

Identification and Treatment of Children With Oppositional Defiant Disorder: A Case Study of One State's Public Service System

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This case study of a statewide publicly funded service system followed children ages 3 to 17 years enrolled in Tennessee's Medicaid System over a 5-year period. Oppositional defiant disorder (ODD) was found to be the third most commonly diagnosed psychiatric disorder in this group, diagnosed in 3% of the enrolled population at an average age of 11.7 years. Several factors were found to be associated with the age of onset, including race and gender. Over half of those diagnosed with ODD also were diagnosed with another psychiatric disorder. Over the time period, use of inpatient/residential treatment, family therapy, and medication management increased, while other service types decreased. Implications regarding clinical, administrative, policy, and research issues are discussed for public sector psychologists and others.

Keywords: oppositional defiant disorder, service use, mental health utilization, Medicaid

The diagnosis of oppositional defiant disorder (ODD) was introduced to practitioners and researchers in the mental health field in 1980, when the American Psychiatric Association (APA) included the disorder in the *Diagnostic and Statistical Manual of Mental Disorders* (3rd ed., [DSM-III]; APA, 1980). ODD falls into the category of Disruptive Behavior Disorders in the, *DSM-IV-TR* (4th ed., text revision, APA, 2000), which also includes attention-deficit/hyperactivity disorder (ADHD), conduct disorder (CD), and disruptive behavior disorder not otherwise specified. The *DSM-IV-TR* (APA, 2000) states that between 2% and 16% of the population meet the diagnostic criteria for ODD, and the Methodology for Epidemiology

of Mental Disorders in Children and Adolescents (MECA) study found an ODD prevalence rate of 4.4% (Shaffer, Fisher, Dulcan, Davies, Piacentini, & Schwab-Stone, 1996).

ODD has been viewed as a developmental precursor to more serious behavior problems that tend to occur later in life (Mash & Barkley, 1998) with the onset occurring earlier than the average age of onset for CD (Loeber, Lahey, & Thomas, 1991). The criteria for diagnosing these two disorders are distinct, with the exception of lying and mild physical aggression. Because of the similarity of ODD to CD, the *DSM* forbids codiagnosis of these disorders. Although it is true that nearly all children and adolescents with CD will also meet criteria for ODD (Rapoport & Ismond, 1996), not all children with ODD will go on to have more serious behavior problems (Biederman et al., 1996; Loeber et al., 1991). The ODD/CD progression can be viewed with a unidimensional approach (APA, 2000; Rapoport & Ismond, 1996; World Health Organization, 1992), as phases of the same disorder.

Community studies on ODD have demonstrated gender differences in diagnosis and the presence of co-occurring disorders. Male children are more likely to have ODD than females, often by a large margin (Angold et al., 2002; Costello, Mustillo, Erkanli, Keeler, & Angold, 2003; Keenan & Wakschlag, 2000; Lavigne et al., 1996; Maughan, Rowe, Messer, Goodman, & Meltzer, 2004). ODD is also often accompa-

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nied by at least one other disorder (Costello et al., 2003; Lavigne et al., 2001; Maughan et al., 2004; Ruchkin & Schwab-Stone, 2003; Simonoff et al., 1997). High levels of comorbidity of behavior problems and substance use have been documented in adolescents (Loeber, Burke, Lahey, Winters, & Zera, 2000; Ruchkin & Schwab-Stone, 2003). Past research has found that females were more likely to have co-occurring anxiety and depression (Ruchkin & Schwab-Stone, 2003). However, many studies have focused only on male populations; so much less is known about ODD among girls (Lahey & Loeber, 1994).

Patterns of Service Use

Although there are several studies published evaluating the effectiveness of specific treatments for ODD (e.g., Bradley & Mandell, 2003; Kazdin, 1995; Loeber et al., 1991), very few have focused on the ODD population in terms of patterns of service utilization. McKay, Harrison, Gonzales, Kim, and Quintana (2002) found that childhood disruptive behavior was the number one reason for referral to mental health services for children. ODD diagnosis predicted an increase in mental health services utilization in a group of male children 14 to 16 years of age (Cornelius, Pringle, Jernigan, Kirisci, & Clark, 2001). Mandell, Guevara, Rostain, and Hadley (2003) studied the cost of ODD services and found that they were similar to those for ADHD, and were significantly less than both CD and depression. Most of the services that children received for ODD were mental health outpatient services. Examining patterns of prescription medication for treating ODD and CD, Cooper, Hickson, Fuchs, Arbogast, and Ray (2004) documented a dramatic increase in the use of atypical antipsychotic medication, including risperidone, over a 6-year period.

The Purpose of This Study

This study was designed to provide more specific information on the identification and treatment of ODD within community settings. A case study of one state's publicly funded mental health service system was conducted. Secondary analysis of an existing statewide claims database provided the opportunity to answer a number of questions regarding ODD

within this state's public health/mental health system, funded by Medicaid. The specific research questions of the study are outlined below:

1. How many Medicaid-enrolled children were diagnosed with ODD? How did this compare to other diagnostic categories?
2. What proportion of children with ODD had co-occurring behavioral health disorders?
3. What child factors were associated with receiving an ODD diagnosis?
4. What factors were associated with the age at diagnosis of ODD?
5. What were the service utilization patterns of children with ODD?

Method

Procedures

This study used enrollment and encounter/claims data from Tennessee's Medicaid program (TennCare), which has been operating under contracted managed behavioral health care since July 1996. These data are from 5 years of program operation, state fiscal years (FY) 1996 through 2000. Enrollment data include the date of birth, race, gender, and enrollment category of each child enrolled in TennCare. In addition, the claims data contain information on the child's age, diagnoses, and the type of service he or she received. Claims were processed to retain the first two diagnostic codes (submitted using ICD-9, National Center for Health Statistics [NCHS], 2006; or *DSM-IV*, APA, 2000) for each service. The many procedure codes used to describe services (Center for Medicaid & Medicaid Services [CMS], 2007) were grouped into more general categories for analysis (Saunders & Heflinger, 2004b). These data were acquired with the permission of the Bureau of TennCare through a data-sharing arrangement with the Department of Preventive Medicine at the Vanderbilt University Medical Center. This study was reviewed and approved by the Vanderbilt University Institutional Review Board as an exemption for using existing, nonidentifiable data.

Sample

All children enrolled in TennCare who were 3- through 17-years old were included. Overall, there were 750,339 different children in this age range enrolled over this 5-year period. Approximately half of the enrolled children were female (see Table 1). One third of the children were reported as African American and less than 5% were identified in the enrollment files as Hispanic, Asian, or another ethnic group. The largest group of children enrolled in TennCare was through the eligibility category of Aid to

Families With Dependent Children/Targeted Assistance for Needy Families (AFDC/TANF), with one fourth of the children in another poverty category, 5% in the SSI (supplemental security income) category associated with a disability, and 2% in the foster care eligibility category, indicating those in state custody in a variety of settings. Almost one fourth of the children were enrolled as uninsured or uninsurable, the expansion category under Tennessee's Medicaid managed care waiver (Chang et al., 1998; Lyons & Scheb, 1999; Moreno & Hoag, 2001).

Analyses

First, a series of descriptive analyses were performed on the rate of ODD diagnoses, the presence of co-occurring psychiatric diagnoses, and the types and amounts of services delivered to children with ODD. Children with ODD were identified by having a primary or secondary diagnostic code of 313.81 on their service encounter or claim, the first claim with an ODD diagnosis being flagged. Next, two multivariate analyses were performed. First, all children ages 3 through 17 who had received any type of behavioral health service ($n = 182,478$) were included in a logistic regression predicting the probability of being identified with ODD. Next, children who had received an ODD diagnosis were included in a standard regression to examine which factors influenced the age at their first ODD diagnosis. The predictor variables for both regressions included race, gender, age, Medicaid enrollment category, and previous service system experience. In this state because very few ($\leq 4\%$) minority enrollees are not African American, race was dichotomized as White and minority, with White as the reference category. Gender has the usual dichotomy with male as the reference. SSI served as the reference category for Medicaid enrollment in the analyses because there is more homogeneity across states in terms of their SSI population than in their poverty-related populations due to the heterogeneity in welfare program generosity. Thus, analysts studying other states might more easily compare their results to ours. Previous analyses have combined the AFDC/TANF category with the other poverty category (e.g., Adams,

Table 1
Characteristics of TennCare Enrollees and Those With ODD Diagnosis, Age 3 to 17, FY1996 to FY2000

Characteristic	Enrolled at any time ^a	Any with ODD diagnosis ^b
Race		
Black (%)	33	28
White (%)	62	68
Other (%)	4	4
Gender		
Female (%)	49	36
Male (%)	51	65
<i>M</i> age ^c	8.4	11.7
Age at first ODD diagnosis^c		
3 to 5 years (%)	NA	11
6 to 11 years (%)	NA	35
12 to 17 years (%)	NA	54
MH visits past year		
No. with any visits	NA	10,935
% with any visits	NA	49
<i>M</i> number of MH service days for youth with any visits	NA	18
Medicaid eligibility category^d		
SSI (%)	5	16
AFDC/TANF (%)	44	36
Other poverty (%)	25	11
Foster care/Title IV-E (%)	2	14
Uninsured/uninsurable (%)	24	16
Other state categories (%)	0	8

Note. ODD = oppositional defiant disorder; FY = fiscal year; NA = not applicable; MH = mental health; SSI = supplemental security income; AFDC/TANF = Aid to Families With Dependent Children/Targeted Assistance for Needy Families.

^a $n = 750,339$. ^b $n = 22,384$. ^c For the enrolled population, age in July 1995 or at first enrollment before June 2000; for the ODD sample, age at first ODD diagnosis. ^d For the enrolled population, category in July 1995 or at first enrollment before June 2000; for the ODD sample, category at first ODD diagnosis.

Bronstein, & Raskind-Hood, 2002); while these groups have similar patterns of use, we left them separate because the large sample sizes allow more precise estimation of their unique contribution to the regression model. Any mental health service use in the 12 months prior to diagnosis was also included as a predictor in both regressions. For age at first diagnosis, previous experience with the Medicaid system (number of months enrolled before diagnosis) was also included. Time (FY) was included in the logistic regression to determine if the rate of ODD diagnosis changed over the 5-year time period. Because these data sets were so large, a significance level of $p < .001$ was used to identify statistically significant findings.

Results

How Many Medicaid-Enrolled Children Were Diagnosed With ODD? How Did This Compare to Other Diagnostic Categories?

Approximately 3% ($n = 22,384$) of the enrolled TennCare population aged 3 through 17 years received a diagnosis of ODD during this 5-year period (see Table 1). As in

the general TennCare population, the majority of these were White, and a higher proportion of those diagnosed with ODD were boys. The number of children with an ODD diagnosis in their claims file increased from 6,663 in FY1996 to 7,755 in FY2000. Although this is a 16% rise in the absolute number of children served with an ODD diagnosis, TennCare enrollment increased during this time period by 14%. In addition, all of the children with any behavioral health disorder were enumerated by fiscal year to observe trends in the use of these diagnoses. Other psychiatric, substance use, and learning/developmental disorders were categorized by related diagnoses, again based on a primary or secondary diagnosis. The relative proportions of the TennCare enrollees with ODD and different diagnostic categories remained relatively stable over time (see Figure 1). Every year of the analysis, ODD was the third most prevalent diagnostic category for children ages 3 through 17, given to approximately one fourth of all children with a behavioral health diagnosis. ADD/ADHD was the most frequent diagnosis given to children (over 50%), followed by depressive disorders (approximately 30%).

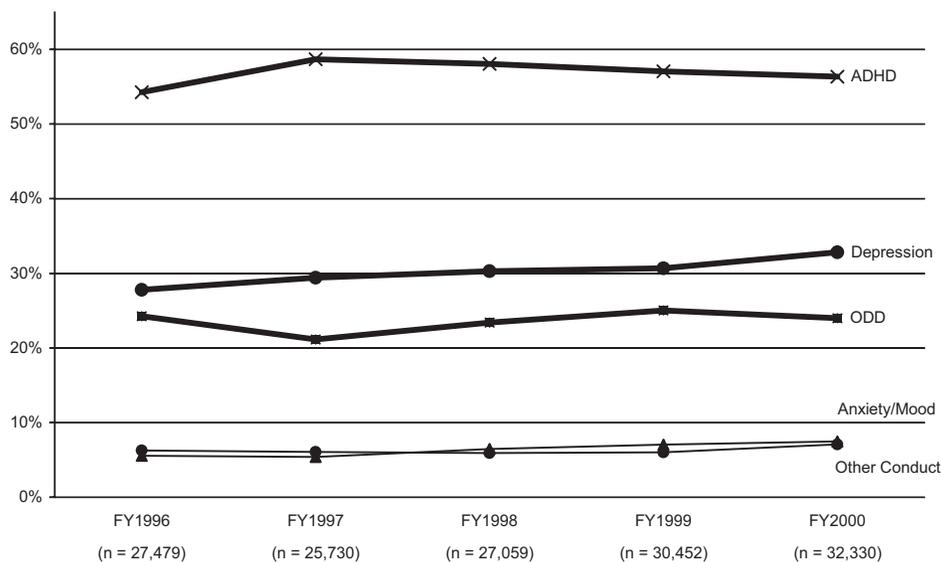


Figure 1. Percentage of treated youth by diagnosis, top five diagnoses FY1996 to FY2000. FY = fiscal year; ADHD = attention-deficit/hyperactivity disorder; ODD = oppositional defiant disorder.

What Proportion of Children With ODD Had Co-Occurring Behavioral Health Disorders?

Co-occurring behavioral health diagnoses given to the children with ODD were examined in two ways: on the same claim with the ODD diagnosis, and on any claim within 6 months before or after the first diagnosis of ODD. Children diagnosed with ODD frequently had a co-occurring behavioral health diagnosis (see Table 2). One-third of the children who eventually received an ODD diagnosis had received prior treatment for another behavioral health disorder, most frequently ADHD or a depressive disorder. Over one third of the children had another behavioral health disorder on the same encounter/claim as their first ODD diagnosis, again most frequently ADHD or a depressive disorder. In the 1-year time period surrounding their first diagnosis of ODD, over half of the children had at least one other behavioral health diagnosis.

What Child Factors Were Associated With Receiving an ODD Diagnosis?

The results of the multivariate logistic regression predicting probability of having a

claim with an ODD diagnosis are shown in Table 3. Factors differentiating those children who received an ODD diagnosis (vs. some other mental health diagnosis) at some point during this 5-year period were being older in age, minority, male, in state custody, or having a previous mental health visit (with a different diagnosis).

What Factors Were Associated With the Age at Diagnosis of ODD?

The mean age of children when the first diagnosis of ODD was recorded for a TennCare service for those between the ages of 3 and 17, was 11.7 years. Table 1 displays the age groups in which children in the TennCare system were first diagnosed, with over half being 12 years of age or older. The factors associated with age of the child at first ODD diagnosis are shown in Table 4. Factors associated with initial diagnosis of ODD at an older age included being White, female, in state custody, and having a greater number of months enrolled in TennCare. Children who were younger when diagnosed with ODD were more likely to be from a minority background, male, enrolled in TennCare due to one of the poverty categories, and having

Table 2
Percentage of Children Age 3 to 17 With ODD Who Have Co-Occurring Diagnoses, FY1996 to FY2000

Diagnostic group	Diagnostic category	At the same time ^a	Around the same time ^b
% with any co-occurring diagnosis		35	55
Substance use	Alcohol abuse/dependence (%)	1	2
	Drug abuse/dependence (%)	3	5
Psychiatric	Depression (%)	14	27
	Conduct (excluding ODD) (%)	1	6
	Anxiety (%)	1	3
	Attention deficit (%)	19	30
	Serious mental illness ^c (%)	1	3
Other	Learning disorders (%)	1	2
	Developmental disorder/mental retardation (%)	1	1
	Autism spectrum disorders (%)	0	1

Note. $N = 22,384$. ODD = oppositional defiant disorder; FY = fiscal year.

^a On same claim as first ODD diagnosis. ^b On any claim between 6 months before and 6 months after the first ODD diagnosis. This is a child-level analysis, so individual children could have more than one co-occurring diagnosis during this 12 month period, but each child is counted only once within each diagnostic category, and the denominator is the number with any from the first line. ^c *DSM-IV-TR* (APA, 2000) diagnoses included schizophrenia, other psychotic disorders.

Table 3
*Logistic Regression Predicting Probability of Having a Claim With an ODD
 Diagnosis for TennCare Children Ages 3 to 17*

	95% Confidence interval			<i>p</i>
	Odds ratio	Lower bound	Upper bound	
Intercept	0.18	0.18	0.19	<.001
Time (Fiscal Year)	0.99	0.98	1.00	<i>ns</i>
Age	1.07	1.06	1.07	<.001
Minority	1.39	1.34	1.43	<.001
Female	0.83	0.80	0.86	<.001
Enrollment category (referent SSI)				
Uninsured/uninsurable	0.82	0.78	0.87	<.001
Foster care	1.14	1.08	1.20	<.001
AFDC/TANF	1.05	1.01	1.10	<i>ns</i>
Other poverty	0.85	0.80	0.90	<.001
Other state	0.89	0.84	0.95	<.001
MH visit previous year	1.24	1.21	1.27	<.001

Note. $N = 182,478$. Wald $\chi^2(10, N = 182, 478) = 2,550.34$, χ^2 probability < .0001. ODD = oppositional defiant disorder; SSI = supplemental security income; AFDC/TANF = Aid to Families With Dependent Children/Targeted Assistance for Needy Families; MH = mental health.

previously used mental health services for some other type of problem.

What Were the Service Utilization Patterns of Children With ODD?

Table 5 displays the patterns of service use for children with ODD, showing the types of services

Table 4
*Multivariate Linear Regression of Age in Years at
 First ODD Diagnosis, Age 3 to 17*

	B	SE B	β
Intercept	11.52	11.36	11.68*
Minority	-0.39	-0.50	-0.28*
Female	0.60	0.50	0.70*
Enrollment category (referent SSI)			
Uninsured/uninsurable	0.05	-0.12	0.23
Foster care	1.73	1.56	1.90*
AFDC/TANF	-1.27	-1.41	-1.13*
Other poverty	-2.76	-2.94	-2.59*
Other state category	1.28	1.08	1.49*
MH visit previous year	-0.11	-0.21	-0.01
Previous months of enrollment	0.03	0.03	0.03*

Note. $N = 22,384$. $R^2 = .13$, $F(9, 22,374) = 408.26$, Root MSE = 3.68, $p < .0001$. ODD = oppositional defiant disorder; SSI = supplemental security income; AFDC/TANF = Aid to Families With Dependent Children/Targeted Assistance for Needy Families; MH = mental health.

* $p < .001$.

used for each of the 5 years of the study. For each type of service, the access rate (or percentage of children with the ODD diagnosis that year) and the average length of stay in days (for inpatient/residential episodes) or number of treatment sessions (days) per year is presented. Some type of outpatient therapy for ODD was used by approximately two thirds of children with the diagnosis. This corresponds with 8 to 12 per 1,000 (or 0.8 to 1.2%) of all TennCare-enrolled children. For children with ODD, use of inpatient hospitalization or residential treatment doubled, family therapy was used nearly four times as often by the end of the time period, and use of medication management increased by sevenfold. The proportion of children with ODD who were receiving case management increased by a factor of 11. Other types of services became less frequently used for children with ODD: individual and group therapy declined by 25% and 13%, respectively. The use of day treatment or partial hospitalization dropped even more dramatically.

Average numbers of days or treatment sessions per year for specific service types are also displayed in Table 5—this can be thought of as the “dose” of services. The average number of days/sessions increased for inpatient/residential, case management, and medication management. Although access rates increased for family therapy, the number of

Table 5
Number of Inpatient and Outpatient Specialty Service Users, Access Rates^a, and Average Number of Treatment Days per Year Among Children and Adolescents With ODD, FY1996 to FY2000 for Ages 3 to 17

	FY1996 ^b	FY1997 ^c	FY1998 ^d	FY1999 ^e	FY2000 ^f
Inpatient/residential	175	350	343	437	487
Access rate (%)	3	6	5	6	6
Admits	207	442	329	425	505
Avg. length of stay (Days)	9.4	16.8	16.4	18.4	19.1
Outpatient therapy overall	5,479	3,737	4,190	4,900	5,055
Access rate (%)	82	69	66	64	65
Avg. days	19.6	7.5	7.2	7.2	6.6
Individual therapy	4,974	3,023	3,419	3,967	4,235
Access rate (%)	75	56	54	52	55
Avg. days	6.4	4.3	4.6	4.5	4.3
Family therapy	338	1003	1335	1469	1456
Access rate (%)	5	18	21	19	19
Avg. days	3.3	2.8	2.8	2.9	3.1
Group therapy	761	574	603	656	761
Access rate (%)	11	11	10	9	10
Avg. days	17.1	8.2	11.1	10.6	9.1
Day treatment/partial hospitalization	1,099	472	295	491	371
Access rate (%)	17	9	5	6	5
Avg. days	55.8	15.8	13.7	13.0	9.9
Case management	205	921	1349	2012	2630
Access rate (%)	3	17	21	26	34
Avg. days	4.3	7.8	10.6	11.2	11.5
Medication management	242	1,072	1,548	1,880	2,048
Access rate (%)	4	20	24	25	26
Avg. days	2.1	2.6	3.0	3.2	3.2

Note. ODD = oppositional defiant disorder; FY = fiscal year; avg = average.

^a Percentage of TennCare enrollees who had a diagnosis of ODD in that year. ^b *n* = 6,663.

^c *n* = 5,439. ^d *n* = 6,333. ^e *n* = 7,615. ^f *n* = 7,755.

sessions in which children participated in family therapy remained approximately three per year.

Discussion

In this statewide population of children served by Medicaid, ODD was diagnosed in one fourth of children receiving treatment, and was the third most diagnosed disorder in children ages 3 to 17, following ADHD and depression, respectively. The 3% of all enrolled TennCare children receiving a diagnosis of ODD at some time during this 5-year period falls at the lower end of the prevalence range estimated by the APA (2000) and is similar to Mandell et al.'s (2003) study of Medicaid children. This study also documents high rates of co-occurring mental health disorders, with over half of those with ODD also being diagnosed

with another disorder within 6 months of their first ODD diagnosis (see Table 2). The high rates of co-occurring ADHD are consistent with previous research (Kashani et al., 1987; Lavigne et al., 1996; Maughan et al., 2004; Simonoff et al., 1997). Lavigne and colleagues (2001) suggested that there is a developmental link between these two disorders. Biederman et al. (1996) estimated that 65% of children with ADHD have ODD but did not examine the relationship of ODD to ADHD. In this study, 30% of the children with ODD had a co-occurring diagnosis of ADHD and 27% were diagnosed with depression. Although depression and anxiety were the second and third most frequent co-occurring disorders found in this study, anxiety was present at low rates (up to 3%). In other studies, however, these were the co-occurring diagnoses most frequently found (Costello et al., 2003; Lavigne et al., 2001;

Maughan et al., 2004; Ruchkin & Schwab-Stone, 2003; Simonoff et al., 1997).

Factors significantly associated with receiving an ODD diagnosis and the age at which children were diagnosed included gender, race, state custody, and previous system experience. These are discussed in more detail below, as are the findings on age at first diagnosis and patterns of service use for children with ODD.

Gender Findings

Looking at the demographic characteristics associated with ODD, these findings that boys were more likely to be diagnosed than girls and that they were diagnosed at a younger age are consistent with other studies (e.g., Angold et al., 2002; Mandell et al., 2003). Saunders and Heflinger (2004a) found that female children in two southern states received services with a behavioral health diagnosis, in general, at approximately two thirds the rate of males and there was a consistent pattern of lower behavioral health-care access among female youth across all of the service categories investigated.

Race Findings

Although in the descriptive Table 1 it appeared that White youth may be overrepresented in the ODD group compared to the total enrolled population, in the multivariate model controlling for all other factors, minority children were found to be 38% more likely to receive an ODD diagnosis than their White counterparts. In addition, minority children were more likely to be diagnosed at a younger age than White children. Mandell and colleagues (2003) found a very similar pattern among Medicaid children in one large city, in which minority children were more likely to be given a conduct-related disorder diagnosis than one for depression. The same pattern was found in children being served through the federally funded Comprehensive Community Mental Health Services for Children and Their Families Program, in which African American children were more likely to have been diagnosed with disruptive behavior disorder (Nguyen, Huang, Aranza, & Liao, 2007).

Findings Regarding Children in State Custody

Children in state custody were also more likely to receive an ODD diagnosis than children in other Medicaid enrollment categories. Perhaps other factors related to being placed in state custody are associated with increased behavior problems that require treatment. In other studies of this Medicaid population and the broader population of children in the child welfare system, these children exhibit high rates of mental health need, and children in state custody consistently used mental health and substance use services at higher rates than other groups of enrolled youth (Burns et al., 2004; Jones, Heflinger, & Saunders, 2007; Raghavan et al., 2006; Saunders & Heflinger, 2004a). However, children in state custody in this study were also older when they were first diagnosed with ODD, indicating that their behavioral problems had not been identified when they were younger.

The Role of Previous Service System Experience

Another factor found to be related to a diagnosis of ODD was previous mental health utilization. Those children who had some type of mental health treatment in the past year (with some other diagnosis) were 24% more likely to receive an ODD diagnosis than children with no previous treatment. In other words, ODD was often not the first diagnosis received and the child had received previous mental health services. Children "new" to the mental health system with no previous diagnosis were more likely to be given a different diagnosis (e.g., ADHD, depression). Regarding service system factors associated with the age at which they received the ODD diagnosis, the length of time enrolled in Medicaid system was statistically significant, although the coefficient was relatively close to zero.

Age at First Diagnosis

The diagnosis of ODD appears to be conceptualized in the literature for use in the diagnosis of younger children with psychiatric problems. Studies report different peak ages; the *DSM-*

IV-TR (APA, 2000) stated that ODD onset usually occurs before age eight, and rarely after the early teen years. Rapoport and Ismond (1996) put age limits on the low end of diagnosis, stating that ODD should not be diagnosed in children under age three, citing that oppositional and defiant behavior are both common and normal for this developmental group. In this study, however, the disorder prevalence peaked during the teen years (see Table 1). Many of the adolescents were being given the diagnoses of ODD for the first time in their teens. Because this study relies on diagnoses found in claims, it is not known whether ODD was, in fact, the correct diagnosis, and the co-occurrence of CD on 5% of the claims around the time of the first diagnosis may indicate problems with differential diagnosis.

Patterns of Service Use

That most services to children with ODD are delivered in an outpatient setting is not surprising (see Table 5). However, the claims data do not provide details on therapy approaches used, just the setting in which it took place. It is unknown whether evidence-based treatments were being implemented in the sessions. The increased use of family therapy during this time period corresponds with the demonstration of the effectiveness of some models of parent or family intervention in the literature (e.g., Bradley & Mandell, 2003; Sexton & Alexander, 2002). However, the proportion of ODD children who received any type of family-based therapy never exceeded 33% of those in outpatient treatment (or 21% of those with any ODD diagnosis), and the average number of sessions of family therapy each year remained at three.

The increase of medication use in those with ODD is also noteworthy. The access rate for medication management increased sevenfold during this 5-year period, and by FY2000 over 40% of all children with ODD treated in an outpatient setting were receiving medication. Two studies have demonstrated some effectiveness of medication on the symptoms of ODD with co-occurring ADHD (e.g., the NIMH Collaborative Multisite Multimodal Treatment Study of Children With Attention-Deficit/Hyperactivity Disorder (MTA) Study, MTA Cooperative Group, 1999a, 1999b; Newcorn, Spencer, Biederman, Milton, & Michelson,

2005). The high comorbidity of ODD with other disorders found in this study, specifically ADHD, may indicate which treatment options are best for those children and adolescents with more complicated combinations of difficulties, including multimodal treatment such as Multi-Systemic Treatment (Henggeler & Lee, 2003) or those from the MTA trials (MTA, 1999a, 1999b).

The overall patterns of service use to the ODD population were similar to changes in service use patterns for behavioral health services in general, between FY1996 and FY2000 (Saunders & Heflinger, 2003), where the use of family therapy, medication management, and case management increased and group therapy and day treatment declined. Also of note was the increasing rate of inpatient/residential care for this group of children, despite the paucity of studies documenting any effectiveness of this restrictive and expensive level of care. This treatment choice is surprising given that the trend overall for use of psychiatric hospitalization and residential treatment for children was dropping during this time frame immediately after the implementation of managed care in this state (Saunders & Heflinger, 2003, 2004a) and across the country (Burns, Teagle, Schwartz, Angold, & Holtzman, 1999; Dickey, Normand, Norton, Rupp, & Azeni, 2001; Hutchinson & Foster, 2002). The largest change in all service use patterns in this study appeared between FY1996 and FY1997 (see Table 5). During this time period, this state's Medicaid behavioral health services transferred from a fee-for-service system to a managed behavioral health contract (see Chang et al., 1998 and Saunders & Heflinger, 2003).

Study Limitations

There are several limitations to this study. First, it only includes children in Tennessee's Medicaid service system, which limits its generalizability beyond settings of publicly funded mental health services. Second, as noted earlier, there were several cases (5%) in which children were diagnosed with ODD and CD concurrently, which is an incorrect application of the *DSM-IV-TR* diagnostic criteria (APA, 2000). Similarly, we did not have access to the reliability and validity of the diagnostic procedures used to determine the mental

health diagnoses. A fourth limitation is the finding that many of the children had co-occurring psychiatric disorders and the treatment specified on the claim may have been primarily addressing the other disorder. Finally, this was a cross-sectional study, which limits our ability to make conclusions on the course of individual children's treatment over time.

Conclusions and Implications

This study documents that oppositional defiant disorder is an important mental health problem in children and adolescents. As the third most common mental health problem in this statewide sample of publicly funded children, it appears to be specifically noteworthy issue for public sector psychologists in clinical, administrative, policy, and research roles.

Clinically, recognition and resources need to be given to address the fact that most of these children with ODD have multiple-mental health problems, are older, and are more likely to be in state custody. All of these factors may make treatment more difficult. Also, the behavior problems associated with ODD often are long lasting. Lahey et al. (1995) found that conduct problems in early childhood often continue to develop into adolescence. In a longitudinal study of children with ODD by Cohen, Cohen, and Brook (1993), children continued to have ODD, as well as a high prevalence of CD after a period of 2.5 years. In addition, ODD is a "red flag" for future delinquency problems, as the presence of an externalizing disorder (e.g., ADHD, ODD, CD) was found to be a significant predictor for juvenile justice involvement (Cauffman, Scholle, Mulvey, & Kelleher, 2005). Rosenblatt, Rosenblatt, and Biggs (2000) studied 188 youth who had received mental health services, half had been recently arrested and half had no arrest record. They found that 33% of the recently arrested met criteria for ODD, while only 20% of youth with no arrest record met criteria.

In addition to addressing issues of appropriate treatment for children likely to become involved in multiple-service sectors, public sector psychologists, as well as pediatricians and other professionals who see these children in other settings and have the opportunity to enhance early identification and referral to treatment, need training in evidence-based treatment for

ODD and other frequently co-occurring disorders (Burns & Hoagwood, 2002). Administrators must deal with issues of service authorization and reimbursement patterns that match the treatment needs of these children. Moving from "science" to "service" has been a difficult and elusive enterprise in children's mental health services (Hoagwood, 2003; Huang, Hepburn, & Espiritu, 2003) and requires attention to clinical and administrative issues.

Public sector psychologists are also in a position to bridge across service sectors to address the multiple needs—and associated administrative and policy barriers—for these children and adolescents and their families. Problems surrounding identification and treatment of ODD and other behavioral disorders also should be recognized at the community level and in all related service systems, as well as at the policy level. Treatment of children with serious emotional and behavioral disorders in a system of care (Stroul & Friedman, 1996) has been shown to decrease later use of the juvenile justice system (Foster & Connor, 2005; Foster, Qaseem, & Connor, 2004). Active family involvement in the design and delivery of services is a cornerstone of the system-of-care philosophy, and studies of family based services have shown that family involvement and engagement is related to quality of care (Hoagwood, 2005). Many argue that authentic family participation and collaboration would improve all aspects of service delivery, including planning, implementation, and evaluation (e.g., McCammon, Spencer, & Friesen, 2001; Osher & Osher, 2002). The involvement of family members is thought to result in more relevant services, more impetus for change, and less feelings of blame and stigma for families. Funding for such systems of care, however, continues to be uneven, relying on federal grants and locally crafted braided funding instead of coordinated through and paid for by managed behavioral health care companies such as those administering Medicaid mental health services across the country. Few, if any, Medicaid programs or other insurers fund the full array of services associated with systems of care. Other barriers to care, such as provider barriers and family perceptions about the service system, must also be recognized and addressed (Brannan & Heflinger, 2006).

The issue of children's access to appropriate behavioral health care extends beyond children

with ODD and calls for policy intervention and advocacy (Friesen, Giliberti, Katz Leavy, Osher, & Pullmann, 2003; Heflinger & Dokecki, 1989) by public sector psychologists. Children without health insurance (Institute of Medicine, 2002), or those at risk of being disenrolled from existing public sector programs, are especially vulnerable (Davis, 2007). Medicaid is the largest insurer of children in the United States (Kaiser Commission on Medicaid and the Uninsured, 2006) and TennCare enrolled 43% of the state's children during FY2000, the last year of this study. Of those, almost one fourth were enrolled as uninsured/uninsurable (see Table 1), which equates to 11% of the state's children. This population of children are at risk of losing coverage under TennCare changes and an additional 8% were reported as having no health insurance (U. S. Census Bureau, 2000). This means that one in five of Tennessee's children are at risk of no access to health or behavioral health care, and this concern is present in every state and among parents, employers, health care providers, and government officials (Holahan & Cook, 2006). During 2007, the United States Congress is debating the mechanisms by which all children may have comprehensive health care coverage. One option developed by the Children's Defense Fund (CDF, 2007) is to extend the Medicaid program, and its wide range of benefits for children, to a greater proportion of the US population. As discussed above, Medicaid is not "the" solution (Fox, Limb, & McManus, 2007), but its benefit package is generally broader than most private insurance plans, it already covers a large proportion of children in the United States (Kaiser Commission on Medicaid and the Uninsured, 2006), and it includes provisions for "early and periodic screening, diagnosis, and treatment" (CMS, 2003; Kaiser Commission on Medicaid and the Uninsured, 2005).

Continuing to conduct or support research should also be a priority for public-sector psychologists. Clearly, there is much to be learned in many areas about ODD, and research continues to be needed in biological bases and pharmacotherapy, psychosocial and family interventions, and factors that influence the use of evidence-based practices. Clinical trials, in the past often limited to efficacy studies with children with uncomplicated single diagnosis profiles, must be expanded to include samples of children with

multiple problems that are more similar to those seen in local clinical practice (Weisz & Jensen, 1999). Caregiver strain (Brannan & Heflinger, 2001) among parents and grandparents who are caring for children with ODD must be better understood and more effective family support interventions developed, as strain has been demonstrated to influence both the types and amounts of service received. Services and implementation research should also be incorporated into work on evidence-based practice to better understand how to improve clinical practice in real-world communities with real children and families. This need has been recognized by the National Institute for Mental Health (NIMH) who provides funding for such efforts (e.g., NIMH 2007a, 2007b). In addition, policy changes, such as the impact of any changes to the Medicaid program across the states, will continue to need study. One strength of studies using Medicaid data is that they focus on the entire enrolled population of publicly funded children and, thus, can be used to examine and monitor patterns of service use over time. Empirical policy guidance could help determine methods to increase appropriate access to health and behavioral health care (Raghavan et al., 2006).

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