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hawk-i

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hawk-i evaluation

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Study of Children in *hawk-i* with a Diagnosis of Attention Deficit Hyperactivity Disorder

Introduction

This report presents the first in a series of studies designed to delve more deeply into subjects that are particularly pertinent to children enrolled in the Healthy and Well Kids in Iowa program (***hawk-i)***. These studies are being conducted by the University of Iowa Public Policy Center at the request of the Iowa Department of Human Services (IDHS). For this first study, the IDHS, in collaboration with the Clinical Advisory Committee for the ***hawk-i*** program, requested that a study of children with Attention Deficit Hyperactivity Disorder (ADHD) be the specific area of investigation due to the prevalence of this problem and to the general disagreement as to its diagnosis and treatment.

The ***hawk-i*** program is the separate portion of the Iowa State Child Health Insurance Program (SCHIP) that provides services to children in families with incomes between 133 and 200% of the Federal Poverty Level (FPL). The IDHS contracts with John Deere Health Plan, Iowa Health Solutions and Wellmark Blue Cross/Blue Shield to provide services to ***hawk-i*** enrollees on a county-by-county basis.

This study had three primary goals:

- To determine the prevalence of ADHD diagnosis in the ***hawk-i*** population by age and gender of the child
- To establish baseline demographic information regarding children with a diagnosis of ADHD
- To evaluate the utilization of behavioral and emotional health care services by children with ADHD

Prevalence of ADHD in hawk-i

In this report, the rates for children in ***hawk-i*** diagnosed with ADHD are reported four different ways.

1. Number and rate of children with an ADHD diagnosis (by diagnosis code).
2. Number and rate of children eligible for ***hawk-i*** for at least 11 months with an ADHD diagnosis.
3. Number and rate of children with an ADHD diagnosis per 1,000 member months.
4. Number of children reported to have “problems with attention” on the survey.

For the first three analyses, ***hawk-i*** program claims and encounter data were used to identify children and adolescents between the ages of three and eighteen enrolled in the ***hawk-i*** program

during calendar year 2001 as the study population. There were a total of 17,166 children enrolled for at least one month in 2001.

For the fourth analysis, data from the evaluation survey were used to evaluate changes in health status and access to care for children before and after joining the ***hawk-i*** program.

1) Number and rate of children with an ADHD diagnosis (by diagnosis code)

Of the 17,166 children enrolled for at least one month in 2001, 563 had at least one claim with a diagnosis of Attention Deficit Disorder (ICD-9 314.00), Attention Deficit with Hyperactivity Disorder (ICD-9 314.01), or Hyperkinetic Conduct Disorder (ICD-9 314.9). The majority of children with a diagnosis had Attention Deficit with Hyperactivity Disorder. Table 1 provides a listing of all children enrolled for at least one month in 2001 by age and the rate of ADHD within the ***hawk-i*** enrollees.

Table 1. Children and adolescents enrolled for at least one month by age and rate of ADHD, 2001

Age group	Number with ADHD	Total number	Percent with ADHD
3-6 years	49	4,751	1.0%
7-9 years	166	3,675	4.5%
10-12 years	185	3,492	5.3%
13-15 years	120	2,951	4.1%
16-18 years	43	2,297	1.9%
Total	563	17,166	3.3%

The rate of diagnosis of ADHD from the claims/encounter data was highest for children in the 10-12 age range, with about one in twenty children in this age group who were enrolled at any point in the year having received treatment for a diagnosis of ADHD.

2) Number and rate of children eligible for at least 11 months with an ADHD diagnosis

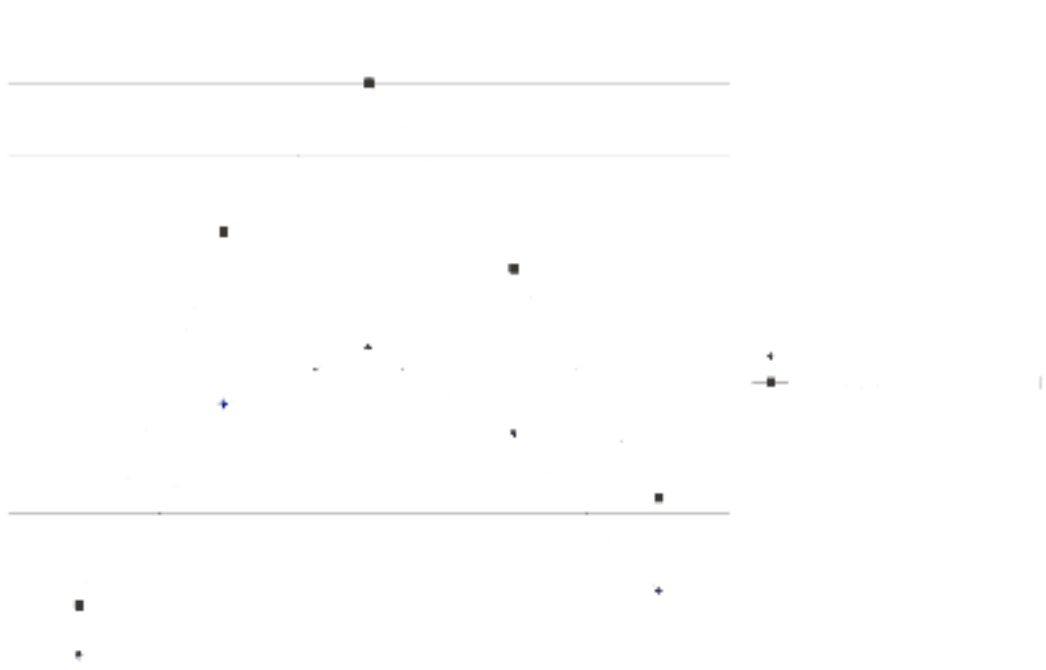
There were 4,947 children enrolled for at least 11 months in calendar year 2001. These children all had approximately the same amount of time in which to have received a diagnosis of ADHD. Table 2 provides a listing of these children by age and the rate of ADHD.

Table 2. Children and adolescents enrolled for at least 11 months by age and rate of ADHD, 2001

Age group	Number with ADHD	Total number	Percent with ADHD
3-6 years	21	1,230	1.7%
7-9 years	72	1,039	6.9%
10-12 years	93	1,033	9.0%
13-15 years	57	892	6.4%
16-18 years	24	753	3.2%
Total	267	4,947	5.4%

To better understand the influence of the denominator used to calculate the prevalence of ADHD in this population, Figure 1 shows the difference in rates of children diagnosed with ADHD for all those enrolled in ***hawk-i*** (for at least one month) compared to those enrolled for at least 11 months.

Figure 1. ADHD rates by age and enrollment period



The rate of ADHD is higher in the group of children who have been enrolled for at least 11 months. Both rates demonstrate similar patterns, however, with the highest rates being for children ages 10-12 years old. The difference between the rates may be a result of longer enrollment periods for children diagnosed with a condition, or it could be that children with shorter enrollments were not diagnosed early in their enrollment.

3) Number and rate of children with an ADHD diagnosis per 1,000 member months

Table 3 presents the number of children with ADHD per 1,000 member months. The denominator of 1,000 member months provides a standardized method for comparing populations with varying enrollment periods. Each member month is considered a unit of exposure for utilization or diagnosis. The rates across age groups are therefore standardized, and are not affected by the average child's or adolescent's length of enrollment.

Table 3. Rate of ADHD per 1,000 member months, 2001

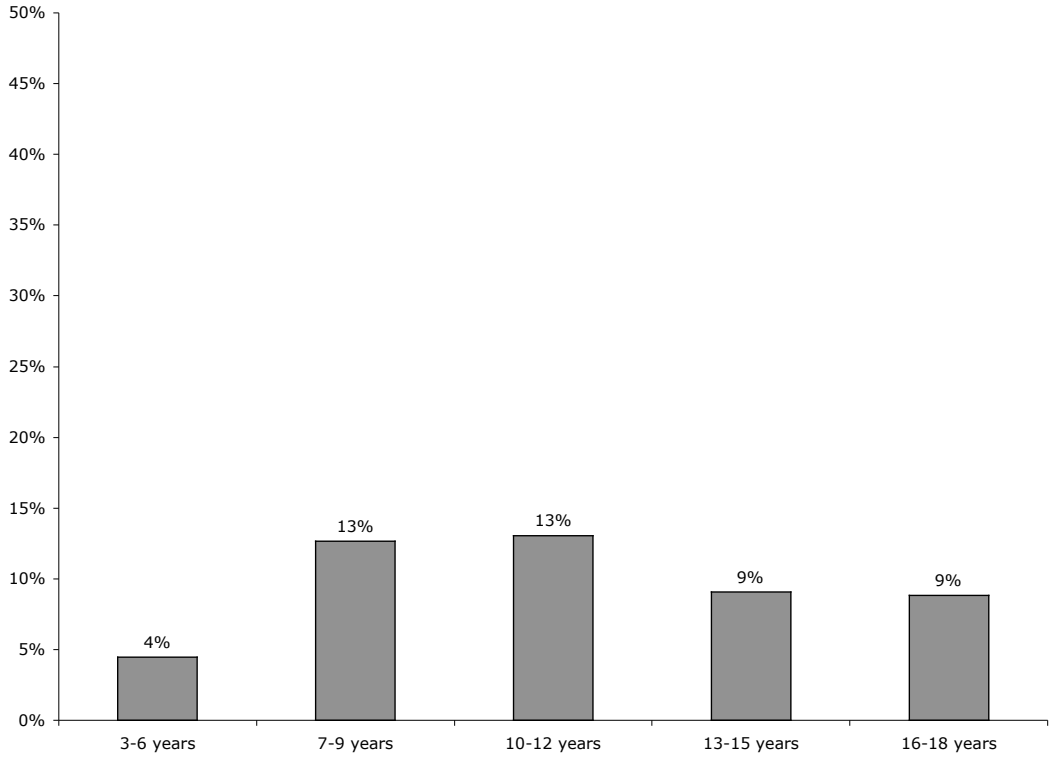
Age group	Number of member months	Number with ADHD	Number per 1,000 member months
3-6 years	33,253	49	1.47
7-9 years	26,529	166	6.26
10-12 years	25,540	185	7.24
13-15 years	21,868	120	5.49
16-18 years	17,580	43	2.45
Total	124,770	563	4.51

This calculation again highlights that ADHD is more prevalent in 10-12 year olds.

4) Number of children with "problems with attention" reported on the survey

Figure 2 shows the survey results for the number of children whom parents reported as having had "attention problems" for the previous three months. As with the encounter data, the highest rates were reported for children ages 10-12 (13%); however, the rate for children 7-9 was also 13%.

Figure 2. Percent of children with "attention problems" reported on the survey



Baseline demographic information regarding children with a diagnosis of ADHD

The rates of children who received a service with a diagnosis of ADHD were further evaluated to determine if differences exist by:

- Age and gender of the child
- Gender and race of the child

1) Prevalence by age and gender

Table 4 provides a breakdown of ADHD rates by age and gender. Boys are diagnosed with ADHD at a rate about 3 times that of girls; this pattern is consistent across all age groups.

Table 4. Rate of ADHD by age and gender for all enrollees, 2001

Age group	Gender	Number with ADHD	Total Number	Percent with ADHD
3-6 years	Female	8	2,309	0.3%
	Male	41	2,442	1.7%
7-9 years	Female	51	1,802	2.8%
	Male	115	1.873	6.1%
10-12 years	Female	39	1,717	2.3%
	Male	146	1,775	8.2%
13-15 years	Female	24	1,436	1.7%
	Male	96	1,515	6.3%
16-18 years	Female	9	1,167	0.8%
	Male	34	1,130	3.0%
Total	Female	131	8,431	1.6%
	Male	432	8,735	4.9%

2) Prevalence by gender and race

Table 5 provides a breakdown of ADHD rates by gender and race. Caucasian boys had the highest percentage diagnosed with ADHD (5.3%). African-American boys were the next highest group with a rate of 4.1%. While Hispanic boys had rates higher than girls, their rate was significantly lower than that of Caucasian or African-American boys.

Table 5. Rate of ADHD by race and gender for all enrollees, 2001

Race	Gender	Number with ADHD	Total Number	Percent with ADHD
Caucasian	Female	85	5,455	1.6%
	Male	296	5,602	5.3%
African-American	Female	2	90	2.2%
	Male	5	121	4.1%
Hispanic	Female	1	222	0.5%
	Male	3	228	1.3%
Native American*	Female	1	24	—
	Male	0	30	—
Asian*	Female	0	31	—
	Male	0	32	—
Other	Female	17	731	2.3%
	Male	34	778	4.4%

*There are too few children in this category to provide a reliable rate.

Utilization of behavioral and emotional health care services

Encounter data with a diagnosis of ADHD for calendar year 2001 was used to evaluate the utilization and site of care for children with ADHD. Each claim was coded to reflect whether a psychiatric evaluation or treatment had occurred, an office visit had taken place, or a hospital visit had been made. The codes used to identify a psychiatric visit are as follows:

90806 Individual psychotherapy, 45-50 min.

90862 Pharmacological management

90801 Psychiatric diagnostic interview

90805 Individual psychotherapy with medical evaluation and management

90804 Individual psychotherapy, 20-30 min.

Table 6 and Figure 3 provide data regarding the utilization rates for psychiatric, office, and hospital visits for children with an ADHD diagnosis.

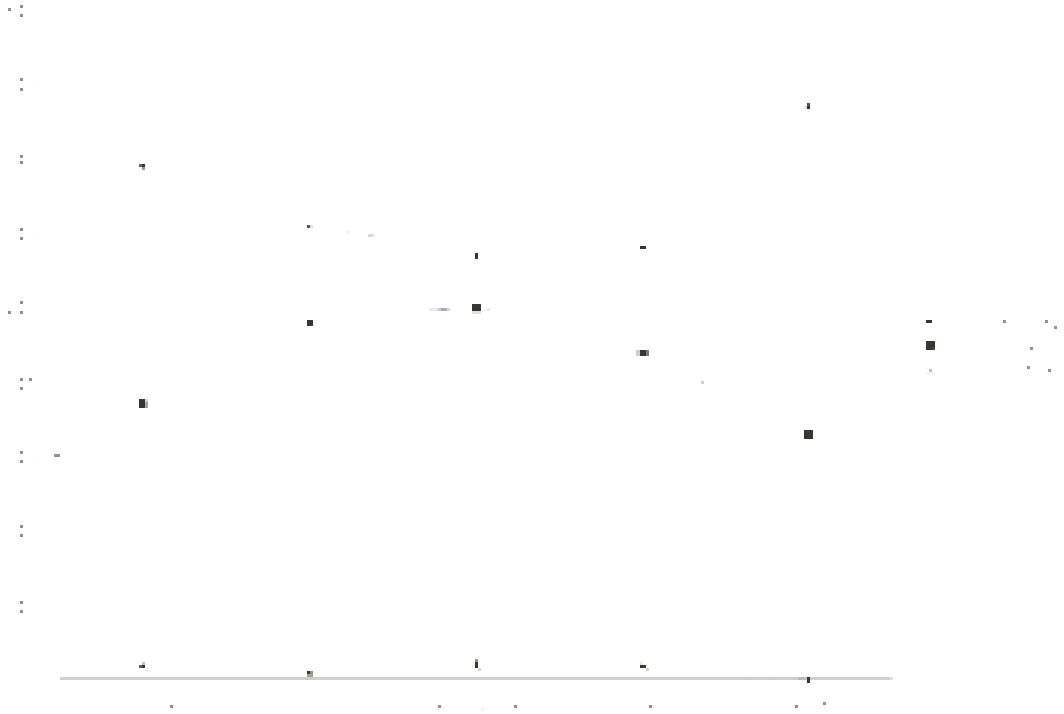
Table 6. Rates of utilization by type of visit and age, 2001

Age group	Psychiatric visit	Office visit	Hospital visit
3-6 years	34 (69%)	18 (37%)	1 (2%)
7-9 years	101 (61%)	79 (48%)	2 (1%)
10-12 years	106 (57%)	92 (50%)	4 (2%)
13-15 years	69 (58%)	53 (44%)	2 (2%)
16-18 years	33 (77%)	14 (33%)	0 (0%)
Total	343 (61%)	256 (46%)	9 (2%)

Approximately 60% of all children with an ADHD diagnosis had a visit coded as a psychiatric evaluation or treatment. Almost half (46%) had a physician office visit, while about two percent had a physician visit while in a hospital for ADHD.

The site of care did vary by age, with the youngest and oldest children being more likely to have a psychiatric office visit and less likely to have had a physician office visit.

Figure 3. Utilization rates by type of visit and age, 2001



The percentage of children overall who were seen for a psychiatric visit seems high, particularly with the low supply of pediatric psychiatrists and psychologists in many parts of Iowa. These rates, however, may reflect the use of psychiatric social workers or psychiatric nurse practitioner or physician assistant. The encounter data does not allow for the determination of provider specialty. With further investigation and the cooperation of the plans, however, we may be able to identify the providers by the provider identifier and thereby code the specialty.

Other behavioral and emotional health issues from the survey

Within the survey, parents could list "attention problems," "behavioral or emotional problems," and "depression" as mental health diagnoses. Of the 158 children and adolescents who were described as having "attention problems," 34 (17%) were also reported to have behavioral or emotional problems and depression, 62 (31%) were also reported to have behavioral or emotional problems, and 8 (3%) were also reported to have depression. These results indicate that at least half of the children reported as having attention problems may have additional mental health problems as evaluated by their parents.

Comparison of the information regarding ADHD from the encounter data and the surveys

Overall, the percent of children with "attention problems" indicated on the survey is higher than the percent with ADHD in the claims data for all age groups. It is difficult to determine why this is so. It is possible that parents are likely to report attention problems before children are diagnosed, or it may be that parents with children who have attention problems or are health care utilizers were more likely to complete the survey.

To compare the two sources of data directly, results were gathered for those for whom we had both a survey and encounter data—a total of 2,149 individuals. Results from the survey data were then compared to the encounter data. Of the 2,149 cases, 62 had a diagnosis of ADHD in the encounter data and 200 were reported to have attention problems on the survey. Table 7 provides a summary of the comparison indicating the agreement rates between the survey and encounter data.

Table 7. Survey and encounter data rate of agreement

	Problems with attention reported on survey	**No problems with attention reported on survey**	**Total**
ADHD diagnosis on encounter	43 (72%)[a]	17 (28%)[b]	60 (100%)
No ADHD diagnosis on encounter	157 (7%)[c]	1,930 (93%)[d]	2,087 (100%)

Cells a and d in Table 7 indicate agreement between the survey and the encounter data. Ninety-three percent (n=1,930) of the time when there was no ADHD diagnosis in the encounter data parents also did not report any attention problems, while 72% (n=43) of the time when there was an ADHD diagnosis in the encounter data parents did report attention problems. Cells b and c indicate areas of disagreement between the two data sources. Almost 30% of children (n=17) with an ADHD

diagnosis in the encounter data were not reported as having attention problems by their parents, while 7% of children (n=157) without an ADHD diagnosis in the encounter files were reported as having attention problems.

ADHD diagnosis is still a rare occurrence, despite the fact that it occurs in up to 15% of the population. It is not difficult to imagine that parents may report attention problems prior to actually seeking medical intervention. It could also be that parents are reluctant to label their children as having attention problems There are also issues regarding differences in how the survey question was asked and how an encounter is coded that could have produced differences. For example, the survey question specifically asked if the child currently had a problem that had lasted at least the past 3 months. Some parents may not have indicated that the child had a problem currently because their symptoms were being controlled by an intervention. Another hypothesis is that the timing of the survey resulted in parents being asked about attention problems before children were actually diagnosed. This is unlikely since the encounters for ADHD were within the year prior to the survey for over 97% of the encounters. Regardless, it is important to know that differences in prevalence rates can occur when using encounter data and survey data.

Children with ADHD identified through filled prescriptions

Presentation of the above results to the Clinical Advisory Committee led members and researchers to question whether there were children within the population who were prescribed medications for ADHD but had not had an encounter within the year with a diagnosis code of ADHD. Children with at least one filled prescription for an ADHD-specific medication (see list below) were considered as having ADHD. Of 652 children with a filled prescription for an ADHD medication, 331 also had an encounter with ADHD as the diagnosis. Nearly half (321) did not have an encounter with ADHD as the diagnosis. Additionally, 40% of children with an encounter listing ADHD as the diagnosis did not have a filled prescription for an ADHD medication. When both diagnosis code and filled prescription are used to find children with ADHD, the number of children with ADHD increases from 563 to 884 (see Table 8).

The ADHD-specific medications included in our analysis were

- Adderall
- Cylert
- Dexedrine
- Methylphenidate hydrochloride
- Pemoline
- Ritalin
- Strattera

Table 8. Children and adolescents enrolled for at least one month by age and rate of ADHD, 2001 (includes children identified by filled prescription)

Age group	Number with ADHD	Total number	Percent with ADHD
3-6 years	73	4,751	1.5%
7-9 years	249	3,675	6.8%
10-12 years	295	3,491	8.5%
13-15 years	199	2,948	6.8%
16-18 years	68	2,296	3.0%
Total	884	17,161	5.2%

The addition of children with a filled prescription for an ADHD-specific medication increases the percentage of children with ADHD by about one-third across all age groups. Table 9 indicates the age and rate of ADHD for children who were eligible for at least 11 months. The rate of ADHD is greater in this table than in Table 2 due to the addition of children with a filled prescription for an ADHD-specific medication. Rates in Table 9 more closely resemble national rates for ADHD by age.

Table 9. Children and adolescents eligible for at least 11 months by age and rate of ADHD, 2001 (includes children identified by filled prescription)

Age group	Number with ADHD	Total number	Percent with ADHD
3-6 years	27	1,230	2.2%
7-9 years	97	1,039	9.3%
10-12 years	126	1,033	12.2%
13-15 years	87	892	9.8%
16-18 years	31	752	4.1%
Total	368	4,946	7.4%

Table 10 provides information on ADHD rates by age and gender. Though the rate of ADHD increases for all age and gender groups, the pattern remains the same: boys are identified as having ADHD three times as often as girls.

Table 10. Rate of ADHD by age and gender for all enrollees, 2001 (includes children identified by filled prescription)

Age group	Gender	Number with ADHD	Total Number	Percent with ADHD
3-6 years	Female	11	2,309	0.5%
	Male	62	2,442	2.5%
7-9 years	Female	72	1,802	4.0%
	Male	177	1.873	9.5%
10-12 years	Female	71	1,717	4.1%
	Male	224	1,774	12.6%
13-15 years	Female	50	1,435	3.5%
	Male	149	1,513	9.8%
16-18 years	Female	16	1,166	1.4%
	Male	52	1,130	4.6%
Total	Female	220	8,429	2.6%
	Male	664	8,732	7.6%

Conclusion

In summary, ADHD prevalence within the ***hawk-i*** population is similar to that found nationally when both diagnosis code and filled prescription are used to determine whether a child or adolescent has ADHD. Additionally, children and adolescents within ***hawk-i*** diagnosed with ADHD are likely to have seen a psychiatric provider despite state shortages in pediatric psychiatry and psychology. Finally, determining ADHD prevalence using claims/encounter data may result in different estimates than those found using parental reports from a survey. Both estimates may be useful for identifying children with ADHD or at risk of being diagnosed with ADHD, but they are indeed different.

hawk-i
Attention Deficit Hyperactivity Disorder and Children

This report presents the results of a special project of the ***hawk-i*** program. Enrollment and health care encounter data for calendar year 2001were used to determine the prevalence of ADHD diagnosis in the ***hawk-i*** population by age and gender of the child, to establish baseline demographic information regarding children with a diagnosis of ADHD, and to evaluate the utilization of behavioral and emotional health care services by children with ADHD.

This research effort was sponsored by the Iowa Department of Human Services at the direction of the ***hawk-i*** Board of Directors and the Iowa Legislature. Data for the analyses were provided by MAXIMUS, the fiscal intermediary during calendar year 2001. Data analysis and production of this report were completed by researchers at the University of Iowa Public Policy Center.

None of the results express any opinions of the Iowa Department of Human Services, the ***hawk-i*** program, the participating health plans, or the University of Iowa. This project was not sponsored or conducted by the individual health plans providing services to ***hawk-i*** enrollees. The conclusions are the independent products of university research and do not necessarily reflect the views of the funding agency.