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Age-Related Variation in Health Service Use and Associated Expenditures Among Children with Autism

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Abstract

This study examined differences by age in service use and associated expenditures during 2005 for Medicaid-enrolled children with autism spectrum disorders. Aging was associated with significantly higher use and costs for restrictive, institution-based care and lower use and costs for community-based therapeutic services. Total expenditures increased by 5 % with each year of age; by 23 % between 3–5 and 6–11 year olds, 23 % between 6–11 and 12–16, and 14 % between 12–16 and 17–20 year olds. Use of and expenditures for long-term care, psychiatric medications, case management, medication management, day treatment/partial hospitalization, and respite services increased with age; use of and expenditures for occupational/physical therapy, speech therapy, mental health services, diagnostic/assessment services, and family therapy declined.

Keywords

Autism; Economics; Cost; Expenditures; Utilization; Medicaid; Age variation

Introduction

There is growing evidence of the substantial economic burden of autism on publicly and privately-funded service systems, families and society (Amendah et al. 2011). Based on a recent review (Amendah et al. 2011), recent estimates of annual medical expenditures per individual range from \$2,100 to \$11,200 and represent 3–5 % of the estimated total annual cost for a child with an autism spectrum disorder (ASD). For nonmedical costs, the mean annual incremental cost of educating a child with an ASD as a qualifying condition for special education is about \$13,000. Intensive behavioral interventions cost between \$40,000 and \$60,000 per child per year. Estimates of residential costs per person with an ASD or learning disabilities range from \$60,000 to \$128,000 per year. A life time societal cost of \$3.2 million has been estimated for a typical child with an ASD (Ganz 2006; Ganz 2007). The exponential increase in numbers of children with autism in the last two decades has further increased the efforts to document the cost of care for this growing group (Newschaffer and Curran 2003).

Among the many studies examining the economic impact of ASD, attention has mostly focused on determining associated healthcare service utilization and expenditures (Ruble et al. 2005; Croen et al. 2006; Gurney et al. 2006; Liptak et al. 2006; Mandell et al. 2006; Leslie and Martin 2007; Shimabukuro et al. 2008). Such investigation is important for understanding the service needs of affected individuals and their families as well as the extent to which private and public resources are required. Much research in this vein to date has compared healthcare expenditures of children with ASD to those with other psychiatric diagnoses or with typically developing children (Croen et al. 2006; Liptak et al. 2006; Mandell et al. 2006; Leslie and Martin 2007; Shimabukuro et al. 2008). Taken as a group, these studies provide considerable evidence that healthcare expenditures for children with ASD significantly exceed those for children with other disabilities and typically developing children (Croen et al. 2006; Liptak et al. 2006; Mandell et al. 2006; Leslie and Martin 2007; Shimabukuro et al. 2008).

Few studies have explored the variation in service use and costs *among* children with ASD (Aman et al. 2003; Oswald and Sonenklar 2007a, b; Rosenberg et al. 2010; Wang and Leslie 2011; Logan et al. 2012; Lokhandwala et al. 2012; Peacock et al. 2012). In particular, their service use at various developmental stages has rarely been examined (Howlin et al. 2004). ASDs have varying manifestations, treatment approaches, and funding sources for treatment at different ages (Tidmarsh and Volkmar 2003; Shattuck et al. 2006). Some of the differences in funding sources and costs may be associated with healthcare policies that are linked to the age of the beneficiaries (Stahmer and Mandell 2007). The majority of previous research has lumped children of varying ages together, making it difficult to ascertain spending trends and what service resources are most utilized at different ages. Previous research also has rarely examined use of specific services (e.g. occupational therapy, respite care, etc.); exceptions have not focus on autism but on developmental disabilities in general (Pruchno and McMullen 2004; Kang and Harrington 2008). Most studies combined different types of mental health services into broad categories (e.g. inpatient, outpatient), hindering a more detailed understanding of patterns of specific service use and how this use changes with age.

The present study explores the service use and expenditure patterns among children with ASD of different age groups, for 1 year, in a national public health insurance system. This study also contributes to the literature by examining use of and expenditures for specific outpatient care services. Such analyses of the nature of the ASD treatment system by age group can provide important information to policymakers and program planners in their resource allocation decisions and, we hope, will drive further efforts to determine how best to deliver and finance healthcare to children with ASD.

Methods

Data and Sample

Data for this study came from the 2005 Medicaid Analytic Extract (MAX) data files from all 50 states and the District of Columbia <https://www.cms.gov>. All states are required to submit their Medicaid individual eligibility and claims data to Centers for Medicare and Medicaid Services (CMS) on a quarterly basis. The MAX data files contain individual-level Medicaid enrollment and personal information (e.g. demographic) and four separate files of encounter-level claims: Inpatient Hospital, Long-Term care, Other Services, and Prescription Drug files. Health care expenditures consisted of Medicaid reimbursements contained in these four claims files.

The study sample was limited to individuals 3–20 years old who were continuously enrolled in Medicaid for the duration of the calendar year in a fee-for-service (FFS) insurance plan. Children younger than 3 were excluded because of concerns regarding the validity of the diagnosis (Lord et al. 2006). The exclusion of individuals enrolled in managed care plans was necessary because of concerns regarding the consistency and quality of the encounter records in the MAX files. According to the Centers for Medicare and Medicaid Services (CMS) (<https://questions.cms.gov/faq.php?id=5005&faqId=2457>), the records of services provided through FFS providers are reasonably complete. The same is not true for encounter records from managed care plans. While federal law and CMS require states to collect and report encounter data, CMS has not enforced this requirement (USDHHS 2009). As a result, the consistency and quality of reporting for encounters is not of high enough quality and completeness to support research and other types of data analyses using encounter records. The CMS also notes that this same limitation does not apply for individuals covered by primary care case management (PCCM) plans because PCCM claims are usually paid under FFS.

Study subjects were identified as having ASD if they had at least one inpatient or long-term care claim, or two outpatient claims in calendar year 2005 associated with an International Classification of Diseases (ICD-9) (Medicode 1987) primary diagnosis of 299.xx. These criteria were required to insure that children were not classified as having ASD because of coding errors or because of a “rule out” diagnosis. While not validated, this classification scheme has been used in previous studies (Mandell et al. 2002) and has been found to be accurate for other psychiatric diagnoses (Lurie et al. 1992).

Measures

Outcomes of interest were healthcare utilization and expenditures associated with a psychiatric diagnosis incurred by Medicaid-enrolled individuals with ASD. To identify these claims, all encounter-level claims associated with a psychiatric diagnosis (ICD-9 diagnosis codes 290–319) were extracted and categorized as inpatient, outpatient, or long term care. We did not require that claims be associated with a 299 diagnosis because children with ASD may receive care associated with other disorders, either because the disorders are truly co-occurring or because they have been assigned as a way of qualifying for services. Outpatient care was categorized as one of 10 service type categories: occupational/physical therapy, speech therapy, diagnostic assessment, case management, mental health/social skills/behavior modification, medication management, personal care/home health aide, day treatment/partial hospitalization, family therapy, and respite care. A full list of specific Current Procedure Terminology (CPT) codes and corresponding service type categorization developed by the study team can be found at <http://www.pautism.org/tools.html>. Psychotropic medication use was defined as any medication prescription in one of five major classes: anti-depressants, anti-psychotics, anti-anxiety agents, mood-stabilizing agents, or stimulants. Use of each category of mental health service use was dichotomously coded (used/not used). Expenditures were calculated using the amount paid for each Medicaid encounter claim. Total expenditures were defined as the sum of inpatient, outpatient, long term care and psychotropic medication expenditures.

Age in years was the primary independent variable. We examined age both as a continuous and categorical variable. For the latter, we divided patients into four groups (3–6, 7–11, 12–16 and 17–20 years of age). This categorization was chosen to compare expenditures of pre-school-age, school-age and transition-age children. Demographic characteristics included gender, race/ethnicity, and state of residence. Race/ethnicity was coded as white, black or African American, Hispanic, or other. Categories of Medicaid eligibility included foster care, poverty, disability and other. As ASDs often co-occur with other medical conditions (Levy et al. 2010; Peacock et al. 2012); indicators of common comorbid psychiatric and neurological diagnoses were also included. They were identified using ICD-9 codes and included schizophrenia (295), bipolar disorder (296 excluding major depressive disorder (296.2 and 296.3)), depression (311, 296.2 and 296.3), anxiety disorders (300), attention deficit hyperactivity disorder (ADHD) (314), intellectual disabilities (317–319) and seizure disorders (345).

Analysis

Descriptive and multivariable approaches were used to assess variation in utilization and expenditures both across age groups and by service types. Demographic, eligibility and clinical characteristics were summarized as frequencies across the four age categories. We performed Chi-square tests to compare the proportions of children in each of the four age groups on various demographic and clinical characteristics, and eligibility basis. We also compared unadjusted differences in service-type-specific mean utilization rates and mean expenditures among users across age groups.

Log binomial regressions were used to examine the association between age and the likelihood of using services, controlling for sex, race/ethnicity, basis of enrollment, presence of specific comorbidity, and state of residence. Models were fit for each service type with the exception of outpatient services. All individuals had received outpatient services; consequently, there was no variation in this outcome measure to warrant analysis. Adjusted relative risk ratios for any service utilization outcome were calculated. We reported the change in the probability of service use by each year of age. We also compared the probabilities across successive (3–6 vs. 7–11, 7–11 vs. 12–16, and 12–16 vs. 17–20) age cohorts.

A series of multivariate ordinary least squares (OLS) semi-log regression models were estimated for expenditures, conditional on use, for each of the 14 service categories and total expenditures as dependent variables, controlling for the same measures above. Models were fit for each service type including outpatient services. Adjusted percentage changes in mean service-type-specific expenditures with each year of age were reported. We also compared conditional expenditures among successive age cohorts.

In examining the distribution of expenditures, we found some individuals who were outliers. To reduce potential bias from extreme values, expenditures were winsored at the 1 % level: i.e., expenditures below the first percentile were set to equal to the first percentile expenditure; and expenditures above the 99th percentile were set to equal to the 99th percentile. Floors and ceilings were set separately for each category of service, which resulted in truncating between 449 and 460 individuals, depending on the service category.

Results

Sample Characteristics

A total of 94,201 children between ages 3 and 20 years with ASD were enrolled in Medicaid in 2005. Nearly half (49 % or 45,948) were continuously covered under FFS or PCCM plan during 2005. Table 1 presents data on sample characteristics by age group. Of the sample, 23 % were preschool age (3–6 years old), 35 % were of elementary school age (7–11 years old), 30 % of middle/high school age (12–16 years old), and 12 % were 17–20 years old. The groups differed slightly by sex, and more prominently by race/ethnicity, presence of mental health comorbidity, and basis of Medicaid eligibility (Table 1). Younger groups were more likely than older groups to be male and Hispanic or of another race/ethnicity. Older groups had a higher percentage of persons diagnosed with schizophrenia or bipolar disorder, depression or anxiety disorder, and seizure disorders. Individuals between the ages of 7 and 16 were more likely to be diagnosed with ADHD than the youngest and oldest group. Older groups were more likely to be eligible for Medicaid through disability, whereas younger groups were more likely to be eligible through poverty.

Bivariate Analysis of Service Use and Expenditures by Age

Table 2 presents unadjusted estimates of the percentage of individuals in each age group who used each service of interest and the associated expenditures among users of that service. Use of and expenditures for inpatient hospitalizations, long-term care and

psychotropic medication increased with age. Among outpatient services, use of occupational/physical therapy, speech therapy, and diagnostic/assessment services decreased with age, while case management, medication management, day treatment, personal care and respite care increased with age. Overall outpatient expenditures increased with age, with much of the increase concentrated in mental health/social skills/behavior modification services, personal care/home health aide services and respite care.

Multivariate Analysis of Service Use and Expenditures by Age

Table 3 presents relative risk for each age group of use of each service type (with the youngest group as the reference). Estimates are adjusted for gender, race/ethnicity, psychiatric comorbidity, and Medicaid eligibility. The risk of utilization increased with age for long-term care (10 % per year of age) and psychotropic medication (5 % per year of age). Among outpatient services, utilization significantly declined with each year of age for occupational/physical therapy (9 %), speech therapy (8 %), mental health services (2 %), diagnostic/assessment services (2 %), and family therapy (3 %). Utilization significantly increased with age for case management/service coordination (2 %), medication management (6 %), personal care/home health aide (1 %), day treatment/partial hospitalization (4 %), and respite services (3 %). The most dramatic changes in service utilization occurred between the 3–6 and 7–11 age cohorts. Long-term care, psychotropic medications, medication management, respite care, and day treatment/partial hospitalization utilization were substantially higher for 7–11 year olds than for 3–6 year olds (respectively 198, 59, 79, 70, and 70 % higher).

For personal care/home health aide and respite care services, the significantly increasing trend declined for the oldest group; the oldest group was 9 and 17 % less likely to use personal care/home health aide and respite care, respectively, than the 12–16 year olds.

Analysis of service expenditures yielded similar results. Inpatient care expenditures increased by 2 %, long-term care expenditures by 4.4 %, and psychotropic medication expenditures by 9 % with each year of age. Among outpatient services, expenditures significantly declined with each year of age for occupational/physical therapy (4 %), speech therapy (5 %), diagnostic/assessment services (4 %), and family therapy (1 %). Expenditures increased with age for mental health (1 %), case management/service coordination (1 %), personal care/home health aide (2 %), and respite services (4 %). Among users, the largest increase in inpatient, long term, and psychotropic medication expenditures was seen between 3–6 and 7–11 year olds (20, 41, and 75 % respectively). For respite care, the largest increase occurred between the 12–16 and 17–20 year olds (29 %). There was substantial increase in psychotropic medication expenditures for successive age cohorts. There was no linear trend in outpatient service expenditures among users. Outpatient expenditures for the 12–16 age group were higher than the 7–11 age group. Expenditures declined in the oldest age group.

Overall, adjusted mean total expenditures significantly increased 5 % with each year of age. Total expenditures increased by 23 % between 3–5 and 6–11 year olds, 23 % between 6–11 and 12–16, and 14 % between 12–16 and 17–20 year olds.

Discussion

The results of this study suggest that total Medicaid-reimbursed mental healthcare spending for ASD treatment is large and increases with age. The results also suggest a realignment of services as children age. Specifically, use of and expenditures for long-term care, psychiatric medications, case management, medication management, day treatment/partial hospitalization, and respite services generally increase with age; while use of and expenditures for occupational/physical therapy, speech therapy, mental health services, diagnostic/assessment services, and family therapy decline. In addition, we found substantial shifts in service use and expenditures occurring between the 3–6 and the 7–11 age groups. Finally, findings suggest an “aging-out” process for 17–20 year olds, in that probability of use of many services and expenditures among users declined.

A number of factors may drive the increase in high-cost, intensive institution-based care and reduction in more community-based therapeutic services as children age. First, these patterns may reflect organizational responsiveness to patient needs. As individuals age, condition severity—and specifically maladaptive behaviors that make community care difficult—may increase (Howlin and Goode 1998; Howlin et al. 2004; Seltzer et al. 2004; Shattuck et al. 2007), resulting in increased needs for intensive and restrictive care. Thus, increasing use of and associated expenditures for these services might represent an appropriate response to greater need. Alternatively, these patterns may reflect the absence of appropriate and less restrictive and expensive alternatives for individuals who might otherwise reside in the community (Shattuck et al. 2011). As children move to adolescence and young adulthood, there are fewer proven-efficacious services, which may increase their likelihood of moving to more expensive and restrictive forms of care (Mandell 2008; Mandell et al. 2008b). The use of high-cost institution-based care may be reduced by developing interventions aimed at enhancing independent living skills, and identifying and implementing less costly home- and community-based alternatives. Yet another explanation for the increase in service use and expenditures for older age groups may be a cohort effect. This cohort effect may manifest in two ways. First, older individuals may have had access to a less developed service system than younger cohorts (Grether et al. 2009), resulting in less access to more therapeutic services and a heavier reliance on more restrictive and caretaking services. A second possibility is that older individuals diagnosed with ASD, who were diagnosed when there was less awareness of ASD, may represent the more severely impaired end of the spectrum.

The most dramatic shifts in utilization and expenditures occurred between the 3–6 and the 7–11-year-old cohorts; long-term care, psychiatric medication, medication management, day treatment/partial hospitalization, and respite care services increased substantially, and utilization and expenditures for speech therapy, occupational/physical therapy, and diagnostic/assessment services declined. One explanation for the changes between these two particular age groups is that the responsibility for paying for some of these services shifts to the education system, resulting in lower costs to Medicaid (Mandell et al. 2008a). A second, more alarming interpretation is that needed services are no longer available to children of school age through Medicaid. While the increase in medication services and more restrictive types of care may indicate greater need among these children and the manifestation of new

symptoms, it may also signal the effects of reducing access to more therapeutic services (Mandell et al. 2012).

The services this population receives as children and adolescents often come to an end during the transition to adulthood, even if the need for them continues (CMS 2011). The policies that govern coverage of certain services commonly used by individuals with ASD may apply rigid age cut-offs to delineate service boundaries, creating discontinuities in provision of care. Exacerbating the effects of these policies, there are relatively few practices with a strong evidence base for adolescents and adults with ASDs. Two study findings suggest such an “aging out” process for 17–20 year-olds. First, the percentage of the sample that was 17–20 years old was relatively low (12 %), suggesting that older youth may disenroll from Medicaid or switch diagnostic categories. Second, there was a decline in respite care and personal care/home health aide service used by this group, suggesting significant barriers to access for this subgroup at a time in the development of these young adults when a strong network of social and residential support may be most necessary (Shattuck et al. 2011).

Several study limitations should be noted. First, the sample was limited to children and adolescents with ASD who had Medicaid fee-for-service coverage; findings may not be generalizable to individuals in managed care and non-Medicaid populations. Second, the diagnosis of ASD in the Medicaid claims may not be as accurate as one made by a structured diagnostic interview, although administrative diagnosis of ASD in other secondary data has been found to be highly specific (Fombonne et al. 2004). Third, observed expenditures do not include out-of-pocket expenditures, expenditures by private insurance or other secondary payers, other societal costs, or opportunity costs to patients or caregivers. This is particularly important as some individuals may receive mental health care funded from other sources. It is quite possible that the children and young adults are still getting community services but these are being paid for by other public or private programs. Fourth, the study is cross-sectional and our conclusions with respect to increases or decreases in expenditures associated with aging are potentially confounded by cohort effects.

Despite these limitations, there are important implications related to this study. To our knowledge, this is the first examination of changes in service use and expenditures by age and by specific service categories. There are ongoing discussions about building a service system for adolescents and young adults and the role of the publicly-funded health care system. Our findings suggest considerable healthcare expenditures already for these individuals. The challenge ahead may not be about allocating more resources per se, but about reallocating existing resources more effectively and efficiently; and being creative in thinking about more options that address the challenges these children have as they age, while keeping them in their communities.

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Table 1

Descriptive characteristics of sample by age group

| % of Sample* | Age 3–6 n = 10447 | Age 7–11 n = 16360 | Age 12–16 n = 13732 | Age 17–20 n = 5409 |
|----------------------------|----------------------|-----------------------|------------------------|-----------------------|
| Male | 80 | 80 | 79 | 78 |
| Race/ethnicity | | | | |
| White | 49 | 54 | 56 | 60 |
| Black | 13 | 13 | 16 | 20 |
| Hispanic | 11 | 9 | 8 | 8 |
| Other | 26 | 24 | 19 | 12 |
| Psychiatric comorbidity | | | | |
| ID | 14 | 22 | 31 | 44 |
| Schizophrenia/bipolar | 3 | 9 | 16 | 19 |
| Depression/anxiety | 4 | 9 | 14 | 17 |
| ADHD | 22 | 33 | 31 | 20 |
| Seizure | 6 | 8 | 9 | 12 |
| Medicaid eligibility | | | | |
| Foster care | 6 | 7 | 10 | 7 |
| Poverty | 23 | 14 | 11 | 5 |
| Disability | 68 | 76 | 76 | 86 |
| Other eligibility category | 3 | 3 | 3 | 2 |

* For each variable p value for the Chi-square test of overall differences in sample means between age groups was <0.001

Table 2

Probability of service use and expenditures among users by age group

| Service Type* | Utilization (%) | | | | | Expenditures among users (\$) | | | | |
|---|-----------------|------|-------|-------|-----|-------------------------------|--------|--------|--------|-----|
| | 3-6 | 7-11 | 12-16 | 17-20 | 9 | 3-6 | 7-11 | 12-16 | 17-20 | 9 |
| Inpatient care | 5 | 6 | 7 | 7 | 9 | 5,032 | 6,475 | 6,805 | 6,919 | 9 |
| Long term care | 1 | 4 | 7 | 7 | 9 | 17,852 | 28,958 | 33,605 | 43,397 | 9 |
| Psychotropic medications | 34 | 58 | 68 | 71 | 71 | 1,432 | 2,508 | 3,479 | 3,969 | 71 |
| Outpatient care | 100 | 100 | 100 | 100 | 100 | 7,848 | 9,353 | 11,217 | 13,061 | 100 |
| Occupational/physical therapy | 16 | 10 | 7 | 4 | 4 | 4,309 | 3,166 | 3,201 | 3,612 | 4 |
| Speech therapy | 37 | 25 | 15 | 9 | 9 | 1,620 | 1,259 | 978 | 906 | 9 |
| Mental health/social skills/behavior modification | 22 | 24 | 21 | 18 | 18 | 2,838 | 2,516 | 2,695 | 3,078 | 18 |
| Diagnostic/assessment | 51 | 42 | 40 | 38 | 38 | 686 | 669 | 534 | 397 | 38 |
| Case management | 34 | 38 | 43 | 45 | 45 | 1,590 | 1,825 | 1,991 | 2,006 | 45 |
| Medication management | 10 | 21 | 28 | 31 | 31 | 265 | 335 | 346 | 313 | 31 |
| Personal care/home health aide | 17 | 23 | 24 | 22 | 22 | 11,975 | 13,482 | 13,164 | 14,310 | 22 |
| Day/partial treatment | 4 | 9 | 13 | 14 | 14 | 2,910 | 2,777 | 3,084 | 2,835 | 14 |
| Family therapy | 13 | 13 | 13 | 8 | 8 | 783 | 667 | 673 | 624 | 8 |
| Respite care | 4 | 8 | 9 | 9 | 9 | 3,070 | 3,228 | 3,525 | 4,250 | 9 |
| Total | NA | NA | NA | NA | NA | 8,815 | 12,450 | 16,877 | 21,684 | NA |

* For each variable *p* value for the test of overall differences in sample means between age groups were < 0.001, except for the mental health/social skills/behavior modification service expenditures (*p* = 0.127)

Table 3

Change in utilization and expenditures by service type and age groups

| Service type | Utilization (relative risk) | | | | | Expenditures among users (% change) | | | | |
|---|-----------------------------|--------------|--------------|--------------|--------------|-------------------------------------|---------------|---------------|---------------|-------|
| | Each 1-year age increase | 7-11 | 12-16 | 17-20 | 17-20 | Each 1-year age increase | 7-11 | 12-16 | 17-20 | 17-20 |
| Inpatient care | 1.00 | 0.91 | 0.94 | 0.97 | 0.97 | 1.5 | 19.9* | 23.3 | 22.4 | |
| Long term care | 1.10 | 2.98* | 4.30* | 5.44* | 5.44* | 4.4 | 40.5* | 48.0 | 75.2* | |
| Psychotropic medications | 1.05 | 1.59* | 1.80* | 1.95* | 1.95* | 8.8 | 75.4* | 109.6* | 126.2* | |
| Outpatient care | NA | NA | NA | NA | NA | -0.1 | -1.8 | 2.1* | -3.8* | |
| Occupational/physical therapy | 0.91 | 0.65* | 0.45* | 0.28* | 0.28* | -3.7 | 17.3* | -28.8 | -55.9* | |
| Speech therapy | 0.92 | 0.75* | 0.49* | 0.30* | 0.30* | -4.6 | 16.5* | -42.7* | -55.1* | |
| Mental health/social skills/behavior modification | 0.98 | 1.01 | 0.86* | 0.77* | 0.77* | 0.9 | -4.5 | 7.2* | 6.5 | |
| Diagnostic/assessment | 0.98 | 0.80* | 0.74* | 0.74 | 0.74 | -4.2 | -10.2* | -13.3* | -13.27 | |
| Case management | 1.02 | 1.10* | 1.19* | 1.23 | 1.23 | 0.8 | 4.0 | 9.3* | 10 | |
| Medication management | 1.06 | 1.79* | 2.19* | 2.56* | 2.56* | 0.2 | 12.7* | 12.4 | 9.7 | |
| Personal care/home health aide | 1.01 | 1.19* | 1.24* | 1.14* | 1.14* | 2.2 | 28.4* | 33.3 | 31.1 | |
| Day/partial treatment | 1.04 | 1.70* | 2.02* | 1.97 | 1.97 | 0.0 | 2.2 | 5.8 | 3.2 | |
| Family therapy | 0.97 | 0.94 | 0.88* | 0.60* | 0.60* | -0.9 | -14.9* | -8.1 | -19.5 | |
| Respite care | 1.03 | 1.70* | 1.91* | 1.57* | 1.57* | 3.9 | 10.7 | 23.6* | 52.3* | |
| Total | NA | NA | NA | NA | NA | 4.7 | 23.3* | 46.3* | 60.5* | |

Reference group is 3-6 year olds

Figures in bold represent estimates significant at the 5% level

* Significantly different value from the preceding age group