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Drug Use Evaluation: Antipsychotic Use in Children – 2022 Update

Plain Language Summary:

- Children younger than 18 years can have serious behavior issues related to mental health conditions. Doctors can prescribe medicines called antipsychotics to help manage conditions like bipolar disorder, psychosis, depression, autism, and disruptive behavior.
- Antipsychotic medicines can have a lot of side effects. Many can result in weight gain, movement problems, and changes in hormones. Risk for side effects tend to increase with higher doses and longer length of therapy. Providers should regularly monitor for these side effects, and limit treatment to the shortest duration and lowest dose needed to improve symptoms. Because of these side effects, it is widely recommended that children try other behavioral therapy before taking an antipsychotic medicine to help with symptoms.
- We checked to see how antipsychotic medicine are used in children ages 6-17 years on the Oregon Health Plan (OHP). We found that:
    - Less than 1% of children enrolled in the OHP are prescribed an antipsychotic each month.
    - About 59% of children prescribed an antipsychotic medicine were on them for more than 5 months.
    - About 36% of children on an antipsychotic medicine did not have a condition that has been shown to be treatable with an antipsychotic medicine.
    - Only 57% of children had blood sugar tests, which is recommended for anyone on an antipsychotic medicine.
    - About 79% of children had at least one visit to a behavioral therapist, which is recommended for all children on an antipsychotic medicine.

Research Questions:

- What proportion of Medicaid members aged 6-17 years are prescribed an antipsychotic medication?
- What diagnoses are present in medical claims of members aged 6-17 years that are likely indications for the prescribed antipsychotic medication?
- What proportion of members aged 6-17 years prescribed an antipsychotic have glucose monitoring?
- What proportion of members 6-17 years of age who were prescribed an antipsychotic have claims for psychotherapy?
- How does antipsychotic use, metabolic monitoring, or use of psychotherapy differ in members aged 6-17 years based on member characteristics (member location, age, diagnoses, enrollment in a coordinated care organization [CCO] or prior antipsychotic use), prescriber characteristics (taxonomy), or drug characteristics (drug and duration of therapy)?

Conclusions:

- In 2023, about 0.6% of Medicaid members who were 6 to 17 years of age, were prescribed an antipsychotic each month. **Figure 1** shows a decreasing trend in antipsychotic use for Medicaid members since the start of the COVID pandemic. About 59% of members with claims for an antipsychotic were prescribed long-term therapy for more than 5 out of 6 months.
- Only 50% of members 6-17 years of age had a diagnosis that matched an indication approved by the Food and Drug Administration (FDA) in the 6 months before the first antipsychotic claim (defined as the index event [IE]). The most common FDA-approved diagnoses included autism (25%), major depression (18%), and bipolar disorder (10%). About 14% of members had a compendia-supported diagnosis, and 36% of members did not have a

diagnosis that supports use of an antipsychotic medication. Other common mental health diagnoses included attention deficit hyperactivity disorder (ADHD; 19%), reaction to severe stress and adjustment disorders (15%) and generalized anxiety disorder (10%).

- In members 6 to 17 years of age who were prescribed an antipsychotic, only 57% had glucose monitoring in the 6 months before or after the IE. Various patient, therapy, and prescriber characteristics appeared to influence metabolic monitoring. Compared to the general population, the following groups had lower rates of glucose monitoring:
    - Members with younger age
    - Members living in Oregon's frontier counties
    - Members identifying as male
    - Members who are not in foster care
    - Members with a diagnosis of a developmental disorder
    - Members with shorter durations of therapy (e.g., 1 month vs. ≥5 months)
    - Members with prescriptions from a non-psychiatrist
- The majority of members with claims for an antipsychotic had at least one visit for psychotherapy (78.5%) in the 6 months before or after the antipsychotic claim. For members with psychotherapy visits, the median number of visits was 20 visits (interquartile range 8 to 39) over a 12 month period. Use of psychotherapy was generally consistent across member groups. The following groups had a lower proportion of members with claims for psychotherapy:
    - Members identifying as Asian or Pacific Islander
    - Members enrolled in fee-for-service (FFS) at the time of the IE
    - Members with a diagnosis of a developmental disorder
    - Members with prescriptions written by a general practitioner

Recommendations:

- No policy changes recommended for members over 6 years of age.

Background

Few antipsychotics have been studied in young children, and efficacy and safety has not been established for any antipsychotic in young children less than 5 years of age. Indications with the most evidence of effectiveness in children include use for irritability associated with autistic disorder (including symptoms of aggression towards others, deliberate self-injuriousness, temper tantrums, and quickly changing moods). Both risperidone and aripiprazole have an indication for irritability associated with autism for patients at least 5 and 6 years of age, respectively.[1,2] Other antipsychotics have approval for bipolar disorder and schizophrenia in adolescents, but none of them are approved in children under 10 years of age. Current guidelines recommend non-pharmacological therapy as first-line therapy for children prior to prescription of an antipsychotic.[3-5] Antipsychotics can be associated with significant risk of long-term adverse events. Because antipsychotics increase the risk of metabolic syndrome, laboratory monitoring is recommended before starting treatment and routinely during long-term therapy. In Medicaid, several national quality metrics aim to improve use of psychotropic medications in children. The 2023 core set of children's health care quality measures includes metabolic monitoring and use of first-line psychosocial care in children and adolescents taking antipsychotics.[6]

The Pharmacy and Therapeutics committee has previously reviewed evidence for antipsychotics and has recommended several initiatives with the goal of improving appropriate use of antipsychotics in children and adolescents. When compared to placebo, there was evidence that the following therapies have some benefit in children and adolescents:[7]

- Antipsychotics for symptoms of mania in children and adolescents with bipolar disorder in short-term studies (<4 weeks).

- Antipsychotics for symptomatic and functional improvement in children and adolescents with schizophrenia and first-episode psychosis.
- Risperidone and aripiprazole for behavioral symptoms in children and adolescents with irritability associated with autism spectrum disorder.
- Aripiprazole, quetiapine and risperidone for symptomatic and functional improvement in children and adolescents with disruptive behavior disorder.

There is a lack of evidence evaluating whether antipsychotics improve progress in school for any diagnosis or decrease hospitalization or need for acute symptomatic treatment for autism spectrum disorder and disruptive behavior disorders.[7] The utility of antipsychotics is limited by common adverse events including weight gain, metabolic changes, changes in prolactin levels, akathisia, and extrapyramidal symptoms.

Drug compendia also reference several off-label conditions in which antipsychotics have been studied. In this analysis, compendial diagnoses were based on off-label conditions with evidence of efficacy in Micromedex®. Off-label conditions included quetiapine for adults with generalized anxiety disorder, risperidone for people with intellectual disability, aripiprazole for pediatric patients with anorexia nervosa and adults with personality disorder.[8-10] Olanzapine is also recommended as an antiemetic for people with chemotherapy-induced nausea and vomiting. Evidence for off-label intellectual disability, anorexia, and personality disorder was generally based on small trials of short durations.[9,10]

- Quetiapine has been studied in multiple RCTs for adults with generalized anxiety disorder (GAD).[8] There is moderate quality evidence that extended-release (ER) quetiapine improves anxiety symptoms, improves function and induces remission of GAD, as evidenced by statistically significant improvement in Hamilton Anxiety Scale (HAM-A).[8] However, quetiapine is not well tolerated in people with generalized anxiety disorder (GAD), and was associated with more treatment discontinuations due to adverse events compared to placebo.[8]
- Two placebo-controlled RCTs evaluated risperidone in people with intellectual disability over 4-6 weeks.[9] Intellectual disability was defined as borderline intellectual functioning or mild to moderate mental retardation. All trials included people with other comorbid diagnoses such as conduct disorder, oppositional defiant disorder, or disruptive behavior disorder.[9] The average age of children enrolled in these trials was 8-10 years.[9] Compared to placebo, risperidone improved aberrant behavior in adults and severe behavior problems in children.[9] Post-hoc analyses of 2 additional 6-week placebo-controlled studies also identified reduced aggression scores with use of risperidone compared to placebo.[9]
- A small retrospective chart review (n=22) evaluated aripiprazole in adolescents with anorexia nervosa.[10] Participants prescribed aripiprazole had improvement in BMI compared to members not prescribed aripiprazole (BMI percentile on discharge of 36.4% with aripiprazole vs. 28.6% with non-aripiprazole). Mean age of participants in the study was 15 years. [10] Patients in this study were enrolled in an inpatient or partial hospital program, and 2020 from the Canadian practice guidelines recommend use only with consultation from a provider with knowledge aripiprazole only after consultation with an specialist with expertise in the treatment of eating disorders. [10]
- A small 8-week RCT (n=52) evaluated aripiprazole compared to placebo in adults with borderline personality disorder. [10] Patients treated with aripiprazole had a reduction in symptoms compared to placebo. [10] Symptoms were evaluated using a variety of scales and included assessment of anger, impulsivity, and dysregulation. [10]

The Oregon Mental Health Clinical Advisory Group (MHCAG) has published documents related to use of antipsychotics as a first-line treatment option in people with bipolar disorder or schizophrenia and as augmentation in people with major depressive disorder or generalized anxiety who fail to have benefit with alternative therapies. The MHCAG recommends consultation with the Oregon Psychiatric Access Line for several groups of people, including children and young adults and people with co-occurring anxiety disorder, ADHD, or substance use disorder. Bipolar disorder is difficult to accurately diagnose in children and young adults because of a broad differential for symptoms and high rates of comorbid conditions.[11] Because children and adolescents are also more prone to metabolic side effects of medications, MHCAG recommends confirmation of the diagnosis before initiation of medications, use of the lowest effective medication dose, periodic re-assessment to evaluate for dose reductions when appropriate, and frequent monitoring for emergent side effects.[11] MHCAG has also recommended a monitoring schedule for people prescribed second-generation antipsychotic medications, which includes laboratory monitoring for glucose and lipids.[12] Other

routine assessments for adverse effects include evaluations for weight, waist circumference, blood pressure, movement disorders, sexual dysfunction, and treatment adherence.[12]

Ongoing programs for youth that include review of antipsychotics are outlined in **Table 1**. Programs include provider outreach for consultation through the Oregon Psychiatric Access Line (OPAL-K) for children less than 10 years of age prescribed long-term antipsychotics when there is lack of glucose monitoring, non-pharmacologic therapy or FDA-indicated diagnoses identified in claims. Other programs include patient profile review and educational provider letters for youth prescribed multiple mental health drugs or with mental health drug claims from multiple providers. There are also ongoing programs to assist the Department of Human Services and Oregon Youth Authority to provide oversight of mental health drugs prescribed for youth in foster care or in the criminal legal system.

Table 1. Current retrospective and prospective initiatives that aim to improve antipsychotic prescribing in children and adolescents enrolled in the Oregon Health Plan (OHP).

Current programs that include evaluation of antipsychotics	Implementation	Population	Intervention
Foster Care	2010	Members less than 18 years of age in foster care with recent claims for a mental health drug	Review by the Department of Human Services (DHS) is required before starting a new mental health medication. A yearly review is performed by DHS for each member with provider consultation through OPAL-K if needed.
Oregon Youth Authority (OYA)	2018	Members less than 18 years of age in the criminal justice system with recent claims for a metal health drug	Profiles generated every 6 months and sent to OYA for review.
OPAL-K Referrals	2019	Age < 10 years with new start antipsychotic use >6 months and other risk factors (e.g., lack of diagnoses, glucose monitoring, or psychotherapy)	Retrospective provider letter Phone outreach by OPAL-K to provider for optional consultation
Mental Health High-risk Groups	2021	Age <18 years and > 4 mental health drugs for >90 days Age <18 years and > 3 prescribers for mental health drugs Age < 5 years with a mental health drug Any age with combination antipsychotic + stimulant Any age with combination antipsychotics from ≥2 prescribers	Profile review and retrospective provider fax
Antipsychotics in Children <= 5 years of age	2022	Age ≤ 5 years of age with a recent antipsychotic	Retrospective provider fax Prior authorization required after 30 days

The goal of this drug use evaluation is to assess prescribing patterns for antipsychotics in children and adolescents older than 5 and younger than 18 years of age, to evaluate factors that are associated with metabolic monitoring and psychotherapy, and identify opportunities to improve and coordinate care for these members.

Methods:

Members who were 6 to 17 years of age were identified for inclusion in the study based on paid FFS claims for an antipsychotic (defined based on PDL class). The evaluation window for claims was from 10/1/2021 to 09/30/2022 and the first claim in the evaluation window was designated as the IE. For each member the following periods were designated as the baseline and follow-up periods:

- Baseline period: 6 months prior to the IE
- Follow-up period: 6 months following the IE

Inclusion criteria:

- At least one paid FFS claim for an antipsychotic during the evaluation window; AND
- Member aged 6 to 17 years (inclusive) at the time of the IE.

Exclusion criteria:

- Primary insurance coverage (i.e., third party liability [TPL]) at any time during the baseline or follow-up periods;
- Non-continuous Medicaid eligibility during the baseline or follow-up periods; AND
- Patients with Medicare Part D coverage or limited or no Medicaid drug benefit at any time during the baseline or follow-up periods. Claims data for these patients may be incomplete. Patients were identified based on the following benefit packages:

Category	Benefit Package	Description
Medicare Part D coverage	BMM BMD MED	Qualified Medicare Beneficiary + Oregon Health Plan with Limited Drug Oregon Health Plan with Limited Drug Qualified Medicare Beneficiary
Limited or no Medicaid drug benefit	MND CWM SMF SMB	Transplant package Citizenship Waived Emergency Medical Special Low-Income Medicare Beneficiary Only Special Low-Income Medicare Beneficiary Only

Population descriptors included:

1. Patient characteristics, including:
    a. Demographics evaluated at the time of IE (age, race, CCO enrollment).
    b. Residential area based on member zip code and categorized into rural, urban, or frontier groups based on criteria in **Appendix 1.**[13] Members without an Oregon zip code were categorized as unknown.
    c. Current foster care enrollment or Oregon Youth Authority enrollment.
2. Provider characteristics based on primary prescriber taxonomy for the IE.
3. Drug characteristics, including:
    a. Molecular entity prescribed at the time of the IE.
    b. Duration of therapy for all antipsychotics based on days covered in the 6 months following the IE.
    c. Prior prescription of antipsychotics in the baseline period.

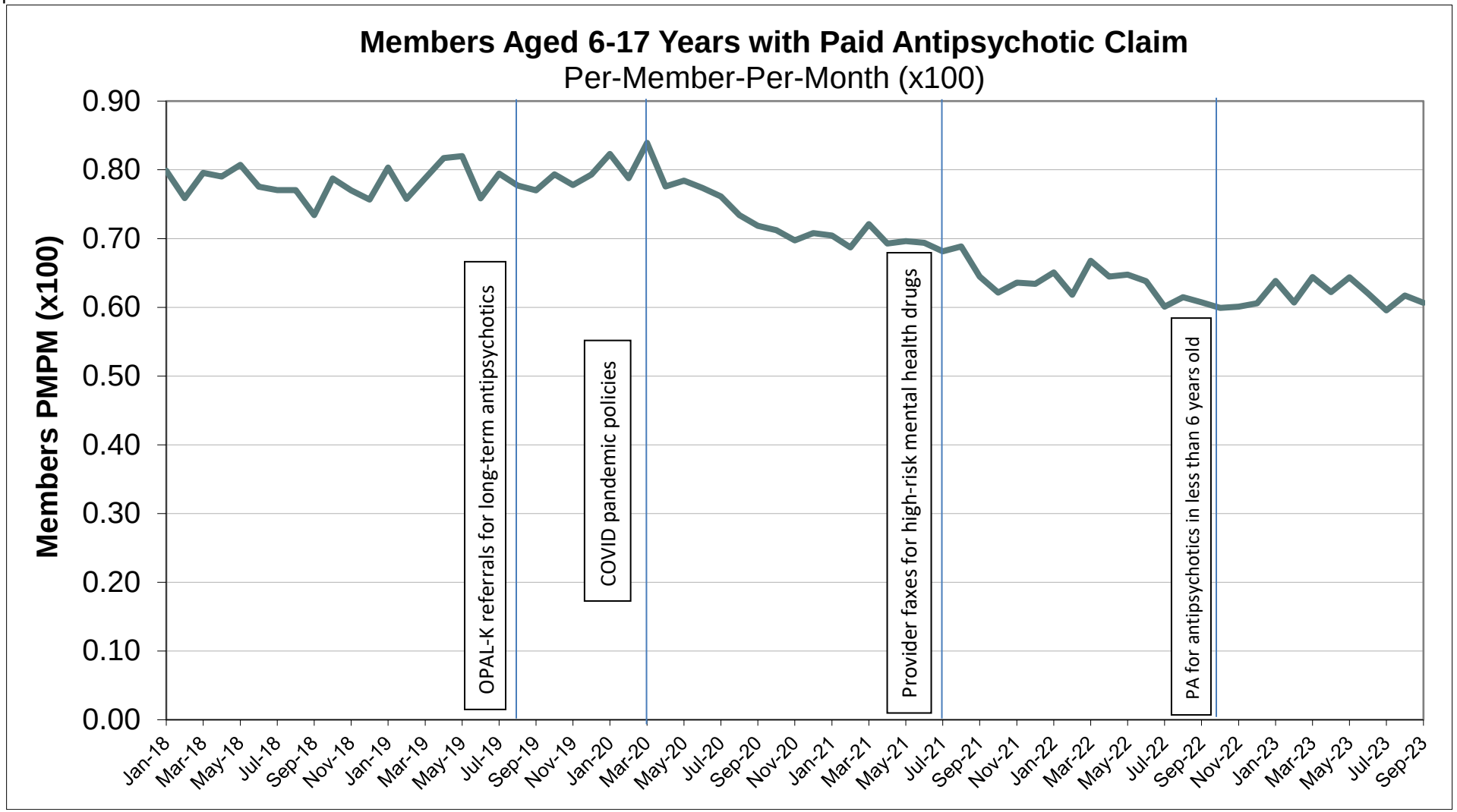
Outcomes evaluated in this analysis included:

1. Proportion of members with claims for metabolic monitoring in the baseline or follow-up period (see **Appendix 1** for medical codes)
2. Proportion of members with claims for psychotherapy in the baseline or follow-up period (see **Appendix 1** for medical codes)
3. Proportion of members with claims for an FDA-approved diagnosis in the baseline period (see **Appendix 1** for ICD-10 codes)

Results:

The proportion of Medicaid members ages 6-17 years of age with paid claims for an antipsychotic has decreased slightly over time. **Figure 1** shows the proportion of members with a paid claim for an antipsychotic compared to total members enrolled in Medicaid who were 6-17 years of age. About 0.6% of members 6-17 years of age had a paid claim for an antipsychotic each month, which is lower than the 0.7% to 0.8% per month rate in 2018. During the coronavirus pandemic, which began in early 2020, eligibility determinations for members on Medicaid were suspended, resulting in an increased number of members enrolled with Medicaid. The number of enrolled members 6 to 17 years of age increased from 268,689 members in March 2020 to 326,997 members in September 2023. The total number of members 6 to 17 years of age prescribed an antipsychotic was 2,255 in March 2020 and 1,983 in September 2023.

Figure 1. Members aged 6-17 years prescribed an antipsychotic per month from 2018 to present. Vertical lines represent implementation dates for various policies.



Numerator: enrolled Medicaid members 6-17 years old with a paid antipsychotic claim. Denominator: enrolled Medicaid members who are 6-17 years old.

Table 2 describes how exclusion criteria affected the population of members eligible for this study. Of members with a paid claim for an antipsychotic during the 1-year evaluation window, 3760 members were 6 to 17 years of age at the time of their first claim. About 20% of these members were excluded because they had other insurance, Medicare, a limited drug benefit, or did not have continuous enrollment during the study period which may make their claims data incomplete. Ultimately, 3,009 members who had a claim for an antipsychotic and were 6 to 17 years of age were included in this analysis.

Table 2. Number of members included in this analysis

	Medicaid Members	
Members with claims for an antipsychotic in the evaluation window	41,254	
After exclusion of members ≤5 or ≥18 years of age at the time of the IE	3,760	100.0%
After exclusion of members with TPL, Medicare, or limited drug benefit	3,219	85.6%
After exclusion of continuous eligibility in baseline/follow-up period	**3,009**	**80.0%**

Demographic information for members with prescriptions for an antipsychotic are outlined in **Table 3**. Most members were over 10 years of age (86%), and the majority were enrolled in a CCO (97%). Approximately 57% of included members identified as male and 54% identified as white. About half of members with claims for an antipsychotic lived in an urban area, and 40% lived in a rural area. Location was classified based on zip code and categorized according to definitions provided by the Oregon Office of Rural Health. Rural areas were defined as locations that were 10 or more miles from a population center of 40,000 people or more. About 4% of members with claims for an antipsychotic were living in a frontier county. Frontier areas were defined as any county with six or fewer people per square mile. Frontier counties include Baker, Gilliam, Grant, Harney, Lake, Malheur, Morrow, Sherman, Wallowa, and Wheeler counties.

Information regarding enrollment in foster care or supervision under the Oregon Youth Authority is only available at a single point in time, and could not be tracked over the course of the evaluation window. However, as of October 2023, about 8% of included members with claims for an antipsychotic were also engaged in foster care or had oversight from the Oregon Youth Authority.

Therapy characteristics are described in **Table 4**. Second-generation oral antipsychotics were prescribed for most patients (98%), and the most commonly prescribed drugs included aripiprazole (40%), risperidone 27%), quetiapine (12%), and olanzapine (10%). Of members included in this analysis, 62% had claims for an antipsychotic in the prior 6 months. Most members (59%) were prescribed long-term antipsychotic therapy and had over 151 days covered by an antipsychotic in the 6-month follow-up period (at least 5 out of 6 months with antipsychotic claims).

Table 3. Baseline demographics at the time of the index event (IE)

	Members with a paid antipsychotic claim	
	3,009	%
Age		
6-9	432	14.4%
10-13	957	31.8%
14-17	1,620	53.8%
Sex		
Female	1,302	43.3%

Male	1,707	56.7%
Race		
White	1,615	53.7%
Unknown	821	27.3%
Native American	262	8.7%
Hispanic	175	5.8%
Black	99	3.3%
Asian or Pacific Islander	37	1.2%
Managed Care Enrollment (as of IE)		
FFS	98	3.3%
CCO	2,911	96.7%
Member Location		
Urban	1,653	54.9%
Rural	1,199	39.8%
Frontier	108	3.6%
Unknown	49	1.6%
Foster Care Enrollment (as of October 2023)	235	7.8%
Oregon Youth Authority (as of October 2023)	14	0.5%

Table 4. Drug Therapy Characteristics

	Members with a paid antipsychotic claim	
	3,009	%
PDL Class on IE		
First-gen	48	1.6%
Second-gen	2,946	97.9%
Parenteral	15	0.5%
Days covered in follow-up period		
<=30	296	9.8%
31-90	412	13.7%
91-150	521	17.3%
>151	1,780	59.2%

Antipsychotic claims in baseline		
New start (no claims)	1,137	37.8%
Prior claim(s)	1,872	62.2%

Top 10 most common IE drugs (by HSN)		
aripiprazole	1,189	39.5%
risperidone	819	27.2%
quetiapine fumarate	345	11.5%
olanzapine	311	10.3%
lurasidone HCl	134	4.5%
ziprasidone HCl	67	2.2%
paliperidone	39	1.3%
chlorpromazine HCl	26	0.9%
cariprazine HCl	19	0.6%
haloperidol	13	0.4%

Table 5 described diagnoses present in medical claims for children and adolescents prescribed antipsychotics. Groups for FDA-approved indications, compendia-supported diagnoses, or no diagnosis are mutually exclusive; if a member has an FDA-approved diagnosis, then they are excluded from the following categories for compendia supported diagnoses. However, members with multiple diagnoses may be counted in more than one group within each of these categories. Only 50% of members with a claim for an antipsychotic had a FDA-approved diagnosis identified in medical claims in the 6 months before the IE. The most common diagnoses included autism (25%), major depression (18%), and bipolar disorder (10%). Diagnoses for schizophrenia (2%), tic disorders (4%) and schizoaffective disorder (1%) were less common. **Table 4** identifies drugs with evidence supporting use for these indications and the proportion of members prescribed one of these agents. For members with a diagnosis of autism, the drugs FDA-approved for autism spectrum disorder (risperidone and aripiprazole) were the most commonly prescribed agents. Risperidone, aripiprazole, However, only 38% of members with tic disorder were prescribed aripiprazole or haloperidone which have FDA indications for tic disorders. Of the 37 members with a diagnosis of schizoaffective disorder, only 5% (n=2) were prescribed paliperidone which is the only antipsychotic with an FDA-approval for this indication.

Risperidone, aripiprazole and quetiapine have off-label, compendia-supported diagnoses for various indications including intellectual and developmental disorders, eating disorders, personality disorders and generalized anxiety disorder (**Table 4**). About 14% of members without an FDA-approved diagnosis had an off-label, compendia-supported diagnoses in the 6 months before the IE. However, in people with generalized anxiety disorder, quetiapine was prescribed for only 39 of 293 members (13%). For 87% of people with a diagnosis of generalized anxiety disorder, a different antipsychotic was prescribed. Risperidone has been studied off-label for people with intellectual disabilities, but of the 88 members with this diagnosis, only 25 (28%) were prescribed risperidone. This may indicate that other antipsychotics are being used off-label for anxiety or intellectual disabilities or may indicate a lack of accurate diagnostic data based on medical claims.

For 36% of members with claims for an antipsychotic, there was no FDA-approved or evidence-supported diagnoses in medical claims in the 6 months before the IE. The most common mental health diagnoses for members with antipsychotic claims included ADHD (19%), reactions to severe stress and adjustment disorders (15%), other anxiety disorders (7%), and conduct disorders (7%).

Table 5. Diagnoses for members with claims for an antipsychotic.

	Members with a paid antipsychotic claim	
	3,009	%
FDA-approved diagnosis	1,516	50.4%
Autism (irritability)	752	25.0%
Risperidone or aripiprazole	563	18.7%
Other drug	189	6.3%
Major Depression (adjunct, for adults)	532	17.7%
Bipolar disorder	294	9.8%
<=9 years	7	0.2%
>=10 years	287	9.5%
Tic disorders (e.g., Tourette's syndrome)	128	4.3%
Aripiprazole or haloperidol	46	1.5%
Other drug	82	2.7%
Schizophrenia	56	1.9%
<=11 years	3	0.1%
>=12 years	53	1.8%
Schizoaffective disorder (for adults)	37	1.2%
Paliperidone	2	0.1%
Other	35	1.2%
Compendia diagnoses where evidence favors efficacy	442	14.7%
Generalized anxiety disorder (for adults)	293	9.7%
Quetiapine	39	1.3%
Other drug	254	8.4%
Intellectual disability (for adults and pediatric)	88	2.9%
Risperidone	25	0.8%
Other drug	63	2.1%

Eating disorders (e.g., anorexia nervosa) (for pediatric)	74	2.5%
Aripiprazole	20	0.7%
Other drug	54	1.8%
Cancer (for adults and pediatric)	25	0.8%
Olanzapine	18	0.6%
Other drug	7	0.2%
Personality disorder (for adults)	12	0.4%
Aripiprazole	8	0.3%
Other drug	4	0.1%
None of the above	1,057	35.1%
Top 10 other mental health diagnoses*		
F90: Attention-deficit hyperactivity disorders	568	18.9%
F43: Reaction to severe stress, and adjustment disorders	446	14.8%
F41: Other anxiety disorders	220	7.3%
F91: Conduct disorders	217	7.2%
F32: Depressive episode	177	5.9%
F34: Persistent mood [affective] disorders	157	5.2%
F98: Other behavioral/emotional disorders with onset usually occuring in childhood & adolescence	67	2.2%
F94: Disorder social with onset specific to childhood & adolescence	46	1.5%
F29: Unspecified psychosis not due to a substance or known physiologic condition	44	1.5%
F88: Other disorders of psychological development	43	1.4%

*Defined as ICD-10 codes beginning with F grouped by first 3 characters of the ICD-10 code

Table 6 describes the proportion of members who had claims for metabolic glucose monitoring and psychotherapy in the baseline and follow-up periods. Only 57% of children and adolescents had claims for glucose monitoring in the 6 months before or 6 months after the IE. For members with a claim, most had a single lab test during the 6 months before or after the IE. About 78% of members with prescriptions for an antipsychotic had claims for psychotherapy. For member with psychotherapy visits, the median number of visit dates was about 20 over the course of the 12-month period (11 visits in the 6 months before the IE and the same number in the 6 months after the IE).

Table 6. Members with metabolic monitoring and non-pharmacologic treatment

Members with a paid antipsychotic claim		**Median number of service dates per member (for members with a claim) and interquartile range**		
3,009	%	Q1	Median	Q3

Any metabolic monitoring	1,702	56.6%	1	1	2
Baseline Metabolic Monitoring	1,096	36.4%	1	1	2
Follow-up Metabolic monitoring	1,142	38.0%	1	1	2
Any psychotherapy	2,363	78.5%	8	20	39
Baseline	2,114	70.3%	4	11	21
Follow-up	2,100	69.8%	5	11	21

The proportion of members with claims for metabolic monitoring and psychotherapy was also evaluated by subgroup. The following tables describe how the proportion of members with claims for metabolic monitoring and psychotherapy changed based on patient characteristics (**Table 7**), drug or therapy characteristics (**Table 8**), and prescriber type (**Table 9**).

Glucose monitoring appeared to increase based on patient age and location. Glucose monitoring occurred for 37% of members 6 to 9 years of age, 52% of members 10 to 13 years of age and 64% of members 14 to 17 years of age. Glucose monitoring also varied for members living in urban (58%), rural (55%), and frontier counties (45%). Monitoring was also more common for members identifying as female compared to members identifying as male (65% vs. 50%). Compared to the general population, glucose monitoring was more frequent for members enrolled in foster care (65%). Glucose monitoring appeared to be less common for members with pervasive developmental disorders (51.5%) and developmental disorders of speech and language (48%). In people with less than 30 days of antipsychotic treatment, metabolic monitoring occurred in 48.6% of members. Rates of monitoring increased to 58.6% in people with therapy for more than 150 days (about 5 months) over a 6 month period (**Table 8**). Compared to the general population, risperidone was associated with lower rates of glucose monitoring (45.5%) and members prescribed haloperidol (77%), olanzapine (73%), and paliperidone (72%) had higher rates of glucose monitoring. Members were more likely to have metabolic monitoring if they had prescriptions written by a psychiatrist (63%) compared to other types of mental health providers or general practitioners (53%; **Table 9**).

On average, 78.5% of members with prescriptions for antipsychotics also had a psychotherapy in the 6 months before or after the first claim for an antipsychotic. Comparatively, psychotherapy was identified for 66% of members who were enrolled in FFS at the time of the IE. A relatively small proportion of people identified as Asian or Pacific (1.2%), and psychotherapy was identified for 67% of these members, which was lower than the general population. However, race was unknown for 27% of the population which makes it difficult to identify any potential differences based on race. Psychotherapy did not differ based on age, but was lower than the general population for members with speech and language disorders (66%) and pervasive developmental disorders (70%; **Table 7**). Psychotherapy was generally similar when evaluating various subgroups based on drug characteristics. Members with antipsychotic claims prescribed by a mental health provider more frequently had psychotherapy visits (86%) compared to members with prescriptions written by general practitioners (63%).

In these analyses, age is a confounding factor for drug selection and diagnoses as some drugs such as aripiprazole and risperidone have more evidence in younger populations and mental health diagnoses are likely to change as members get older. In members 6 to 9 years of age, risperidone was prescribed for a larger proportion of members in this age group (50%) compared to members 10-13 or 14-17 years of age (34% and 18% respectively). For example, diagnoses for developmental disorders are more common for younger ages and diagnoses like depression and bipolar disorder are more common for adolescents. This analysis did not account for any of these confounding factors.

Table 7. Outcomes by Patient Characteristics

	Metabolic Monitoring		Psychotherapy		Total
	1,702	56.6%	2,363	78.5%	3,009
Age					
6-9	159	**36.8% ***	318	73.6%	432
10-13	501	**52.4% ***	773	80.8%	957
14-17	1,042	**64.3% ***	1,272	78.5%	1,620
Sex					
Female	842	**64.7% ***	1,091	83.8%	1,302
Male	860	**50.4% ***	1,272	74.5%	1,707
Race					
White	916	56.7%	1,293	80.1%	1,615
Unknown	462	56.3%	633	77.1%	821
Native American	146	55.7%	199	76.0%	262
Hispanic	106	60.6%	132	75.4%	175
Black	51	51.5%	81	81.8%	99
Asian or Pacific Islander	21	56.8%	25	**67.6% ***	37
Managed Care Enrollment (as of IE)					
FFS	50	51.0%	65	66.3%	98
CCO	1,652	56.8%	2,298	78.9%	2,911
Member Location					
Unknown	29	**59.2% ***	39	79.6%	49
Urban	959	**58.0% ***	1,321	79.9%	1,653
Rural	665	**55.5% ***	920	76.7%	1,199
Frontier	49	**45.4% ***	83	76.9%	108
Foster Care Enrollment (as of October 2023)	152	64.7%	196	83.4%	235
Oregon Youth Authority (as of October 2023)	10	71.4%	12	85.7%	14
Top 10 MH diagnoses					
F33: Major depressive disorder, recurrent	398	74.8%	500	94.0%	532
F32: Depressive episode	546	71.5%	708	92.7%	764
F31: Bipolar disorder	208	70.7%	264	89.8%	294
F41: Other anxiety disorders	832	64.2%	1,132	87.3%	1296
F43: Reaction to severe stress, and adjustment disorders	777	63.5%	1,144	93.5%	1223

F34: Persistent mood [affective] disorders	287	63.4%	416	91.8%	453
F91: Conduct disorders	290	54.9%	468	88.6%	528
F90: Attention-deficit hyperactivity disorders	813	54.3%	1,259	84.2%	1496
F84: Pervasive developmental disorders	401	**51.5% ***	546	**70.1% ***	779
F80: Specific developmental disorders of speech and language	117	**48.1% ***	160	**65.8% ***	243

* Designates groups with the largest differences from the general population or notable trends

Table 8. Outcomes by Therapy Characteristics

	Metabolic Monitoring		Psychotherapy		Total
	1,702	56.6%	2,363	78.5%	3,009
PDL Class on IE					
Parenteral	11	73.3%	14	93.3%	15
First-gen	30	62.5%	37	77.1%	48
Second-gen	1,661	56.4%	2,312	78.5%	2,946
Days covered in follow-up period					
<=30	144	**48.6% ***	227	76.7%	296
31-90	226	**54.9% ***	317	76.9%	412
91-150	290	**55.7% ***	407	78.1%	521
>151	1,042	**58.5% ***	1,412	79.3%	1,780
Antipsychotic claims in baseline					
New start (no claims)	656	57.7%	921	81.0%	1,137
Prior claim(s)	1,046	55.9%	1,442	77.0%	1,872
Top 10 most common IE drugs (by HSN)					
haloperidol	10	76.9%	12	92.3%	13
olanzapine	226	**72.7% ***	243	78.1%	311
paliperidone	28	71.8%	32	82.1%	39
ziprasidone HCl	45	67.2%	58	86.6%	67
quetiapine fumarate	217	62.9%	286	82.9%	345
cariprazine HCl	11	57.9%	16	84.2%	19
chlorpromazine HCl	15	57.7%	22	84.6%	26
lurasidone HCl	76	56.7%	112	83.6%	134
aripiprazole	674	56.7%	981	82.5%	1,189
risperidone	373	**45.5% ***	566	**69.1% ***	819

* Designates groups with the largest differences from the general population or notable trends

Table 9. Outcomes by Prescriber Type

	Metabolic Monitoring		Psychotherapy		Total
	1,702	56.6%	2,363	78.5%	3,009
Provider Type on IE					
Psychiatrist	669	**63.2% ***	910	85.9%	1,059
Non-physician mental health provider	534	53.4%	857	85.7%	1,000
All other practitioners	499	52.5%	596	**62.7% ***	950

* Designates groups with the largest differences from the general population or notable trends

Limitations:

As a claims-based analysis, this study has multiple important limitations:

- Diagnostic data are based on claims history which may be incomplete or not accurately reflect true patient diagnoses. It is difficult to determine the intended indication for the drug, particularly when therapy is used off-label or the member has more than one mental health diagnosis.
- About 20% of members identified with paid FFS claims for an antipsychotic were excluded from this analysis. This study assumes that included members are still representative of the entire Medicaid population.
- Information on provider specialty may be inaccurate or incomplete for some providers. Prescribers with multiple specialties or designations may not be identified. Claims data is unable to capture instances where a prescriber consults with an appropriate specialist.
- This analysis relies on claims paid by Medicaid to evaluate duration of therapy which may not be an accurate indicator of what dose the member actually takes. Medical claims for antipsychotics were not included. Thus, the proportion of members prescribed injectable antipsychotics may be underestimated.
- This analysis used common medical codes for psychotherapy to evaluate members accessing non-pharmacologic therapy and may not provide a comprehensive assessment for use of non-pharmacotherapy. Similarly, we were unable to discern the type of psychotherapy provided.
- In this analysis, we used glucose testing as a marker for overall metabolic monitoring. We did not assess how often members had in-person provider visits, and are unable to assess how often physical assessments like weight and waist circumference were performed for members.
- Historical enrollment data for members in foster care or the criminal justice system is unavailable which limits findings from these analyses. Enrollment data from October 2023 was used to categorize patients in this analysis, but the study evaluation period was 10/1/2021 to 09/30/2022. Members who are no longer in foster care would not be accurately categorized.
- The retrospective nature of the study also does not control for confounders which may influence antipsychotic prescribing. Because this analysis does not control for any of these potential confounders, changes in antipsychotic prescribing are difficult to attribute to a single policy decision. Some examples of known confounding factors are listed below.
    - Based on trends in antipsychotic prescribing over time, the COVID pandemic appears to be a significant confounding factor. Between March 2020 and September 2023, the number of members 6 to 17 years of age enrolled in Medicaid increased by over 58,000 members per month. This was associated with a general decrease in the proportion of members prescribed antipsychotics. During this period there were multiple changes related to Medicaid coverage, availability of medical services, family lifestyles, and school routines. It is unknown how these changes may have influenced antipsychotic prescribing.
    - Metabolic monitoring appeared to vary based on age. However, post-hoc analyses showed that drug selection and diagnoses also varied based on member age. Diagnoses like developmental disorders are more common in members 6 to 9 years of age and diagnoses like schizophrenia and bipolar disorder were more common for adolescents.

Discussion:

This policy evaluation provides documentation that overall utilization of antipsychotics for members on Medicaid is not increasing and that many members do have access to some type of psychotherapy within 6 months of being prescribed an antipsychotic. While there are no direct comparisons for antipsychotic prescribing rates between state Medicaid programs, this is consistent with national trends in recent years.[14-16] However, there continues to be opportunities to improve antipsychotic prescribing for appropriate indications. Only 50% of members had an FDA-approved diagnosis present in medical claims. Glucose monitoring was identified in only 57% of members, and monitoring rates varied based on patient, drug therapy and prescriber characteristics. Equitable access

to appropriate evidence-based treatment remains a concern. For example, members living in Oregon's frontier counties appeared to have lower rates of glucose monitoring compared to members in rural or urban areas. Members who identified as Asian or Pacific Islander and members with antipsychotic prescriptions written by a general practitioner also had fewer claims for psychotherapy.

It is difficult to quantify how current retrospective provider educational initiatives impact evidence-based prescribing compared to larger statewide and national policy decisions. Historically, retrospective initiatives have been limited by ability of staff to contact providers. However, this analysis also indicates that ongoing initiatives to improve antipsychotic prescribing may have some benefit. One of the earliest initiatives implemented in the Medicaid program includes oversight of prescribing for members in foster care. This program includes both prospective and retrospective drug reviews conducted by the Department of Health Services. While there are limitations in this review, this analysis identified that members currently enrolled in foster care have slightly higher rates for glucose monitoring and psychotherapy compared to the overall population.

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Appendix 1:

Table A1. PICOS

Population	Medicaid members with a paid FFS claim for antipsychotics in the evaluation window. AND age 6-17 years at the time of the IE AND continuous Medicaid enrollment in the baseline and follow-up periods
Intervention	Initiation of antipsychotic (index event)
Comparators	Age groups Race CCO enrollment Locations (based on zip code) Diagnoses Taxonomy (psychiatrist vs. MHNP vs. non-specialist) Drug type (by generic name) Duration =<30 days vs. 31-119 vs. >=120 Prior antipsyc claims in the baseline period
Outcomes	Metabolic monitoring in the baseline period or follow-up period Psychotherapy in the baseline period or follow-up period Diagnoses

Table A2. ICD-10 codes for FDA-approved or compendia supported mental health diagnoses

ICD-10 Code	Description
F20x	Schizophrenia
F25x	Schizoaffective disorders
F31x	Bipolar disorder
F33x	Major depressive disorder, recurrent
F411x	Generalized anxiety disorder
F60x	Specific personality disorders
F70x-F79x	Intellectual disabilities
F840	Autistic disorder
F50x	Eating disorders including anorexia nervosa
F95x	Tic disorder including tourette's disorder

Table A3. Provider taxonomy groups for mental health providers

Taxonomy	**Taxonomy Description**	**Category**
2080P0006X	PHYSICIAN-PEDIATRICS-DEVELOPMENTAL BEHAVORIAL PEDIATRICS	Psychiatrist
2080P0008X	PHYSICIAN-PEDIATRICS-NEURODEVELOPMENTAL DISABILITIES	Psychiatrist

2084A0401X	PSYCHIATRY & NEUROLOGY, ADDICTION MEDICINE	Psychiatrist
2084B0002X	PHYSICIAN-PSYCHIATRY&NEUROLOGY-BARIATRIC MEDICINE	Psychiatrist
2084B0040X	BEHAVIORAL NEUROLOGY & NEUROPSYCHIATRY	Psychiatrist
2084D0003X	PHYSICIAN-PSYCHIATRY&NEUROLOGY-DIAGNOSTIC NEUROIMAGING	Psychiatrist
2084F0202X	PHYSICIAN-PSYCHIATRY&NEUROLOGY-FORENSIC PSYCHIATRY	Psychiatrist
2084H0002X	PHYSICIAN-PSYCHIATRY&NEUROLOGY-HOSPICE AND PALLIATIVE MEDICINE	Psychiatrist
2084N0008X	PHYSICIAN-PSYCHIATRY&NEUROLOGY-NEUROMUSCULAR MEDICINE	Psychiatrist
2084N0400X	PHYSICIAN-PSYCHIATRY&NEUROLOGY-NEUROLOGY	Psychiatrist
2084N0402X	PHYSICIAN-PSYCHIATRY&NEUROLOGY-NEUROLOGY WITH SPECIAL QUAL IN CHILD NEUROLO	Psychiatrist
2084N0600X	PHYSICIAN-PSYCHIATRY&NEUROLOGY-CLINICAL NEUROPHYSIOLOGY	Psychiatrist
2084P0005X	PHYSICIAN-PSYCHIATRY&NERUOLOGY-NEURODEVELOPMENTAL DISABILITIES	Psychiatrist
2084P0015X	PHYSICIAN-PSYCHIATRY&NEUROLOGY-PSYCHOSOMATIC MEDICINE	Psychiatrist
2084P0800X	PHYSICIAN-PSYCHIATRY&NEUROLOGY-PSYCHIATRY	Psychiatrist
2084P0802X	PHYSICIAN-PSYCHIATRY&NEUROLOGY-ADDICTION PSYCHIATRY	Psychiatrist
2084P0804X	PHYSICIAN-PSYCHIATRY&NEUROLGY-CHILD&ADOLESCENT PSYCHIATRY	Psychiatrist
2084P0805X	PHYSICIAN-PSYCHIATRY&NEUROLGY-GERIATRIC PSYCHIATRY	Psychiatrist
2084P2900X	PHYSICIAN-PSYCHIATRY&NEUROLOGY-PAIN MEDICINE	Psychiatrist
2084S0010X	PHYSICIAN-PSYCHIATRY&NEUROLOGY-SPORTS MEDICINE	Psychiatrist
2084S0012X	PHYSICIAN-PSYCHIATRY&NEUROLOGY-SLEEP MEDICINE	Psychiatrist
2084V0102X	PHYSICIAN-PSYCHIATRY&NEUROLOGY-VASCULAR NEUROLOGY	Psychiatrist
103T00000X	PSYCHOLOGIST	Non-physician Mental Health Provider
103TA0400X	PSYCHOLOGIST - ADDICTION (SUBSTANCE USE DISORDER)	Non-physician Mental Health Provider
103TC0700X	PSYCHOLOGIST - CLINICAL	Non-physician Mental Health Provider
103TC2200X	PSYCHOLOGIST - CLINICAL CHILD & ADOLESCENT	Non-physician Mental Health Provider
163WP0807X	REGISTERED NURSE - PSYCHIATRIC/MENTAL HEALTH	Non-physician Mental Health Provider
163WP0808X	REGISTERED NURSE - PSYCHIATRIC/MENTAL HEALTH	Non-physician Mental Health Provider
163WP0809X	REGISTERED NURSE - PSYCHIATRIC/MENTAL HEALTH	Non-physician Mental Health Provider
1835P1300X	PHARMACIST - PSYCHIATRIC	Non-physician Mental Health Provider
363LP0808X	NURSE PRACTITIONER - PSYCHIATRIC/MENTAL HEALTH	Non-physician Mental Health Provider
364SP0807X	CLINICAL NURSE SPECIALIST - PSYCHIATRIC/MENTAL HEALTH	Non-physician Mental Health Provider
364SP0808X	CLINICAL NURSE SPECIALIST - PSYCHIATRIC/MENTAL HEALTH	Non-physician Mental Health Provider
364SP0809X	CLINICAL NURSE SPECIALIST - PSYCHIATRIC/MENTAL HEALTH	Non-physician Mental Health Provider

Table A4. CPT codes for metabolic monitoring

CPT Code	Description
80048	Blood Test, Basic Group Of Blood Chemicals (Calcium, Total)
80049	Basic Metabolic Panel
80050	General Health Panel
80053	Blood Test, Comprehensive Group Of Blood Chemicals
80054	Comprehensive Metabolic Panel
80065	Metabolic Panel
81506	Endo Assay Seven Anal
82945	Glucose Other Fluid
82947	Assay Glucose Blood Quant
82948	Reagent Strip/Blood Glucose
82950	Glucose Test
82951	Glucose Tolerance Test (Gtt)
82952	Gtt-Added Samples
82953	Glucose-Tolbutamide Test
82954	Glucose, Urine
82961	Glucose Tolerance Test, Intravenous
82962	Glucose Blood Test
83036	Hemoglobin Glycosylated A1c
83037	Hb Glycosylated A1c Home Dev
95249	Cont Gluc Mntr Pt Prov Eqp
95250	Cont Gluc Mntr Phys/Qhp Eqp
95251	Cont Gluc Mntr Analysis I&R
0403T	Diabetes Prev Standard Curr
3044F	Hg A1c Level Lt 7.0%
3045F	Hg A1c Level 7.0-9.0%
3046F	Hemoglobin A1c Level >9.0%
3047F	Hemoglobin A1c Level = 9.0%
3051F	Hg A1c>Equal 7.0%<8.0%
3052F	Hg A1c>Equal 8.0%<Equal 9.0%
3754F	Screening Tests Dm Done
D0411	Hba1c In Office Testing
D0412	Blood Glucose Level Test
G0096	Basic Metabolic Panel (Carbon Dioxide (B

G0098	Comprehensive Metabolic Panel (Albumin-S
G2089	A1c Level 7 To 9%
G8015	Diabetic Pt W/ Hba1c>9%
G8016	Diabetic Pt W/ Hba1c<Or=9%
G8017	Dm Pt Inelig For Hba1c Measu
G8777	Diabetes Screen
TR200	Tracking Only - Hemoglobin A1c - <7.0
TR201	Tracking Only - Hemoglobin A1c - >7 <8.0
TR202	Tracking Only - Hemoglobin A1c - >8 <9.0
TR203	Tracking Only - Hemoglobin A1c - >9.0

Table A5. CPT codes for psychotherapy

CPT Code	Description
90785	Psychiatric Services Complicated By Communication Factor
90832	Psychotherapy, 30 Minutes
90833	Psychotherapy With Evaluation And Management Visit, 30 Minutes
90834	Psychotherapy, 45 Minutes
90836	Psychotherapy With Evaluation And Management Visit, 45 Minutes
90837	Psychotherapy, 1 Hour
90838	Psychotherapy With Evaluation And Management Visit, 1 Hour
90839	Psychotherapy For Crisis, First Hour
90840	Psychotherapy For Crisis, Each Additional 30 Minutes
90846	Family Psychotherapy Without Patient, 50 Minutes
90847	Family Psychotherapy With Patient, 50 Minutes
90849	Multiple-Family Group Psychotherapy
90853	Group Psychotherapy
90876	Psychophysiological Therapy Incorporating Biofeedback Training With Psychotherapy, 45 Minutes
90899	Other Psychiatric Service Or Procedure
96158	Treatment Of Behavior Impacting Health, Initial 30 Minutes
96159	Treatment Of Behavior Impacting Health, Each Additional 15 Minutes
96167	Treatment Of Behavior Impacting Health With Family And Patient, Initial 30 Minutes
96168	Treatment Of Behavior Impacting Health With Family And Patient, Each Additional 30 Minutes
97153	Adaptive Behavior Treatment By Technician Using An Established Plan, Each 15 Minutes
97154	Adaptive Behavior Treatment By Technician With Multiple Patients Using An Established Plan, Each 15
97155	Adaptive Behavior Treatment By Professional Using An Established Plan, Each 15 Minutes

97156	Adaptive Behavior Treatment By Professional With Family Using An Established Plan, Each 15 Minutes
0362T	Behavior Identification Supporting Assessment For Patient Exhibiting Destructive Behavior, Each 15 M
0373T	Adaptive Behavior Treatment With Protocol Modification For Patient Exhibiting Destructive Behavior,
G0177	Training And Educational Services Related To The Care And Treatment Of Patient'S Disabling Mental He
G0410	Group Psychotherapy Other Than Of A Multiple-Family Group, In A Partial Hospitalization Setting, App
H0004	Behavioral Health Counseling And Therapy, Per 15 Minutes
H0036	Community Psychiatric Supportive Treatment, Face-To-Face, Per 15 Minutes
H0037	Community Psychiatric Supportive Treatment Program, Per Diem
H0038	Self-Help/Peer Services, Per 15 Minutes
H0039	Assertive Community Treatment, Face-To-Face, Per 15 Minutes
H2014	Skills Training And Development, Per 15 Minutes
H2018	Psychosocial Rehabilitation Services, Per Diem
H2027	Psychoeducational Service, Per 15 Minutes
S9480	Intensive Outpatient Psychiatric Services, Per Diem

Table A6. Residential area based on Zip Code. Based on the Oregon Office of Rural Health Geographic Definitions[13]

Zip Code	Designation	Zip Code	Designation	Zip Code	Designation	Zip Code	Designation	Zip Code	Designation
97001	Rural	97018	Rural	97037	Rural	97060	Urban	97103	Rural
97002	Rural	97019	Rural	97038	Rural	97062	Urban	97106	Urban
97003	Urban	97020	Rural	97039	Frontier	97063	Rural	97107	Rural
97004	Rural	97021	Rural	97040	Rural	97064	Rural	97108	Rural
97005	Urban	97022	Rural	97041	Rural	97065	Frontier	97109	Rural
97006	Urban	97023	Rural	97042	Rural	97067	Rural	97110	Rural
97007	Urban	97024	Urban	97044	Rural	97068	Urban	97111	Rural
97008	Urban	97026	Rural	97045	Urban	97070	Urban	97112	Rural
97009	Urban	97027	Urban	97048	Rural	97071	Rural	97113	Urban
97010	Rural	97028	Rural	97049	Rural	97075	Urban	97114	Rural
97011	Rural	97029	Frontier	97050	Frontier	97076	Urban	97115	Rural
97013	Rural	97030	Urban	97051	Rural	97077	Urban	97116	Urban
97014	Rural	97031	Rural	97053	Rural	97078	Urban	97117	Rural
97015	Urban	97032	Rural	97054	Rural	97080	Urban	97118	Rural
97016	Rural	97033	Frontier	97055	Rural	97086	Urban	97119	Rural
97017	Rural	97034	Urban	97056	Rural	97089	Urban	97121	Rural
		97035	Urban	97057	Rural	97101	Rural	97122	Rural
		97036	Urban	97058	Rural	97102	Rural	97123	Urban

97124	Urban	97214	Urban	97290	Urban	97343	Rural	97385	Rural
97125	Rural	97215	Urban	97291	Urban	97344	Rural	97386	Rural
97127	Rural	97216	Urban	97292	Urban	97345	Rural	97388	Rural
97128	Rural	97217	Urban	97293	Urban	97346	Rural	97389	Urban
97130	Rural	97218	Urban	97294	Urban	97347	Rural	97390	Rural
97131	Rural	97219	Urban	97296	Urban	97348	Rural	97391	Rural
97132	Rural	97220	Urban	97298	Urban	97350	Rural	97392	Urban
97133	Rural	97221	Urban	97301	Urban	97351	Urban	97394	Rural
97134	Rural	97222	Urban	97302	Urban	97352	Urban	97396	Rural
97135	Rural	97223	Urban	97303	Urban	97355	Rural	97401	Urban
97136	Rural	97224	Urban	97304	Urban	97357	Rural	97402	Urban
97137	Rural	97225	Urban	97305	Urban	97358	Rural	97403	Urban
97138	Rural	97227	Urban	97306	Urban	97359	Urban	97404	Urban
97140	Urban	97228	Urban	97307	Urban	97360	Rural	97405	Urban
97141	Rural	97229	Urban	97308	Urban	97361	Rural	97406	Rural
97143	Rural	97230	Urban	97309	Urban	97362	Rural	97407	Rural
97144	Rural	97231	Urban	97310	Urban	97364	Rural	97408	Urban
97145	Rural	97232	Urban	97312	Urban	97365	Rural	97409	Urban
97146	Rural	97233	Urban	97317	Urban	97366	Rural	97410	Rural
97147	Rural	97236	Urban	97321	Urban	97367	Rural	97411	Rural
97148	Rural	97238	Urban	97322	Urban	97368	Rural	97412	Rural
97149	Rural	97239	Urban	97324	Rural	97369	Rural	97413	Rural
97201	Urban	97240	Urban	97325	Rural	97370	Urban	97414	Rural
97202	Urban	97242	Urban	97326	Rural	97371	Urban	97415	Rural
97203	Urban	97256	Urban	97327	Rural	97372	Rural	97416	Rural
97204	Urban	97258	Urban	97329	Rural	97373	Rural	97417	Rural
97205	Urban	97266	Urban	97330	Urban	97374	Rural	97419	Rural
97206	Urban	97267	Urban	97331	Urban	97375	Rural	97420	Rural
97207	Urban	97268	Urban	97333	Urban	97376	Rural	97423	Rural
97208	Urban	97269	Urban	97335	Rural	97377	Rural	97424	Rural
97209	Urban	97280	Urban	97336	Rural	97378	Rural	97425	Rural
97210	Urban	97281	Urban	97338	Rural	97380	Rural	97426	Urban
97211	Urban	97282	Urban	97339	Urban	97381	Rural	97428	Rural
97212	Urban	97283	Urban	97341	Rural	97383	Rural	97429	Rural
97213	Urban	97286	Urban	97342	Rural	97384	Rural	97430	Rural

97431	Rural	97470	Rural	97527	Rural	97638	Frontier	97760	Rural
97432	Rural	97471	Rural	97528	Rural	97639	Rural	97761	Rural
97434	Rural	97473	Rural	97530	Rural	97640	Frontier	97801	Rural
97435	Rural	97475	Urban	97531	Rural	97641	Frontier	97810	Rural
97436	Rural	97476	Rural	97532	Rural	97701	Urban	97812	Frontier
97437	Rural	97477	Urban	97533	Rural	97702	Urban	97813	Rural
97438	Rural	97478	Urban	97534	Rural	97703	Urban	97814	Frontier
97439	Rural	97479	Rural	97535	Urban	97707	Rural	97817	Frontier
97440	Urban	97480	Rural	97536	Rural	97708	Urban	97818	Frontier
97441	Rural	97481	Rural	97537	Rural	97709	Urban	97819	Frontier
97442	Rural	97484	Rural	97538	Rural	97710	Frontier	97820	Frontier
97443	Rural	97486	Rural	97539	Rural	97711	Rural	97823	Frontier
97444	Rural	97487	Rural	97540	Urban	97712	Rural	97824	Rural
97446	Rural	97488	Rural	97541	Rural	97720	Frontier	97825	Frontier
97447	Rural	97489	Rural	97543	Rural	97721	Frontier	97826	Rural
97448	Rural	97490	Rural	97544	Rural	97722	Frontier	97827	Rural
97449	Rural	97491	Rural	97601	Rural	97730	Rural	97828	Frontier
97450	Rural	97492	Rural	97602	Rural	97731	Rural	97830	Frontier
97451	Rural	97493	Rural	97603	Rural	97732	Frontier	97833	Frontier
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97454	Rural	97496	Rural	97621	Rural	97735	Frontier	97836	Frontier
97455	Urban	97497	Rural	97622	Rural	97736	Frontier	97837	Frontier
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97457	Rural	97499	Rural	97624	Rural	97738	Frontier	97839	Frontier
97458	Rural	97501	Urban	97625	Rural	97739	Rural	97840	Frontier
97459	Rural	97502	Urban	97626	Rural	97741	Rural	97841	Rural
97461	Rural	97503	Urban	97627	Rural	97750	Frontier	97842	Frontier
97462	Rural	97504	Urban	97630	Frontier	97751	Rural	97843	Frontier
97463	Rural	97520	Rural	97632	Rural	97752	Rural	97844	Frontier
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97469	Rural	97526	Rural	97637	Frontier	97759	Rural	97856	Frontier

97857	Frontier
97859	Rural
97861	Frontier
97862	Rural
97864	Frontier
97865	Frontier
97867	Rural
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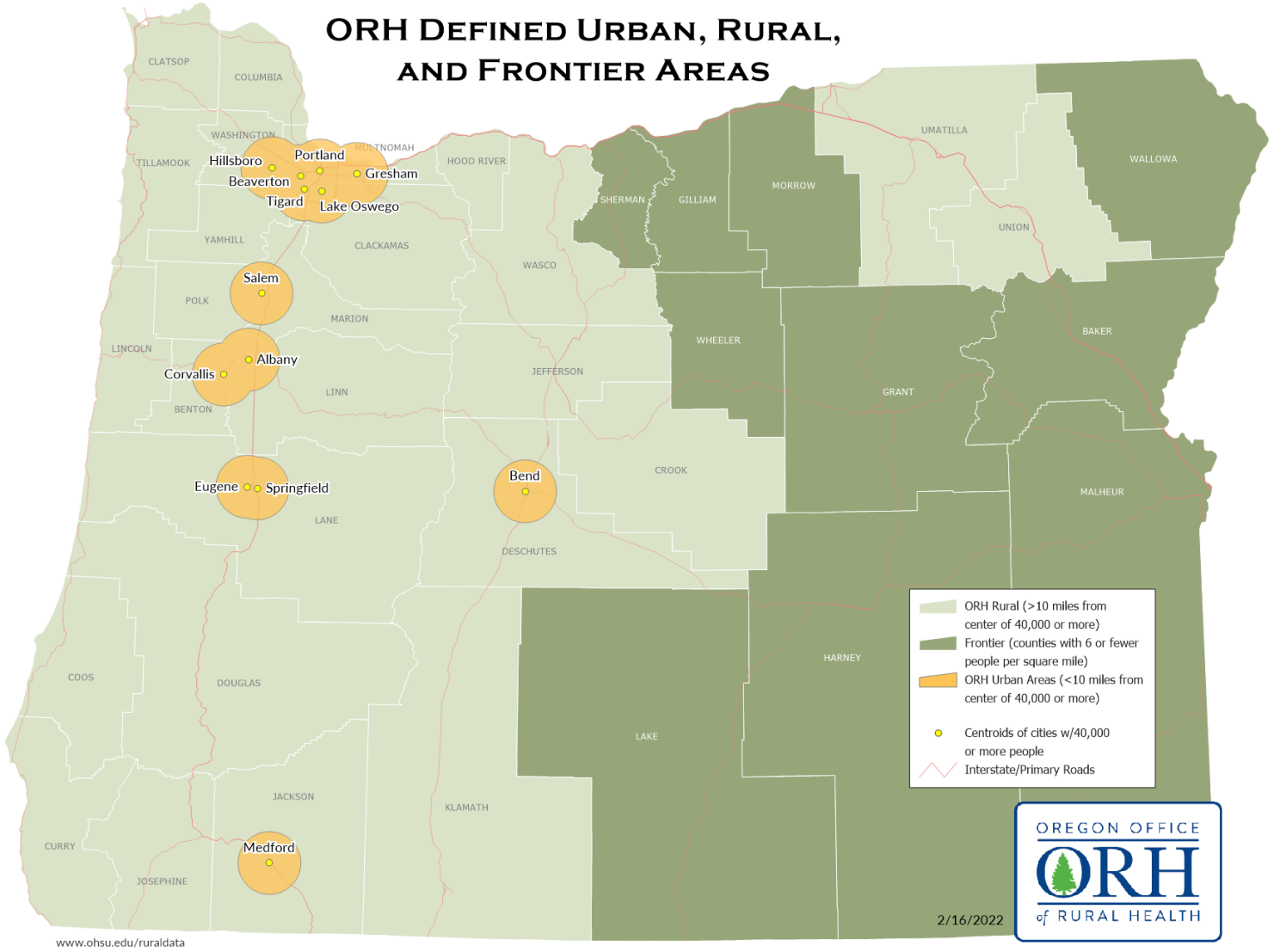

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