

Children's Health Spending: 2009-2012

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Letter from the Executive Director

Children's Health Spending: 2009-2012 is the Health Care Cost Institute's second report examining the trends driving health care costs for children covered by employer-sponsored health insurance (ESI). Health services research often examines the costs of care for the aging and the elderly; however, children have some of the fastest growing health expenditures. In this report covering the period 2009 to 2012, we describe how health spending per child rose by 5.5 percent per year and out-of-pocket spending rose by 6.6 percent per year.

Why health expenditures rose so rapidly for children is not only an important policy research question, but relevant for the economic future of the United States. Families make daily decisions regarding the health needs of their children, and policies or events, such as the recession, can mediate those decisions. For example, HCCI found evidence suggesting that parents may have deferred some care for their children in 2010. Encouragingly, HCCI also found that parents increasingly took children to the doctor for preventive office visits. The creation of a benchmark baseline for preventive care use by children, before it became an essential health benefit, will be useful for assessing effects of the Affordable Care Act.

Beyond dollars and cents, this report focuses on critical trends in children's health care use by age and gender. Typically, information on children's health is not available for the different phases of childhood. Here we were able to observe the drivers of rising spending on infants and toddlers, the differences in health care use for boys and girls, the growing number of children using central nervous system drugs, and the drop in teen labor and delivery admission rates.

This is our first 2014 report on the privately insured. Our intent with this report (as with other HCCI publications) is to identify key trends in health care costs and utilization, and to spur further research. To date, HCCI's work has been on the commercially insured only, but our hope is to bring into HCCI's data holdings Medicaid data, and with it, complete the picture of health care use and costs for insured children.

We encourage interested individuals and organizations to learn more about HCCI's research and activities by visiting our website at www.healthcostinstitute.org and subscribing to our regular email updates.

David Newman

Executive Director, Health Care Cost Institute

Executive Summary

In 2012, about 43 million children ages 18 and younger were covered by employer-sponsored health insurance (ESI) in the United States, representing about a quarter of the total ESI population.¹ Despite their sizable number, few studies of health care spending trends for these children have been conducted.^{2,3} HCCI sought to partially fill this gap with this report, *Children's Health Spending: 2009-2012*, continuing and expanding on the work started in HCCI's *Children's Health Care Spending Report: 2007-2010* and the *2012 Health Care Cost and Utilization Report*.^{4,5}

For this study, HCCI analyzed fee-for-service claims for about 10.5 million ESI children per year between 2009 and 2012.⁶⁻⁸ Data in this report were weighted to be nationally representative of the entire ESI children population. HCCI examined total spending, out-of-pocket spending, payer spending, and drivers of health care costs, with particular attention to utilization trends.

All children

HCCI found that per capita expenditures on children (ages 0-18) rose, across regions, gender, and service categories (Table 1). Spending per child was higher for boys than for girls.

During the study period, the share of out-of-pocket spending for children increased (Table A1 and Table A2). Although payer expenditures accounted for most of the spending (Table A2), per capita out-of-pocket spending increased in each year and grew faster than payer expenditures (Table A1).

Children generally saw increases in medical service utilization between 2009 and 2012. Inpatient admissions per 1,000 children grew slightly, as did the use of professional procedures. In particular, children's use of preventive care visits to primary care physicians rose. Medical service use fluctuated, with some services such as emergency room (ER) visits declining in 2010, leading to an overall decline in outpatient visits in that year.

Despite the general trend of increased use of services, it was rising prices that helped push up spending on medical services for children. Price growth outpaced utilization changes for inpatient, outpatient, and professional procedures. Resource intensity (that is, the complexity of service provided; see "Key Definitions"), was not the primary driver of price growth – except for professional procedures.

Prescription use rose over time, mostly due to increased generic

2012 BY THE NUMBERS

\$2,437

Health care expenditures per child (ages 0-18).

\$4,446

Health care expenditures per infant or toddler (ages 0-3).

\$1,653

Health care expenditures per younger child (ages 4-8).

\$1,776

Health care expenditures per pre-teen (ages 9-13).

\$2,617

Health care expenditures per teenager (ages 14-18).

17.5%

Share of health care expenditures on children paid out of pocket (ages 0-18).

8.6%

Increase in the use of generic prescriptions by children (ages 0-18).

prescription use. Children used fewer brand prescription days per 1,000 insureds over time, while generic prescription use rose in 2011 and 2012.

During the study period, prices rose for brand prescriptions, but fell slightly for generic prescriptions in 2011 and 2012. Rising prices helped keep brand prescription expenditures growing, even as use declined. In contrast, increased generic prescription use was the main driver of rising generic prescription spending.

Infants and toddlers



Spending on infants and toddlers (ages 0-3) was somewhat different from

spending on other children's age groups. Per capita expenditures on these children were the highest of any of the children's age groups examined.⁵ About 12 percent of the spending was paid out of pocket, reflecting relatively lower cost sharing compared with older children (Table 3).

Inpatient admissions and professional procedures accounted for almost 80 percent of the spending for infants and toddlers (Table 3). More than three-fourths of the admissions were for newborn infants shortly after delivery, and those admits per 1,000 children grew over time (Table A6). Nearly 40 percent of professional procedures for infants and toddlers were for

vaccines and injections (data not shown).

Younger children and pre-teens



The health care dollars spent per younger child (ages 4-8) and preteen (ages 9-13)

were the lowest of any age groups analyzed (Tables 5 and 6). However, the share of per capita spending paid out of pocket (20.9% for younger children and 19.9% for preteens in 2012) was higher than that for infants and toddlers (12.3%). During the study period, spending grew slower for younger children (4.5% per year) than for any other children's age group; spending on pre-teens grew the fastest (6.1%) of any group.



Prescriptions appeared to be an increasingly important health care service category for younger children and preteens.

Prescription use by younger girls was similar to infants and toddlers, with anti-infective agents the most used class of drugs (Table A8). Prescription use by younger boys and preteens was dominated by central nervous system (CNS) agent use, which increased between 2009 and 2012 (Tables A8 and A10).

Teenagers



During the study period, spending per teenager rose (5.8% per year) at the second

fastest rate for any children's age group. About 20 percent of this spending was on prescription drugs, and prescription spending increased every year of the study period. As with younger children and pre-teens, by 2012 nearly a fifth of the spending on teens was paid out of pocket. Two trends distinguished the spending of teens from other children's age groups.

One trend observed was increases in mental health and substance use (MHSU) admissions and in the use of prescription CNS agents (Table A13). During the study period, both MHSU admissions and CNS prescription filled days rose for teens, and were greater than for any other children's age group.

The other trend was differences in the use of services between boys and girls. Unlike other children's age groups, spending per teen was higher for girls than for boys due to higher medical spending on teen girls (Table 7). Girls generally used more medical services than boys, including more MHSU admissions per 1,000 girls (Figure 17). Boys, on the other hand, had higher prescription spending (Table A25). Girls used more prescription filled days due to use of hormones and synthetic substitute drugs (Table A19); however, those filled days were generally for generic prescriptions and the prices paid per day were relatively low. Teen boys used more filled days of CNS drugs (combined brand and generic)

than did teen girls (Table A19), and the average prices for those prescriptions were higher than prices paid for the hormones drug class.

Conclusions

Children are not small adults, and their patterns of health care expenditures between 2009 and 2012 reflected this. HCCI found that children began life with high expenditures on inpatient care and routine spending. As younger children, they continued with routine care but much of their spending and care occurred in outpatient settings. As pre-teens, their routine care and outpatient expenditures increased, but so did their prescription drug use. As teenagers, their use of prescriptions more than doubled.

During the study period, another key difference between children and adults was spending by gender. For the first 13 years of life, more was spent on the health

care of boys than girls. Between the ages of 4 and 8, prescription drug expenditures on boys began a pattern of CNS use that continued throughout childhood. Use of CNS prescriptions by girls increased during the pre-teens years, and further during the teens years. But teen boys had higher use of brand CNS drugs than teen girls. For teenage girls, the clearest gender difference in care was higher use of medical services, which in turn led to expenditures for teen girls being higher than those for teen boys.

There is little evidence in this report that the recession and the recovery substantially altered these patterns of use and spending. Expenditures per child rose for each age group over time, although the rates of change slowed, particularly in 2010. For every service category, except generic prescriptions, increasing prices generally led to rising expenditures.

This is not to say that children's health spending was not affected at all by the recession and recovery, as utilization of some health care services declined during the study period. Rather, this report suggests that families covered by ESI were generally willing to bear rising health care prices and rising cost sharing to provide their children with the care that they needed.

KEY DEFINITIONS

What is spending per capita?

Per capita health spending is an estimate of total expenditures paid for children divided by the population of insured children.

What are out-of-pocket and payer expenditures per capita?

Out-of-pocket payments made directly to a health care provider on behalf of a child, including any copayments, coinsurance payments, and deductible payments. Any health care payments made out-of-pocket for which a claim was not filed (such as over-the-counter medicines), are not included in this metric. Payer expenditures are dollars paid by the insurer directly to a health care provider on behalf of a child, excluding any rebates, discounts, incentive payments, or administrative costs not captured by the claims system. Out-of-pocket and payer expenditures per capita are calculated by dividing total out-of-pocket or payer expenditures by the population of insured children.

What are medical service, subservice, and detailed categories?

Three medical service categories are identified: inpatient facility, outpatient facility, and professional procedures. HCCI reports on three facility subservice categories: inpatient subset, which excludes skilled nursing facilities, hospice care, and ungroupable claims; outpatient facility visits; and outpatient facility other services.⁴

These are then further classified into “detailed service” categories.

What are prescription service and subservice categories?

HCCI analyzed prescription drug and device claims from pharmacies. The prescription service category is further classified by brand and generic drug subservice categories.

How did HCCI calculate utilization and what is average price?

Utilization was calculated by counting the number of claim lines and calculating an average number of service uses per 1,000 children. For every service, an associated dollar amount was paid to providers by insurers and the insured. Average price was calculated by summing all the dollars spent on a service category, sub-service category, or detailed service category, and dividing by the associated number of service uses.

What is intensity?

Intensity is a measure of the complexity of a service, including the length of time, the severity of the illness addressed, and the amount of resources required for treatment. There can be many reasons for changes in the intensity of services, including: new and better forms of treatment, the health status of the population receiving services, and modifications in the reimbursement system that either encourage or discourage one form of treatment

over another. HCCI measures intensity by assigning a weight designed by the Centers for Medicare and Medicaid Services (CMS) and commercially adjusted to each medical service, when possible. HCCI did not calculate intensity of prescriptions, as the dosage levels and days are fully captured by the price.

What is an intensity-adjusted price?

Isolating the effect of intensity on the price paid per service allows for the calculation of an intensity-adjusted price. The patient never sees this price directly. The intensity-adjusted price, or unit price, was calculated by dividing the price paid for the service by the intensity of the service. For example, intensity equal to one would lead to no difference between prices paid and intensity-adjusted prices. Intensity greater than one would lead to intensity-adjusted prices being higher than prices paid; and an intensity level less than one would mean that intensity-adjusted prices were less than the prices paid. Using this metric, HCCI is able to determine how much of the change in price growth came from changes in resource use (intensity growth) and how much came from changes in other factors influencing prices (intensity-adjusted price growth).

Health Care Spending on Children (ages 0-18)

This section details expenditures on children (ages 0-18) – total, out-of-pocket, and payer, including expenditure trends by region and gender. HCCI found that spending rose over time but at a slower rate in 2012 than in previous years. Rising prices helped push up spending for medical services, and at least for one medical category (professional procedures) increases in resource intensity drove up prices more than other factors. Declining utilization slowed brand prescription spending, whereas greater generic prescription use increased expenditures on generic prescriptions. This section also discusses which services drove spending on children in 2011 and

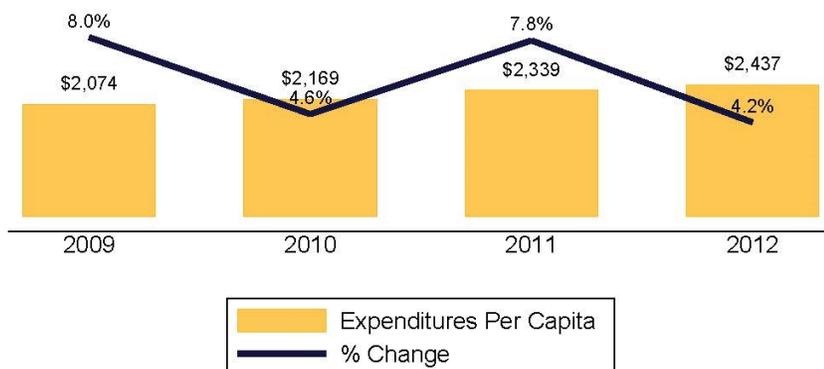
what services helped slow spending growth in 2012.

Per capita spending

In 2012, \$2,437 was spent per child on prescriptions and medical care (Table 1 and Figure 1). Spending per child grew by 4.2 percent that year, which was 3.6 percentage points slower than growth in 2011.

Between 2009 and 2012, health care expenditures per child grew by an average 5.5 percent per year (Figure 1). As shown in Figure 2, spending growth rates varied by age during this period, ranging from 6.1 percent per year for pre-teens to 4.5 percent per year for younger children.

Figure 1
**ESI Expenditures Per Capita on Children,
Ages 0-18: 2009-2012**



Source: HCCI, 2013.
Notes: All data weighted to reflect the national, ages 0-18 ESI population.
Data from 2011 and 2012 adjusted using actuarial completion.

2012 KEY FINDINGS

\$2,437

Health care expenditures per child.

4.2%

The 1-year increase in health care spending per child.

\$427 AND 5.9%

Out-of-pocket expenditures per child and 1-year percentage growth in those expenditures.

0.0% AND 6.5%

The 1-year changes in outpatient visits per 1,000 children and average price.

54.6

The number of filled days of generic prescriptions per child.

19.5

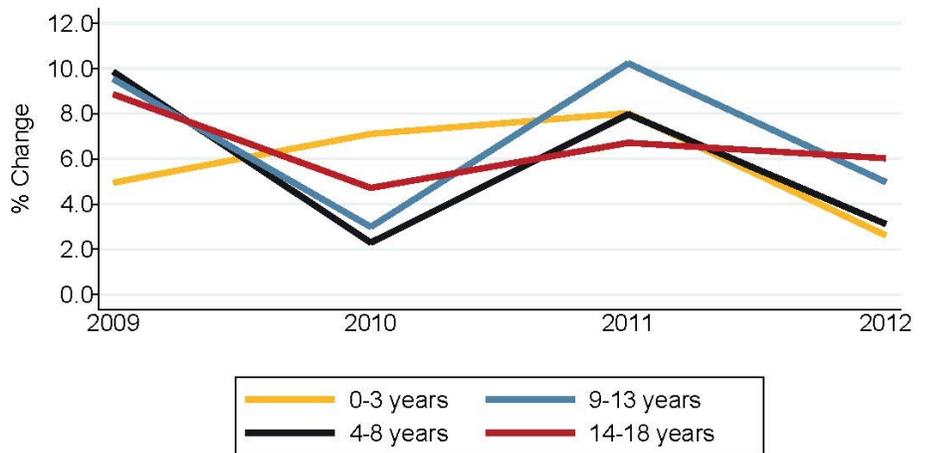
The number of filled days of brand prescriptions per child.

Health care spending for children also varied by region. In all years studied, the Northeast had the highest expenditures per child (\$2,596 in 2012) and the West had the lowest (\$2,231 in 2012; Table 1). The West also had the slowest expenditure growth (1.8% in 2012). Between 2011 and 2012, the difference in expenditures between the Northeast and the West widened from \$299 per child to \$365 per child.

HCCI also found differences in health care spending for children by gender. Spending was higher for boys than for girls in all years studied (Table 1). Between 2009 and 2012, per capita expenditures for boys increased \$398 to \$2,572, compared with spending on girls at \$2,296. As a result, there was a \$276 expenditures difference between boys and girls in 2012.

Spending was higher for boys than girls for each service category

Figure 2
Annual Percentage Changes in Expenditures Per Capita by Age Group: 2009-2012



Source: HCCI, 2013.
Notes: All data weighted to reflect the national, ages 0-18 ESI population. Data from 2011 and 2012 adjusted using actuarial completion.

(Table A21). There was an especially large difference for brand prescriptions, which made up 9.6 percent of spending on boys and 7.2 percent of spending on girls in 2012. As a share of expenditures, a larger share of the spending on girls (40.5% in 2012)

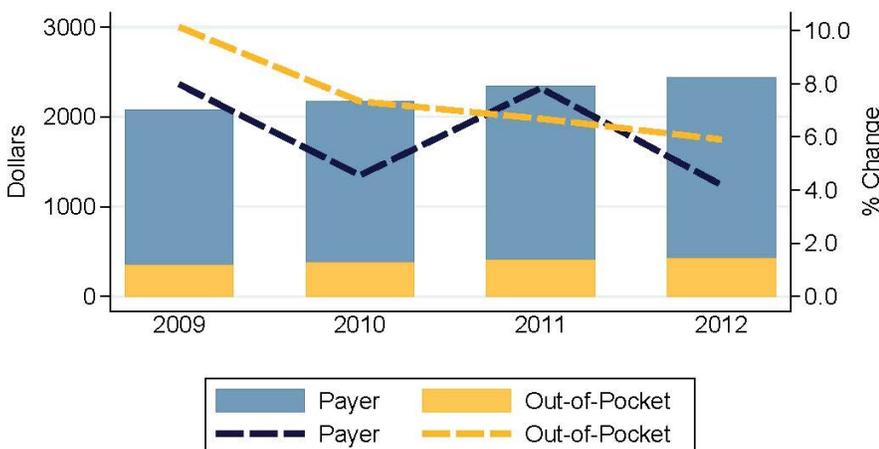
was for professional procedures than for boys (38.4%).

Out-of-pocket and payer spending

HCCI found that out-of-pocket expenditures grew 5.9 percent in 2012, and made up 17.5 percent of total per capita spending on children (\$427 per child; Table A1). Though out-of-pocket spending continued to increase, the growth rate slowed between 2009 and 2012 (Figure 3).

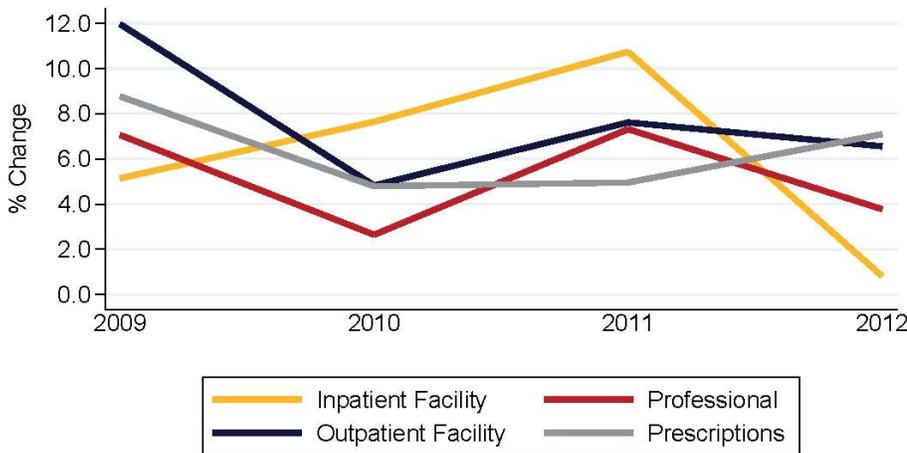
In 2012, out-of-pocket expenditures grew slightly faster for girls (6.0%) than for boys (5.8%); however, per capita out-of-pocket expenditures for girls (\$414) remained lower than for boys (\$440). The Midwest and South, the regions with the fastest out-of-pocket growth rates in 2012, also had the highest out-of-pocket per capita expenditures (Table A1). In the South, out-of-

Figure 3
Payer and Out-of-Pocket ESI Expenditures Per Capita on Children, Ages 0-18: 2009-2012



Source: HCCI, 2013.
Notes: All data weighted to reflect the national, ages 0-18 ESI population. Data from 2011 and 2012 adjusted using actuarial completion.

Figure 4
Growth in Expenditures Per Capita
by Service Category, Ages 0-18: 2009-2012



Source: HCCI, 2013.
 Notes: All data weighted to reflect the national, ages 0-18 ESI population.
 Data from 2011 and 2012 adjusted using actuarial completion.

pocket per capita expenditures increased by \$31 (7.2%) in 2012 to \$454 per child; in the Midwest, this growth was 6.3 percent (\$28) to \$477.

Also in 2012, payer expenditures increased by 3.8 percent to \$2,010 per child (Table A2). For both payers and consumers, professional procedures accounted for most of their per child expenditures (\$755 and \$205, respectively). Inpatient admissions accounted for payers' second largest share of expenditures (\$522 per child). Outpatient facility claims accounted for the second largest share of out-of-pocket expenditures (\$118 per child). Payer and out-of-pocket expenditures on children grew for all service categories (inpatient, outpatient, professional

procedures, and prescriptions) in all years.

Drivers of spending growth

HCCI analyzed the effect of different spending components on children's per capita expenditures by service and subservice categories. During the study period, utilization increased for each service and subservice category, except outpatient visits and filled days for brand prescriptions, but increases in prices drove most of the increases in spending (Table A3 and Table 2). Growth in average annual prices was fastest for brand prescriptions (16.3% per year), outpatient visits (8.2% percent per year), and inpatient admissions (6.2% per year). Resource intensity grew slower than intensity-adjusted prices for inpatient admissions and

outpatient other and visits, suggesting intensity was the not the primary driver of rising facility prices for children. However, in 2011, intensity was the primary contributor to rising procedure prices.



In 2012, at \$548 per capita, inpatient admissions were 22.5 percent of expenditures on children (Table 1). Growth in inpatient subset (see "Key Definitions") expenditures slowed between 2011 and 2012, from 11.5 percent to 0.8 percent (Figure 4). The growth in inpatient spending was largely driven by rising prices for admissions. In 2012, the growth in prices for admissions slowed to 2.4 percent (Table A3). Also in that year, intensity and utilization of inpatient admissions declined.



Growth in per capita expenditures for outpatient services slowed in 2012 (Table 1 and Figure 4). Outpatient expenditures accounted for 24.3 percent of health care spending. Expenditure growth slowed by one percentage point for visits (\$382 per capita) and by 1.3 percentage points for other services (\$211 per capita). Between 2011 and 2012, outpatient visit use was flat (0.0% change), while outpatient other facility use grew 2.2 percent (Table A3). The average price paid per outpatient visit rose 6.5 percent and 4.2 percent for outpatient other services.



For 2012, 39.4 percent of per child health care dollars were spent on professional procedures (Table 1). In that year, growth in expenditures for professional procedures slowed to 3.8 percent (Figure 4). Utilization per 1,000 children increased by 1.3 percent (148 professional procedures per 1,000 children; Table A3), while the average price paid slowed to 2.4 percent. At the same time, the average intensity for professional procedures rose 0.2 percent.



Also in 2012, 13.8 percent of per child spending was on prescriptions (Table 1). Prescription spending overall grew faster over time, rising by 7.1 percent in 2012. In that year, growth in spending on brand prescriptions slowed slightly, while spending on generic prescriptions grew by 13.7 percent.

In each year studied, the number of filled days of generic prescriptions was higher than the number of brand filled days (Table

A3). Between 2011 and 2012, brand prescription use declined 15.6 percent, compared with an 8.6 percent increase in generic prescription use.

Between 2011 and 2012, the price for a filled day grew by 6.0 percent (Table A3). For generic prescriptions, the average price per filled day rose 4.7 percent; however, the price of a generic filled day remained around \$2 during the entire study period. The average price for brand drugs per filled day rose by 22.3 percent to \$11 per filled day (Table 2).

Summary

In 2012, per capita health care expenditures on children continued to rise, across regions, gender, and service categories (Table 1). These expenditures grew 4.2 percent from 2011, the slowest growth rate observed during the study period. The following sections further deconstruct these trends, as use of services varied across age groups and gender.

For the third consecutive year, the share of out-of-pocket expenditures increased, although the growth rate slowed every year. In 2012, per child out-of-pocket expenditures increased by \$24, and continued to grow faster than payer expenditures (Table A1), reflecting rising cost sharing for families. Payer expenditures accounted for most of the spending, but the growth rate was generally slower for payers than for those paying out of pocket (Table A2).

PROFESSIONAL PROCEDURES TREND TO NOTE: RISING PREVENTIVE CARE VISITS

For all children's age groups and in all years of the study, HCCI observed a rise in preventive care visits to primary care providers (PCPs) and specialists. Between 2009 and 2012, preventive visits to PCPs increased yearly by an average 1.6 percent for infants and toddlers, 2.1 percent for younger children, 3.6 percent for pre-teens, and 3.1 percent for teens (Appendix Tables A6, A8, A10, and A13). Preventive visits to specialists also rose for these age groups in every year during this period, except for teens in 2010 and 2012, although the total number of visits to these providers remained low.

Table 1: Expenditures Per Capita for Children (2009–2012)

	2009	2010	2011	2012	Percent Change 2009/2010	Percent Change 2010/2011	Percent Change 2011/2012
Per Capita, All Children	\$2,074	\$2,169	\$2,339	\$2,437	4.6%	7.8%	4.2%
Per Capita by Age							
0-3	\$3,745	\$4,011	\$4,333	\$4,446	7.1%	8.0%	2.6%
4-8	\$1,451	\$1,485	\$1,603	\$1,653	2.3%	8.0%	3.1%
9-13	\$1,490	\$1,535	\$1,692	\$1,776	3.0%	10.2%	5.0%
14-18	\$2,208	\$2,313	\$2,468	\$2,617	4.7%	6.7%	6.0%
Per Capita by Region							
Northeast	\$2,205	\$2,337	\$2,492	\$2,596	6.0%	6.6%	4.2%
Midwest	\$2,141	\$2,240	\$2,426	\$2,541	4.6%	8.3%	4.7%
South	\$2,066	\$2,131	\$2,299	\$2,421	3.2%	7.9%	5.3%
West	\$1,915	\$2,020	\$2,193	\$2,231	5.5%	8.5%	1.8%
Per Capita by Gender							
Boys	\$2,174	\$2,282	\$2,462	\$2,572	5.0%	7.9%	4.5%
Girls	\$1,970	\$2,050	\$2,211	\$2,296	4.1%	7.8%	3.8%
Per Capita by Service Category							
Inpatient	\$456	\$491	\$544	\$548	7.6%	10.7%	0.8%
Inpatient Subset ¹	\$453	\$486	\$542	\$546	7.3%	11.5%	0.8%
Outpatient	\$493	\$517	\$556	\$593	4.8%	7.6%	6.6%
Visits	\$318	\$334	\$358	\$382	5.0%	7.5%	6.5%
Other	\$175	\$183	\$198	\$211	4.6%	7.9%	6.6%
Professional Procedures	\$840	\$862	\$925	\$960	2.6%	7.3%	3.8%
Prescriptions ²	\$285	\$299	\$313	\$336	4.8%	5.0%	7.1%
Brand	\$175	\$193	\$200	\$207	10.4%	3.6%	3.3%
Generics	\$110	\$106	\$113	\$129	-3.8%	7.4%	13.7%

Source: HCCL, 2013.

Notes: All data weighted to represent the total population of insureds ages 0-18 and covered by ESI. Actuarial completion was performed on data from 2011 and 2012. All per capita dollars calculated from allowed costs. All figures rounded.

1. Skilled nursing facility (SNF), hospice, and ungroupable claims were excluded from analysis of inpatient expenditure trends due to the lack of information about the intensity and unit prices of those services at the time of analysis.
2. Prescriptions uncategoryzable as brand or generic were also analyzed, but they are not included in the tables due to very low dollar amounts.

Table 2: Decomposition of Expenditure Growth (2009–2012)

	<u>2009-2012</u>	<u>Components of 2009-2012</u>		<u>Components of 2009-2012</u>	
	<u>Expenditures</u>	<u>Expenditures Trend</u>		<u>Price Trend</u>	
	<u>Per Capita</u>	<u>Utilization</u>	<u>Prices Paid</u>	<u>Intensity</u>	<u>Unit Price</u>
Inpatient	6.3%	0.2%	6.2%	N/A	N/A
Inpatient Subset ¹	6.4%	0.1%	6.2%	0.1%	6.2%
Outpatient	6.3%	0.6%	5.7%	-0.5%	6.2%
Visits	6.3%	-1.7%	8.1%	0.4%	7.7%
Other	6.4%	1.1%	5.2%	1.2%	3.9%
Professional Procedures	4.5%	0.5%	4.1%	2.1%	2.0%
Prescription - Filled Days ²	5.6%	0.9%	4.7%	N/A	N/A
Brand	5.7%	-9.0%	16.1%	N/A	N/A
Generics ³	5.5%	5.6%	-0.1%	N/A	N/A

Source: HCCI, 2013.

Notes: All data weighted to represent the total population of insureds ages 0-18 and covered by ESI. Actuarial completion was performed on data from 2011 and 2012. All per capita dollars calculated from allowed costs. All figures rounded.

1. Skilled nursing facility (SNF), hospice, and ungroupable claims were excluded from analysis of inpatient expenditure trends due to the lack of information about the intensity and unit prices of those services at the time of analysis.
2. Prescriptions uncategorizable as brand or generic were also analyzed, but they are not included in the tables due to very low dollar amounts and low utilization.
3. Generic prices per day are between one and two dollars.

Infants and Toddlers (ages 0-3)



Spending on infants and toddlers (“babies”) was somewhat different from spending on other children during the study period. Growth in expenditures did not slow in 2010, as it did for the other children’s age groups (Table 3 and Figure 5). One reason may have been that health care service use by infants and toddlers was less influenced by the economic recession and recovery.

Per capita expenditures on infants and toddlers were the highest of any of the children’s age groups examined and higher than the per capita expenditures for some adults.⁵ As with the national, younger than 65 ESI population, rising prices for medical services from 2009 through 2012 kept expenditures on infants and toddlers high. At the same time, utilization increases (particularly for some professional procedures and inpatient care) in 2010 and 2011 also drove high average spending growth for this age group.

Spending on infants and toddlers rose by 5.9 percent per year

In every year of the study, spending for infants and toddlers was considerably higher than expenditures on any other children’s age group. Between 2009 and 2012, per capita

spending on infants and toddlers grew by \$701, or 5.9 percent per year, reaching \$4,446 in 2012.

Out-of-pocket expenditures were also higher for this age group than for any other children’s age group (\$548 per baby in 2012; Table 3). Spending rose by an average of 5.6 percent per year but the out-of-pocket spending growth slowed over time. In 2012, the share of expenditures paid out of pocket was lower for infants and toddlers (12.3%; Table 3) than for all children (17.5%; Table 1).

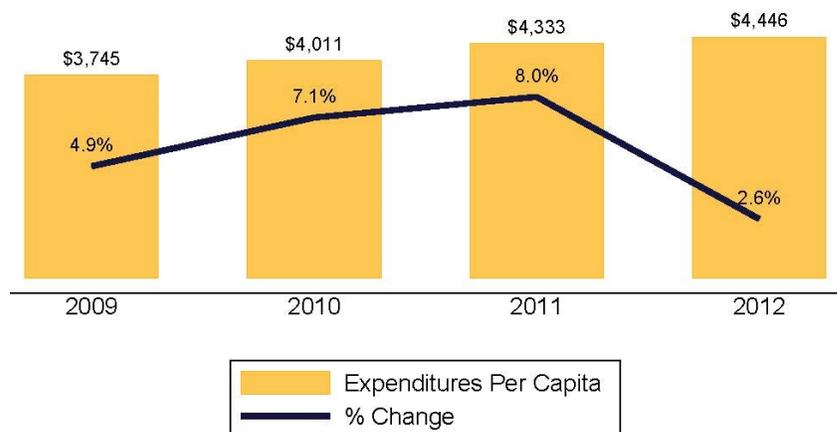
The majority of spending on infants and toddlers was for inpatient admissions and professional procedures. The total share of expenditures spent on

these services increased over the study period (Figure 6). The other service categories - outpatient facility and prescriptions - accounted for nearly 20 percent of the spending, and that share declined over time.

Spending on routine care rose by 5.4 percent per year

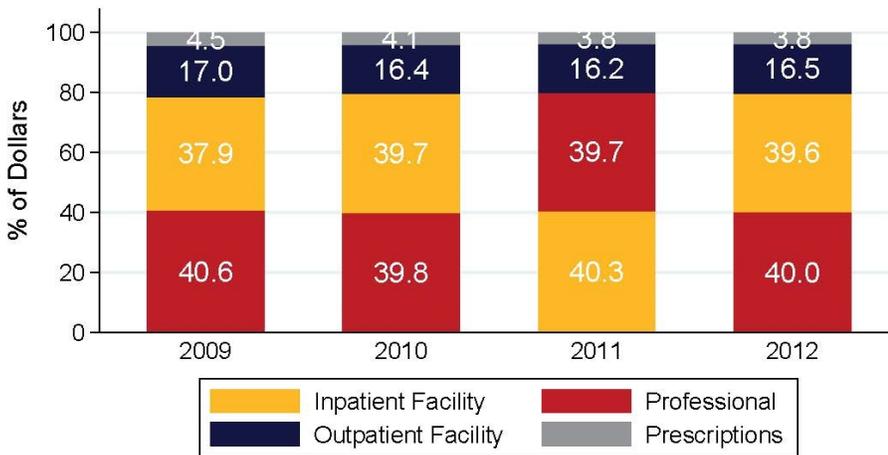
The American Association of Pediatrics recommends that infants and toddlers receive multiple routine care visits and vaccines between birth and age 3.^{9,10} Therefore, unsurprisingly, professional procedures comprised most of the dollars spent for infants and toddlers (\$1,781 in 2012; Table 3).

Figure 5
ESI Expenditures Per Capita on Children, Ages 0-3: 2009-2012



Source: HCCI, 2013.
Notes: All data weighted to reflect the national, ages 0-18 ESI population.
Data from 2011 and 2012 adjusted using actuarial completion.

Figure 6
Share of Expenditures Per Capita by Service Category, Ages 0-3: 2009-2012



Source: HCCI, 2013.
 Notes: All data weighted to reflect the national, ages 0-18 ESI population.
 Data from 2011 and 2012 adjusted using actuarial completion.



From 2009 to 2012, increases in expenditures per baby on professional

procedures were due to a combination of increases in intensity (3.7% annually) and price (5.3% annually). Procedure utilization was nearly flat (0.1% average annual growth), with the largest utilization increase (1.0%) occurring in 2011 (Table A4).

Nearly 55 percent of professional procedures used by infants and toddlers were for other professional procedures (Table A6), of which 70.7 percent were vaccines and injections (data not shown). The number of other procedures grew in all years, although the growth rate slowed over time.

The second most common professional procedure was visits to primary care providers. Infants

and toddlers used 3.2 primary care office visits per child in 2012 (Table A6). From 2009 through 2012, the rate of change for these visits was either zero or negative (Figure 7). Declines in primary care office visits may have

reflected changes in billing practices as well as increased use of preventive visits or visits to specialists. Primary care preventive visits (which included well baby/child visits, CPT Codes 99391 and 99392) grew an average of 1.6 percent during this same period (to 2.2 visits per baby in 2012).

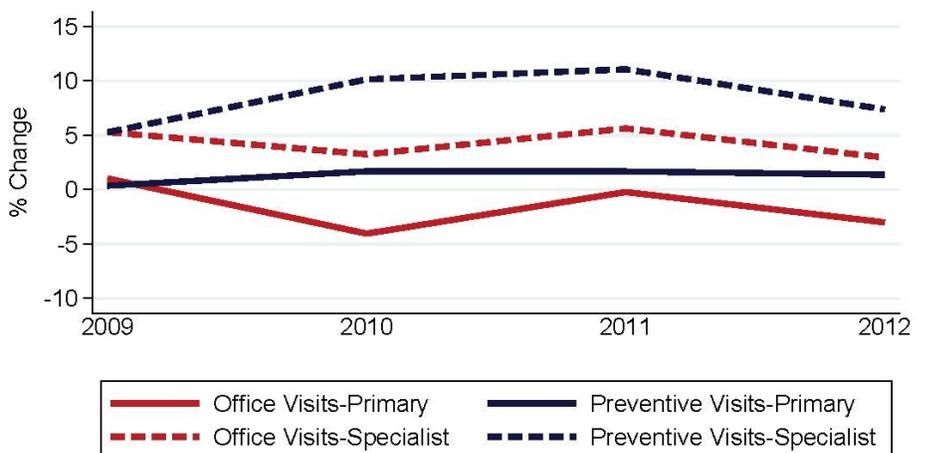
Over the study period, both office visits and preventive visits to specialists increased (Table A6 and Figure 7). However, the number of visits to specialists was relatively low: 638 office visits and 94 preventive visits per 1,000 babies in 2012.

Hospitalizations accounted for nearly 40 percent of spending



In 2012, inpatient admissions comprised the second largest amount of dollars

Figure 7
Annual Percentage Changes in Selected Professional Visits Utilization per 1,000 Children, Ages 0-3: 2009-2012



Source: HCCI, 2013.
 Notes: All data weighted to reflect the national, ages 0-18 ESI population.
 Data from 2011 and 2012 actuarially completed.

spent per baby (Figure 6). In all years, approximately 40 percent of expenditures for infants and toddlers were for hospital stays (\$1,762 in 2012; Table 3). Inpatient expenditures on this age group increased 7.6 percent annually between 2009 and 2012.

During the study period, price growth was the dominant influence on inpatient spending growth. Prices for the average inpatient admission rose an average of 5.9 percent per year (Table A4). However, price growth slowed over time, due in part to declining service intensity. Utilization of inpatient services grew by 1.6 percent per year, with 150 admits per 1,000 babies in 2012.

Labor and delivery (LD) admits accounted for about 59 percent of inpatient spending on infants and toddlers (\$1,033 per baby in 2012; Table A5), and nearly 79 percent of the admissions for this age group (Table A6). These admissions did not include the cost of birth but rather the costs for hospital stays incurred separately from the mother if the infant could not be discharged

with the mother. The number of babies admitted to the hospital shortly after they were born increased by 3.3 percent per year to 118 admissions per 1,000 babies in 2012 (Figure 7).

Summary

Between 2009 and 2012, spending on infants and toddlers grew by \$701, or an average 5.9 percent per year (Table 3). In 2012, about 12.3 percent of the spending on infants and toddlers was paid out of pocket (\$548 per baby), reflecting relatively lower cost sharing for inpatient and routine care.

Approximately 80 percent of the spending for infants and toddlers was for inpatient admissions and professional procedures (Table 3). Between 2009 and 2012, inpatient admissions rose by 7 admissions per 1,000 babies, and more than three-fourths of these stays were for newborn infants shortly after delivery (Table A6). The trends presented here suggest that families continued to access essential services, such as vaccines and preventive visits, for

their infants and toddlers throughout the study period.

HCCI found that spending on infants and toddlers increased in every year of the study, and that the spending and use trends for this age group were little effected by the economic recession or recovery. While rising prices generally drove increasing spending, utilization and intensity of services also generally increased in 2010 and 2011. It is not yet clear what the effect of rising prices, utilization, and intensity will be on the health of these children.

PRESCRIPTION USE BY INFANTS AND TODDLERS

The prescription expenditures and filled days per child were lower for infants and toddlers than for any other children's age group studied by HCCI. In 2012, \$169 per child was spent on prescriptions, and there were 50.5 filled days of prescriptions per baby (Table 3 and Table A4). For this age group, there were 54 filled days per boy compared to 47 filled days per girl (Table A14). There was little difference in the categories of drugs prescribed to boys and girls. The most frequently filled class of prescriptions for infants and toddlers was generic anti-infective agents, which accounted for about 26 percent of filled days (Table A6).

Table 3: Expenditures Per Capita for Infants and Toddlers (2009–2012)

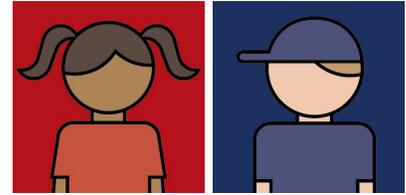
	2009	2010	2011	2012	Percent Change 2009/2010	Percent Change 2010/2011	Percent Change 2011/2012
Per Capita, Babies	\$3,745	\$4,011	\$4,333	\$4,446	7.1%	8.0%	2.6%
Per Capita by Gender							
Boys	\$4,031	\$4,341	\$4,711	\$4,832	7.7%	8.5%	2.6%
Girls	\$3,446	\$3,667	\$3,938	\$4,042	6.4%	7.4%	2.7%
Per Capita by Service Category							
Inpatient	\$1,420	\$1,592	\$1,748	\$1,762	12.1%	9.8%	0.8%
Inpatient Subset ¹	\$1,413	\$1,585	\$1,744	\$1,758	12.1%	10.0%	0.8%
Outpatient	\$636	\$657	\$701	\$735	3.3%	6.6%	4.9%
Visits	\$428	\$445	\$473	\$498	3.9%	6.4%	5.4%
Other	\$208	\$213	\$227	\$236	2.3%	7.0%	3.8%
Professional Procedures	\$1,522	\$1,598	\$1,718	\$1,781	5.0%	7.5%	3.6%
Prescriptions ²	\$167	\$164	\$166	\$169	-2.0%	1.5%	1.7%
Brand	\$78	\$78	\$80	\$83	0.7%	2.5%	3.5%
Generics	\$89	\$86	\$86	\$86	-4.1%	0.6%	-0.2%
Out-of-Pocket Per Capita							
National, Babies	\$466	\$498	\$522	\$548	6.9%	4.8%	5.1%
Share of Expenditures	12.4%	12.4%	12.0%	12.3%	N/A	N/A	N/A
Payer Per Capita							
National, Babies	\$3,279	\$3,513	\$3,811	\$3,898	7.1%	8.5%	2.3%
Share of Expenditures	87.6%	87.6%	88.0%	87.7%	N/A	N/A	N/A

Source: HCCI, 2013.

Notes: All data weighted to represent the total population of insureds ages 0-18 and covered by ESI. Actuarial completion was performed on data from 2011 and 2012. All per capita dollars calculated from allowed costs. All figures rounded.

1. Skilled nursing facility (SNF), hospice, and ungroupable claims were excluded from analysis of inpatient expenditure trends due to the lack of information about the intensity and unit prices of those services at the time of analysis.
2. Prescriptions uncategoryable as brand or generic were also analyzed, but they are not included in the tables due to very low dollar amounts.

Younger Children (ages 4-8) and Pre-teens (ages 9-13)



In this section, HCCI focused on changes in health expenditures for younger children (ages 4-8) and pre-teens (ages 9-13). The health care dollars spent per child for these two age groups were the lowest of any age group analyzed. Younger children and pre-teens had similar cost and utilization trends for the medical service categories. Prescription utilization trends, however, differed. Prescription use, particularly by younger girls, was similar to that for infants and toddlers in use of anti-infective agents. Prescription use by younger boys and pre-teens was dominated by central nervous system agent use, which substantially increased during the study period.

Per capita expenditures remained low for younger children and pre-teens

Between 2009 and 2012, spending for younger children grew at an average annual rate of 4.5 percent, the slowest per capita spending growth rate for any age group studied (Table 5 and Figure 8). In contrast, over this period, spending on pre-teens grew by 6.1 percent per year, the fastest growth rate of any age group studied (Table 6 and Figure 9). In 2012, \$1,653 was spent per younger child, and \$1,776 was spent per pre-teen.

For both age groups in all years, spending on professional procedures was more than 40 percent of health care spending (Figure 10 and Figure 11). Expenditures on outpatient facility services made up an additional quarter of total spending. Relatively few dollars were spent on inpatient admissions for either group, or on prescriptions for younger children. However, 20 percent of the spending for pre-teens was for prescriptions; this was the largest share of dollars spent on prescriptions for any children's age group.

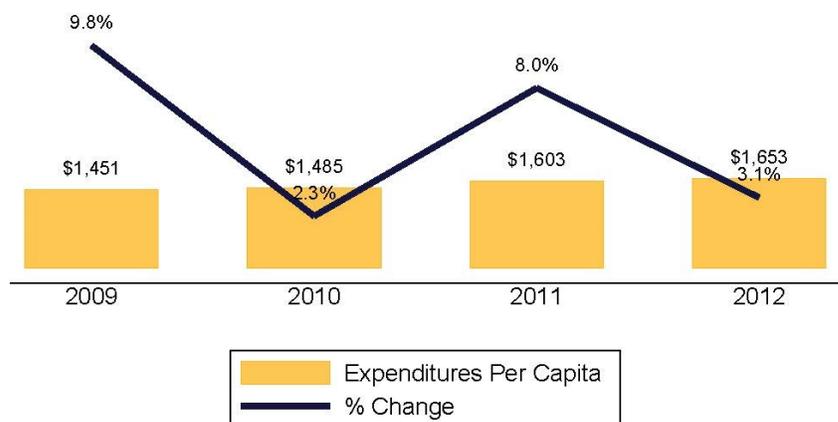
In 2012, out-of-pocket expenditures were \$345 per younger child, and \$354 per pre-

teen (Tables 5 and 6). Although per capita spending out of pocket was lower for these age groups than for infants and toddlers, the share paid out of pocket for these age groups (20.9% for younger children and 19.9% for pre-teens in 2012) was higher than that for infants and toddlers (12.3%). During the study period, both younger children and pre-teens had greater average annual rates of growth for out-of-pocket spending (6.1% per year and 7.3% per year, respectively) than that for infants and toddlers.

Use of medical services slowed in 2010, recovered in 2011

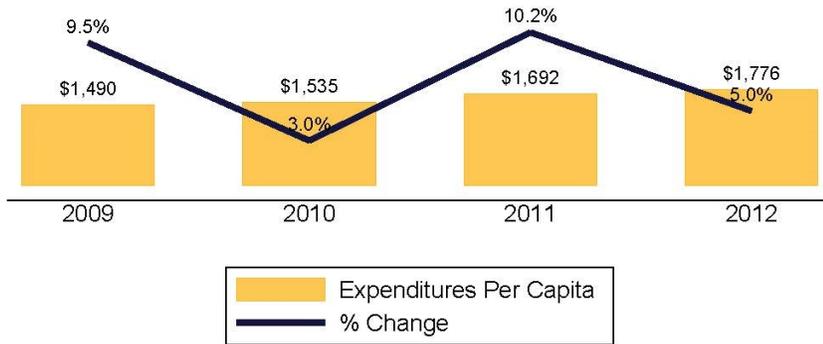
During the study period, spending

Figure 8
ESI Expenditures Per Capita on Children, Ages 4-8: 2009-2012



Source: HCCI, 2013.
Notes: All data weighted to reflect the national, ages 0-18 ESI population.
Data from 2011 and 2012 adjusted using actuarial completion.

Figure 9
ESI Expenditures Per Capita on Children,
Ages 9-13: 2009-2012



Source: HCCI, 2013.
 Notes: All data weighted to reflect the national, ages 0-18 ESI population.
 Data from 2011 and 2012 adjusted using actuarial completion.

on professional procedures and outpatient services made up nearly 65 percent of spending on younger children and pre-teens (Figure 10 and Figure 11). In most years, growth in expenditures for both of these service categories were driven largely by changes in prices and intensity (Tables A7 and A9).

However, in 2010, expenditure growth slowed, due largely to declines in use of professional procedures (-4.7% for younger children and -4.3% for pre-teens) and outpatient visits (-8.4% and -7.5%, respectively). In 2011, both utilization and expenditures of these services rebounded.

 In 2010, the largest declines in professional procedure use were for pathology and laboratory services, office visits to primary

care providers (PCPs), and radiology services (Tables A8 and A10). Modest growth occurred in office visits to specialists and preventive visits to PCPs (Figure 12), but this did not offset the declines in the use of other professional procedures. For both

age groups, use of all these services, except radiology, increased in 2011.

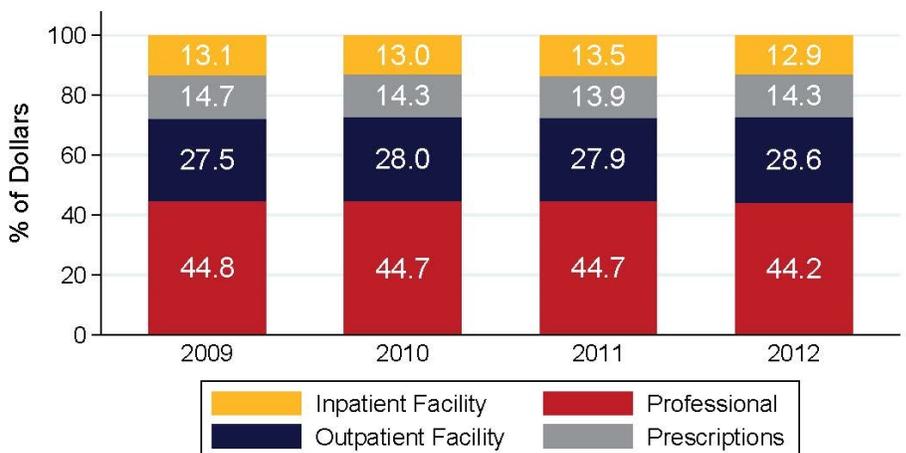


Similarly, in 2010, the largest declines in outpatient visits were for emergency room (ER) visits (Tables A8 and A10). In 2010, the number of ER visits declined 11.5 percent for younger children and 9.4 percent for pre-teens. In 2011, the rates of ER visits recovered, rising 5.2 percent for younger children and 2.0 percent for pre-teens. In contrast, the number of outpatient surgery and observation visits for younger children and pre-teens increased in 2010, and due to those increases, the use of observation visits continued to grow in 2011 and 2012.

Use of central nervous system drugs rising

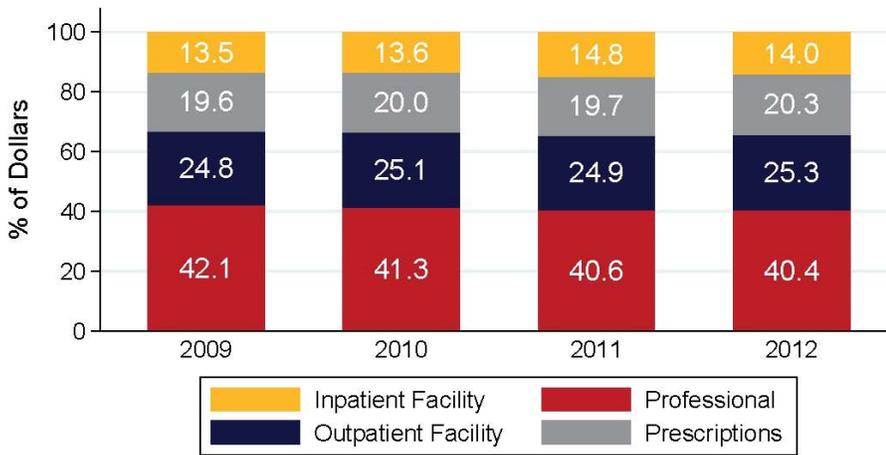
Overall prescription spending

Figure 10
Share of Expenditures Per Capita
by Service Category, Ages 4-8: 2009-2012



Source: HCCI, 2013.
 Notes: All data weighted to reflect the national, ages 0-18 ESI population.
 Data from 2011 and 2012 adjusted using actuarial completion.

Figure 11
Share of Expenditures Per Capita
by Service Category, Ages 9-13: 2009-2012



Source: HCCI, 2013.
 Notes: All data weighted to reflect the national, ages 0-18 ESI population.
 Data from 2011 and 2012 adjusted using actuarial completion.

trends for younger children and pre-teens were similar. Expenditures increased for both brand and generic prescriptions for both age groups for all years, with the exception of generic prescriptions in 2010 (Tables 5 and 6). Expenditures on prescriptions were higher for pre-teens than for younger children (\$360 per pre-teen and \$236 per younger child, in 2012). In that year and for both age groups, overall prescription prices increased (Tables A7 and A9), and these increases drove spending growth.



In 2012, trends in use of prescriptions for younger children and pre-teens differed,

with younger children's use declining and pre-teen use increasing. Examining prescription filled days by gender

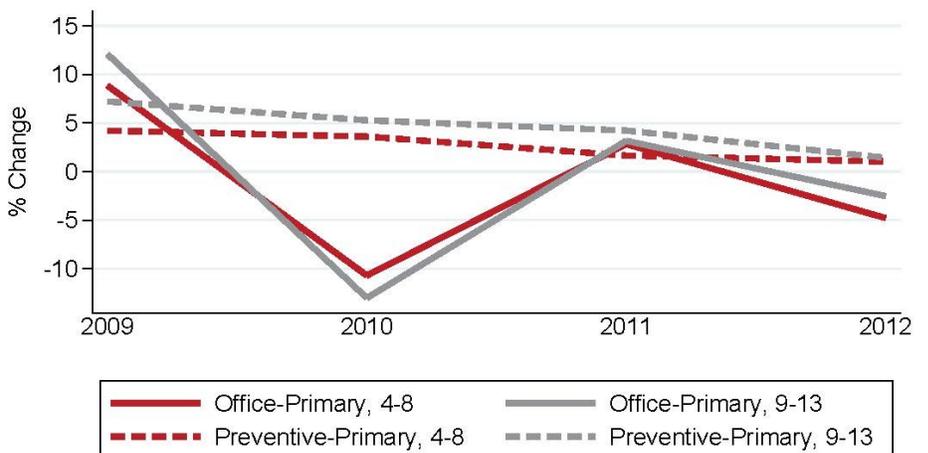
revealed more differences (Tables A15 and A17). In 2012, for both genders and both age groups, boys had more filled prescription days (63.73 filled days per younger boy and 82.96 per pre-teen boy) than did girls (46.47 filled days per

younger girl and 56.46 per pre-teen girl).

The prescription use by younger girls more closely resembled prescription use by infants and toddlers. The most commonly used therapeutic drug class for these girls was anti-infective agents (9.05 filled days per younger girl in 2012; Table A15).

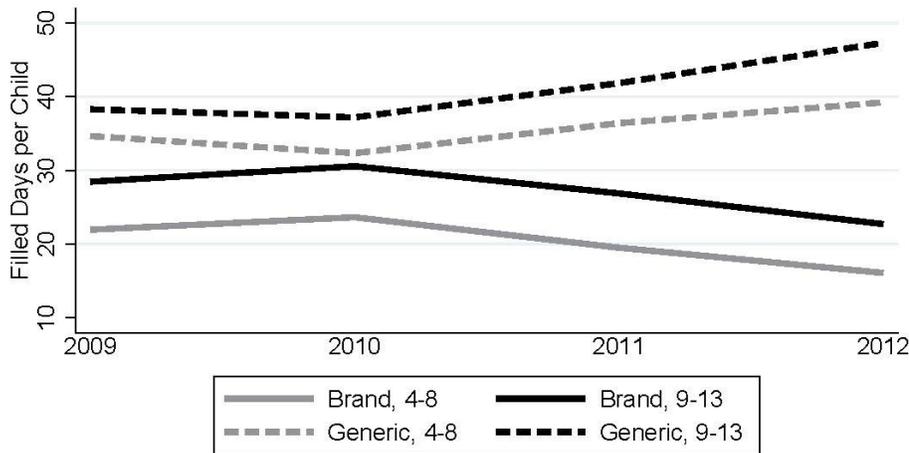
For younger boys and pre-teens, the most commonly used therapeutic drug class was central nervous system (CNS) agents. For both younger children and pre-teens, use of CNS drugs rose each year of the study period (Tables A8 and A10, and Figure 14). In 2011 and 2012, both age groups saw double digit growth in generic CNS use. In 2012, there were 6.68 CNS filled days (brand and generic) per younger girl, 15.90 filled days per younger boy, 18.49 filled days per pre-teen girl, and

Figure 12
Annual Percentage Changes in Professional Visit
Utilization per 1,000 Children, Ages 4-8 and 9-13: 2009-2012



Source: HCCI, 2013.
 Notes: All data weighted to reflect the national, ages 0-18 ESI population.
 Data from 2011 and 2012 actuarially completed.

Figure 13
Annual Filled Days of Generic and Brand Prescriptions per Child, Ages 4-8 and 9-13: 2009-2012



Source: HCCI, 2013.
 Notes: All data weighted to reflect the national, ages 0-18 ESI population. Data from 2011 and 2012 actuarially completed.

39.70 filled days per pre-teen boy.

The most commonly used CNS agents for younger boys and pre-teens were drugs from the amphetamines and miscellaneous anorexigenics, respiratory and cerebral stimulants therapeutic subclasses (Tables A16 and A18). These two subclasses include drugs used to treat such conditions as attention deficit hyper-activity disorder (ADHD). In 2012, there were 3.26 filled days per younger girl of these two drug subclasses, 9.46 filled days per younger boy, 8.76 filled days per pre-teen girl, and 22.94 filled days per pre-teen boy.

Summary

At \$1,653 per younger child and \$1,776 per pre-teen in 2012, the spending on these children represented the lowest levels of any age group analyzed by HCCI.⁵

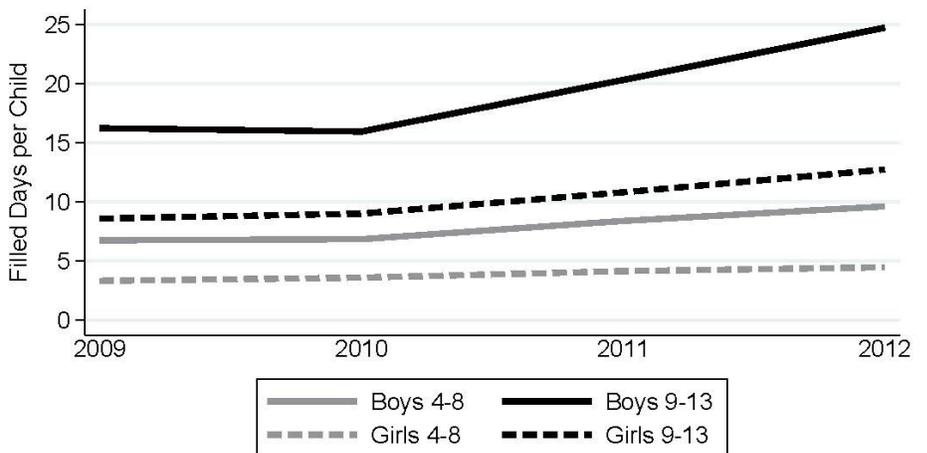
For these children, most of the spending was for professional procedures and outpatient services.

Between 2009 and 2010, the use of some outpatient and professional procedure services

declined and slowed medical spending growth. One cause of the decline in service use may have been the recession, as HCCI observed a decline in the utilization of these services in all children's age groups and in the national ESI population younger than age 65.⁵ In the following year (2011), both utilization and expenditures rebounded.

Prescriptions appear to be an increasingly important health care service category for younger children and pre-teens. Younger girls continued to take more anti-infective agents than other classes of drugs, but younger boys and pre-teens used more filled days of CNS agents than any other category. HCCI will continue to monitor whether use of CNS agents continues to rise in the younger age groups.

Figure 14
Annual Filled Days of Generic CNS Prescriptions per Child by Gender, Ages 4-8 and 9-13: 2009-2012



Source: HCCI, 2013.
 Notes: All data weighted to reflect the national, ages 0-18 ESI population. Data from 2011 and 2012 actuarially completed.

CHANGES IN HEALTH POLICY MAY HAVE LED TO SPIKE IN MENINGITIS VACCINES IN 2011

Meningitis is an infection of the protective membranes covering the brain and spinal cord that can sometimes lead to death. Meningococcal vaccines help prevent some forms of bacterial and viral meningitis. Since 2005, the vaccines have been recommended by the Centers for Disease Control and Prevention (CDC) for children between the ages of 11 and 12.¹¹ In 2011, the CDC expanded the meningococcal vaccine recommendations to include a booster shot given at age 16.¹² Also in that year, the Affordable Care Act (ACA) added the meningococcal vaccine to the list of mandated preventive services to be covered with no consumer cost sharing by all non-grandfathered, private health insurance plans.¹³

HCCI data, which begins in 2007, indicated a steady increase in pre-teen vaccinations between 2007 and 2010 (6.5% per year from 2007-2010, data not shown). Between 2010 and 2011, vaccinations rose by 9.8 percent to 141 vaccinations per 1,000 pre-teens, before falling by 3.0 percent to 137 per 1,000 pre-teens in 2012.

Between 2007 and 2010, vaccine rates for teenagers declined (data not shown) and then spiked in 2011, corresponding with both the change in benefits by the ACA and the CDC recommendation for a booster shot. The number of meningococcal vaccinations for teens in 2011 increased 47.9 percent to 81 vaccines per 1,000 teens. In 2012, vaccine rates rose an additional 16.4 percent (Table 4).

Table 4: Utilization of meningococcal vaccines for children ages 9-18, 2009–2012

	2010	2011	2012	Percent Change 2009/2010	Percent Change 2010/2011	Percent Change 2011/2012
Utilization per 1,000 Children¹						
9-13	128	141	137	4.0%	9.8%	-3.0%
14-18	55	81	94	-24.6%	47.9%	16.4%

Source: HCCI, 2013.

Notes: All data weighted to represent the total population of insureds ages 0-18 and covered by ESI. Actuarial completion was performed on data from 2011 and 2012. All figures rounded. Includes both meningococcal conjugate vaccines (90734) and meningococcal polysaccharide vaccines (90733).

Table 5: Expenditures Per Capita for Younger Children (2009–2012)

	2009	2010	2011	2012	Percent Change 2009/2010	Percent Change 2010/2011	Percent Change 2011/2012
Per Capita, Younger Children	\$1,451	\$1,485	\$1,603	\$1,653	2.3%	8.0%	3.1%
Per Capita by Gender							
Boys	\$1,598	\$1,629	\$1,760	\$1,839	2.0%	8.0%	4.5%
Girls	\$1,298	\$1,334	\$1,438	\$1,458	2.7%	7.8%	1.4%
Per Capita by Service Category							
Inpatient	\$190	\$193	\$216	\$213	1.7%	11.8%	-1.1%
Inpatient Subset ¹	\$188	\$191	\$215	\$212	1.8%	12.4%	-1.1%
Outpatient	399	\$416	\$447	\$473	4.1%	7.6%	5.8%
Visits	\$263	\$275	\$298	\$315	4.4%	8.3%	6.0%
Other	\$136	\$141	\$150	\$158	3.6%	6.4%	5.4%
Professional Procedures	\$650	\$663	\$717	\$731	2.1%	8.1%	1.9%
Prescriptions ²	\$213	\$213	\$223	\$236	0.1%	4.8%	5.6%
Brand	\$124	\$132	\$136	\$140	6.4%	3.1%	2.9%
Generics	\$88	\$81	\$87	\$95	-8.5%	7.6%	9.8%
Out-of-Pocket Per Capita							
National, Younger Children	\$289	\$305	\$330	\$345	5.5%	8.2%	4.5%
Share of Expenditures	19.9%	20.5%	20.6%	20.9%	N/A	N/A	N/A
Payer Per Capita							
National, Younger Children	\$1,162	\$1,180	\$1,273	\$1,308	1.5%	7.9%	2.8%
Share of Expenditures	80.1%	79.5%	79.4%	79.1%	N/A	N/A	N/A

Source: HCCI, 2013.

Notes: All data weighted to represent the total population of insureds ages 0-18 and covered by ESI. Actuarial completion was performed on data from 2011 and 2012. All per capita dollars calculated from allowed costs. All figures rounded.

1. Skilled nursing facility (SNF), hospice, and ungroupable claims were excluded from analysis of inpatient expenditure trends due to the lack of information about the intensity and unit prices of those services at the time of analysis.
2. Prescriptions uncategorizable as brand or generic were also analyzed, but they are not included in the tables due to very low dollar amounts.

Table 6: Expenditures Per Capita for Pre-Teens (2009–2012)

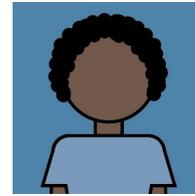
	2009	2010	2011	2012	Percent Change 2009/2010	Percent Change 2010/2011	Percent Change 2011/2012
Per Capita, Pre-Teens	\$1,490	\$1,535	\$1,692	\$1,776	3.0%	10.2%	5.0%
Per Capita by Gender							
Boys	\$1,607	\$1,652	\$1,817	\$1,909	2.8%	9.9%	5.1%
Girls	\$1,368	\$1,411	\$1,561	\$1,637	3.2%	10.6%	4.8%
Per Capita by Service Category							
Inpatient	\$201	\$208	\$251	\$249	3.5%	20.3%	-0.5%
Inpatient Subset ¹	\$200	\$206	\$249	\$247	3.2%	20.8%	-0.7%
Outpatient	\$370	\$385	\$421	\$450	4.1%	9.3%	6.9%
Visits	\$226	\$235	\$257	\$275	3.9%	9.5%	7.0%
Other	\$144	\$150	\$164	\$174	4.4%	8.9%	6.7%
Professional Procedures	\$627	\$634	\$686	\$717	1.0%	8.3%	4.5%
Prescriptions ²	\$292	\$308	\$334	\$360	5.5%	8.5%	7.7%
Brand	\$194	\$219	\$229	\$235	12.7%	4.6%	2.6%
Generics	\$97	\$89	\$105	\$125	-8.5%	18.2%	18.8%
Out-of-Pocket Per Capita							
National, Pre-Teens	\$287	\$307	\$332	\$354	7.2%	8.0%	6.6%
Share of Expenditures	19.3%	20.0%	19.6%	19.9%	N/A	N/A	N/A
Payer Per Capita							
National, Pre-Teens	\$1,204	\$1,228	\$1,360	\$1,422	2.0%	10.8%	4.6%
Share of Expenditures	80.7%	80.0%	80.4%	80.1%	N/A	N/A	N/A

Source: HCCL, 2013.

Notes: All data weighted to represent the total population of insureds ages 0-18 and covered by ESI. Actuarial completion was performed on data from 2011 and 2012. All per capita dollars calculated from allowed costs. All figures rounded.

1. Skilled nursing facility (SNF), hospice, and ungroupable claims were excluded from analysis of inpatient expenditure trends due to the lack of information about the intensity and unit prices of those services at the time of analysis.
2. Prescriptions uncategorizable as brand or generic were also analyzed, but they are not included in the tables due to very low dollar amounts.

Teenagers (ages 14-18)



In this section, HCCI focused on changes in the health care expenditures for teens (ages 14-18), with particular emphasis on two key trends. One trend was the differences in health care use by gender. Another trend was the increased use of mental health services, such as, mental health admissions and prescription central nervous system (CNS) agents.

Per capita expenditures on teens

Between 2009 and 2012, spending per teen (\$2,617 in 2012) grew by an average 5.8 percent per year (Table 7 and Figure 15). Much of the spending for teens was on professional procedures (35.4%

or \$927 per capita in 2012; Figure 16); however, the share of total spending on teens for these services declined slightly over time. HCCI found that, over time, as a share of total expenditures outpatient services increased (1.3%), while the share of expenditures changed little for inpatient admissions (-0.3%) and prescriptions (0.4%).

Out-of-pocket expenditures were higher for teens, \$502 in 2012, than for younger children and pre-teens, although the share of expenditures paid out of pocket on teens (19.2%) was slightly lower than for the other two age groups. The growth in out-of-pocket spending slowed between 2009 and 2012, but still rose by 7.5

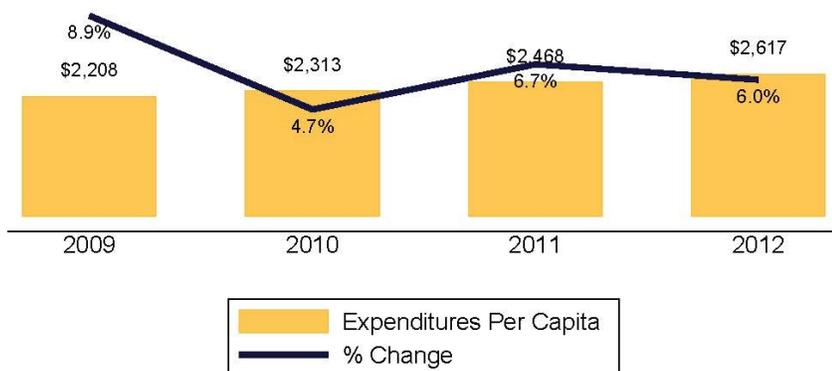
percent per year. Payer expenditures for teens grew every year, with the slowest growth in 2010 (3.8%). Growth in out-of-pocket spending for teens outpaced growth for payer expenditures in all years, except in 2011.

Differences in use of services by boys and girls

Health care expenditures on teens, unlike those for other children's age groups, were higher for teen girls (\$2,668 per girl in 2012) than for teen boys (\$2,568 per boy in 2012; Table 7). Spending was higher on girls for each of the medical service categories, while spending was higher on boys for brand and generic prescriptions (Table A25). Two of the services also had clear gender differences in their utilization trends for the number and type of inpatient admissions, and filled prescription days.

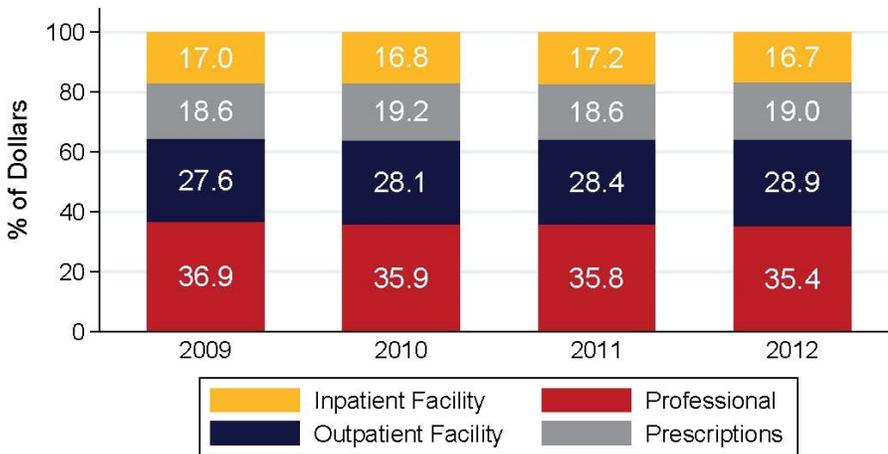
Both teen girls and teen boys used inpatient services, but the specific patterns of use showed gender differences, including higher spending on girls (Table A25). In 2012, 16.7 percent of expenditures were for admissions, or \$437 per teen (Table 7). The average price for an inpatient admit rose over time, while the number of teen inpatient

Figure 15
ESI Expenditures Per Capita on Children,
Ages 14-18: 2009-2012



Source: HCCI, 2013.
Notes: All data weighted to reflect the national, ages 0-18 ESI population.
Data from 2011 and 2012 adjusted using actuarial completion.

Figure 16
Share of Expenditures Per Capita
by Service Category, 14-18: 2009-2012



Source: HCCI, 2013.
 Notes: All data weighted to reflect the national, ages 0-18 ESI population.
 Data from 2011 and 2012 adjusted using actuarial completion.

increased 3.6 percent for girls and 2.9 percent for boys.

In 2012, the difference in the number of filled days per teen boy versus teen girl (39 days), was driven largely by the number of hormones and synthetic substitutes (“hormones,” including birth control in pill form) taken by teen girls. Use of hormones averaged 44.87 filled days per teen girl, compared with 4.33 filled days per teen boy.

Use of mental health services rose for teens

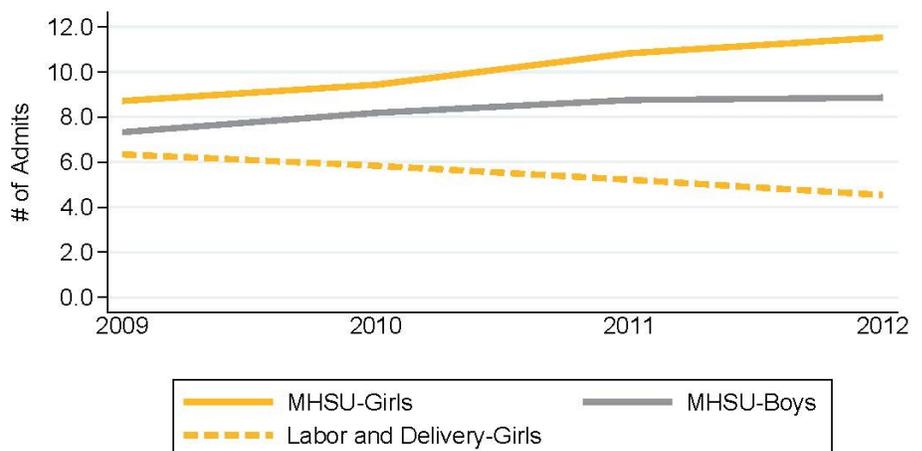
During the study period, teens’ use of mental health services rose, and was greater than all other children’s age groups. For the purposes of this report, HCCI classified mental health services as MHSU admissions and CNS agents. The therapeutic drug class CNS agents are drugs that work on

admissions remained relatively stable throughout the study period (Table A11). In 2012, there were 28 admissions per 1,000 teens (Table A11). Admissions for teen girls outnumbered those for boys (32 per 1,000 teen girls versus 24 per 1,000 teen boys in 2012). Of these 32 admits for girls, 5 were labor and delivery (LD) admissions (Figure 17). Over the study period, the number of LD admissions for teen girls covered by ESI fell (from 6 admits per 1,000 teen girls in 2009 to 5 in 2012), consistent with research on the national teen girl population.¹⁴

Unlike expenditures on hospital admissions, boys had higher spending on prescriptions (Table A25); however, girls used more prescriptions (Figure 18). In 2012, teen boys used, on average, 89 filled days of prescriptions (Table

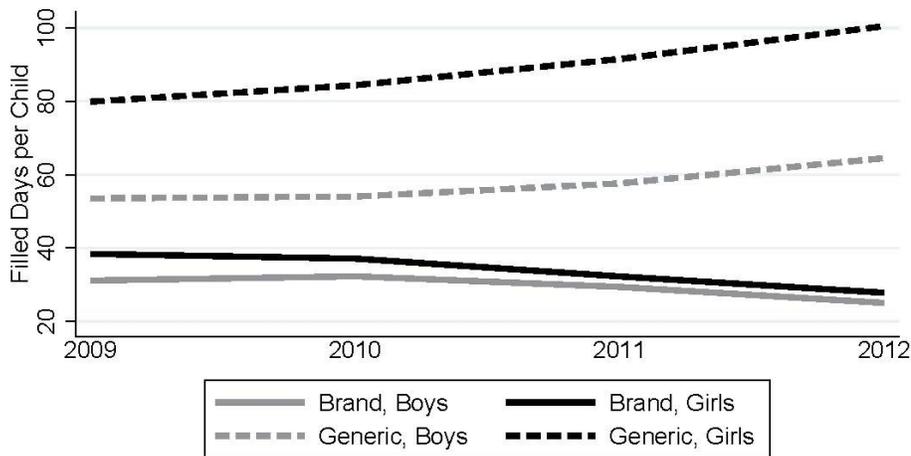
A19), compared with an average 128 filled days for teen girls. In addition, girls’ use of prescriptions grew faster. Between 2011 and 2012, the number of filled days

Figure 17
Number of Admits per 1,000 Children by Gender
for Selected Admissions, Ages 14-18: 2008-2012



Source: HCCI, 2013.
 Notes: All data weighted to reflect the national, ages 0-18 ESI population.
 Data from 2011 and 2012 actuarially completed.

Figure 18
Annual Filled Days of Generic and Brand Prescriptions per Child by Gender, Ages 14-18: 2009-2012



Source: HCCI, 2013.
 Notes: All data weighted to reflect the national, ages 0-18 ESI population.
 Data from 2011 and 2012 actuarially completed.

the brain and spinal cord,¹⁶ and include many varied subclasses used to treat a wide range of conditions including chronic pain, Alzheimer's disease, and epilepsy.¹⁷ Many of these subclasses, such as amphetamines and anti-depressants, can be used to treat mental health conditions.

 In 2012, there were 10 MHSU admits per 1,000 teens (Table A13). Comparatively, in 2012, MHSU and medical admissions were tied (10 admits per 1,000 teens) as the most common types of admissions for teens. The per teen expenditures for MHSU admits (\$84) were lower than per teen expenditures for medical admits (\$149; Table A12). However, the \$84 per teen for MHSU admits was higher than the per capita expenditures on

MHSU admits for the national ESI population younger than age 65 (\$32).¹⁵

There were more MHSU admissions for girls than for boys in all years of the study period (Figure 17). Between 2010 and 2012, MHSU admits rose from 9 admits per 1,000 teen girls to 11 per 1,000, compared with a rise from 7 admits per 1,000 teen boys to 9 admits per 1,000.

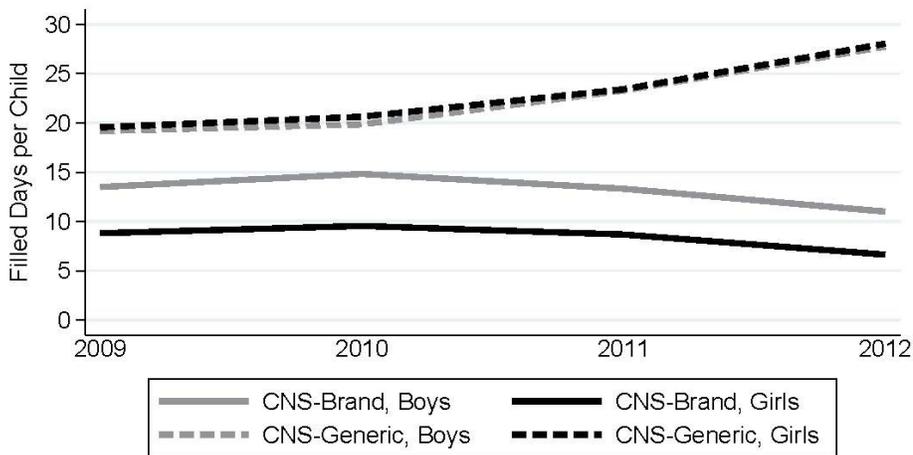
 In every year of the study period, the largest category of prescriptions taken by teens was generic CNS agents (Table A13). The number of filled days of generic CNS agents per 1,000 teens also increased every year, rising 19.4 percent between 2011 and 2012. This increase accounted for nearly half of the net increase in the number of

prescription filled days for teens in 2012.

Teen boys took more CNS agents (38.75 filled days per teen boy) than girls (34.69 filled days per teen girl; Table A19). On average, teen boys used 4 more filled days of brand CNS agents than did teen girls (Figure 19), while girls on average took slightly more generic CNS agents than did teen boys. Overall, of the average 64 filled days of generic prescriptions per teen boy in 2012, 43.0 percent were for generic CNS agents. For teen girls, of the average 100 filled days per teen girl of generic prescriptions in 2012, 27.9 percent (28 filled days) were generic CNS agents.

Teen boys and girls differed in their use of CNS subclasses of drugs (Table A20). For boys, most of the filled days of CNS agents were for amphetamines and miscellaneous anorexigenics, respiratory, and cerebral stimulants (16.62 filled days per teen boy in 2012). Drugs from these two CNS subclasses are commonly used to treat ADHD and similar conditions. The two most commonly prescribed ADHD drugs include mixed amphetamine salts (an amphetamine; for example, Adderall) and methylphenidate (a miscellaneous anorexigenics, respiratory, and cerebral stimulant; for example, Ritalin).¹⁸ Girls' use of drugs from these subclasses was about half that of boys (8.84 filled days per teen girl in 2012).

Figure 19
Annual Filled Days of Generic and Brand Central Nervous System Prescriptions per Child by Gender, Ages 14-18: 2009-2012



Source: HCCT, 2013.
 Notes: All data weighted to reflect the national, ages 0-18 ESI population.
 Data from 2011 and 2012 actuarially completed.

In 2012, teen girls used an average 13.27 filled days of anti-depressants, compared to 8.80 filled days for boys (Table A20). Use of additional subclasses of CNS drugs also occurred, but their use was far below that for the three previously mentioned CNS subclasses.

Summary

Between 2009 and 2012, spending on teens grew by \$409, or 5.8 percent per year (Table 7), and nearly 20 percent of total spending was on prescription drugs. In 2012, 19.2 percent of the spending on teens was paid out of pocket. The most important trends in the use of health care services by teens over the study period were the differences in services use by gender, and the increased use of mental health services.

Though little change occurred in the overall number of admissions per 1,000 teens during the study period, more of these admits were for MHSU in 2012 than in previous years (Table A13). Girls had more MHSU admits than boys. The increase in the number of MHSU admits for girls was partially offset by the decline in the number of LD admits.

Throughout the study period, teen girls used more filled days of prescriptions than did teen boys (Table A19). This difference was due largely to the number of hormones taken by teen girls. Boys used more filled days of CNS drugs (combined brand and generic) than did teen girls, but the number of filled days of CNS drugs for all teens increased in every year studied. The most commonly used CNS drugs were those from subclasses commonly

used to treat mental health issues, specifically those containing drugs commonly associated with ADHD for boys (amphetamines and miscellaneous anorexigenics, respiratory, and cerebral stimulants) and anti-depressants for girls (Table A20).

Together, these findings suggest that teens were increasingly using prescriptions, particularly those associated with mental health issues and hormones. As well, teen prescription spending was higher than spending on any facility category (admissions, visits, or other use). More research needs to be done to determine how rising prescription use affects the health outcomes of teens and their health care costs as teens transition from children to adults.

Table 7: Expenditures Per Capita on Teenagers (2009–2012)

	2009	2010	2011	2012	Percent Change 2009/2010	Percent Change 2010/2011	Percent Change 2011/2012
Per Capita, Teens	\$2,208	\$2,313	\$2,468	\$2,617	4.7%	6.7%	6.0%
Per Capita by Gender							
Boys	\$2,145	\$2,274	\$2,414	\$2,568	6.0%	6.1%	6.4%
Girls	\$2,275	\$2,353	\$2,524	\$2,668	3.4%	7.3%	5.7%
Per Capita by Service Category							
Inpatient	\$375	\$389	\$425	\$437	3.7%	9.3%	2.8%
Inpatient Subset ¹	\$370	\$378	\$421	\$433	2.1%	11.4%	2.8%
Outpatient	\$609	\$650	\$700	\$755	6.7%	7.7%	7.9%
Visits	\$389	\$415	\$444	\$477	6.8%	7.0%	7.5%
Other	\$221	\$235	\$256	\$278	6.5%	9.0%	8.7%
Professional Procedures	\$814	\$831	\$884	\$927	2.0%	6.5%	4.8%
Prescriptions ²	\$410	\$444	\$459	\$498	8.1%	3.4%	8.6%
Brand	\$258	\$289	\$298	\$310	12.0%	3.3%	4.1%
Generics	\$152	\$155	\$161	\$188	1.6%	3.7%	16.9%
Out-of-Pocket Per Capita							
National, Teens	\$405	\$441	\$470	\$502	9.0%	6.5%	6.9%
Share of Expenditures	18.3%	19.1%	19.0%	19.2%	N/A	N/A	N/A
Payer Per Capita							
National, Teens	\$1,804	\$1,871	\$1,998	\$2,114	3.8%	6.8%	5.8%
Share of Expenditures	81.7%	80.1%	81.0%	80.8%	N/A	N/A	N/A

Source: HCCI, 2013.

Notes: All data weighted to represent the total population of insureds ages 0-18 and covered by ESI. Actuarial completion was performed on data from 2011 and 2012. All per capita dollars calculated from allowed costs. All figures rounded.

1. Skilled nursing facility (SNF), hospice, and ungroupable claims were excluded from analysis of inpatient expenditure trends due to the lack of information about the intensity and unit prices of those services at the time of analysis.
2. Prescriptions uncategoryzable as brand or generic were also analyzed, but they are not included in the tables due to very low dollar amounts.

EMERGING PRESCRIPTION TREND: NET INCREASE IN PRESCRIPTION DRUG USE BY TEENS

Teens' use of prescriptions was higher than that of other children. Between 2009 and 2012, total prescription utilization increased in each year, growing an average of 2.4 percent per year (Table A11). Use of brand prescriptions fell annually by 8.5 percent per year, while the use of generic prescriptions rose annually by 7.4 percent per year. Overall, declining use of brand prescriptions was offset by increases in the use of generic prescriptions. This led to a net increase in the number of filled days of prescriptions per teen in each year studied.

Data & Methods

HCCI has access to several billion de-identified commercial health insurance claims for the years 2007 through 2012.⁶ HCCI's claims data are compliant with the Health Insurance Portability and Accountability Act (HIPAA) and includes the prices paid to providers. HCCI data includes claims for the people with group insurance (fully insured and administrative services only), individual insurance, and Medicare Advantage. Three major health insurers contributed the data to HCCI for the purposes of producing this national, multi-payer, commercial health care claims database.

For the *Children's Health Spending Report: 2009-2012*, HCCI performed research on over 5.4 billion claim lines (2007-2012) for about 40 million insureds per year of which 10.5 million insureds were children.⁶⁻⁸ The analytic subset of the data used in this report consisted of all non-Medicare claims on behalf of children ages 0 through 18 covered by ESI.

The analytic subset was weighted using U.S. Census Bureau data to make the estimates representative of the national ESI population across demographic and geographic characteristics.⁶ Claims for 2011 and 2012 were adjusted

using actuarial completion to account for claims incurred but not adjudicated. HCCI used these weighted and adjusted claims to estimate per capita health expenditures, prices, utilization, unit prices, and service intensity for 2007 through 2012. HCCI did not correct dollars for inflation; thus, all reported expenditures and prices were nominal.

HCCI analyzed four major categories of services, several subservice categories, and detailed service categories.⁶ Inpatient facility claims were from hospitals, skilled nursing facilities (SNFs), and hospices where there was evidence that the insured stayed overnight. Outpatient facility claims were claims that did not have an overnight stay, but include observation and emergency room claims. Both outpatient and inpatient claims consisted of only the facility charges associated with such claims. Professional procedures were from claims billed by physicians and non-physicians according to procedure codes commonly used in the industry. Prescription data came from retail and mail order pharmacies.

This report studies the health care trends for children ages 0 through 18. Children are further subdivided into four age

categories: infants and toddlers (ages 0-3), younger children (ages 4-8), pre-teens (ages 9-13), and teenagers (ages 14-18). Children are grouped into age categories based on the age that they were on the first day of the given year; a child who turned four during 2012 would be in the 0 to 3 age group for all of 2012.

While HCCI recognizes that the terms "health care spending" and "health spending" could be interpreted differently; however, they are used interchangeably in this report.

Limitations

Our study had several limitations that can affect the interpretation of the findings. For this reason, HCCI considers its work a starting point for analysis and research on children covered by ESI, rather than a complete analysis of this population's effect on health care in the United States.

First, our findings were estimates for the US population based on a sample of approximately 25 percent of ESI children ages 0 to 18. Estimates for the number of insured children by each plan type were weighted to account for any demographic differences between the HCCI sample and population estimates based on the US Census,

making the dataset representative of the national, population of children covered by ESI.⁹

Second, this was a descriptive study, and findings were not causal. The tables and figures presented here were limited to descriptive statistics for children covered by ESI.

Third, the effect of chronic conditions and other health status issues that could drive spending and utilization for children were not covered in this report.

A note on premiums

HCCI does not report on premiums or their determinants. For more information on health insurance premiums and the multiple factors that affect them (including health care expenditure; beneficiary, group, and market characteristics; benefit design; and the regulatory environment) see Congressional Research Service, *Private Health Insurance Premiums and Rate Reviews, 2011*; American Academy of Actuaries, *Critical Issues in Health Reform: Premium Setting in the Individual Market, 2010*; and Congressional Budget Office, *Key Issues in Analyzing Major Health Insurance Proposals, Chapter 3, Factors Affecting Insurance Premiums, 2008*.¹⁹⁻²¹

Citation for the report

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"Children's Health Spending Report (2009-2012)." Health Care Cost Institute, Inc., Feb. 2014. Web.

Endnotes

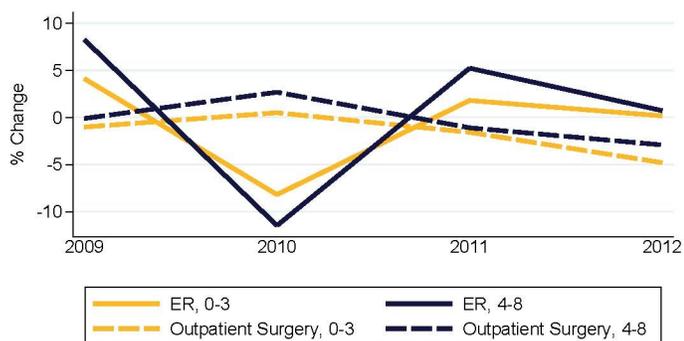
1. United States Census Bureau. "Health Insurance Historical Tables - HIB Series." *Census.gov*. United States Census Bureau (U.S. Department of Commerce), Sept. 2013. Web. 10 Jan. 2014.
2. "100 Percent of our Future: Improving the Health of America's Children." UnitedHealth Center for Health Reform & Moderation, Working paper 10, Aug. 2013. Web.
3. "Children's Health Insurance: Information on the Coverage of Services, Costs to Consumers, and Access to Care in CHIP and Other Sources of Insurance." United States Government Accountability Office, GAO-14-40, Nov 2013. Web.
4. Health Care Cost Institute. Children's Health Care Spending Report: 2007-2010. HCCI, Jul. 2012. Web.
5. Health Care Cost Institute. 2012 Health Care Cost and Utilization Report. HCCI, Sep. 2013. Web.
6. Health Care Cost Institute. 2012 Health Care Cost and Utilization Report Analytic Methodology v. 2.9. Health Care Cost Institute, Feb. 2013. Web.
7. Health Care Cost Institute, Inc. Aggregated ESI Cost and Utilization Dataset (2007-2012). Health Care Cost Institute, 2013. Digital file.
8. Health Care Cost Institute, Inc. Aggregated ESI Cost and Utilization CNS Dataset (2007-2012). Health Care Cost Institute, 2014. Digital file.
9. "Recommendations for Preventive Pediatric Health Care." *Bright Futures*. American Academy of Pediatrics, 2008. Web. 27 Jan. 2014.
10. Lopatin, Shari, and Tom Lipscomb. "Understanding Emergency, Urgent and Routine Care." *Edwards Air Force Base*. U.S. Air Force, Apr. 2010. Web. 27 Jan. 2014.
11. Advisory Committee on Immunization Practices. "Updated Recommendations for Use of Meningococcal Conjugate Vaccines." *Morbidity and Mortality Weekly Report*. Centers for Disease Control and Prevention, 28 Jan. 2011. Web. Jan. 2014.
12. "Meningococcal Vaccine Information Statement." *CDC.gov*. Centers for Disease Control and Prevention, 58 Oct. 2011. Web. 27 Jan. 2014.
13. "The Affordable Care Act and Immunization." *HHS.gov/HealthCare*. United States Department of Health and Human Services, 20 Jan. 2012. Web. 27 Jan. 2014.
14. Hamilton, Brady E., T.J. Mathews, and Stephanie J. Ventura. "Declines in State Teen Birth Rates by Race and Hispanic Origin." *CDC.gov*. National Center for Health Statistics (Centers for Disease

- Control and Prevention), May 2013. Web. 27 Jan. 2014.
15. Health Care Cost Institute. 2012 Health Care Cost and Utilization Report Appendix. Washington (DC): HCCI, 2014 Feb. Web.
16. Ophardt, Charles E. "Drugs of C.N.S." *Virtual Chembook*. Elmhurst College, 2003. Web. 27 Jan. 2014.
17. Editors of Consumer Guide. "Understanding Central Nervous System Medications." *Discovery Fit and Health*. Discovery Communications, n.d. Web. 27 Jan. 2014.
18. Setlik, Jennifer, G. Randall Bond, and Mona Ho. "Adolescent Prescription ADHD Medication Abuse is Rising Along with Prescriptions for these Medications." *Pediatrics* 124.3 (2009): 875-880. Print.
19. Newsom, Mark, and Bernadette Fernandez. "Private Health Insurance Premiums and Rate Reviews." Congressional Research Service, 11 Jan. 2011. Web. 27 Jan. 2014.
20. "Critical Issues in Health Reform: Premium Setting in the Individual Market." American Academy of Actuaries, Mar. 2010. Web. 27 Jan. 2014.
21. "Key Issues in Analyzing Major Health Insurance Proposals, Chapter 3, Factors Affecting Insurance Premiums." *CBO.gov*. Congressional Budget Office (Congress of the United States), Dec. 2008. Web. 27 Jan. 2014.
22. Hartman, Micah, et al. "National Health Spending In 2011:

Overall growth remains low, but some payers and services show signs of acceleration." *Health Affairs* 32.1 (2013): 87-98. Print.

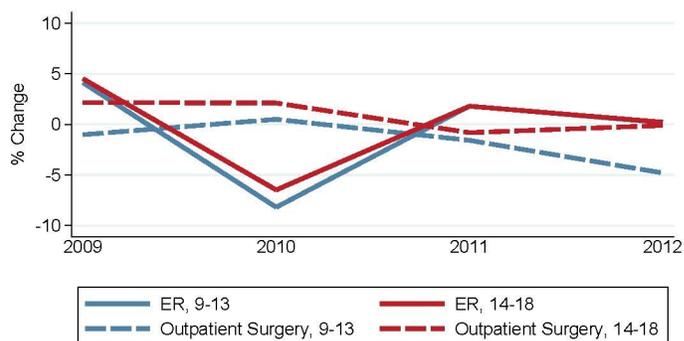
Trend to Note: Visits to Outpatient Facilities

Figure 20
Annual Percentage Changes in Outpatient Visit Utilization per 1,000 Children, Ages 0-3 and 4-8: 2009-2012



Source: HCCI, 2013.
Notes: All data weighted to reflect the national, ages 0-18 ESI population. Data from 2011 and 2012 actuarially completed.

Figure 21
Annual Percentage Changes in Outpatient Visit Utilization per 1,000 Children, Ages 9-13 and 14-18: 2009-2012



Source: HCCI, 2013.
Notes: All data weighted to reflect the national, ages 0-18 ESI population. Data from 2011 and 2012 actuarially completed.

In 2010, children's outpatient visits to emergency rooms (ERs) declined, with the most pronounced declines for younger children (-11.5%; Table A8 and Figure 20). ER visits per 1,000 children fell by 9.4 percent for pre-teens (Table A10), 8.2 percent infants and toddlers (Table A6), and 6.5 percent for teens (Table A12 and Figure 21). In 2011, children's visits to the ER rose, increasing 1.8 percent for infants and toddlers, 5.2 percent for younger children, 2.0 percent for pre-teens, and 1.8 percent for teens. However, by 2012, visits to the ER for all children remained below 2009 levels.

Yet not all visits to ambulatory care centers declined in 2010. Outpatient surgery visits per 1,000 insured children increased for all of the children's age groups.

One reason for the 2010 decline in ER visits may have been the delayed effects of the recession, which may have had a large impact on the health care sector in that year by limiting spending on, and use of, health care services by the commercially insured.^{5,22} If so, the trends observed by HCCI may suggest that, while some health care services for children may have been recession-proof, others were not. More work is necessary to examine the effects of recessions and other external factors on the health care cost and use trends for children.

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