

## Comparing the Medical Expenses of Children with Medicaid and Commercial Insurance in an HMO

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### Abstract

**Background:** In recent years, growing numbers of children with Medicaid have been enrolled in managed care plans nationwide. Yet, large, commercial managed care plans are increasingly discontinuing their participation in Medicaid because of low Medicaid payment rates.

**Objective:** To compare the healthcare utilization and costs of children with Medicaid and children with commercial insurance within the same health maintenance organization (HMO).

**Study Design:** Retrospective study using electronically captured cost and utilization data.

**Patients and Methods:** We compared the healthcare utilization and costs of children with Medicaid (n=42,636) and children with commercial insurance (n=159,651) who were members of the same large, nonprofit HMO at any time between January 1,

1995, and December 31, 1997. Medicaid children were grouped as income eligible, medically needy, and blind or disabled.

**Results:** The unadjusted costs of income-eligible, Medicaid-insured children were not significantly different from those of commercially insured children. The medically needy were \$25 per month more expensive than commercially insured children ( $P = .02$ ), and the blind or disabled were \$213 per month more expensive ( $P < .01$ ). After adjusting for age and sex, income-eligible children were \$5 per month more expensive than children with commercial insurance ( $P = .07$ ), the medically needy were \$20 per month more expensive ( $P = .02$ ), and the blind or disabled were \$216 per month more expensive ( $P < .01$ ).

**Conclusions:** The costs of income-eligible, Medicaid-insured children in this HMO were similar to those of commercially insured children, but the costs for the medically needy and the blind and disabled were substantially higher.

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Medicaid programs have enrolled increasing numbers of recipients in managed care plans in recent years.<sup>1</sup> Ideally, managed care arrangements could expand patients' access to mainstream providers, improve care, and reduce program costs.<sup>2</sup> However, concerns have been raised about commercial health maintenance organizations' (HMOs') continuing commitment to participate in Medicaid.<sup>3,4</sup> Several large, commercial HMOs that had been accepting Medicaid enrollees recently withdrew from the program citing financial losses

amid reduced reimbursement rates.<sup>5</sup> To improve Medicaid financing policy, both states and HMOs need more detailed information about the costs of Medicaid patients relative to commercially insured patients.

Recent studies<sup>6-12</sup> of Medicaid-insured children have compared costs and service use between fee-for-service and managed care settings and have produced conflicting evidence about whether the healthcare utilization of Medicaid-insured children differs from that of commercially insured children. Limited data are available, however, on cost differences between Medicaid and commercially insured enrollees in the same HMOs. A 1995 study<sup>13</sup> that pooled a single year of claims data from 9 HMOs found that Medicaid patients cost 23% more than commercially insured enrollees after age and sex adjustment. However, this study included limited details on children and only included patients with Medicaid based on Aid to Families with Dependent Children and low-income eligibility standards. In addition, differences in the administration and management of services among the different HMOs may have been responsible for some of the observed cost differences.

Our study's aims were to (1) compare the costs of health services for Medicaid-insured and commercially insured children enrolled in a large, commercial, group-model HMO during 3 years; (2) describe the costs of different subgroups of Medicaid-insured children defined by eligibility criteria; and (3) compare utilization patterns, especially emergency department use and immunization rates, between the Medicaid and commercially insured groups. Examining commercially insured and Medicaid children within this type of group-model HMO allows us to make comparisons that are not affected by administrative and managerial differences.

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... METHODS ...

### Setting

The Kaiser Permanente (KP) Medical Care Program, Oakland, CA, is an integrated, group-model, nonprofit HMO serving 2.8 million members in more than 15 counties in Northern California. During the study, approximately 6% of KP's membership younger than 18 years were Medicaid recipients.

In California, the Medicaid managed care initiative is county based. Almost 80% of Medicaid children with KP coverage came from counties in which enrollment in managed care was mandatory for

most children. In all but one county, managed care enrollment was voluntary for the blind or disabled, and they were often eligible to receive additional covered care outside of KP even if they were members of KP. Kaiser Permanente's share of eligible Medicaid children ranged from nearly 30% in some counties to less than 5% in others.

### Sample Selection

Our sampling universe consisted of all children enrolled in KP at any time between January 1, 1995, and December 31, 1997, who were younger than 18 years on December 31, 1997. All children who were covered under a Medicaid contract for some or all of this 3-year period were included in the study and composed our Medicaid population. Our comparison population included a 20% random sample of commercially insured children who had no Medicaid coverage during this time.

To account for differences in health status within the Medicaid population, we classified Medicaid children into 3 separate groups based on state-assigned codes: those with a blind or disabled code (ie, eligibility related to the Supplemental Security Income program) at any time during the study period; those with no blind or disabled code who were classified with a medically needy code or medically indigent code at any time during the study period; and those who were eligible for Medicaid coverage based on income eligibility criteria. The medically needy were separately identified because, unlike income-eligible children, they do not gain Medicaid coverage automatically. Therefore, the parents of these children were likely to have had special motivation to seek out Medicaid coverage because of their children's actual or expected medical expenses. Children whose high medical expenses resulted in "spending down" to Medicaid eligibility (known as "share of cost" children) were not eligible for the managed care program and are therefore not included in our analyses.

### Cost Data

We included all medical costs incurred by KP for these children while they were KP members during the study period, including costs incurred by the health plan during any gaps in membership and costs for mental health services. Because commercially insured infants usually become members in the month after birth, only costs associated with very long initial hospitalizations tend to be included in our study. For Medicaid-insured children, major organ transplantations and services covered by

California Children's Services (a statewide maternal and child health program for low- or moderate-income children with serious ongoing medical conditions) were not covered under KP's contracts with the counties and were therefore not included in our analysis. Dental services for Medicaid and commercially insured children were not provided directly by KP and therefore the costs of these services were not available to us and were not included in this study. Also not included in this study for either Medicaid or commercially insured children were patient out-of-pocket expenses, custodial nursing care (which is not covered by KP), and certain administrative and overhead costs associated with HMO membership (such as marketing expenses). Copayments made by commercially insured individuals (typically \$5-\$15) were not deducted from the cost of services included in this study.

Costs for services provided directly by KP were obtained from the Northern California Region's Cost Management Information System, an automated system that integrates hospital, laboratory, radiology, outpatient visit, and home health utilization databases with the program's financial ledger. Fully allocated costs were generated by department, medical center, and patient using standard accounting methods and program-specific relative value units for each service. Regional average unit costs were used, which eliminates differences due solely to differing cost structures among facilities and counties. The costs of insurance-related functions such as marketing and some other programwide overhead were excluded. Costs associated with the administration of Medicaid contracts and the Medicaid program were not specifically attributed to Medicaid children. Pharmacy costs were obtained directly from KP's Pharmacy Information Management System, an automated, regionwide clinical database that records each prescription issued at any of the outpatient pharmacies in the KP system. Costs of care to KP for covered services provided by non-KP vendors were included. Because the cost of non-KP emergency department visits could not be distinguished from any immediately subsequent outside hospitalization, those costs were counted as hospital costs instead of emergency department costs. In both the commercial and Medicaid cohort, non-KP emergency department use was a very small proportion of overall emergency department use.

### Analysis

Our primary outcome was cost per member-month, with the individual as the unit of analysis in

our ordinary least squares regressions. Using the WEIGHT statement option in our statistical package (SAS Institute Inc, Cary, NC), we weighted each observation by the number of months the child was a member during the study period to give greater weight to persons who had longer enrollment periods. Unless otherwise noted, all differences discussed in the text are statistically significant at  $P \leq .05$ .

All data other than costs were drawn from KP's administrative records. We adjusted for age using each child's age at the midpoint between his or her earliest and latest month of enrollment during the study. Children were classified into 1 of 6 age groups within which similar patterns of use are expected, and this categorical age variable was included in the age- and sex-adjusted models. In addition, we included a dummy variable in our multivariate model indicating whether the child became a member during his or her first 60 days of life within our study period. Although it is common for commercially insured children to become health plan members shortly after birth, when costs are highest, Medicaid children tend to join the health plan later in their first year of life. Because our age variable tended to obscure this fact, this indicator was included in all models controlling for age.

Membership patterns during the study period consisted of 4 mutually exclusive groups: those who joined KP, those who quit, those who both joined and quit, and those with continuous membership throughout the entire 36 months. In addition, we identified children with gaps in membership longer than 31 days during the study period whose membership resumed after the gap.

Our data on healthcare utilization included measures of 4 types of services: number of inpatient hospital days, number of hospital outpatient encounters (such as same-day surgeries), number of outpatient clinic visits (excluding visits to the injection clinic unless a provider was seen), and number of visits to KP-owned emergency departments. In addition, we examined one measure of the appropriateness of healthcare immunization histories. All recommended childhood immunizations administered by KP are covered with no copayment and are recorded in a regional immunization tracking system. We included 3 measures of immunization compliance during our study period, based on age, months of continuous membership, and number of specific immunizations.<sup>14</sup> First, children aged 8 months with at least 7 months of continuous membership were compliant if they had at least 3 diphtheria/tetanus/pertussis immunizations

during those 7 months. Second, children who were KP members at age 24 months with at least 13 months of continuous membership at that time were compliant if they received all 3 of the following immunizations between ages 11 and 24 months: diphtheria/tetanus/pertussis, measles/mumps/rubella, and *H influenza* type b. Finally, children who were KP members on their sixth birthday with 24 months of continuous membership at that time were classified as compliant if they had at least one diphtheria/tetanus/pertussis immunization between ages 4 and 6 years. Because of the age and membership requirements, the sample sizes for the immunization analyses are comparatively small. Therefore, all Medicaid-enrolled children were treated as a single group for this analysis.

... RESULTS ...

During the study period, 42,777 Medicaid children were enrolled for 1 month or more in KP managed care. The commercially insured sample included 159,651 children. Most of the Medicaid children (37,279 [87%]) were income-eligible children without specially designated health needs (Table 1). About 9% (3800) were identified as medically needy, and the remaining 4% were blind or disabled. Income-eligible and medically needy children were

somewhat younger on average than commercially insured children (6.9 and 6.5 years vs 8.0 years). During our 36-month follow-up, income-eligible children were members of the health plan for an average of 21 months compared with 25 months for our random sample of commercially insured children. The medically needy were members for an average of 18 months, and the blind or disabled averaged 25 months. In addition, 20% of income-eligible children and 29% of medically needy children were also commercially insured KP members at some time during the study period (data not shown).

**Enrollment Patterns**

Medicaid children clearly had more turnover in enrollment than commercially insured children. Thirty percent of income-eligible children both joined and quit the plan during the 36 months of the study compared with only 18% of commercially insured children (Table 1). The medically needy group had the highest percentage of children who both joined and quit during the study period (50%). This finding is consistent with the fact that small changes in family income can cause medically needy children to be reclassified as share of cost children, who are not eligible for Medicaid managed care, or to lose their Medicaid eligibility altogether. The medically needy were also more than 4 times more likely than commercially insured children to

**Table 1.** Demographic and Enrollment Statistics for Medicaid and Commercially Insured Children, Northern California Kaiser Permanente, 1995-1997

	Medicaid Groups			
	Commercially Insured Group	Income Eligible	Medically Needy	Blind or Disabled
<b>Demographic Characteristics</b>				
Children in study, No.	159,651	37,279	3800	1698
Age, mean (SE)	8.0 (0.01)	6.9 (0.02)	6.5 (0.08)	9.0 (0.11)
Girls, %	49	50	49	42
Member-months per child, mean (SE)	25 (0.03)	21 (0.06)	18 (0.20)	25 (0.30)
<b>Enrollment Patterns During the Study Period</b>				
Joined, did not quit, %	29	30	28	34
Quit, and joined before January 1, 1995, %	10	16	9	11
Joined and quit, %	18	30	50	19
Continuous membership, %	44	24	13	36
Gap in HMO membership, %	8	15	34	13
Among those born during the study period, % who joined within 60 d of birth	73	13	21	18

have gaps in KP coverage (34% vs 8%). Among children who were born during the study period, 73% of the commercially insured children became KP members within 60 days of birth, whereas considerably fewer Medicaid-covered children did so: 13% of income-eligible children, 21% of the medically needy, and 18% of the blind or disabled.

**Healthcare Utilization**

Commercially insured and income-eligible Medicaid children had similar levels of use of outpatient services, averaging approximately 3.6 clinic visits and 0.03 hospital outpatient encounters per member-year during the study period (Table 2). Medically needy children had significantly more clinic visits (5.2), whereas blind or disabled Medicaid enrollees had significantly more hospital outpatient encounters (0.09) and clinic visits (5.6) than their commercially insured counterparts. These differences are likely attributable to the poorer health status and additional need for healthcare among these groups. Both commercially insured children and the Medicaid medically needy averaged approximately 0.10 inpatient hospital days during the study period. Interestingly, income-eligible Medicaid children averaged only 0.08 inpatient hospital days—a considerably lower utilization rate that is largely due to not being members early in life when long hospital stays are more likely.

Emergency department use is one area in which there has been an ongoing concern that Medicaid enrollees may overuse services, resulting in increased costs for this population. We found that although emergency department visits were a relatively small contributor to overall costs (9% of costs for income-eligible Medicaid children and 6% of costs for commercially insured children), income-eligible Medicaid children made 47% more emergency department visits than commercially insured children (0.28 vs 0.19 visits per year).

Our measures of immunization compliance demonstrated that both Medicaid and commercially insured children had very high rates of compliance with receiving recommended immunizations (data not shown). Nonetheless, compliance rates were slightly lower for Medicaid children than for those who were commercially insured: 86.7% vs 90.1% for 8-month-olds ( $P = .25$ ), 92.0% vs 94.0% for 24-month-olds, and 95.2% vs 97.5% for 6-year-olds.

**Healthcare Costs**

Looking at our mean unadjusted costs per month, we found that income-eligible Medicaid children had costs that were similar to those of commercially insured children, totaling approximately \$60 per month (Table 3). The 95% confidence interval for the cost difference between income-eligible

**Table 2.** Utilization Statistics for Medicaid and Commercially Insured Children, Northern California Kaiser Permanente, 1995-1997

Mean Utilization per Member-Year*	Medicaid Groups			
	Commercially Insured Group (n = 159,651)	Income Eligible (n = 37,279)	Medically Needy (n = 3800)	Blind or Disabled (n = 1698)
Inpatient hospital days	0.10	0.08 <sup>†</sup>	0.11	0.98 <sup>†</sup>
Hospital outpatient encounters <sup>‡</sup>	0.03	0.03	0.04 <sup>†</sup>	0.09 <sup>†</sup>
Clinic visits <sup>§</sup>	3.63	3.74 <sup>†</sup>	5.19 <sup>†</sup>	5.57 <sup>†</sup>
Emergency department visits <sup>  </sup>	0.19	0.28 <sup>†</sup>	0.36 <sup>†</sup>	0.37 <sup>†</sup>

\*Because of the very large sample sizes, SEs of the mean were very small (1%-5% of the sample means) and are therefore not included in this table.

<sup>†</sup>Statistically significant at the .05 level, 2-tailed test, compared with commercially insured children.

<sup>‡</sup>Includes outpatient surgery and other hospital-based encounters expected to be <24 hours.

<sup>§</sup>Does not include visits to the injection clinic unless a provider was seen.

<sup>||</sup>Includes only visits to Kaiser Permanente-owned emergency departments.

Medicaid children and commercially insured children ranged from -\$4 to \$6, which was not statistically significant. Their clinic visits and emergency department costs combined were \$3 higher per month than for commercially insured children, whereas hospital costs were somewhat lower (\$4 less per month,  $P = .07$ ). The medically needy were substantially more costly than the commercially insured (\$81 vs \$61 per month), mostly due to increased outpatient clinic costs (\$12 more per month) and emergency department costs (\$3 more per month). The blind or disabled also were substantially more costly than the commercially insured (\$277 vs \$61 per month), with higher costs in every category, although the largest difference was in hospital costs (\$144 more per month than commercially insured children).

Healthcare costs followed a generally consistent pattern by age for most of the groups we studied, with the highest costs occurring in the youngest age group, costs decreasing through early adolescence, and then rising among older adolescents (data not shown). Income-eligible Medicaid enrollees were much less costly than commercially insured chil-

dren at ages 0 to 1 years, mostly reflecting the fact that these children tended to join KP later during their first year of life. Children with continuous membership had the lowest cost per month (\$51 for both commercially insured and income-eligible Medicaid enrollees, data not shown), whereas those who both joined and quit during the follow-up period tended to be the most costly per month (\$73 and \$72 per month for commercially insured and income-eligible Medicaid children, respectively).

Because commercially insured children were much more likely to join the health plan during their first 60 days of life (when costs are highest), and because Medicaid children tended to be younger overall, we ran an ordinary least squares regression of total cost per month in which we adjusted for age, sex, and whether the child had joined KP within 60 days of birth. After adjusting for these variables, income-eligible children were \$5 more costly per month than commercially insured children, although this difference was only marginally statistically significant ( $P = .07$ , Table 3). By comparison, medically needy children cost \$20 per month more than commercially insured children, and the blind or disabled

**Table 3.** Mean Cost per Month, Adjusted and Unadjusted, for Medicaid and Commercially Insured Children, Northern California Kaiser Permanente, 1995-1997

	Medicaid Groups			
	Commercially Insured Group (n = 159,651)	Income Eligible (n = 37,279)	Medically Needy (n = 3800)	Blind or Disabled (n = 1698)
Mean Unadjusted Cost per Month, \$*				
Hospital costs	20	16	21	164 <sup>†</sup>
Clinic costs	34	35 <sup>†</sup>	46 <sup>†</sup>	75 <sup>†</sup>
Emergency department costs <sup>‡</sup>	3.5	5.3 <sup>†</sup>	6.6 <sup>†</sup>	7.2 <sup>†</sup>
Outpatient pharmacy costs	3.9	4.5 <sup>†</sup>	5.7 <sup>†</sup>	20.0 <sup>†</sup>
Total cost (median, 95th percentile)	61 (27, 173)	60 (28, 181)	80 <sup>†</sup> (40, 254)	266 <sup>†</sup> (45, 812)
Total adjusted costs per month, \$ <sup>§</sup>	61	66	81	277
Additional cost compared with commercially insured children	Not Applicable	5 <sup>  </sup>	20 <sup>†</sup>	216 <sup>†</sup>

\*Because of the very large sample sizes, SEs of the mean were very small (1% = 5% of the sample means) and are therefore not included in this table.

<sup>†</sup>Statistically significant at the .10 level, 2-tailed test, compared with commercially insured children.

<sup>‡</sup>Includes only visits to Kaiser-Permanente-owned emergency departments.

<sup>§</sup>Adjusted to the distribution of the commercially insured children with respect to age, sex, and entry into Kaiser Permanente within 60 d of birth.

<sup>||</sup>Statistically significant at the .05 level, 2-tailed test, compared with commercially insured children.

group cost \$216 per month more. There were negligible changes in cost per month for the blind or disabled group when the one county with mandatory managed care membership was excluded.

These results indicate that income-eligible Medicaid children may be slightly more costly than commercially insured children of the same age and sex. Such a trend might be expected given the well-known fact that low-income individuals tend to be sicker than their middle class counterparts. However, because Medicaid children so rarely joined the health plan shortly after birth, when costs are highest, average medical costs to the health plan were not significantly different from those of commercially insured children.

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... DISCUSSION ...

This study found that Medicaid-insured children who were classified as medically needy or blind or disabled were more costly than both income-eligible Medicaid and commercially insured children in the same HMO. In this HMO, income-eligible Medicaid children incurred costs nearly identical with commercially insured children. In contrast, costs for Medicaid-insured children designated as medically needy were more than 30% greater, and costs for those designated as blind or disabled were more than 400% greater than their commercially insured counterparts. These findings underscore the importance of risk adjustment to account for the substantially higher costs of Medicaid-insured children with medical needs or disabilities.<sup>15,16</sup>

Several issues need to be considered in interpreting our results. The first is the degree to which our cohort and its costs are representative of the general population of Medicaid-enrolled children. Most of the income-eligible and medically needy children in our study were required to enroll in managed care but had a choice among health plans. We could not determine whether the children who chose KP were similar to those who chose (or were assigned to, if they did not make a selection) some other plan. In addition, the blind or disabled were generally free to enroll in managed care or remain in a fee-for-service plan. Results of previous studies suggest that when they have a choice, sicker, more costly individuals tend to remain in fee-for-service plans rather than managed care.<sup>13,17-20</sup>

Blind or disabled children in our study may have been eligible to receive care outside this HMO through California Children's Services. Thus, our

findings most likely underestimate the total medical costs for blind or disabled children, but they represent a lower bound. We were unable to control for the health status of the children enrolled in KP and thus do not know whether health status was comparable between the income-eligible and commercially insured children we studied or whether they were representative of the health status of the general population of children. Income-eligible children may have worse health status, as is often seen with low-income individuals. On the other hand, the commercially insured group may contain some children whose health status is comparable to the Medicaid medically needy or blind or disabled children. Thus, it is difficult to speculate on how adjusting for the health status of the commercially insured children would affect these results.

From an HMO's perspective, our results somewhat underestimate the total financial impact of enrolling Medicaid recipients. Because most Medicaid members have no copayments and most commercially insured members do, the costs presented here underrepresent the true financial impact of enrolling Medicaid patients compared with commercially insured patients. Even if Medicaid-insured children cost the same as commercially insured children, higher capitation rates would be required to achieve equitable reimbursement because Medicaid enrollees do not make copayments. Moreover, any added administrative burden of enrolling Medicaid recipients, which has been noted as an issue of concern by Medicaid HMO executives, is not incorporated in our cost estimates.<sup>3</sup> Finally, the cost estimates for both commercially insured and Medicaid-insured children are underestimates of fully allocated costs because certain membership-related overhead costs are not included here.

In California, capitation rates paid to commercial managed care organizations for coverage of Medicaid enrollees are confidential by statute in many counties. Currently, California has several different Medicaid managed care capitation rates based on broad eligibility criteria. A comparison of the costs found in our study with capitation rates that are publicly available was not possible, in part because those rates do not generally distinguish between children and adults. As a nonprofit plan, KP expects to enroll a limited number of members at rates below cost. However, our findings suggest that the rates set for commercially insured children may be appropriate benchmarks for the reimbursement rates needed to encourage health plans to accept publicly insured children.

In a 1995 summary of the literature on Medicaid managed care, the Kaiser Commission on the Future of Medicaid concluded that it is "crucial to ensure that there is equity in the rates paid for care delivered to private patients and those enrolled in Medicaid."<sup>21</sup> The costs of income-eligible Medicaid children in the HMO we studied were not markedly different from those of commercially insured children. If these findings hold in other large HMOs, this would suggest that states that wish to continue enrolling Medicaid recipients in such health plans may need to adopt reimbursement levels that are comparable to rates paid by the commercial population. In addition, because of the higher costs of medically needy and blind or disabled children, these results also highlight the need to incorporate adequate risk adjustment mechanisms for children with special needs.

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