

## Persistence in Health Status and Health Care Expenditures Among Publicly-Insured Children with Special Health Care Needs

Cross-sectional studies have consistently shown that a small percentage of children consume a large percentage of the health care dollar.<sup>1</sup> Yet, very little is known about the dynamics of health care expenditures among children. Specifically, little information is available about whether children with high health care expenditures in one year, continue to have similarly high expenditures in subsequent years. High health care expenditures in one year could stem from random events, such as accidents that result in high cost care at the time of the event, but have no long-term sequelae. High expenditures also could stem from non-recurring, planned events such as a major surgery to correct a congenital defect. Finally, high expenditures could be systematically associated with the child's prior health care expenditure patterns, underlying health status, and sociodemographic characteristics. These expenditures may persist longitudinally.

Understanding the dynamics of health care expenditures among children is important for two primary reasons. First, such information could be used to develop financing strategies for programs serving children with special health care needs (CSHCN). For example, some states place publicly-insured CSHCN in care coordination programs.<sup>2,3</sup> While not the only factor, health care costs are an important consideration in identifying CSHCN for intensive care coordination services. Understanding the dynamics of CSHCN's health care expenditures could contribute to the development of

financing strategies to fund these programs and to reimburse providers participating in them.

Second, understanding the persistence of health care expenditures could help in the development of reimbursement strategies for health plans and providers that mitigate the financial consequences

“Understanding the persistence of CSHCN's health care expenditures could help in the development of reimbursement strategies...”

associated with high-cost enrollees.<sup>4</sup> If plans and providers are reimbursed equitably when caring for CSHCN, the incentive to avoid them may be reduced; thereby increasing access to care for those who need it the most.

Prior studies about the persistence of health care expenditures among high-cost enrollees have focused on the elderly<sup>5</sup> or adults and children combined,<sup>6</sup> and often rely on national data such as the Medical Expenditure Panel Survey (MEPS) data.<sup>7</sup> To our knowledge there are no studies focusing on the persistence of health care expenditures among CSHCN; particularly those who are publicly insured.

Studies about health care expenditure dynamics among publicly insured CSHCN are particularly important for two major reasons. First, a large percentage of CSHCN are insured through public programs. Medicaid provides health insurance coverage for one-third of all CSHCN.<sup>8</sup> In addition, state children's health insurance programs (SCHIP) often enroll relatively high proportions of these children.<sup>9,10</sup> Second, State Medicaid and SCHIP initiatives face challenges in attracting health plans and providers to participate in their programs. Ensuring a medical home and good continuity of care is contingent upon building and retaining a strong provider network. Currently, about one-half of Medicaid and SCHIP health plans report difficulties in negotiating contracts with primary care providers and specialists, particularly pediatric sub-specialists, which can further reduce access to care for CSHCN. However, the problems in contract negotiations may be mitigated if reimbursement and financing strategies afford health plans and health care providers greater protection against financial risk.

In this issue brief, we describe expenditure persistence among CSHCN in Medicaid and SCHIP over a two year period using person-level health care use data. We also examine the children's health and sociodemographic factors related to the persistence of high health care expenditures from one year to the next.

## The Data

For these analyses, health plans participating in a Medicaid Managed Care Organization (MCO) Program in one state and SCHIP in two states provided person-level health care use data for their enrollees ages 0 to 19. In addition, one state provided data for a random sample of enrollees ages 0 to 19 participating in their Primary Care Case Management (PCCM) Program. Person-level health care use data contains International Classification of Disease, 9th Revision, Clinical Modification (ICD-9-CM) Codes assigned at the time of the health care encounters, Current Procedure Terminology (CPT) codes, and revenue codes. Inpatient and outpatient information for the years 2001 to 2003 were used in these analyses.<sup>11</sup> The participating states also provided enrollment files containing information about the children's age, gender, and number of months enrolled in the program.

We used the Clinical Risk Groups (CRGs) to categorize enrollees into health status categories and to examine the relationship between the

children's health status and high expenditure persistence.<sup>12</sup> The CRGs include nine core health status groups: healthy (includes enrollees who have not used health care services), significant acute, minor chronic, multiple minor chronic conditions, single moderate chronic, multiple moderate chronic pairs, multiple moderate chronic triplets, metastatic malignancies, and catastrophic conditions. For these analyses, moderate chronic conditions affecting two or three body systems (pairs and triplets) were combined into one category, multiple moderate.

To calculate the expenditures for the delivered health care services, the CPT codes were linked to the Practice Management Information Incorporated (PMIC) listing of physician fees and a per diem of \$3,000 was assigned to each day of an inpatient stay. These fees do not necessarily reflect the health plans' actual payment experiences. However, use of the index allows us to compare children's expenditures across programs, while holding the fees constant.

## The Sample

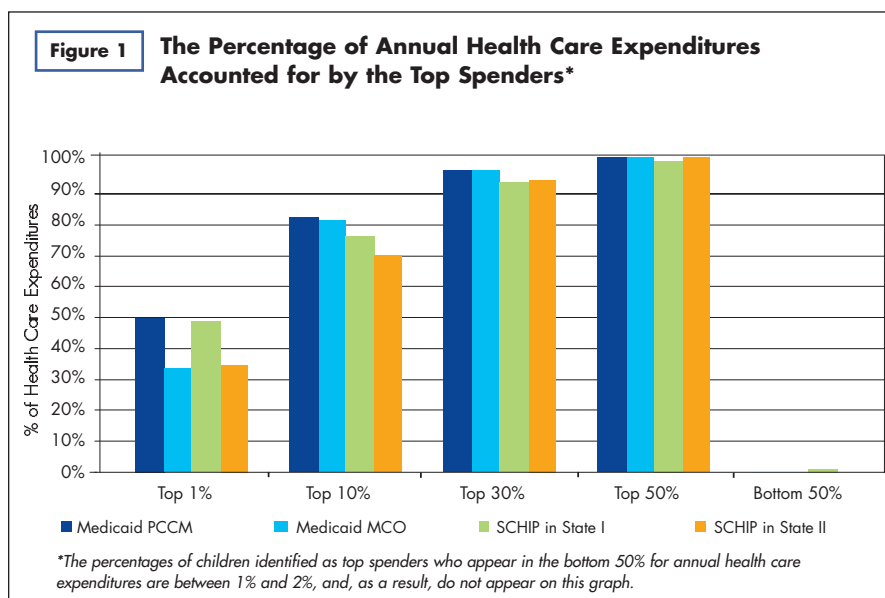
A census of all children in each program were included in the expenditure threshold calculations: 218,077 children in the Medicaid PCCM Program, 566,983 children in the Medicaid MCO Program, 304,476 children in SCHIP in State I, and 727,881 children in SCHIP in State II. Children over 1 year of age had to be in the program for 6 months or longer to be classified by the CRGs and those under 1 year of age had to be enrolled for 3 months or longer. Those enrolled for less than those time frames were included in the analysis but were reported as "not classified."

## The Children's Health Care Expenditures & Health Status

Most health care expenditures are concentrated among a small percentage of children. For example, the top 1% of health care spenders accounted for 34% (SCHIP in State II) to 49% (PCCM Program) of the annual health care expenditures within their programs. Almost all of the health care expenditures were concentrated among the top 30% of spenders who accounted for 92% to 96% of the annual expenditures in the Medicaid Programs and SCHIP initiatives (Figure 1).

The average annual expenditures for the top 1% of children ranked according to their health care expenditures ranged from a high of \$48,814 in SCHIP in State I to a low of \$15,222 in SCHIP in State II (Table 1, see page 3).

Figures 2 and 3 show the distribution of children in the CRG health status categories for the Medicaid MCO Program and for SCHIP in State II in year 1 and the changes in their CRG health status category assignment in year 2. Children who were not enrolled in the program long



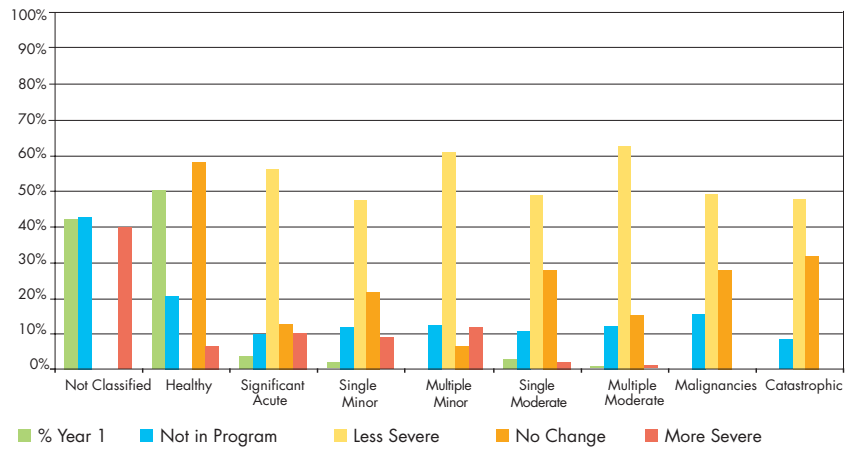
enough to be classified into a health status category are listed as “not classified” on the figures. The pattern of results is the same for the Medicaid PPCM Program and for SCHIP in State 1, so these are not shown. The figures reveal the following key points:

- The category labeled “percentage in year 1” refers to the percentage of children in the CRG health status category in year 1. Most children were newly enrolled and therefore could not be classified or they were healthy. Less than 0.5% of the children in any of the programs had a multiple minor chronic condition, a multiple body system moderate chronic condition, malignancies, or a catastrophic condition.
- The category labeled “not in program” refers to those children who were enrolled in their programs in year 1 but were not enrolled in year 2. Among children classified into health status categories in year 1, 10% to 20% are not enrolled in year 2. This finding is seen even among children in the more severe chronic condition categories.
- Over 40% of children in the Medicaid MCO Program who could not be classified in year 1 due to insufficient length of enrollment were not enrolled in year 2.
- Within each CRG acute and chronic health status category, over 50% of the children moved from a more severe to a less severe category in year 2 (labeled “less severe”).
- Over 50% of children who were rated as healthy in year 1 remained in the healthy category in year 2 (labeled “no change”). About 11% of children in both programs in the “significant acute” category, remained in that category in year 2. In contrast, depending on the program, 30% to 60% of children in the catastrophic condition category in year 1 were in that category in year 2.

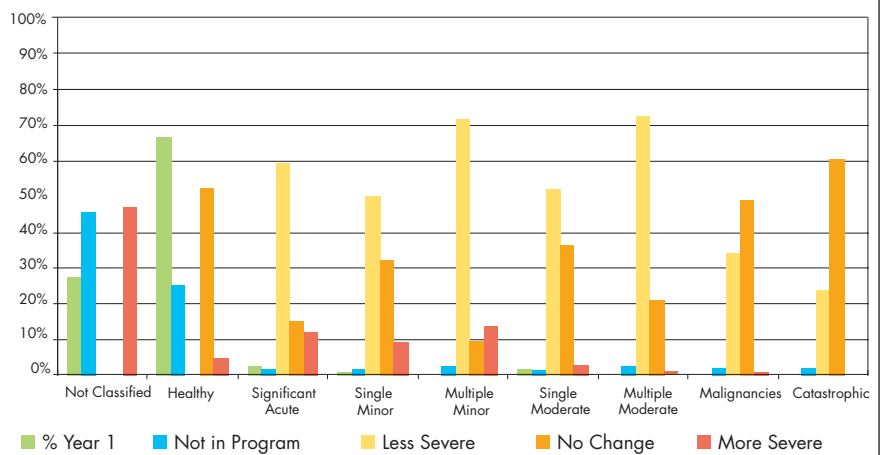
**Table 1 Annual Health Care Expenditures for Children in Medicaid and SCHIP in Two States for Year 1**

% of Children Ranked by Expenditures	Medicaid PCCM Program Average Annual Expenditures (Standard Deviation)	Medicaid MCO Program Average Annual Expenditures (Standard Deviation)	SCHIP State I Average Annual Expenditures (Standard Deviation)	SCHIP State II Average Annual Expenditures (Standard Deviation)
Top 1%	\$47,563 (\$74,810)	\$38,340 (\$43,402)	\$48,814 (\$104,657)	\$15,222 (\$24,917)
Top 10%	\$7,860 (\$27,229)	\$9,348 (\$17,127)	\$7,661 (\$35,853)	\$3,132 (\$8,890)
Top 30%	\$3,102 (\$16,078)	\$3,748 (\$10,659)	\$3,130 (\$20,945)	\$1,401 (\$5,279)
Top 50%	\$1,940 (\$12,529)	\$2,332 (\$8,436)	\$2,002 (\$16,284)	\$904 (\$4,134)
Bottom 50%	\$7 (\$16)	\$6 (\$15)	\$35 (\$55)	1 (\$6)

**Figure 2 The Medicaid MCO Program: Percentage of Children By CRG Category in Year 1 and Changes in Category Assignment in Year 2**



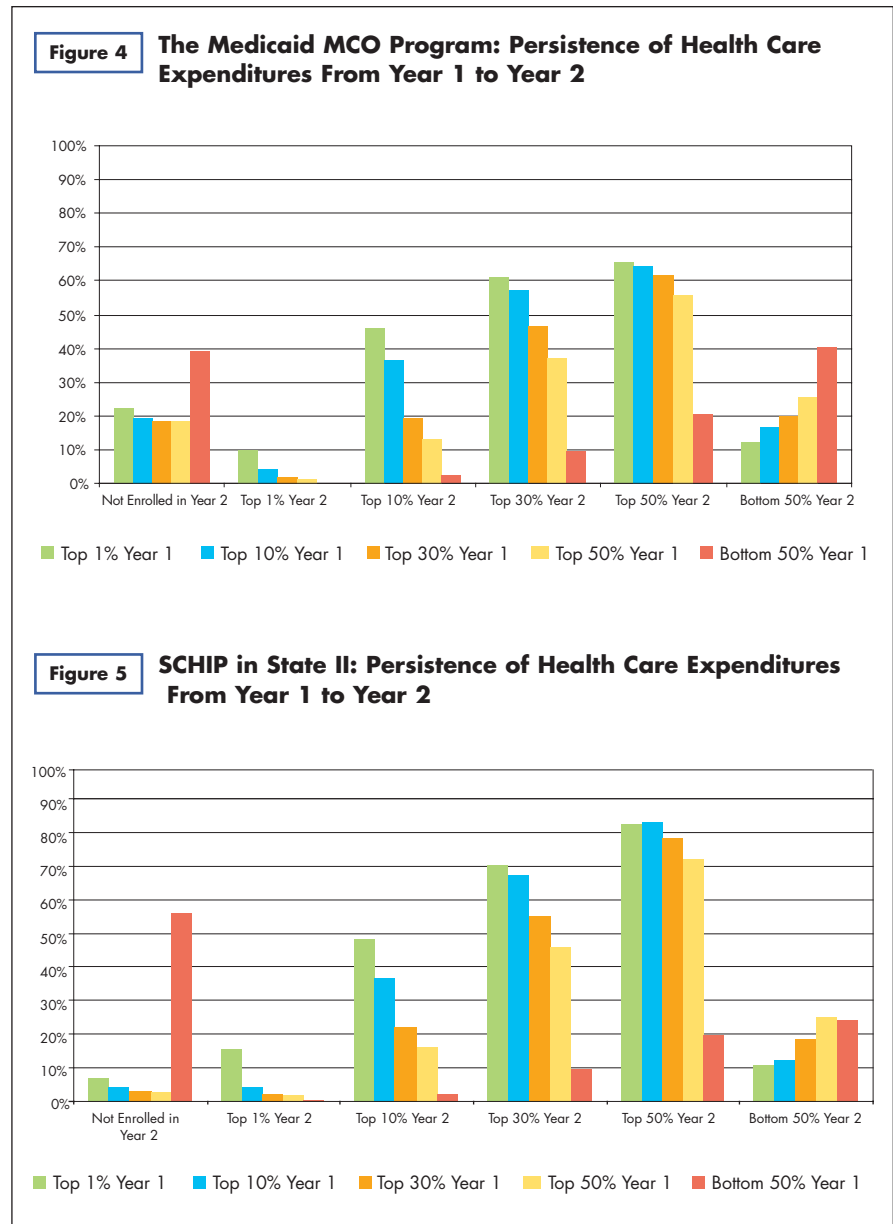
**Figure 3 SCHIP in State II: Percentage of Children by CRG Category in Year 1 and Changes in Category Assignment in Year 2**



## Persistence of Health Care Expenditures

Figures 4 and 5 show the persistence of health care expenditures from year 1 to year 2 for children in the Medicaid MCO Program and in SCHIP in State II. The following key findings were consistently observed for each of the programs (including the Medicaid PCCM Program and SCHIP in State I – results not shown):

- Turnover within the programs is evident. For example, among the top 1% of health care spenders in year 1, 7% in SCHIP in State II and 21% in the Medicaid MCO Program were not enrolled in the subsequent year. In all programs, the largest turnover was observed among the bottom 50% of health care spenders but turnover among the highest spenders, particularly in the Medicaid MCO Program is considerable.
- Health care expenditures tend to decline somewhat in the second year for the top spenders, but still remain high. For example, only 10% of those in the top 1% of expenditures in year 1 in the Medicaid MCO Program and 15% of those in SCHIP in State II remained in that group in year 2. However, about 70% of the top 1% of spenders in year 1 in SCHIP and about 60% in the Medicaid MCO Program remained in the top 30% or higher of spenders in year 2.
- Persistence in health care expenditures is seen among several top spending groups of children, not just the top 1% or 10% of spenders. For example, in SCHIP in State II, 55% of those who were among the top 30% of spenders in year 1 were in the top 30% of spenders in year 2. Moreover, some of them moved into more costly categories. Of the top 30% of spenders in SCHIP in



State II in year 1, 19% of them were in the top 10% of spenders in year 2.

### Health and Sociodemographic Factors Associated With Persistent Health Care Expenditures

Logistic regression models were developed to examine the relationship between the child's health and sociodemographic characteristics and the likelihood that the child would have persist-

ently high health care expenditures. Specifically, the probability of the top 10% of spenders in year 1 remaining in that category in year 2 was examined. Children had to be enrolled in their program for at least one month in the first year and one month in the second year to be included in the analyses. Key findings associated with being in the top decile of health care spenders from year 1 to year 2 are described for Medicaid and SCHIP.<sup>13</sup>



## Medicaid: The PCCM and MCO Programs

### Age

In the PCCM and Medicaid MCO Program, children over the age of 1 were 25% to 64% less likely than those 12 months old or younger to remain in the top 10% of health care spenders in year 2.

### Race/Ethnicity

In the PCCM Program, Black non-Hispanic children were 42% less likely to be in the top 10% of health care spenders from year 1 to year 2 when compared to White non-Hispanic children. Hispanic children were 7% less likely compared to White non-Hispanic children to be in the top decile of spenders in the second year.

In the Medicaid MCO Program, Black non-Hispanic children were 23% less likely than White non-Hispanic children to be in the top 10% of spenders from year 1 to year 2. However, Hispanic children were 26% more likely to remain in the top decile of spenders during the second year when compared to White non-Hispanic children.

### Health Status

As expected for both the Medicaid PCCM and MCO Programs, health status was significantly related to the odds of remaining in the top 10% of health care spenders from year 1 to year 2. However, the results varied between the two types of Medicaid programs. For example, in the

Medicaid PCCM Program, children with multiple minor chronic conditions who were in the top 10% of health care spenders in year 1 were 3.5 times more likely to remain in that spending category when compared to those classified as healthy. Children with malignancies were about 38 times more likely to remain the top 10% of health care spenders from year 1 to year

2 compared to healthy children in the Medicaid PCCM Program.

In contrast, in the Medicaid MCO Program, children in the minor and moderate condition categories were not significantly different from healthy children in their odds of remaining in the top decile of health care spenders in year 2. Children in the top decile of health care spenders in year 1 with malignancies or with catastrophic conditions were 2 times more likely than healthy children to remain in that spending category in year 2.

“Children with malignancies were about 38 times more likely to remain the top 10% of health care spenders from year 1 to year 2.”

## The State Children's Health Insurance Programs

### Age

In SCHIP in State I, age was not significantly related to the odds of remaining in the highest decile of health care spenders from year 1 to year 2. However, SCHIP in State I does not enroll children under 3 years old, which may have contributed to the findings we obtained. In SCHIP in State II, children from 4 to 19 years old were 7% to 67% more likely, depending on their ages, to remain in the top 10% of health care spenders when compared to those 3 years old or younger.

### Race/Ethnicity

Information about race and ethnicity was only available for SCHIP in State II. Black non-Hispanic and Hispanic children in the top 10% of health care spenders in year 1 were about 40% less likely than their White counterparts to be in the top 10% of spenders in year 2.

### Health Status

For both SCHIP initiatives, the odds of being in the top decile of spenders in year 1 and in year 2 were significantly related to health status. Children in the significant acute and chronic health status groups were significantly more likely than healthy children to remain in the top decile of spenders for the two years. For example, in SCHIP in State I and in State II, children with moderate chronic conditions affecting two or three body systems were 2 to 3 times more likely than healthy children to remain in the top decile of spenders from year 1 to year 2.

## Policy Implications

Several policy implications are noted from our findings. First, children with high health care expenditures in one year tend to have somewhat of a reduction, but not a complete reduction, in those expenditures in the second year. For example, only 7% of children in the top 1% of health care spenders in SCHIP in State II remained in that category from year 1 to year 2. However, 70% of them were in the top 30% of spenders in the second year. Thus, any adverse financial impact that health plans or providers may experience when caring for CSHCN is likely to be persistent. The long-term financial consequences that health plans and providers face when caring for these children could be mitigated by financing and reimbursement strategies that distribute payments more equitably based on the children's health status.

Second, given the observed persistence in health care spending, CSHCN with health care expenditures at a range of different thresholds may benefit from care coordination services. Limited evidence about the effectiveness of care coordination programs suggests that these programs may promote high quality health care while reducing health care expenditures.<sup>14</sup>

Third, particular attention needs to be given to the type of program and to the enrollee turnover within the

program when designing reimbursement strategies. For example, if prospective payment schemes are used, health plans or providers could be receive reimbursement based on a case-mix of enrollees where a substantial percentage of them, including those in poor health status and those with high expenditures, are not enrolled in the second year. For example, in both the Medicaid MCO and PCCM Programs, 29% of children enrolled in year 1 are not enrolled in year 2. However,

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among the top 1% of health care spenders in year 1, 31% in the Medicaid MCO Program compared to only 13% in the PCCM Program are not enrolled in year 2. Thus, a higher percentage of children with

the highest health care expenditures exit the stringently managed Medicaid programs (i.e., Medicaid MCOs) when compared to those less strictly managed (i.e., PCCM Programs). Any payment scheme must take into consideration the enrollee turnover and the program design.

Fourth, specific factors are significantly associated with a child remaining in the top 10% of health care expenditures. Notably, age and health status are important and perhaps can be used to identify children for care coordination programs. The factors related to the racial and ethnic differences observed in expenditure persistence require further exploration.



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