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**Prescription Drugs for
Children with Special
Health Care Needs in
Commercial Managed
Care: Patterns of Use and
Cost, 1999-2001**

Final Report

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EXECUTIVE SUMMARY

Rapidly rising pharmaceutical costs have contributed to increases in health expenditures nationwide, but few studies have examined this trend in the population of children with special health care needs. Little information is available on costs for different types of pharmaceuticals, the extent to which families share these costs, and the rates of cost increases over time. Furthermore, most available studies on costs of care for this population have focused on children enrolled in Medicaid, even though 65 percent of children with special health care needs are privately insured (U.S. Department of Health and Human Services 2004).

Better information on the costs for prescription drugs for privately insured children with special health care needs will help policymakers, program administrators, and consumers to shape financing and insurance policies to meet national objectives for this population. Comprehensive data on prescription drug costs for these children also may assist health plans to manage benefit packages efficiently and develop effective care management programs for children with complex chronic health conditions. To begin developing this information, the Maternal and Child Health Bureau (MCHB) asked Mathematica Policy Research (MPR) to analyze claims and administrative data on a sample of children with special health care needs enrolled in two commercial managed care plans in 1999, 2000, and 2001. MPR worked collaboratively with the Center for Health Care Policy and Evaluation (CHCPE) at UnitedHealth Group to conduct these analyses.

We addressed the following specific research questions:

- How many and what kinds of prescription drugs do children with special health care needs use and how much do these drugs cost?
- How much do these drugs cost and what have been the trends in prescription drug use and cost between 1999 and 2001?
- How do costs for prescription drugs compare with costs for other types of medical services?
- What proportion of costs are paid by the health plans and by plan members?

To provide answers to these questions, we used data from two open-access, managed health care plans in two states. We examined administrative and claims data for 218,388 children in 2000, 243,442 in 1999, and 232,615 in 2001, and applied the Clinical Risk Group (CRG) system to identify children with special health care needs. Using the CRG system, we identified 24,807 children in 1999, 28,346 in 2000, and 29,085 in 2001 as having a special health care need. This group represented 11 to 12 percent of all children enrolled in these plans.

After we identified the group of children with special health care needs, we removed children whose benefit package did not specifically include mental health or pharmaceutical coverage. We removed these children because we would be unable to estimate pharmaceutical

costs accurately if prescription drugs were not included as part of the benefit package. Seven percent of children were excluded in each year. The samples of children with special health care needs that we used for the analyses in this report totaled 23,124 in 1999, 26,327 in 2000, and 26,949 in 2001.

For these children, we calculated total pharmaceutical costs based on payments the health plans made to providers and copays and deductibles paid by members. Pharmaceutical costs were operationally defined as payments made by the health plan and members for drugs covered under the benefit package and prescribed in the selected calendar year. Families may incur additional costs for prescription drugs that are not covered under the health plan or if costs exceed coverage limitations; these additional costs are not included in this study.

Overall, we found that children with special health care needs were given many different prescriptions for a wide range of drugs and, as a result, prescription drug costs were high for this population of children in general and were especially high for certain subgroups. Central nervous system/psychiatric medications were the most frequently prescribed pharmaceuticals and accounted for about one-third (32.2 percent) of all prescription drug costs for children in our sample. On average, each child in our sample received 10 unique prescriptions for drugs (not including refills) in 2001.

Other major findings include the following:

- Use of pharmaceuticals by children with special health care needs increased somewhat from 1999 to 2001, but costs for these drugs increased substantially. Between 1999 and 2001, costs increased seven times more than use (56.3 percent compared with 8.1 percent).
- The overall per member per month (PMPM) cost for prescription drugs for these children was \$28.40 in 1999, \$33.70 in 2000, and \$44.40 in 2001. The total PMPM cost for prescription drugs for children with special health care needs in 2001 was exceeded only by the PMPM cost for inpatient care (\$91.00).
- Prescription drugs were 13.5 percent of the PMPM cost for all services combined in 2001, with percentages varying markedly by age and health status.
- On average, members paid about 25 percent of prescription drug costs. The actual dollar amount of the members' share of the PMPM increased substantially, from \$6.90 in 1999 to \$11.30 in 2001, an increase of 63.8 percent.
- Plan members' share of PMPM costs for prescription drugs was inversely related to the size of the employer, with members in large firms paying \$3.60 PMPM for prescription drugs in 2001 (8.7 percent of the all pharmacy costs) and members in small firms paying \$12.50 PMPM (27.6 percent of the all pharmacy costs).

Our findings suggest that compared with other medical services, prescription drugs account for a major portion of the total cost of providing care to privately insured children with special health care needs. For families of children with complex chronic conditions, annual prescription

drug costs can be substantial, especially if parents work for small companies that typically ask subscribers to pay more of the costs compared with large companies. Our findings also indicate that prescriptions for central nervous system (CNS) and psychiatric conditions contribute substantially to overall prescription drug costs, underscoring the fact that many children who are identified as having special health care needs have serious emotional, behavioral, cognitive, or other central nervous system disorders. To achieve its goals of promoting adequate, affordable health insurance coverage for all children with special health care needs, the MCHB will need to work with employers and commercial health plans to ensure that medications for emotional and behavioral disorders are included in the design of benefit packages.

Prescription drugs also may be used to identify children who could benefit from special care coordination efforts. Multiple prescriptions for the same child, for example, may mean that the child is seeing numerous providers, and would benefit from additional assistance in coordinating services. Prescriptions for multiple drugs or multiple prescriptions for the same drug could signal an increased potential for medical errors resulting either from lack of knowledge about treatment protocols or poor communication among the prescribing physicians. Tracking rates of prescription drugs, therefore, may be important for monitoring quality as well as costs of care.

This report is one in a series of reports that uses claims and administrative data from 1999 to 2001 to describe patterns of use and cost of health services for children with special health care needs enrolled in commercial managed care plans. Other reports examine the use and cost of services for children with special health care needs who also have emotional and behavioral disorders (Humensky et al. 2004) and trends in subscriber costs (Nyman et al. 2004). A prior report (Ireys et al. 2002) describes the development of the database used in these studies.

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I. INTRODUCTION

Rapidly rising pharmaceutical costs have contributed to increases in health expenditures nationwide, but few studies have examined this trend in the population of children with special health care needs.¹ Information on cost trends for prescription drugs for children with special health care needs is generally unavailable. Some studies have examined selected medications for children with particular diagnoses (e.g., Ritalin for children with attention deficit/hyperactivity disorder), but these studies shed little light on pharmacy trends for children with special health care needs as a whole. Furthermore, most studies of prescription drug use by children with special health care needs focus on children with Medicaid coverage. Few studies have examined pharmacy costs for the 65 percent of these children who are covered under private or employer-based insurance (U.S. Department of Health and Human Services 2004).

Better information on the costs of prescription drugs for these children may assist health plans to manage benefit packages efficiently and develop effective care management programs for children with complex or costly chronic health conditions. In addition, comprehensive information on pharmaceutical costs will help the Maternal and Child Health Bureau (MCHB) in the Health Resources and Services Administration (HRSA) to shape programs and policies designed to meet national objectives for children and youth with special health care needs. As part of the New Freedom Initiative, the MCHB aims to promote adequate, affordable insurance coverage for all children with special health care needs. To reach this goal, the MCHB needs

¹Children with special health care needs are defined as children who have or are at increased risk for a chronic physical, developmental, behavioral, or emotional condition and who also require health and related services of a type or amount beyond that required by children generally (McPherson et al. 1998).

substantially more information on service use and costs of care for this population of children than it currently has available.

To help build a stronger foundation of information, the MCHB asked Mathematica Policy Research (MPR) to analyze administrative and claims data on the use and costs of services for children with special health care needs enrolled in commercial managed care. MPR worked collaboratively with the Center for Health Care Policy and Evaluation (CHCPE) at UnitedHealth Group to conduct the analyses and present results.

Staff in the CHCPE identified two health plans within their broad network of health plan affiliates that together had approximately 300,000 children enrolled in each of three years (1999-2001). One of these plans was in a southern state and the other was in a midwestern state. We identified children with special health care needs using the Clinical Risk Group (CRG) system, developed by the National Association of Children's Hospitals and Related Institutions (NACHRI) and 3M (see Neff et al. 2001, 2004). We then excluded those who did not have comprehensive coverage because we would be unable to estimate pharmaceutical costs accurately if prescription drugs were not included as part of the benefit package.

In the report, we address the following four research questions:

1. How many and what kinds of prescriptions drugs do children with special health care needs use and how much do these drugs cost?
2. How much do these drugs costs and what have been the trends in prescription drug use and cost between 1999 and 2001?
3. How do costs for prescription drugs compare with costs for other types of medical services?
4. What proportions of prescription drug costs are paid by the health plans and by plan members?

We examine each of these questions for our entire sample of children with special health care needs and for subgroups defined by age, gender, and health status.

In Chapter II of the report, we describe the methods used to identify the sample of children with special health care needs and to develop our database. Chapter III presents the results of our analyses on the use and cost of pharmaceuticals trends in pharmacy costs for these children. In Chapter IV, we summarize our findings and discuss their implications for the MCHB, health plans, and families.

This report is one in a series of reports that uses claims and administrative data from 1999 to 2001 to describe patterns of health care use and cost in this population. Other reports examine the use and cost of services for children with special health care needs who also have an emotional or behavioral disorder (Humensky et al. 2004) and trends in subscriber costs for services to children with special health care needs (Nyman et al. 2004). A prior report (Ireys et al. 2002) describes the development of the database used in our studies; it also presents information on the use and costs of services for a two-year period (1999-2000) but does not include findings on costs of prescription drugs.

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II. METHODS

This study is a longitudinal descriptive analysis of claims and administrative data for all children with special health care needs enrolled in two commercial managed care plans affiliated with UnitedHealth Group. The size of our study population (more than 20,000 children with special health care needs in each of three years), the longitudinal nature of our data, and the specificity of our cost categories contribute to the study's methodological strength. In this chapter we describe the key components of our approach to assembling and analyzing the database.

Specifically, we describe the:

- Data sources used to generate the database
- Health plans from which the population was drawn
- The Clinical Risk Group (CRG) system used to identify children with special health care needs

A. DATA SOURCES USED TO CONSTRUCT DATABASE

The database for this project was constructed using the following four files maintained by the CHCPE:

1. *An enrollment file*, which contains demographic information—including gender and date of birth—on all health plan members and dependents, along with such other information as unique member identifier, enrollment date, disenrollment date, and information about the plans in which the member is enrolled.
2. *A pharmacy claims file*, which contains information from claims submitted directly and electronically by retail pharmacies, including all outpatient prescription drugs that exceed the cost of the member's copayment amount. Copayment amounts are determined by the member's prescription drug benefit plan and whether the product dispensed is included in the list of preferred drugs. Non-referred products require higher copayments. Included in the pharmacy claims file are the member's unique identifier, pharmacy identifier, prescriber identifier, date dispensed, billing and payment information, copayment amount, and information specific to the drug

prescribed (the National Drug Code (NDC), drug strength, quantity and days supply). Pharmaceuticals used during inpatient stays are included in hospital claims.

3. A *physician claims file*, which includes information submitted by physicians using the HCFA 1500 claim protocol, descriptions of all services performed for which they are reimbursed, a unique member identifier, a unique provider identifier (indicating specialty), up to four ICD-9-CM diagnosis codes, the place of service, billing information, and the insurance product under which the service falls.
4. A *facility claims file*, which contains information submitted by health care facilities (such as hospitals and nursing homes) using the UB92 claim protocol, including the following: a unique member identifier, unique facility identifier, facility type, revenue codes, services performed, up to nine ICD-9-CM diagnosis codes, the place of service, billing information, and the insurance product under which the service falls.

CHCPE staff used a unique identifier to link the claims records of each member. An algorithm was created to address the possibility that a member may have received more than one UnitedHealth “identifier” over time (e.g., if the member was enrolled under more than one employer over time). The algorithm, which creates a single unique “key” for each member, is about 99 percent accurate. The unique identifier was used to build each child’s record, which was constructed from demographic characteristics (age, gender, ZIP code, and county code), and information from medical and pharmaceutical claims, including primary and secondary ICD-9 codes, CPT-4 and ICD-9 procedure codes, dates of service, provider specialty, place of service, and payments to providers by health plans and enrollees (such as copays and deductibles). The process of creating the database included quality-control checks to ensure that no records were missed and that all records for each child were appropriately linked.

B. HEALTH PLANS SELECTED FOR THE STUDY

Our goal was to generate a sample size of at least 25,000 children with special health care needs. A sample of this size permits highly reliable estimates of rates of service utilization and costs for the sample as a whole and for major subgroups. In light of previous studies (e.g., Neff et al. 2001), we expected that an identification method based on administrative and claims data

would identify about 10 percent of children as having a special health care need. Therefore, to generate this sample, the total population of children in selected plans had to be about 250,000. Because children typically constitute one-quarter of the members of a commercial health plan, the selected plans had to have a combined membership of 1 million people.

To meet these requirements, staff from the CHCPE identified two plans, one from a Midwestern state and the other from a Southern state. Both are Independent Practice Association (IPA), open-access plans; have similar benefit packages; and include small, medium, and large employers. Total membership in these plans is about 1 million individuals.

C. POPULATION DEFINITION

We constructed the database by identifying and combining data on all enrolled children from each health plan in calendar years 1999, 2000, and 2001. Children were defined as plan members younger than 19 at the end of each study year. Children living in residential institutions for any part of the year were excluded. We also removed newborns with less than three months of enrollment and children with less than six months of enrollment in each calendar year in order to conform to the specifications of the CRG system (see below). Finally, we excluded children who lacked a comprehensive benefit package that included pharmacy and mental health coverage. We excluded these children because we would not have been able to calculate pharmacy costs, including costs for psychiatric medications.

D. THE CRG SYSTEM

The CRG system is a proprietary software program available from 3M Health Information Systems. It was developed jointly by research teams at 3M and the National Association of Children's Hospitals and Related Institutions (NACHRI). We used version 1.0 of the CRG system, which recommends including only children with at least six months of enrollment and

newborns with at least three months of enrollment. Additional details regarding the CRG system and the rationale for using it to identify children with special health care needs are available on 3M's website (www.3mhis.com/us/products/), in publications from other investigative teams (Madden et al. 2001; Neff et al. 2001; Shenkman et al. 2000), and in prior reports from this project (Ireys et al. 2002).

The CRG system uses diagnostic and procedure codes found in claims records to assign each individual to a single, mutually exclusive, severity-adjusted category, based on clinical history, age, and gender. There are 1,025 such categories. At the highest level of aggregation, the CRG system assigns individuals to one of nine health status categories based on the individual's most significant diagnosis or diagnoses (Table II.1).

We operationally defined children with special health care needs as children who were assigned to categories three to nine. This approach approximates as closely as possible MCHB's general definition of children with special health care needs, excluding the at-risk component (McPherson et al. 1998).

Because only a very small number of children were assigned to the "significant chronic pair" and "chronic triplet" groups, we combined these two groups in our analyses. This combined group is referred to as "pairs and triplets." This decision allowed us to compare our results directly with findings from our earlier report (Ireys et al. 2002) and a previous study (Neff et al. 2001).

E. VARIABLE DEFINITIONS

We reported costs and service use for the following age groupings: 0 to 5, 6 to 12, and 13 to 18. These age groupings reflect broad developmental stages (infants and toddlers, school-aged children, and adolescents). We did not separate infants from toddlers because we were

TABLE II.1
HEALTH STATUS CATEGORIES IN THE CRG SYSTEM

Health Status Category	Description
1. Healthy	Individuals who do not use services.
2. Significant Acute	Individuals with conditions that place an individual at risk for developing a chronic condition.
3. Single Minor Chronic	Individuals with conditions that can generally be managed throughout an individual's life with few complications.
4. Multiple Minor Chronic	Individuals with minor chronic conditions in two or more body systems.
5. Single Dominant or Moderate Chronic	Individuals with serious medical conditions that often result in progressive deterioration of health and that contribute to debility, death, and a future need for medical services (Single Dominant) or individuals with conditions that are not progressive, are highly variable, and that can contribute to debility, death, and a future need for medical services (Moderate Chronic).
6. Significant Chronic Pair	Individuals with dominant or moderate chronic conditions in two organ systems.
7. Chronic Triplet	Individuals with dominant or moderate chronic conditions in three or more organ systems.
8. Dominant, Metastatic, or Complicated Malignancies	Individuals with malignancies that have a difficult progression (for example, brain tumors) or that are fundamentally systemic (for example, leukemia).
9. Catastrophic Conditions	Individuals with conditions that are expected to be lifelong, that are often progressive, and that require extensive services.

NOTE: Adapted from Neff et al. 2002.

concerned about potentially small cell sizes. An important area to examine in future work involves pharmaceutical costs for at-risk infants.

Costs were defined as payments for drugs prescribed in the selected calendar year (even if the payment itself was in a subsequent year). Total costs included (1) payments made to providers and (2) copays and deductibles paid by subscribers. This breakdown allowed us to calculate subscriber costs for prescription drugs. We elected to use payments as the measure of costs, rather than billed charges, to be consistent with other studies in the field and because these data reflect actual expenditures. For all analyses involving rates of service use and costs, we adjusted for length of enrollment to enable us to report annual service rates and costs.

We used the categorization system described in the drug information monographs produced by First Data Bank (www.firstdatabank.com) to classify the pharmaceuticals used by the children in our study. We examined pharmacy claims data and reported on the five drug classes containing the medications most frequently used by the children.

Ninety-nine percent of the study population used one of two UnitedHealth Group plan options, Choice or Choice Plus. Choice limits members to providers in the UnitedHealth Group network. Choice Plus allows members to access out-of-network care, but with higher copayments and deductibles. In 2001, 60.1 percent of families elected the Choice Plus option. The other one percent of the study population was enrolled in either the Select or Select Plus options. Under these options, members were assigned to a primary care provider who served as a case manager.

Employers who offered UnitedHealth insurance plans to their employees were separated into four groups. Small employers were defined as those having less than 25 employees. Medium employers were those who had between 26 and 50 employees, and medium-large employers were those who had between 51 and 250 employees. Any employer with more than 250

employees was defined as large. Using these categorizations, approximately two-thirds of the study population had insurance that was provided by a family member working for a small employer.

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III. RESULTS

Our analyses indicate that prescription drugs are a major component of health care for children with special health care needs, contributing substantially to overall service costs, and are increasing quickly. On average in 2001, children in our study received 10 prescriptions and spent \$533 on pharmaceuticals. Central nervous system (CNS) and psychiatric drugs were the most common drugs used. Costs for prescription drugs increased seven times more than their use between 1999 and 2001. Prescription drugs were the single most expensive service for school-aged children, accounting for 21.4 percent of the overall per member per month (PMPM) figure and exceeding even inpatient costs (which accounted for 15.8 percent). On average, members paid about 25 percent of total prescription drug costs in each year through copayments and deductibles. The average monthly cost paid by members for prescription drugs increased 63.8 percent from 1999 to 2001 (from \$6.90 to \$11.30). This increase resulted primarily from increased drug costs, rather than heightened rates of utilization.

In this chapter of the report, we address our major research questions by first presenting our findings on the use of prescription drugs. We then examine cost for prescription drugs, and compare use and cost trends over time. The third section of the chapter provides a larger context in which to assess our findings by comparing prescription drug costs to the costs of other services. In the final section, we examine subscriber costs for prescription drugs.

A. USE OF PRESCRIPTION DRUGS BY CHILDREN WITH SPECIAL HEALTH CARE NEEDS, 1999-2001

On average, each child with a special health care need in our study received 10 unique prescriptions for drugs (not including refills) in 2001 (Table III.1). Rates of prescription drug

TABLE III.1

UTILIZATION RATES PER 1,000 MEMBER YEARS FOR PRESCRIPTION DRUGS FOR
CHILDREN WITH SPECIAL HEALTH CARE NEEDS ENROLLED IN COMMERCIAL MANAGED
CARE PLANS, BY AGE, GENDER, AND HEALTH STATUS, 1999-2001

	1999		2000		2001	
	Number	Rates	Number	Rates	Number	Rates
All CSHCN	23,124	9,291	26,237	9,097	26,949	10,043
Age						
0-5	4,981	8,913	5,466	8,836	5,726	9,459
6-12	8,746	9,432	10,099	9,190	9,937	10,118
13-18	9,397	9,349	10,762	9,135	11,286	10,257
Gender						
Female	10,127	9,158	11,420	8,969	11,882	9,879
Male	12,997	9,395	14,907	9,196	15,067	10,172
Health Status						
Single Minor	10,040	7,228	11,555	6,893	11,686	7,536
Multiple Minor	440	10,289	551	10,911	612	11,993
Sing. Dom./Mod.	11,193	10,113	12,542	9,970	12,837	11,017
Pairs and Triplets	1,071	17,135	1,215	17,271	1,343	19,026
Malignancies	101	16,422	128	17,967	117	16,061
Catastrophic	279	16,747	336	16,789	357	18,673

SOURCE UnitedHealth Group

NOTE: Rates based on adjusted member years.

use varied markedly across the health status categories. In 2001, the number of unique prescriptions per child approached 20 for children with the most complex conditions. Other findings illustrated in Table III.1 include the following:

- Rates of prescription drug use decreased marginally from 1999 to 2000 (2 percent) and then increased by 10 percent from 2000 to 2001
- Adolescents and school-aged children had similar rates of prescription drug use
- More prescriptions were written for boys than girls

CNS and psychiatric drugs accounted for the largest proportion of prescription drugs used in 2001 (Table III.2). On average, slightly fewer than three prescriptions for these drugs were written for every child in the sample. The rate of CNS/psychiatric drug use was highest among teenagers (on average, 3.7 prescriptions for every adolescent with a special health care need enrolled in 2001), males (3.4), and those with two or three major chronic conditions (5.7). Rates were also high for children in the multiple minor condition group (4.6) and the catastrophic condition group (4.3).

Respiratory drugs were the second most frequently used medication, with a rate of about 2.6 prescriptions per child. There were marked differences across the health status groups, with the pairs and triplets group receiving the greatest number of prescriptions for this class of drugs.

In general, boys were prescribed more CNS/psychiatric and respiratory drugs than girls, but girls received more antimicrobial, endocrine, and dermatological medications. Like adolescents in general, teenagers in this sample used substantially more dermatological prescription drugs than school-aged children (721 versus 251 prescriptions per 1,000 member years).

TABLE III.2
UTILIZATION RATES PER 1,000 MEMBER YEARS FOR SELECTED DRUG CATEGORIES, 2001

	Number of Children	Total	Drug Categories				
			CNS/ Psychiatric	Respiratory	Anti- Microbials	Endocrine	Derma- tological
All CSHCN	26,949	10,043	2,983	2,586	1,877	834	481
Age Groups							
0-5	5,726	9,459	563	3,262	3,001	800	397
6-12	9,937	10,118	3,511	2,981	1,548	807	251
13-18	11,286	10,257	3,680	1,917	1,627	875	721
Gender							
Female	11,882	9,879	2,475	2,387	2,072	876	530
Male	15,067	10,172	3,385	2,744	1,722	801	441
Health Status Groups							
Single Minor	11,686	7,536	3,096	1,206	1,589	240	482
Multiple Minor	612	11,993	4,632	1,774	2,312	389	757
Sing. Dom./ Mod.	12,837	11,017	2,474	3,711	1,938	1,259	441
Pairs and Triplets	1,343	19,026	5,754	4,203	2,948	2,151	647
Malignancies	117	16,061	2,759	1,513	4,015	1,852	788
Catastrophic	357	18,673	4,251	3,436	3,700	685	645

SOURCE: UnitedHealth Group

NOTE: Rates based on adjusted member years. To obtain an average prescription rate per child divide the figures by 1,000. For example, the rate for all CSHCN is 10,043, which means, on average, each child was given 10.0 prescriptions.

B. COST OF PRESCRIPTION DRUGS FOR CHILDREN WITH SPECIAL HEALTH CARE NEEDS, 1999-2001

The overall PMPM cost for prescription drugs for these children was \$28.40 in 1999, \$33.70 in 2000, and \$44.40 in 2001, an increase of 56 percent during these three years (Table III.3). These figures indicate that annual pharmaceutical costs in 2001 averaged about \$533 for each child. If all children in the sample had been enrolled for the entire year of 2001, their prescription drugs would have cost \$14.4 million.

TABLE III.3

PMPM COSTS (IN DOLLARS) FOR PRESCRIPTION DRUGS FOR CHILDREN WITH SPECIAL HEALTH CARE NEEDS IN COMMERCIAL MANAGED CARE PLANS, BY AGE, GENDER, AND HEALTH STATUS, 1999-2001

	1999		2000		2001	
	Number of Children	PMPM	Number of Children	PMPM	Number of Children	PMPM
All CSHCN	23,124	\$28.40	26,237	\$33.70	26,949	\$44.40
Age Groups						
0-5	4,981	18.30	5,466	21.90	5,726	28.30
6-12	8,746	29.30	10,099	34.10	9,937	46.80
13-18	9,397	32.60	10,762	38.90	11,286	49.90
Gender						
Female	10,127	26.20	11,420	32.10	11,882	41.20
Male	12,997	30.10	14,907	34.90	15,067	46.80
Health Status Groups						
Single Minor	10,040	18.60	11,555	19.50	11,686	26.10
Multiple Minor	440	26.50	551	32.90	612	44.90
Sing. Dom./Mod.	11,193	31.30	12,542	38.60	12,837	51.20
Pairs and Triplets	1,071	61.80	1,215	77.30	1,343	97.70
Malignancies	101	66.70	128	144.50	117	112.40
Catastrophic	279	128.40	336	139.90	357	175.60

SOURCE: UnitedHealth Group

Costs increased the most for school-aged children compared with other age groups, climbing 60 percent to \$46.80 in 2001 from \$29.30 in 1999. For children in the Single Dominant/Moderate group (the largest of the health status groups), prescription drug costs increased 64 percent from 1999 to 2001 (to \$51.20 in 2001 from \$31.30 in 1999).

As expected, prescription drug costs varied by age, gender, and health status (Table III.3). Costs were lower for the youngest age group, for females, and for children with single minor conditions. PMPM costs were the highest for children with catastrophic conditions (\$175.60) in 2001. Total drug costs (i.e., PMPM multiplied by the number of children) would be the highest for the Single Dominant/Moderate group because of the large number of children in this group.

Between 1999 and 2001, costs rose more quickly than use. As Table III.4 shows, costs increased seven times more than use (56.3 percent compared with 8.1 percent). These data are consistent with the rapid rise in pharmaceutical costs affecting the health care system in general (see, for example, Strunk and Ginsburg 2003).

TABLE III.4
PERCENT CHANGE IN SERVICE USE RATES AND PMPM COSTS, 1999-2001

	1999-2000	2000-2001	1999-2001
Utilization Rates	-2.1	10.4	8.1
PMPM Costs	18.6	31.8	56.3

SOURCE: UnitedHealth Group

C. COSTS FOR SELECTED TYPES OF PRESCRIPTION DRUGS, 2001

For all children with special health care needs, CNS/psychiatric drugs accounted for about one-third (32.2 percent) of prescription drug costs in 2001, but the type of drugs that accounted for the largest proportion of overall drug costs varied by age and health status group (Table

III.5). For example, respiratory medications accounted for the largest portion (42.4 percent) of drug costs for the youngest age group. Anti-microbials accounted for the largest portion (23.1 percent) of drug costs for children with catastrophic conditions.

TABLE III.5
PMPM COSTS (IN DOLLARS) FOR SELECTED DRUG CATEGORIES, 2001

	Number of Children	Total	Selected Drug Categories				
			CNS/ Psychiatric	Respiratory	Anti- Microbials	Endocrine	Derma- tological
All CSHCN	26,949	\$44.40	\$14.30	\$10.50	\$5.30	\$2.70	\$2.18
Age Groups							
0-5	5,726	28.30	2.50	12.00	6.60	1.60	.90
6-12	9,937	46.80	16.00	13.00	4.60	2.60	.80
13-18	11,286	49.90	18.50	7.50	5.20	3.30	4.10
Gender							
Female	11,882	41.20	11.40	9.40	5.50	2.70	2.10
Male	15,067	46.80	16.60	11.30	5.00	2.70	2.20
Health Status Groups							
Single Minor	11,686	26.10	13.10	4.00	3.80	.50	2.40
Multiple Minor	612	44.90	19.90	6.00	6.20	.60	3.70
Sing. Dom./Mod.	12,837	51.20	13.10	15.30	5.10	4.40	1.90
Pairs and Triplets	1,343	97.70	33.90	17.40	9.00	7.10	2.20
Malignancies	117	112.40	8.50	4.40	11.80	3.70	2.40
Catastrophic	357	175.60	17.60	34.80	40.50	2.10	2.10

SOURCE: UnitedHealth Group

D. PRESCRIPTION DRUG COSTS IN RELATION TO OTHER SERVICES

To examine how prescription drug costs compare to costs for other services used by our sample of children with special health care needs, we present total 2001 PMPM costs for prescription drugs and other selected services in Table III.6. In Table III.7, we show these costs as a percent of total dollars.

TABLE III.6

PMPM COSTS (IN DOLLARS) FOR PRESCRIPTION DRUGS AND OTHER SELECTED SERVICES USED
BY CHILDREN WITH SPECIAL HEALTH CARE NEEDS ENROLLED IN MANAGED CARE PLANS
IN 2001, BY AGE, GENDER, AND HEALTH STATUS

	Number of Children	Total PMPM	Prescription Drugs	In- patient Care	Out- patient Care	Specialty Physicians	Primary Care Physicians	All Other Services
All CSHCN	26,949	\$328.30	\$44.40	\$91.00	\$35.90	\$34.30	\$29.10	\$94.20
Age Groups								
0-5	5,726	623.80	28.30	272.80	61.20	62.10	62.40	137.20
6-12	9,937	223.50	46.80	35.20	28.35	22.60	22.40	68.10
13-18	11,286	278.70	49.90	52.70	30.44	31.20	19.10	95.30
Gender								
Female	11,882	328.70	41.20	94.40	35.15	37.60	29.30	91.00
Male	15,067	328.00	46.80	88.20	36.52	31.60	29.00	95.90
Health Status Groups								
Single Minor	11,686	158.50	26.10	20.10	20.58	22.80	22.40	46.60
Multiple Minor	612	369.80	44.90	88.30	55.81	53.90	33.60	93.40
Sing. Dom./ Mod.	12,837	290.30	51.20	64.20	30.12	30.10	29.10	85.60
Pairs and Triplets	1,343	1,239.00	97.70	511.70	115.45	116.50	62.60	335.10
Malignancies	117	3,206.10	112.40	1,409.00	462.72	180.80	128.50	912.70
Catastrophic	357	2,866.70	175.60	1,387.20	277.44	171.70	87.70	767.00

SOURCE: UnitedHealth Group

NOTE: Other services include emergency room visits, visits to non-M.D. health professionals, mental health services, lab services, home health visits, durable medical equipment, x-ray services, and occupational, physical, and speech therapy.

TABLE III.7

PERCENT OF TOTAL PMPM COSTS REPRESENTED BY PRESCRIPTION DRUGS
AND OTHER SERVICES USED BY CSHCN ENROLLED IN MANAGED CARE PLANS IN 2001,
BY AGE, GENDER, AND HEALTH STATUS

	Number of Children	Total PMPM	Prescription Drugs	Inpatient Care	Out-patient Care	Specialty Physicians	Primary Care Physicians	All Other Services
All CSHCN	26,949	100	13.5	27.7	10.9	10.4	8.9	28.7
Age Groups								
0-5	5,726	100	4.5	43.7	9.8	10.0	10.0	22.0
6-12	9,937	100	20.9	15.8	12.7	10.1	10.0	30.5
13-18	11,286	100	17.9	18.9	10.9	11.2	6.9	34.2
Gender								
Female	11,882	100	12.5	28.7	10.7	11.4	8.9	27.7
Male	15,067	100	14.3	26.9	11.1	9.6	8.8	29.2
Health Status Groups								
Single Minor	11,686	100	16.5	12.7	13.0	14.4	14.1	29.4
Multiple Minor.	612	100	12.1	23.9	15.1	14.6	9.1	25.2
Sing. Dom./Mod.	12,837	100	17.6	22.1	10.4	10.4	10.0	29.5
Pairs and Triplets	1,343	100	7.9	41.3	9.3	9.4	5.0	27.0
Malignancies	117	100	3.5	43.9	14.4	5.6	4.0	28.5
Catastrophic	357	100	6.1	48.4	9.7	6.00	3.1	26.8

SOURCE: UnitedHealth Group

NOTE: Other services include emergency room visits, visits to non-M.D. health professionals, mental health services, lab services, home health visits, durable medical equipment, xray services, and occupational, physical, and speech therapy.

The total PMPM cost for prescription drugs of \$44.40 is the second highest cost for any single service category, following the PMPM for inpatient care (\$91.00). Overall, the 2001 PMPM cost for prescription drugs for children with special health care needs exceeded PMPM costs for outpatient care (\$35.90), specialty physician services (\$34.30), and primary care services (\$29.10).

Prescription drugs were the single most expensive service category for school-aged children (\$46.80 PMPM), exceeding inpatient care (\$35.20 PMPM). Prescription drugs costs also were higher than inpatient costs for children in the Single Minor chronic condition category (\$26.10 compared with \$20.10).

As shown in Table III.7, the total PMPM cost for prescription drugs in 2001 was 13.5 percent of the PMPM cost for all services combined. The percent of total costs that prescription drugs accounted for in 2001 varied markedly by age group, from 20.9 percent for school-aged children to 4.5 percent for children less than 6 years of age.

In general, children with more complex conditions (i.e., children in the Pairs and Triplets, Malignancies, and Catastrophic groups) had higher PMPM costs for prescription drugs than children in the other health status groups (Table III.6). However, these costs represent a smaller percentage of the total PMPM costs for all services combined because inpatient costs are especially high for these three health status groups, accounting for more than 40 percent of total costs (Table III.7).

The figures in Tables III.6 and III.7 reflect averages across the entire group of children with special health care needs. This approach is useful because it is a standard approach for estimating costs for prescription drugs and other services and therefore allows for comparisons with studies of similar groups of children enrolled in other health plans. In future studies, it also would be useful to examine costs of specific prescription drugs and services only for those

children who used them. This approach would lead to estimates of actual costs for families who required drugs or services. These estimates would be higher than the figures in Table III.6 because total costs would be averaged over a smaller group of children.

E. MEMBER COSTS

The database constructed for this project allowed us to separate the total costs for prescription drugs into two categories: costs paid by the health plans and costs paid by health plan members (that is, in most cases, by parents). The costs paid by members include their deductibles and copayments, but does not include premium payments.

Overall, members paid about 25 percent of total prescription drug costs, a percentage that changed little across the three years (Table III.8). This percentage amounted to \$1.8 million in 1999, \$2.5 million in 2000, and \$3.4 million in 2001.

However, the actual dollar amount of the members' share of the PMPM increased substantially, from \$6.90 in 1999 to \$11.30 in 2001, an increase of 63.8 percent. The dollar amount of the health plans' share of the PMPM increased from \$21.40 to 33.00, an increase of 54.2 percent.

The percent of the total PMPM costs that members pay is influenced by the size of the employer and what type of plan the member has chosen (Table III.9). In general the percentage of the PMPM costs for prescription drugs is inversely related to the size of the employer: As employer size increases, the total PMPM cost paid by the member decreases. Members in large firms paid \$3.60 PMPM for prescription drugs in 2001 (8.7 percent of the total pharmacy costs). In contrast, members in small firms paid \$12.50 PMPM for prescription drugs in the same year (27.6 percent of the total pharmacy costs).

TABLE III.8
PLAN AND MEMBER PAYMENTS FOR PRESCRIPTION DRUGS, 1999-2001

	1999			2000			2001		
	Yearly Costs	PMPM Costs	Percent of Total	Yearly Costs	PMPM Costs	Percent of Total	Yearly Costs	PMPM Costs	Percent of Total
Total	\$7,445,340	\$28.40	100.0	\$9,946,827	33.70	100.0	\$13,425,898	\$44.40	100.0
Plan Portion	5,623,508	21.40	75.5	7,401,127	25.10	74.4	10,004,219	33.00	74.5
Member Portion	1,821,833	6.90	24.5	2,545,700	8.60	25.6	3,421,679	11.30	25.5

SOURCE: UnitedHealth Group

TABLE III.9
PMPM COSTS PAID BY MEMBERS FOR PRESCRIPTION DRUGS BY EMPLOYER SIZE AND PLAN TYPES

	1999			2000			2001		
	Number of Children	PMPM	Percent of Costs for Group	Number of Children	PMPM	Percent of Costs for Group	Number of Children	PMPM	Percent of Costs for Group
All CSHCN	22,965	\$6.90	24.5	26,087	\$8.60	25.6	26,623	\$11.30	25.5
Employer Size									
Small	15,080	7.70	27.2	17,829	9.30	27.7	18,775	12.50	27.6
Medium	2,907	6.00	21.2	3,078	7.60	21.6	2,987	9.60	24.3
Medium-Large	3,514	5.70	19.7	3,663	7.60	23.6	3,625	9.70	21.3
Large	1,464	3.90	13.6	1,517	5.30	15.4	1,236	3.60	8.7
Plan Type									
Choice	10,461	6.10	21.4	10,904	7.90	24.3	10,487	10.10	22.7
Choice-Plus	12,504	7.60	27.3	15,183	9.20	26.5	16,136	12.10	27.4

SOURCE: UnitedHealth Group

NOTE: This table includes only children who were in Choice or Choice Plus plans.

Table III.9 also shows that members who elected an enhanced package of benefits paid somewhat more of the PMPM costs for prescription drugs than members who elected a standard benefit package (\$10.10 versus \$12.10 in 2001). This is the result of higher copays or deductibles in packages that cover a wider range of services.

The number of families who enrolled in the Choice Plus plans increased in absolute terms (from 12,504 in 1999 to 16,136 in 2001) and as a percent of the total number of families in the sample (from 54.4 percent in 1999 to 60.1 percent in 2001). This change probably contributed somewhat to the increase in the overall PMPM cost of prescription drugs from 1999 to 2001 because more families were selecting plans that required higher copays and deductibles.

IV. SUMMARY AND IMPLICATIONS OF FINDINGS

A. SUMMARY

Overall, we found that children with special health care needs are given many different prescriptions for a wide range of drugs and, as a result, prescription drug costs are high for this population of children in general and are especially high for certain subgroups. On average, children with the most complex conditions received close to 20 prescriptions in 2001.

CNS and psychiatric medications were the pharmaceuticals most frequently prescribed to children with special health care needs and accounted for about one-third (32.2 percent) of all prescription drug costs for children in the study. The rate of CNS/psychiatric drug prescriptions was higher among children with two or three major chronic conditions (5.7 prescriptions per year) compared with children in other health status groups and teenagers (an average 3.7 prescriptions per year) compared with school-aged children.

Rates of prescriptions for pharmaceuticals for children with special health care needs increased somewhat from 1999 to 2001, but the costs of these prescription drugs increased substantially. The increase in costs was especially dramatic for certain subgroups of children. Specifically, we found:

- Between 1999 and 2001, costs increased seven times more than use (56.3 percent compared with 8.1 percent).
- The overall PMPM cost for prescription drugs for these children was \$28.40 in 1999, \$33.70 in 2000, and \$44.40 in 2001.
- Costs increased the most for school-aged children, climbing more than 60 percent to \$46.80 in 2001 from \$29.30 in 1999.
- For children in the single dominant/moderate group (the largest of the health status groups), prescription drug costs increased 64 percent from 1999 to 2001 (to \$51.20 in 2001 from \$31.30 in 1999).

Costs for prescription drugs for this group of children represent a major share of total service costs. The total PMPM cost for prescription drugs in 2001 was 13.5 percent of the PMPM cost for all services combined, with percentages varying markedly by age and health status. In general, PMPM costs for prescription drugs exceeded all other service categories except inpatient care and, in certain subgroups, exceeded even inpatient care costs. Specifically, we found:

- Overall, the total PMPM cost for prescription drugs for children with special health care needs in 2001 (\$44.40) was exceeded only by the PMPM cost for inpatient care (\$90.95).
- PMPM costs for prescription drugs in 2001 exceeded PMPM costs for outpatient care (\$35.92), specialty physician services (\$34.27), and primary care services (\$29.12).
- For the subgroup of children age 6 to 12, prescription drugs costs (\$46.80 PMPM) exceeded even inpatient care (\$35.22 PMPM).
- Prescription drug costs also were higher than inpatient costs for children in the single minor chronic category (\$26.10 compared with \$20.12).

On average, members paid about one-quarter of all costs for prescription drugs in each of the three years we studied, but the total dollars paid by members increased substantially because of the overall increase in prescription drug costs during this period. Specifically, we found:

- Member costs for prescription drugs totaled \$1.8 million in 1999, \$2.5 million in 2001, and \$3.4 million in 2001.
- The actual dollar amount of the members' share of the PMPM prescription drug costs increased substantially, from \$6.90 in 1999 to \$11.30 in 2001, an increase of 63.8 percent.
- The percentage of PMPM costs for prescription drugs that is paid by plan members was inversely related to the size of the employer, with members in large firms paying \$3.60 PMPM for prescription drugs in 2001 (8.7 percent of the all pharmacy costs) and members in small firms paying \$12.50 PMPM (27.6 percent of the all pharmacy costs).

B. IMPLICATIONS

Our findings suggest that costs for prescription drugs are an important component in calculating overall service costs for children with special health care needs. Compared with other medical services, prescription drugs account for a major portion of the total cost of providing care to these children. Furthermore, prescription drug costs rose sharply from 1999 to 2001. These costs are likely to remain high even as the rate of increase is tempered (Strunk and Ginsburg, 2003). For families of children with complex chronic conditions, annual prescription drug costs can be substantial, especially if parents work for small companies that typically ask employees to pay a greater portion of the costs than do large companies. The MCHB will need to work with employers, especially groups that represent small employers, to address this critical policy problem.

Further examination of the potential factors that are driving increases in prescription drug costs could help develop appropriate policies that reduce the risk of serious financial burdens. Increases in drug costs could result from the introduction of new and expensive drugs, changes in recommended pharmaceutical protocols for particular conditions, changes in the list of preferred drugs, evolution in physician prescribing behavior, continued increase in the proportion of families electing more expensive benefit options, or some combination of these factors. Additional information on the potential impact of these factors could help health plans anticipate and manage future increases.

Our findings also indicate that prescriptions for CNS and psychiatric conditions contribute substantially to overall prescription drug costs, underscoring the fact that many children who are identified as having special health care needs have serious emotional, behavioral, cognitive, or other central nervous system disorders (Humensky et al. 2004). These may include attention deficit/hyperactivity disorder, epilepsy and other seizure disorders, or serious affective disorders.

As the MCHB works to achieve its goal of promoting adequate, affordable insurance coverage for all children with special health care needs, it will need to develop collaborative relationships with insurers and employers to ensure that mental health services are included in standard benefit packages.

Drug prescriptions also may be used to identify children who could benefit from special care coordination efforts. Multiple prescriptions for the same child, for example, may mean that the child is seeing multiple providers, and would benefit from additional assistance in coordinating services. Prescriptions for multiple drugs or multiple prescriptions for the same drug could signal an increased potential for medical errors resulting either from lack of knowledge about treatment protocols or poor communication among the prescribing physicians. Tracking rates of prescription drugs, therefore, may be important for monitoring quality as well as costs of care.

Our analyses also raise a series of additional questions. For example, it would be of considerable interest to examine the relationship between pharmaceutical costs and costs for inpatient care. Is increased use of prescription drugs associated with changes in hospital admissions or length of stay for children with special health care needs? Our findings also invite questions about prescribing behavior. For example, what type of provider (general pediatricians, specialists, or psychiatrists) prescribes what kinds of drugs to these children and does it matter in terms of health outcomes or subsequent service use?² How many children are receiving multiple prescriptions for co-occurring health problems, and does this situation increase the child's risk for poor outcomes secondary to complex drug interactions? These issues will be important to pursue in future work.

²This question is addressed for children with special health care needs who have emotional or behavioral problems in a separate report (Humensky et al. 2004).

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