on services used during the period October 1983 through March 1984. Data for the period April 1984 through September 1984 were derived from the March 1985 claims files. Although it would have been desirable to use claims data for the period immediately prior to the year for which the capitation is estimated, it was not possible to do so. The delay in obtaining and paying Medicaid claims means that rates will always be based on data that is at least 6-18 months old.

Since the underlying data represent claims filed as of a date between 7 to 12 months after the date of service, an incomplete set, they need to be inflated to represent the total claims that will eventually be paid for the service dates in question (New York will not pay claims that are filed more than 1 year after the service date). The completion factor was based on claim lag factors by service category (e.g. physician, inpatient) calculated for a 24-month period and by aid category (Kuzniak and Bass, 1985).

Because of seasonality, some months are typically low-use months, and others are high-use months. Therefore, a superior estimate would involve a correction factor that differed for claims data of different vintages, and which applied a vintage-specific correction factor. Ideally, this seasonality correction would be based on State level data because there is little reason to expect seasonal patterns to vary for different regions of the State.

The adjustment for unfiled claims was based on New York City data rather than on data for the particular area served by HCP, which were available. If Brooklyn claims are filed more or less rapidly than claims in the rest of the city, this will distort the adjustment factor. Using data for the ZIP Codes served by HCP, we have made similar calculations of the aging of claims for recipients from the Aid to Dependent Children (ADC) program. Our first set of estimates, using the same methods of calculation as NYS, showed that of claims filed within 12 months of the service date, 84.5 percent

were filed within 6 months of the date of service, 93 percent were filed within 8 months of the date of service, and 95 percent were filed within 10 months of the date of service. The NYS calculation for ADC claims was 91 percent. Our calculation may differ from that of NYS for two reasons: First, NYS allows a 24-month period for the accumulation of complete claims, while we allow 12 months. Second, the NYS calculation includes all Medicaid claims, including those for individuals with Medicare and other insurance. Because claims with other responsible payers in addition to Medicaid take longer to process (Kuzniak and Bass, 1985), this leads to an overestimate of the lag time for ADC Medicaid eligibles, few of whom have other insurance.

As a result of incurring large medical expenses, some individuals who are not eligible for Medicaid at the time they receive care become retroactively eligible for Medicaid. A costly hospitalization, for example, may allow an individual to qualify under the medically-needy program. This introduces a source of bias in calculating capitation rates because the prepaid plan can never be subject to retroactive eligibility. The prepaid plan serves a defined population, and cannot provide services to people who are not Medicaid eligible at the time of service. Therefore, the amount of service for which the plan is liable cannot grow retrospectively, as it can for the State as a whole. Thus, the Medicaid claims resulting from retroactive eligibility should not enter into the calculation of the prepaid plan's capitation rate.

To isolate the increase in claims caused by a delay in filing from the increase resulting from retroactive eligibility, we calculated the increase in claims over time for a defined population (that is, people who had their Medicaid eligibility as of a given date). The increase in claims for a sample who are continuously eligible does not contain any increases resulting from retroactive eligibility. As expected, we found a shorter claims lag for the defined sample of ADC Medicaid eligibles—95.7 percent of the claims that would ever be received for these individuals were filed within 6 months, 99.3 percent were filed within 8 months, and 99.8 percent were filed within 10 months of the date of service.

The rate of growth in filed claims used by NYS relates to the total, not the per capita, cost of Medicaid. Therefore, it overstates the percentage of claims that are filed late. Our initial calculation, which did not maintain a fixed population of eligibles, arrived at a similar number. The 91 percent filing rate used by NYS means that claims were estimated to be 9.9 percent greater than observed (1.00/.91). Our calculations, based on a defined population specific to the HCP ZIP Codes implies that, on average, more than 98 percent of claims were filed within 6 months of the date of service. This yields an inflation factor of only 1.7 percent (1.00/.983). Thus, use of total rather than per capita figures raised the adjustment for unfiled claims by more than a factor of 5.

Services included

Health Care Plus does not cover certain types of long-term care as part of its capitation. Patients requiring these services return to FFS Medicaid. Therefore, the claims data were adjusted to exclude costs incurred by institutionalized Medicaid recipients, costs of long-term care, intermediate care facilities, and services of the Office of Mental Retardation. Expenditures were calculated to be net of third-party collections (e.g. workers' compensation or other insurance), for which HCP would be allowed to keep the reimbursement.

HCP patients have the right to obtain family planning and reproductive health services from any provider they choose, including FFS providers. The cost of these services is not deducted from the FFS cap, nor is HCP billed for the cost of these services obtained from FFS providers. This provision was included to preserve patients' right to privacy in this sensitive area.

We do not yet know how many HCP enrollees use FFS providers for family planning and reproductive health services. However, we have calculated that 3.6 percent of expenditures for women over the age of 13 relates to this type of care. The requirement that States allow freedom of choice for reproductive services is relatively new, and States are struggling with a way to operate under this rule. If the States make no adjustment to the cap for these services and if all these services are purchased outside the HMO, States will be, in effect, paying twice for 3.6 percent of the medical care of adult women. On the other hand, if reproductive services are deducted from the capitation, the HMO will not be compensated for the reproductive services they do provide to their patients. A possible alternative method would be to deduct these from the cap and have the State reimburse HCP like all other providers, for reproductive services only.

Detailed rate groups

Because average medical costs vary with age, sex, and Medicaid aid category, ADC or Supplemental Security Income (SSI), among other factors, it is important to set capitation rates that reflect this differential use. Otherwise, prepaid plans might enroll primarily low- or high-use groups, but receive a capitation that reflects average use.

Although it is important to distinguish between low- and high-use groups, it is equally important not to have too many groups. With many finely divided groups, rates would be based on fewer observations, leading to less accurate estimates of mean expenditures by group and to rates with high variability from year to year.

NYS examined the Medicaid data for the five HCP ZIP Codes in order to "... identify natural clusters, or sub-groups ... based upon the average cost per person, per month of Medicaid eligibility (cost per eligible month)." (Tenan, 1986). In establishing rate groups, NYS considered the plausibility of the groupings as well as the available sample size for estimating the group means. The rate groups and the number of months of data available for estimating means are given in Table 1.

The size of subgroups used to define the rate structure was very small in some cases, because these subgroups were specific to the HCP marketing area. For example, the rate for SSI recipients between the ages of 1 and 20 were based on only 7,221 months of claims during a period for 1 year (Table 1). It is important to recognize that there is substantial correlation across months in an individual's health care use, so the 7,221 months do not represent independent observations. Because the average

Table 1

Definition and size of sex and age groups used in setting capitation rates for Medicaid enrollees: Brooklyn, New York, 1986

Sex and age group	Number of eligible months	Estimated number of individuals[1]
ADC		
Male or female under 1 year	11,336	1,108
Female 1-14 years	101,500	9,923
Female 15-20 years	32,196	3,147
Male 1-20 years	131,372	12,842
Male or female 21-64 years	117,881	11,523
SSI		
Male or female 1-20 years	7,221	683
Male or female 21-64 years	40,961	3,876
Male or female 65 years or over	40,505	3,833

[1]Number of individuals estimated by dividing number of months by average number of months on ADC and SSI, separately. These averages, 10.23 months for ADC and 10.57 months for SSI, were calculated from New York State Prepaid Health Service Planning Data Sets.

NOTES: ADC is Aid to Dependent Children. SSI is Supplemental Security Income.

SOURCE: (Tenan, 1986).

SSI recipient had Medicaid coverage for 10.57 months in the year (NYS PHSP Planning Data Set), the 7,221 months of data relate to the health care use of fewer than 700 individuals during 1 year.

Claims data are extremely variable, and this variability increases as the sample size falls. For example, using random samples of monthly ADC Medicaid claims data for the HCP marketing area, we can show that confidence intervals around the mean expenditure of $96.98 vary markedly with sample size. For a sample of 7,000 the 95-percent confidence interval is $86.36 to $107.60; for a sample of 30,000 the confidence interval is $92.15 to $101.81; for 82,000 observations the confidence interval is $94.14 to $99.82. Thus, the 95-percent confidence interval (the range within the true value lies 95 percent of the time) shrinks from $21.24 for a random sample of size 7,000 to a more precise $5.68 if the mean is based on a sample of 82,000 monthly claims.

The greater stability of estimates based on more observations means that subgroup definitions based on the entire State would have yielded more precise estimates. These estimates would be less likely to vary widely from year to year.

Rather than base the subgroup rates on data for the marketing area, NYS could have computed the average expenditure of each rate group relative to a standard group that was amply represented within the marketing area. In this methodology, State data would be used to calculate the ratio of the medical use of (for example) females 15-20 years of age relative to female ADC recipients 1-14 years age. This ratio would then be multiplied by the mean use of female ADC recipients 1-14 years of age (who are numerous) within the marketing area to estimate the use of females 15-20 years of age. This combination of State and local data allows the large numbers of observations in the State data to determine the ratios, and the local data to determine the local price and use structure.

This methodology assumes that relative use by age is constant over the State. This is at least as tenable as assuming (as does the NYS methodology) that the trend in medical costs is the same throughout the State. Any misspecification of the local rate groups is likely to be compensated for by the greater reliability (i.e., lower level of statistical uncertainty) of the estimates based on larger sample sizes. In addition to providing a more reliable estimate, this methodology facilitates rate calculations for other HMOs within NYS, since the established rate group relatives would only need to be applied to the local standard group.

The increased sample size available would also have allowed groupings with more intuitive appeal. For example, although there are relatively few males 20 years of age or over on Medicaid in the HCP marketing area, their greater representation in the State data may have allowed separate capitation levels for males and females over 20 years of age. With this separation, the cap could have reflected the relatively heavy use of medical care resulting from reproductive-related services for women over 20 years of age. Males in this age group have significantly lower use, as can be seen from a comparison of each group's average medical costs relative to children 6-13 years of age (Table 2).

Claims for Medicaid recipients of all ages are used in the cap calculation. In practice, however, newborns are never enrolled in HCP at birth because a formal enrollment application must be made for them under the NYS regulations. (In some States, newborns are automatically enrolled in their mother's HMO, and other States include newborns' costs on the mother's record.)

It is also unlikely that a child in neonatal intensive care would be enrolled by the plan. Therefore, in New York, the costs of some of the highest medical care users are included in the capitation, although the plan is not at risk for these costs. We illustrate this point using a sample of FFS Medicaid claims for ADC recipients in the HCP marketing area. Table 3 contrasts the average monthly Medicaid costs for all children under 1 year of age and

Table 2

Comparison of Medicaid costs by sex and age groups relative to children 6-13 years of age

Sex and age group	Percent increase
Males over 21 years	57.2
Females 14-17 years	*−8.2
Females 18-30 years	*90.1
Females 31-44 years	*156.6
Females over 44 years	*180.9

*Significantly different from the value for males over 21.

SOURCE: Medicaid Management Information System: Calculated from claims data for Health Care Plus marketing area.

Table 3

Mean monthly FFS Medicaid costs for infants: September 1985-November 1986

Recipient age	Monthly average cost
All children 0-12 months of age	$223.17
Children 2-12 months of age	*165.28

*Significantly different from the value for all children on a two-tailed test, 1-percent level of significance.

NOTE: FFS is fee-for-service.

SOURCE: Medicaid Management Information System: Calculated from claims data for Health Care Plus marketing area.

the costs for the same group excluding newborns under 2 months of age. Plans that do not enroll newborns for the first 2 months of life could expect claims that average $165 per month. However, if the costs of infants in their first 2 months are included in the rate calculation, the plan will get paid an average of $223 per month, a windfall of $58 per month.

Adjustment for trend

Because of general price increases, medical costs will be higher at the time the rates apply than they were in the base period used to calculate rates. To account for this, it is necessary to estimate the rate of cost increases. NYS obtained a measure of the rate of increase in Medicaid claims by regressing the logarithm of average monthly claims on month of service. This was done separately for ADC and SSI. In order to use the most recent data available, NYS based the monthly rate calculation on summaries of the Medicaid claims data for the 18-month period from August 1983 to March 1985. Apparently, there was no correction for as yet unfiled claims, although such a correction was made to March 1985 claims in the rate group calculation.

The adjustment for cost increases was accomplished with a "midpoint to midpoint" methodology. The rate group averages were based on data covering a 12-month period whose midpoint was April 1984. Rates were projected for a 12-month period whose midpoint was June 1986, a difference of 27 months. Allowing for compound growth during this 27-month period yields an increase in cost resulting from trend of 36.75 percent for ADC and 33.19 percent for SSI.

The adjustment for changes in charges over time accounts for both increases in prices and increases in use of services. This adjustment appropriately reflects increases in technology as well as increases in prices. Since the adjustment is based on statewide averages, however, it also reflects changes in patient mix, which the methodology already partially accounts for. Thus, if the mix of eligibles is shifting over time toward heavier users of services, this would tend to overstate the capitation. If lighter users account for a larger share of Medicaid recipients over time, this will tend to understate the capitation. Basing the trend adjustment on changes in use over time for specific groups, defined in the same way as in the subgroup analysis, could eliminate this potential double counting.

Stop-loss adjustment

A stop-loss provision stipulates that for 1986 New York State would be responsible for all expenditures in excess of $14,500 per year and HCP would be responsible only for the first $14,500 of expenses an individual incurred in a year. Because the FFS expenditure data include all expenses, the total amount of expenditures above $14,500 for any individual were subtracted from the basic data (Tenan 1986).[2] Thus the FFS charges reflect only the portion for which the HMO would be responsible. This adjustment was made separately for each detailed rate group.

The estimated effect of the stop-loss provision fails to account for the trend that causes average expenditures to rise over time. To properly estimate the number of people who can be expected to exceed expenses of $14,500 in 1986, we need to determine the percent of Medicaid recipients who had expenses in excess of $10,603 in the base period. This figure is calculated from New York's estimate of an increase in prices of 36.75 percent between the base period and the midpoint of 1986. Thus, $14,500 in 1986 is equivalent to $10,603 in 1984 ($14,500/(1.00 + .3675)).

The lack of correction for the increase in prices during the forecast period leads to too little being subtracted from the capitation to cover the stop-loss provision. This illustrates the general point that the order in which corrections to the data base are made can greatly affect the results.

New York City does not have a way to track a Medicaid recipient who switches from categorical eligibility to Medicaid only (MA-only), since this transaction results in a change in Medicaid number. Thus, an individual whose expenditures under the two Medicaid numbers exceeds the $14,500 limit would not be counted in the ratesetting. Although it is unlikely that an adult with such high medical expenses would lose categorical eligibility, infants may frequently have both a MA-only and an ADC Medicaid number in their first year of life. This occurs when an infant must be given retroactive eligibility to cover expenses that are several months old. NYS data systems more easily allow the retroactive adjustment for MA-only cases. Because of this mechanism, relatively large expenditures may be missed in the stop-loss calculation. This is another factor that tends to underestimate the size of the adjustment for the stop-loss provision.

By definition, the stop-loss calculation attempts to capture the impact of a rare event. It, therefore, should have been based on statewide data with a larger sample and a possible adjustment for area expenditure differences. Since the stop-loss adjustment was made separately for each rate group, some of the adjustments actually used were based on expenditures of as few as eight people who exceeded the stop-loss limit. In any particular rate group, the experience of one or two individuals out of eight can greatly influence the outcome. Greater statistical reliability could have been obtained from State level data.

Guaranteed eligibility adjustment

NYS had obtained a section 1115 waiver to provide new HCP enrollees 6 months of guaranteed eligibility for Medicaid services. The waiver stipulated (Section IX, Waiver Cost Estimates) that HCP's capitation would be adjusted downward to cover the cost of guaranteed eligibility.

The number of additional months of eligibility was derived from data on the length of eligibility of individuals in the HCP marketing area. For each person enrolled for less than 6 months during the year, NYS calculated the number of months needed to bring them up to 6 months. For a person eligible for only 1 month in

[2]In 1984, expenditures exceeding $14,500 for a single individual accounted for 9.8 percent of total costs.

the year guaranteed eligibility would provide an additional 5 months of medical coverage. To account for the fact that newborns may be eligible for a partial year in any 12 months, but will likely be eligible the following year, children whose birthday was in the last 5 months of the year are excluded from the calculation.

For Medicaid eligibles with less than 6 months of eligibility during the year, the number of months needed to bring them up to 6 months was estimated. In practice, however, the State will look for 6 months of continuous eligibility, even if these 6 months consist of the last 3 months of one calendar year and the first 3 months of the next year. Many people leaving Medicaid in the first 6 months of the year will have been eligible in the prior year. Their total eligibility will exceed 6 months and, therefore, the guarantee would not be operative in practice. Likewise, for those beginning eligibility in the last 6 months of the year, many will remain eligible in the subsequent year. The guarantee will not be operative for them either. Thus, the methodology used overestimates the need for guaranteed eligibility and, therefore, reduces the cap below what it should be.

The number of people with less than 6 months of eligibility may also have been overestimated because those who lose categorical eligibility and enter MA-only assistance receive a new Medicaid number, which is not linked to the old Medicaid number. This would also serve to reduce the cap below what it should be.

To the extent that people who expect to be eligible for less than 6 months have a greater incentive to enroll in the HMO, the guarantee may cost more than implied by the estimate based on data for which no guarantee was in place.

Determination of cost savings

The NYS calculation set the capitation at 92 percent of the adjusted FFS equivalent "... in order to ensure the generation of cost savings. An integral part of this program is the attainment of cost savings resulting from case managed capitated care" (Tenan, 1986). By setting the capitation at 92 percent of the FFS costs, NYS attempted to guarantee reduction in Medicaid expenditures. The extent to which such a strategy ensures savings depends critically on the selectivity of patients enrolled in the HMO (Leibowitz, Buchanan, and Keesey, 1989).

Discussion

New York State's methodology for estimating the FFS equivalent costs for HMO enrollees provides a solid framework for calculating capitation rates. Because the problem involves forecasting the future on the basis of imperfect past data, no scheme is assured of providing the right answer, but the NYS methodology takes into account most of the relevant factors that affect future Medicaid claims.

On several issues, however, we believe that alternative assumptions would have provided a better or more reliable forecast. Some of the adjustments we suggested to the NYS framework would have raised the estimated FFS cap; others would have reduced it. The way NYS adjusted unfiled claims, treated family planning services, and calculated the stop-loss provision, tended to inflate the capitation calculation. However, the treatment of unfiled claims in the trend adjustment, and not calculating guaranteed eligibility on consecutive months or allowing for changes in Medicaid numbers of the medical assistance only group, reduced the capitation calculation (Table 4). Since some of these corrections would have increased the capitation calculation and others would have reduced it, the net effect of more refined calculations is not obvious.

As a general principle, NYS should have relied more heavily on State rather than local area data in determining rate groups, in calculating the stop-loss adjustment, and in calculating the guaranteed eligibility withhold amounts. Using data from the entire State rather than only from the five ZIP Codes comprising HCP's marketing area would lead to less variability in the capitation estimate. These more stable estimates benefit both the State and the HMO.

Table 4

Source and direction of bias in FFS rate cap determination

Source of bias	Effect on FFS cap
Subgroup determination	Indeterminate
Adjustment for unfiled claims	Increase
Family planning not in covered services	Increase
Trend adjustment:	
Doesn't account for unfiled claims	Reduce
Includes adjustment for patient mix	Indeterminate
Stop-loss adjustment:	
Doesn't account for price increase	Increase
No tracking across Medicaid numbers	Increase
Guaranteed eligibility:	
Calendar year calculation	Reduce
Change in Medicaid number for MA-only	Reduce
Attraction of people needing guarantee	Increase

NOTE: FFS is fee-for-service.

SOURCE: Leibowitz, A. and Buchanan, J., RAND Corporation.

If capitation rates are based on small samples and re-estimated annually, the statistical variation in the estimates may lead to wide year to year swings in the established rates. As an example, compare the 1986 capitation rates with the 1988 rates for SSI recipients, a group with small numbers of Medicaid eligibles within the HCP marketing area. During the 2-year period, the rate for SSI recipients 1-20 years of age rose by 23 percent; but the rate for SSI recipients 21-64 years of age rose 44 percent. Random variation in use, and eligibility experience, rather than differential growth in costs, most likely account for this substantial difference in the rate of increase in expenditures. The rates of increase are probably more similar between these two groups than the data from small samples indicate. The proposed methodology would insulate the plans from this undesirable variation.

Summary

Accurate and reliable capitation rates are a necessity if the State is to secure quality program participation and to save money by contracting for Medicaid health care. The prepaid plans who agree to serve Medicaid recipients also benefit from rates that accurately reflect the expected costs of Medicaid recipients, and which exhibit year to year stability. New York has built a good framework within which to estimate capitation rates for Medicaid. The suggestions we have made here can improve the accuracy and the reliability of the rates when they are next re-estimated.

Acknowledgments

This study could not have been conducted without the cooperation of numerous individuals in the New York Department of Social Services, who provided background on the New York Medicaid program and who assisted in obtaining and interpreting New York State Medicaid Management Information System data. We are particularly grateful to Michael Zegarelli of the New York Department of Social Services and to Paul M. Tenan and Patricia Kutel of the New York State Department of Health. Joan Keesey provided invaluable data processing and Kathryn Vitali skillfully typed numerous drafts. We also thank Arne Anderson, Spike Duzor, and Sidney Treiger of the Health Care Financing Administration for their support on this project.

References

Anderson, G.F., Cantor, J.C., Steinberg, E.P., and Holloway, J.: Capitation pricing: Adjusting for prior utilization and physician discretion. *Health Care Financing Review.* Vol. 8, No. 2. HCFA Pub. No. 03226. Office of Research and Demonstrations, Health Care Financing Administration. Washington. U.S. Government Printing Office, Winter 1986.

Ellis, R.P., and McGuire, T.G.: Setting capitation payments in markets for health services. *Health Care Financing Review,* Vol. 8, No. 4. HCFA Pub. No. 03239, Office of Research and Demonstrations, Health Care Financing Administration. Washington. U.S. Government Printing Office, Summer 1987.

Kuzniak, P., and Bass, A.: "Time From Date of Service to Date of Payment of New York State Medicaid Covered Services, Updated 1982," PAUR Note No. 21, New York State Department of Social Services, Division of Medical Assistance, Albany, NY, Aug. 1985.

Leibowitz, A., Buchanan, J. L., and Keesey J.: Capitations and Expected Used By Medicaid HMO Enrollees, unpublished RAND Corporation, Santa Monico, Calif., Mar. 1989.

Lubitz, J., Beebe, J., and Riley G.: Improving the Medicare HMO Payment Formula to Deal with Biased Selection. In *Advances in Health Economics and Health Services Research,* Vol. 6, eds. Richard Scheffler and Louis Rossiter; Greenwich, CT: JAI Press, 1985.

McClure, W.: On the Research Status of Risk-Adjusted Capitation Rates. *Inquiry* 21:(3)205-213, Fall 1984.

Newhouse, J.P., Manning, W.G., Keeler, E.B., and Sloss, E.M.: Adjusting capitation rates using objective health measures and prior utilization. *Health Care Financing Review.* Vol. 10, No. 3. HCFA Pub. No. 03280. Office of Research and Demonstrations, Health Care Financing Administration. Washington. U.S. Government Printing Office, May 1989.

Newhouse, J.P.: Rate adjusters for Medicare under capitation. *Health Care Financing Review,* 1986 Annual Supplement. HCFA Pub. No. 03225. Office of Research and Demonstrations, Health Care Financing Administration. Washington. U.S. Government Printing Office, Dec. 1986.

New York State Prepaid Health Service Plans Waiver Cost Estimates, 1986.

Tenan, M., "Letter to William Pembleton," dated March 6, 1986. Director of the Bureau of Ambulatory Care Reimbursement of the New York Department of Health.