Kentucky
UNBRIDLED SPIRIT™

Commonwealth of Kentucky
Department for Medicaid Services
Division of Program Quality and Outcomes

EPSDT Screening Encounter Data Validation

Clinical Focused Study 2014

FINAL REPORT
May 2014

IPRO Corporate Headquarters
Managed Care Department
1979 Marcus Avenue
Lake Success, NY 11042-1002
phone: (516) 326-7767
fax: (516) 326-6177
www.ipro.org

TABLE OF CONTENTS

Introduction

Early and Periodic Screening, Diagnostic and Treatment (EPSDT) services is a federally mandated health program, which provides comprehensive and preventive health care services for children and adolescents up to age 21. EPSDT services include a complete physical examination, a comprehensive health and developmental history, appropriate immunizations according to the Advisory Committee on Immunization Practices, laboratory testing, including lead toxicity screening, and health education that includes anticipatory guidance regarding child development, healthy lifestyles and accident and injury prevention.[1] Age-appropriate mental health and substance use screening are also part of EPSDT services. The Centers for Medicare and Medicaid Services (CMS) has recently released an informational bulletin noting that although half of mental health conditions and substance use disorders begin by age 14, many young people do not have their conditions identified and do not receive the mental health services they need.[2] While a broad range of services are covered under EPSDT, national studies have shown that not all eligible children receive all components of needed services.[3, 4] In 2010, the Department of Health and Human Services Office of the Inspector General evaluated nine states and found that 60% of children with documented EPSDT screenings had incomplete screenings.[5] The study showed that 76% of children did not receive required medical, vision, or hearing screenings. Accurate assessments of the extent to which Medicaid children receive all required EPSDT services are especially challenging for children enrolled in managed care, since capitation arrangements may lead to underreporting of individual services provided.[6] Difficulty linking data from various sources, as well as gaps in Medicaid enrollment, present additional barriers to ascertaining which services a particular child has received. Foster care can also present barriers to receipt of age-appropriate preventive services.[7]

The importance of early identification and management of developmental disorders and prevention and management of chronic disease is heightened by evolving epidemiologic trends and evidence for the benefits of early intervention.[8] Medicaid's EPSDT services are particularly important because children with public insurance are more likely to have special health care needs, including chronic conditions and developmental delays, for which EPSDT provides access to specialized health services.[7] The Centers for Disease Control and Prevention (CDC) reports developmental disabilities in the United States are increasing. National Health Interview Survey (NHIS) data revealed that 1 in 6 children in the U.S. had an identified developmental disability in 2006-2008, and that children insured by Medicaid had a nearly two-fold higher prevalence of any developmental disability compared to those with private insurance.[9] The American Academy of Pediatrics (AAP) recommends developmental surveillance at every well-child visit (WCV), with administration of standardized developmental screening tests at age 9 months, 18 months and 30 months. This screening is intended to enhance the developmental surveillance process, since clinical impression has been shown to be less accurate than formal screening in estimating a child's developmental status.[10] "Developmental Screening in the First Three Years of Life" is a measure in the Children's Health Insurance Program Reauthorization Act (CHIPRA) core measure set that examines the percentage of children screened for risk of developmental, behavioral, and social delays using a standardized screening tool in the 12 months preceding their first, second, or third birthday.[11] Although this screening can be represented by CPT code 96110, the code has been shown to have questionable validity. Therefore, the measure steward recommends that states conduct a validity assessment of claims data as compared to medical chart review, in order to verify that the use of the CPT code 96110: "Developmental Testing, limited", reflects developmental screening using a standardized screening tool.

Objectives

The study aims to compare administrative data and medical record documentation to validate encounter data codes relevant to the receipt of EPSDT screening of children enrolled in Kentucky Medicaid Managed Care.

Study questions:

1. Do encounter data codes used to indicate EPSDT (well-child) screening visits reflect WCVs that include comprehensive health and developmental history (including mental health and substance use screening), comprehensive physical exam, and health education/anticipatory guidance?

2. Is mental health screening and follow-up of identified problems included in EPSDT visits?

3. Does submission of a CPT 96110 code reflect developmental screening using a standardized developmental screening tool?

4. Does submission of hearing and vision screening codes reflect age-appropriate hearing and vision screening?

Methodology

Review Period

The validation study consisted of a review of WCVs that occurred between January 1, 2013 through April 30, 2013, which was the earliest timeframe identified that included data from all four plans and allowed a three month time period for claims to run out to ensure all applicable claims were considered in the study. The data was obtained from the following MCOs:

- CoventryCares of Kentucky (CoventryCares)
- Humana CareSource (Humana)
    - Humana initiated its Kentucky Medicaid contract in January 2013.
- Passport Health Plan (Passport)
- WellCare of Kentucky (WellCare)

Eligible Population and Scope of Review

The eligible population from which a sample was drawn consisted of Medicaid Managed Care (MMC)-enrolled children who had a WCV code between January 1, 2013 and April 30, 2013. Two cohorts of children were selected from the eligible population:

- **Cohort I**: A stratified (divided into groups before sampling) random sample of 110 eligible children at least 1 year of age through 20 years by April 30, 2013 for each of the 4 MCOs, as available, for whom an administrative claim for WCV was submitted. This cohort was used to evaluate the contents of WCVs relative to recommended EPSDT services.

- **Cohort II**: A stratified random sample of 100 eligible children, at least 1 year of age through 3 years by April 30, 2013 for each of the 4 MCOs for whom an administrative claim for Developmental Screening (CPT code 96110) was submitted. This cohort was used to evaluate the accuracy of the administrative developmental screening code, i.e., whether medical record documentation confirms that the screening was conducted as the claim would indicate.

Member age was determined by the age calculated at the date of the reviewed visit.

Study Indicators

In order to organize the data for meaningful analysis, study indicators were categorized into 4 areas addressing various aspects of WCVs and early childhood developmental screening:

1. EPSDT-screening well visit: The proportion of children in the study sample that had the following assessed during the well-care visit associated with the EPSDT code(s)
    - Well-Child Composite Components (Patient History, Anticipatory Guidance, Physical Exam and Developmental Assessment)
    - Health history
    - Developmental surveillance
    - Mental health assessment (age-appropriate, including depression screening for adolescents)
    - Risk behavior assessment for adolescents, including substance use
    - Comprehensive physical exam
    - Height/weight/BMI percentile
    - Health education/anticipatory guidance

2. Developmental screening
    - The proportion of children with 96110 code that had formal developmental screening
    - The proportion of children without 96110 code that had formal developmental screening
    - The proportion of children with 96110 code that had developmental surveillance
    - The proportion of children without 96110 code that had developmental surveillance

3. Vision screening
    - The proportion of children with a vision screening code that had age-appropriate vision screening
    - The proportion of children without a vision screening code that had vision screening
    - The proportion of children with a vision screening code that did not have age-appropriate vision screening

4. Hearing screening
    - The proportion of children with a hearing screening code that had age-appropriate hearing screening
    - The proportion of children without a hearing screening code that had age-appropriate hearing screening
    - The proportion of children with a hearing screening code that did not have age-appropriate hearing screening

The following defines the categories and specific components that were abstracted from the medical records:

1. Demographic information (collected from medical record and, if unavailable, pre-populated from administrative data)

2. Codes associated with WCVs (pre-populated from administrative data) and specific services: [12]
    - Preventive medicine services (99381-99385; 99391-99395; V20, V70)
    - Developmental screening (96110)
    - Hearing screening (92551, 92552, 92567)
    - Vision screening (99173, 99174)
    - Substance abuse screening and brief intervention (99406-99409)
    - Substance abuse counseling (V65.42)

3. Age-appropriate comprehensive health history:
    - Past Medical History, Family History, Social History, Review of Systems
    - Developmental Surveillance (milestones/general surveillance, parental concerns)
    - Mental Health Assessment
        - Informal query/ Formal tool
        - Depression screening for adolescents
        - Substance abuse screen for adolescents
        - Documented follow-up of identified problems

- Counseling
- Medication
- Further testing
- Referral

4. Age and gender-appropriate comprehensive physical exam:

   - Height/weight/BMI
   - Blood Pressure
   - HEENT/Pulmonary/Cardiovascular/Abdomen/Extremities/Neurologic/Genitourinary

5. Counseling/anticipatory guidance/risk reduction:

   - Nutrition/physical activity/safety-injury prevention/school readiness/risk reduction
   - Adolescent risk behaviors

6. Developmental screening with a standardized tool:

   - Ages and Stages Questionnaire (ASQ) - 4months to 60 months
   - Ages and Stages Questionnaire -3rd Edition (ASQ-3) – 1 month to 66 months
   - Battelle Developmental Inventory Screening Tool (BDI-ST) – Birth to 95 months
   - Bayley Infant Neuro-developmental Screen (BINS) - 3 months to 24 months
   - Brigance Screens-II – Birth to 90 months
   - Child Development Inventory (CDI) – 18 months to 6 years
   - Infant Development Inventory – Birth to 18 months
   - Modified Checklist for Autism in Toddlers (M-CHAT) – 16 months to 48 months
   - Parents' Evaluation of Developmental Status (PEDS) – Birth to 8 years
   - Parents' Evaluation of Developmental Status - Developmental Milestones (PEDS-DM) – Birth to 8 years, with additional measures for older children and adolescents
   - Other Validated Developmental Screening Tool

7. Age-appropriate vision screening:

   - Visual acuity
   - Ocular alignment

8. Age-appropriate hearing screening:

   - Screening
   - Audiometry
   - Tympanometry

Data Analysis

The main goals of the analysis differ by cohort: the objective for the first cohort is to determine the validity of the WCV code; and for the second cohort, the objective is to determine the validity of the developmental screen code from the administrative data. For both cohorts, the analyses aim to determine whether the use of either the WCV code or the developmental screen code reflects appropriate screenings and evaluations. The developmental screening code is also evaluated with respect to the use of global developmental screening tools that meet specifications as delineated in CHIPRA core measure specifications.[13]

In addition, the analysis includes a validation of claims for hearing and vision screening. Abstraction included evaluation of age-appropriate hearing and vision screening, both as part of the WCV and as validation of claims codes submitted.

All data abstracted from the administrative data and the medical records are included in the report via frequency tables. Results are presented by age group (1-4 Years vs. 5-11 Years vs. 12-20 Years). Additional frequencies were analyzed for the following groups:

1) Gender (Males vs. Females)
2) MCO (CoventryCares vs. Humana vs. Passport vs. WellCare)
3) Location Type (Urban vs. Rural)
    a. Each record was determined 'Urban' or 'Rural' according to the county code associated with the member's residence, as extracted from the claims data. The 'Urban' group is comprised of the 36 urban counties in Kentucky, as determined by the DMS-approved County/Region Crosswalk.
4) Electronic Medical Record (Yes vs. No)

Due to poor documentation within the medical records, frequencies for race categories were calculated from administrative data. In addition, small numbers in certain race and ethnicity categories prevented further comparative analysis.

Tools used for analysis include Microsoft Office Excel and SAS 9.3.

Methodological Considerations

To test for any differences in proportions, chi-square tests were employed for all comparative analyses incorporating dichotomous (e.g., yes/no) variables and a p-value was generated for each test. P-values less than 0.05 were considered statistically significant, meaning that the observed outcome has less than a 0.05 probability of occurring randomly. Any differences found to be significant are highlighted in bold font. Any tests which produced a p-value greater than or equal to 0.05 are considered not significant and indicated by "n.s." in the frequency tables. To test the difference in proportions between three or more groups, i.e., age group, logistic regression was utilized to determine the direction of the inequality.

Due to small sample sizes, some items, although of clinical interest, were not analyzed for statistical significance. To maximize the number of comparisons for which significance testing could be performed, the following criteria were applied to chi-square tests:

1) The denominator for each group comparison must be greater than 20.
2) The count of each cell in the frequency table is greater than or equal to 1.

Where the criteria, above, were not met and significance testing was not performed, there appears an 'n/a' in place of a p-value. Regardless of significance testing, all data are presented descriptively.

Presentation of Results

The resulting frequencies are listed in the tables below. Tables are presented separately for each group comparison. In addition to the numerator, denominator, group rate and total rate, each table also contains the outcome of the significance test, if performed. For each group comparison in Cohort I, four tables are presented: Preventive Medicine Services

Validation, Developmental Screen Code Validation, Vision Screen Code Validation and Hearing Screen Code Validation. For each group comparison in Cohort II, one table is presented, Developmental Screen Validation. Select tables are presented within the report accompanied by descriptions of any key findings; comprehensive results, including frequencies for all abstracted elements, can be found in Appendices A - I. For any frequency with a denominator equal to zero, the numerator and rate cells have been shaded in grey.

As the Preventive Medicine Services Validation table contains all items for which data was abstracted, a composite measure was designed to determine how the use of the WCV code reflects the basic components of a WCV. For the Well-Child Composite rates shown in the tables below, rates were calculated based on multiple elements of the abstraction. The measure is comprised of 4 major components:

- Patient History – all elements of the patient history documented
- Developmental Assessment – a formal developmental screen **or** developmental surveillance with milestones and parental concerns addressed
- Physical Exam – all elements of the physical exam performed and documented
- Anticipatory Guidance – at least 1 age-appropriate element documented

Results

Disposition of Records

Medical record sample sizes, retrieval information, any noted exclusions, and the final study sample are presented in Tables 1 and 2. Exclusions noted include those members for whom the record could not be located or retrieved, the record was missing pages, the record was illegible, or the date of service fell outside the study period, based on a review of the submitted charts. All available Humana charts were included.

Table 1: Overall Disposition of Records - Cohort I

	Total Charts Requested	Charts Received	Retrieval Rate[1]	Charts Excluded from Study[2]	Final Study Sample[3]	
					n	% of Total Study Sample
CoventryCares	110	110	100%	14	96	31%
Humana	24	13	54%	0	13	4%
Passport	110	110	100%	6	104	34%
WellCare	110	110	100%	15	95	31%
TOTAL	**354**	**343**	**97%**	**35**	**308**	**100%**

[1] Retrieval Rate = Charts Received / Total Charts Requested

[2] Reasons for exclusion include: record could not be located, record was missing pages, record was illegible, date of service falls outside of study period, and prenatal services provided during visit.

[3] The remaining analyses for this study will be based on these members, unless otherwise noted.

Note: Although the total sample size for the study is 308 records, all rates other than the member characteristics are based on a sample size of 307 records. One submitted record did not include documentation for the date of service associated with the claims codes that determined the member's eligibility in the study. This member was included in the overall sample, as the purpose of this study is to validate the information gathered from the claims data with the information found in the medical record; however, information from this chart could not be used to validate a claim for a separate date.

Table 2: Overall Disposition of Records - Cohort II

	Total Charts Requested	Charts Received	Retrieval Rate[1]	Charts Excluded from Study[2]	Final Study Sample[3]	
					n	% of Total Study Sample
CoventryCares	30	30	100%	2	28	33%
Humana	1	0	0%	0	0	0%
Passport	30	30	100%	0	30	35%
WellCare	30	30	100%	2	28	33%
TOTAL	**91**	**90**	**99%**	**4**	**86**	**100%**

[1] Retrieval Rate = Charts Received / Total Charts Requested

[2] Reasons for exclusion include: record could not be located, record was missing pages, record was illegible, date of service falls outside of study period, and prenatal services provided during visit.

[3] The remaining analyses for this study will be based on these members, unless otherwise noted.

Cohort I

Member Characteristics (Table I.1)

When separated by plan membership, a slightly higher percentage of records were associated with members of Passport (34%). As analyzed by age group, most of those members in the age group 1-4 years (36%) were members of CoventryCares. The most of members in the age group 5-11 years (43%) and 12-20 years (42%) were members of Passport.

Upon review of the medical records, 234 out of 308 records did not identify the race of the member (data not shown) and claims data were used instead to evaluate member race. The majority of the study population was identified as White/Caucasian (71%) from the claims data. Black/African American comprised 21% of the study sample, 'Other' race, which combined the values for American Indian and Alaska Native, Asian, Hawaiian or Other Pacific Islander, Multiple Races, and Other Race, comprised 3%, while 5% of race was unreported in the administrative data. Administrative data were not available for ethnicity, and medical record abstraction revealed that 94% of the records did not include documentation of ethnicity, while 3% of members were identified as Hispanic.

The primary language spoken by parents or guardians was unable to be determined from 88% of the submitted medical records. English was the primary language as documented in 11% of the records, while Spanish was not documented as the primary language in any of the records. Interpreter services were provided for 1 member in the study population. For 90% of records for which language was unknown or not specifically identified as English, there was no documentation indicating whether an interpreter was provided.

The study population included 47% female members and 53% male members. Sixty-eight percent of members resided in urban counties and 32% resided in rural counties. A majority (67%) of providers used an electronic medical record (EMR) for documentation.

Table I.1: Member Characteristics

MEDICAL RECORD REVIEW/ ADMINISTRATIVE DATA: Member Characteristics	Cohort I by Member Age							
	Group 1 1-4 Years N = 150		Group 2 5-11 Years N = 77		Group 3 12-20 Years N = 81		TOTAL N = 308	
	n	%	n	%	n	%	n	%
Plan								
CoventryCares of Kentucky	54	36%	23	30%	19	23 %	96	31%
Humana CareSource	6	4 %	4	5%	3	4%	13	4%
Passport Health Plan	37	25%	33	43%	34	42%	104	34%
WellCare of Kentucky	53	35%	17	22 %	25	31%	95	31%
Race								
White	111	74%	57	74%	52	64%	220	71%
Black	29	19%	14	18%	21	26 %	64	21%
Other[1]	4	3%	2	3%	4	5%	10	3%
Unreported[2]	6	4 %	4	5%	4	5%	14	5%
Ethnicity								
Hispanic	4	3%	1	1%	3	4%	8	3%
Non-Hispanic	7	5%	1	1%	1	1%	9	3%
Unreported	139	93%	75	97%	77	95%	291	94%
Gender								

MEDICAL RECORD REVIEW/ ADMINISTRATIVE DATA: Member Characteristics	Cohort I by Member Age							
	Group 1 1-4 Years N = 150		Group 2 5-11 Years N = 77		Group 3 12-20 Years N = 81		TOTAL N = 308	
	n	%	n	%	n	%	n	%
Female	74	49%	34	44%	38	47%	146	47%
Male	76	51%	43	56%	43	53%	162	53%
Primary language spoken by the parent or guardian documented								
English	20	13%	8	10%	5	6%	33	11%
Spanish	0	0%	0	0%	0	0%	0	0%
Other	1	1%	1	1%	3	4%	5	2%
UTD (No documentation on language)	129	86%	68	88%	73	90%	270	88%
Interpreter services provided for the parent or guardian that accompanied the child to the visit documented								
Yes	0	0%	0	0%	1	1%	1	0%
No	8	5%	3	4%	3	4%	14	5%
UTD[3]	132	88%	69	90%	75	93%	276	90%
NA[4]	10	7%	5	6%	2	2%	17	6%
Location Type								
Rural	53	35%	20	26%	26	32%	99	32%
Urban	97	65%	57	74%	55	68%	209	68%
Medical record documentation was EMR								
Yes	105	70%	49	64%	53	65%	207	67%
No	45	30%	28	36%	28	35%	101	33%

[1]Other includes values for the following races: American Indian and Alaska Native, Asian, Hawaiian or Other Pacific Islander, Multiple Races, and Other Race.
[2]Unreported was selected when the member's race was not documented in administrative data.
[3]UTD: English is NOT the primary language AND there is no documentation indicating whether an interpreter was provided.
[4]NA: The primary language is English or it is documented that an interpreter is not needed.

Preventive Medicine Services Validation

In order to determine if WCV-related encounter codes reflect a comprehensive WCV consistent with EPSDT services, documentation for various elements of each visit were reviewed. These elements include EPSDT screening components such as history, physical exam, anticipatory guidance, developmental assessment, hearing/vision screening, and oral health assessment. Frequencies for each of these EPSDT items are described in the following sections.

Composite Well-Child Visit (Table I.2a-g)
**One visit was removed from the denominator because the date of service was different than the claim date.*

A composite variable for a WCV was created using HEDIS® specifications for evidence of a WCV.[13] For the purposes of this study, a basic WCV is one that encompasses the following components: a comprehensive health and developmental history, comprehensive physical exam, and anticipatory guidance. About 27% of visits had all elements of at least 3 WCV components documented while 82% had all elements of at least 1 WCV component. On comparison of age groups, a significant majority (p = 0.036) of visits covered at least 2 components of a composite WCV for ages 1-4 years (64%) as opposed to those 12-20 years of age (47%). For the 12-20 years age group, 89% of visits were identified as WCV compared to the younger ages at 93% (1-4 years) and 92% (5-11 years).

Upon review of the various components included in a basic WCV, past medical history was assessed in 89% of visits. Family history was obtained in 55% of visits. A social history was documented for 71% of visits, while a review of systems occurred in 59% of visits. As part of a comprehensive physical exam, 94% of members had a height and weight documented. Of those 53% of members older than 2 years of age who had a BMI percentile documented, 30% had their BMI categorized by the provider as normal, underweight, overweight, obese or greater than the 95th percentile. Blood pressure was measured in 90% of children ages 3 years and older. Blood pressure was documented for adolescents (96%) significantly more often (p = 0.039) than for the youngest age group (83%). Most of the other elements of a comprehensive physical exam were performed for all members. The exceptions include examination of the head (78%), skin (80%), spine/back (49%), neurologic system (79%), extremities/musculoskeletal system (62%), and genitalia (64%). Examination of the spine/back occurred statistically more frequently (p = 0.028) among ages 5-11 years (58%) than the youngest age group (41%). Genitalia exams of members 12-20 years of age (46%) were conducted statistically less frequently (p<0.001) than younger age groups (74% and 63%). An oral health assessment was included as part of the exam in 50% of members. Overall, 6% of members were referred to an oral health provider; 10% of these were 1-4 years of age.

Table I.2.a: Well-Child Visit – Composite, Patient History, Physical Exam, Oral Health and Height and Weight Assessment

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Age Group								Significance	
	Group 1		Group 2		Group 3					
	1-4 Years (N = 150)		5-11 Years (N = 77)		12-20 Years (N = 81)		TOTAL (N = 308)			
	n	%	n	%	n	%	n	%	p-value	Difference
Well-Child Visit Composite										
Members with a visit on at least 1 of the visit dates identified by the claims data	149	99%	77	100%	81	100%	307	100%	n/a	
Of whom:[1]	**(n = 149)**		**(n = 77)**		**(n = 81)**		**(n = 307)**			
Members for whom reviewed visit was also identified as a well visit in the record	138	93%	71	92%	72	89%	281	92%	n.s.	
Members with visit which includes basic screening components of a WCV. Of the 4 components (patient history, physical exam,										

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Age Group								Significance	
	Group 1 1-4 Years (N = 150)		Group 2 5-11 Years (N = 77)		Group 3 12-20 Years (N = 81)		TOTAL (N = 308)			
	n	%	n	%	n	%	n	%	p-value	Difference
anticipatory guidance and developmental screening) the medical record showed evidence of all elements for:										
All components	5	3%	3	4%	4	5%	12	4%	n.s.	
At least 3 components	45	30%	24	31%	15	19%	84	27%	n.s.	
At least 2 components	96	64%	44	57%	38	47%	178	58%	**0.036**	Grp1>Grp3
At least 1 component	125	84%	64	83%	62	77%	251	82%	n.s.	
None	24	16%	13	17%	19	23%	56	18%	n.s.	
Patient History										
Among all members with at least one visit matching claims data :	**(n = 149)**		**(n = 77)**		**(n = 81)**		**(n = 307)**			
Patient had following elements of patient history documented:										
Past Medical History	130	87%	68	88%	75	93%	273	89%	n/a	
Family History	78	52%	44	57%	46	57%	168	55%	n/a	
Social History	102	68%	58	75%	58	72%	218	71%	n/a	
Review of Systems	80	54%	46	60%	56	69%	182	59%	n/a	
Physical Exam										
Among all members with at least one visit matching claims data :	**(n = 149)**		**(n = 77)**		**(n = 81)**		**(n = 307)**			
Members for whom physical exam included examination of:										
Head	121	81%	60	78%	57	70%	238	78%	n.s.	
Eyes	136	91%	74	96%	71	88%	281	92%	n.s.	
Ears/Nose/Throat	137	92%	75	97%	71	88%	283	92%	n.s.	
Lungs/Respiratory	137	92%	76	99%	75	93%	288	94%	n.s.	
Heart/Cardiovascular	139	93%	74	96%	75	93%	288	94%	n.s.	
Abdomen/GI	139	93%	73	95%	74	91%	286	93%	n.s.	
Skin	123	83%	63	82%	61	75%	247	80%	n.s.	
Spine/Back	61	41%	45	58%	43	53%	149	49%	**0.028**	Grp1<Grp2
Neurologic	121	81%	64	83%	57	70%	242	79%	n.s.	
Extremities/ Musculoskeletal	91	61%	52	68%	47	58%	190	62%	n.s.	
Genitalia	110	74%	48	63%	37	46%	195	64%	**<0.001**	Grp1,Grp2> Grp3
Among members **ages 3 years and older**:	**(n = 47)**		**(n = 77)**		**(n = 81)**		**(n = 205)**			

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Age Group								Significance	
	Group 1 1-4 Years (N = 150)		Group 2 5-11 Years (N = 77)		Group 3 12-20 Years (N = 81)		TOTAL (N = 308)			
	n	%	n	%	n	%	n	%	p-value	Difference
Had blood pressure documented	39	83%	68	88%	78	96%	185	90%	**0.039**	Grp1<Grp3
Oral Health										
Among all members with at least one visit matching claims data :	**(n = 149)**		**(n = 77)**		**(n = 81)**		**(n = 307)**			
Received an oral health assessment	82	55%	37	48%	36	44%	155	50%	n.s.	
Referred to an oral health provider	15	10%	2	3%	2	2%	19	6%	n/a	
Height and Weight Assessment										
Among all members with at least one visit matching claims data :	**(n = 149)**		**(n = 77)**		**(n = 81)**		**(n = 307)**			
Patient had height/length and weight documented	137	92%	74	96%	78	96%	289	94%	n.s.	
Among members **ages 2 years and older**:	**(n = 89)**		**(n = 77)**		**(n = 81)**		**(n = 247)**			
Had BMI percentile documented	42	47%	43	56%	47	58%	132	53%	n.s.	
of whom:	**(n = 42)**		**(n = 43)**		**(n = 47)**		**(n = 132)**			
Had BMI category documented[2]	10	24%	16	37%	13	28%	39	30%	n.s.	

[1] One record did not have a matching date of service to the date of the claims codes used to determine eligibility in the study. This record was included in the overall sample; however, information from this chart could not be used to validate a claim for a separate date.

[2] BMI categories as documented include: Underweight, Normal or Healthy Weight or Normal BMI 5-85th percentile, Overweight, Obese, BMI 85th to less than the 95th percentile, BMI greater than 95th percentile.

n.s. – Not significant.

n/a – Significance test not performed due to small sample size.

Mental Health, Depression, and Substance Abuse Assessment (Table I.2.b and Table I.2.c)

According to EPSDT requirements and clinical guidelines, mental health screening is a necessary component of a comprehensive health and developmental history. In Cohort I, 144 out of 307 members had at least 1 form of mental health screening during their WCV (Table I.2.b). Among this study population, 2% of members had a formal mental health screening tool applied during their visit, 19% of members had an inquiry of parental concerns documented, 42% of visits had provider inquiry or documented observations of mental health development, and 7% of visits applied CPT II code 2014-F: Mental Status Assessed. Overall, provider inquiry/observation appeared to be the most common type of mental health assessment across all age groups, particularly for those ages 12-20 years (57%). Of those with CPT II code 2014-F, 86% of the 5-11 year age group and 12-20 year age group had any form of mental health screening. This code was not used among those members ages 1-4 years.

Among those members who had at least one form of mental health assessment performed, 26% had a positive finding identified in any element of the assessment. When compared by age group, the significantly ($p < 0.001$) higher percentage (47%) of these members were ages 5-11 years and ages 12-20 years (31%). Approximately 8% of members with a mental health concern were recommended for follow-up counseling, 3% were recommended for further testing, and 8% were scheduled for a repeat screening or evaluation. Medication was prescribed for 18 of the 38 members with an identified mental health issue and 6 were referred to another provider. A total of 34% of members with an identified mental health risk had no follow-up care documented in the medical record for the reviewed visits.

Of those members with a formal mental health assessment tool used during their visit, the Pediatric Symptom Checklist was used for one member and the Vanderbilt Attention Deficit Hyperactivity Disorder (ADHD) Assessment Scale was used for one member, while a practice-specific adolescent questionnaire, the Modified Checklist for Autism in Toddlers (M-CHAT), and Perkins Adolescent Risk Screen was used for three other members. (Appendix A, Table A.1)

Among adolescent members, ages 12-20 years, 2% had a formal depression screening performed, while 36% were asked about depression symptoms (Table I.2.b). Perkins Adolescent Risk Screen and the Kutcher Adolescent Depression Scale were used as formal depression screening tools.

Medical record review documentation indicated that alcohol use was screened in 36% of visits and illicit drug use was asked during 28% of visits. Note that each visit may screen for the use of more than one substance. No formal substance abuse screening tool, such as the CAGE (Cut-Annoyed-Guilty-Eye) questionnaire, Drug Abuse Screening Test (DAST) or CRAFFT (Car, Relax, Alone, Forget, Friends, Trouble) screening interview was documented in the records, although substance abuse was covered on the Perkins Adolescent Risk Screen and a sports physical exam form for two members. Tobacco use assessment was documented in 51% of adolescent records.

A total of four teenagers were identified as tobacco users, one was identified as an alcohol user, and one was identified as an illicit drug user. Two of the four adolescents who use tobacco were counseled or advised to quit, while there was no documentation of alcohol or drug use counseling, referral, or treatment for adolescents identified as alcohol or drug users.

Upon review of claims for adolescent WCVs, none of the members had substance abuse screening and brief intervention claim codes, 99406-99409, and substance abuse counseling code, V65.42, applied to the visit. Therefore, validation of these codes could not be performed.

Table I.2.b: Well-Child Visit – Mental Health Assessment

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Age Group								Significance	
	Group 1		Group 2		Group 3					
	1-4 Years (N = 149)		5-11 Years (N = 77)		12-20 Years (N = 81)		TOTAL (N = 307)			
	n	%	n	%	n	%	n	%	p-value	Difference
Mental Health Assessment										
Formal mental health screening tool documented	1	1%	2	3%	2	2%	5	2%	n.s.	
Parental observations/concerns documented	24	16%	22	29%	13	16%	59	19%	n.s.	
Provider inquiry or observation documented	42	28%	42	55%	46	57%	130	42%	**<0.001**	Grp1<Grp2,Grp3
Total members who received a mental health assessment[1]	52	35%	43	56%	49	60%	144	47%	**<0.001**	Grp1<Grp2,Grp3
CPT II Code 2014F- Mental Status Assessed	0	0%	7	9%	14	17%	21	7%	n/a	
Of whom:	**(n = 0)**		**(n = 7)**		**(n = 14)**		**(n = 21)**			
Had a mental health assessment			6	86%	12	86%	18	86%	n.s.	
Of those members who received a mental health assessment:	**(n = 52)**		**(n = 43)**		**(n = 49)**		**(n = 144)**			
Had a mental health problem identified	3	6%	20	47%	15	31%	38	26%	**<0.001**	Grp1<Grp2,Grp3
of whom:	**(n = 3)**		**(n =20)**		**(n = 15)**		**(n = 38)**			
Follow-up care was documented as follows:										

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Age Group								Significance	
	Group 1		Group 2		Group 3					
	1-4 Years (N = 149)		5-11 Years (N = 77)		12-20 Years (N = 81)		TOTAL (N = 307)			
	n	%	n	%	n	%	n	%	p-value	Difference
Counseling	0	0%	2	10%	1	7%	3	8%	n/a	
Follow-up care (continued)	(n = 3)		(n =20)		(n = 15)		(n = 38)			
Testing	0	0%	1	5%	0	0%	1	3%	n/a	
Revisit for repeat screening or evaluation	0	0%	2	10%	1	7%	3	8%	n/a	
Medication	1	33%	8	40%	9	60%	18	47%	n/a	
Referral for further evaluation or treatment	0	0%	4	20%	2	13%	6	16%	n/a	
None	2	67%	7	35%	4	27%	13	34%	n/a	
Among members **ages 12-20 years**:	(n = 0)		(n = 0)		(n = 81)		(n = 81)			
A depression screening was performed										
Informal inquiry					29	36%	29	36%	n/a	
Formal screening[2]					2	2%	2	2%	n/a	
Total					31	38%	31	38%	n/a	

[1]A Mental Health Assessment included at least 1 of the following: Formal Mental Health Screening Tool, Parental Concerns/Observations documented or Provider Inquiry/Observations documented.

[2] Formal depression screening tools included Perkins Adolescent Risk Screen and Kutcher Adolescent Depression Scale.

n.s. – Not significant.

n/a – Significance test not performed due to small sample size.

Table I.2.c: Well-Child Visit – Substance Abuse Screening

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Age Group		Significance	
	12-20 Years (N = 81)			
	n	%	p-value	Difference
Substance Abuse Screening [Ages 12-20 ONLY]				
Members **ages 12-20 years** were assessed for:	(n = 81)			
Tobacco use	41	51%	n/a	
Alcohol use	29	36%	n/a	
Drug use	23	28%	n/a	
At least 1 form of substance use	42	52%	n/a	
of whom:	(n = 42)			
Formal tool was used for alcohol or drug screening for members **ages 12-20 years**:				
DAST	0	0%	n/a	
CRAFFT	0	0%	n/a	
CAGE-AID	0	0%	n/a	
Other[1]	2	5%	n/a	

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Age Group 12-20 Years (N = 81) n	%	Significance p-value	Difference
Members **ages 12-20 years** were identified with:	**(n = 81)**			
Tobacco use	4	5%	n/a	
Alcohol use	1	1%	n/a	
Drug use	1	1%	n/a	
Using 1 or any combination of substances	5	6%	n/a	
Members **ages 12-20 years** who were identified as a tobacco user received follow-up care:	**(n = 4)**			
Tobacco counseling/advice to quit	2	50%	n/a	
Tobacco referral	0	0%	n/a	
Tobacco medication/treatment	0	0%	n/a	
Members **ages 12-20 years** who were identified as a alcohol user received follow-up care:	**(n = 1)**			
Alcohol counseling/brief intervention	0	0%	n/a	
Alcohol referral for treatment	0	0%	n/a	
Members **ages 12-20 years** who were identified as a drug user received follow-up care:	**(n = 1)**			
Drug use counseling/brief intervention	0	0%	n/a	
Drug use referral for treatment	0	0%	n/a	

[1]Other Substance Abuse Screening tools included: Perkins Adolescent Risk Screen and TSSAA Pre-Participation Physical Evaluation.
n/a – Significance test not performed due to small sample size.

Anticipatory Guidance (Table I.2.d)

Frequencies of the provision of age-appropriate anticipatory guidance categories, including nutrition and diet, safety/injury prevention, physical activity, development/mental health/emotional well being, school readiness/academic/social, and risk reduction/physical development, are included in Table I.2.d. Of statistical significance, anticipatory guidance on nutrition and diet (64%) ($p = 0.012$) and safety/injury prevention (76%) ($p < 0.001$), was provided more often among the 1-4 years age group than for older age groups. The documentation of guidance on physical activity was only determined for those members aged 2 years and older. Guidance on development/mental health/emotional well being was provided to 39% of members 5-11 years of age and 40% of members aged 12-20 years. Guidance on school readiness/academic/social was performed for 36% of members 5-11 years of age and 30% of members aged 12-20 years. Risk reduction/physical development anticipatory guidance was given to 54% of all teenagers aged 12-20 years.

Table I.2.d: Well-Child Visit – Anticipatory Guidance

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Member Age: Group 1 1-4 Years (N = 149) n	%	Group 2 5-11 Years (N = 77) n	%	Group 3 12-20 Years (N = 81) n	%	TOTAL (N = 307) n	%	Significance p-value	Difference
Anticipatory Guidance										
Age-appropriate anticipatory guidance provided for:										
Nutrition and Diet	95	64%	39	51%	36	44%	170	55%	**0.012**	Grp1>Grp3
Safety/Injury Prevention	113	76%	43	56%	40	49%	196	64%	**<0.001**	Grp1>Grp2,Grp3

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Member Age								Significance	
	Group 1		Group 2		Group 3					
	1-4 Years (N = 149)		5-11 Years (N = 77)		12-20 Years (N = 81)		TOTAL (N = 307)			
	n	%	n	%	n	%	n	%	p-value	Difference
Among members **ages 2 years and older**	(n = 89)		(n = 77)		(n = 81)		(n = 247)			
Physical Activity/ Screen Time	51	57%	39	51%	36	44%	126	51%	n.s.	
Among members **ages 5 years and older**	(n = 0)		(n = 77)		(n = 81)		(n = 158)			
Development/Mental Health/ Emotional Well Being			30	39%	32	40%	62	39%	n.s.	
School Readiness/ Academic/ Social			28	36%	24	30%	52	33%	n.s.	
Among members **ages 12 years and older**	(n = 0)		(n = 0)		(n = 81)		(n = 81)			
Risk Reduction/ Physical Development					44	54%	44	54%	n/a	

n.s. – Not significant.
n/a – Significance test not performed due to small sample size.

Developmental Assessment (Table I.2.e)

Two categories of developmental assessment during the WCV were analyzed: developmental surveillance and developmental screening. Overall for Cohort I, developmental surveillance was documented for 82% of members. Developmental surveillance was performed primarily through discussion of developmental milestones and/or general surveillance (97%). Developmental milestones were surveyed significantly ($p = 0.036$) more frequently among the 1-4 year age group (99%) than the 12-20 year age group (92%). For 44% of members, parental concerns were assessed, although this was significantly less frequent ($p = 0.016$) for the age group 12-20 years (29%) as expected due to greater responsibility placed on self-care at older ages. For members who had surveillance performed, developmental surveillance elements were categorized by social-emotional, cognitive, language and motor skills. As anticipated, developmental skills were assessed more often among the youngest age group when access to early intervention services can be ensured. Language skills (70%) were the least assessed, although 89% of children ages 1-4 years, when such assessment is most critical, were assessed for language. Motor skills were assessed significantly more often ($p < 0.001$) in the 1-4 year age group (89%). Cognitive skills were assessed at the highest percentage (85%) across all age groups. This assessment was statistically higher ($p = 0.005$) among the 1-4 year (87%) and the 5-11 year age groups (92%). During a stage of development when youth are often testing social barriers, asserting their independence, and having a greater reliance on peer relationships, socio-emotional development was assessed among 77% of adolescents, while 84% of members aged 1-4 years were assessed during their visits.

The use of at least one formal developmental screen was documented in 9% of visits (Table I.2.e). There were 2 of 29 visits, where a global standardized screening test was used that addresses four developmental domains (motor, cognitive, language, and socio-emotional) and is also considered to have established reliability, validity, sensitivity, and specificity, according to CHIPRA Developmental Screening measure specifications. In Cohort I, the only tool documented that meets these specifications was the Parents' Evaluation of Developmental Status (PEDS). Other tools, identified in the study, were condition-specific, addressed less than four developmental domains, or did not meet CHIPRA-specified thresholds for established reliability, validity, sensitivity, and specificity. These tools include M-CHAT, Bellefonte Pediatric Development Questionnaire, CHADIS, Denver and Denver II, IH Adolescent Questionnaire, Perkins Adolescent Risk Screen, Vanderbilt ADHD Assessment Scale, and Lansky Performance Status Scale. Overall, the screening tool used most often was the M-CHAT (48%), which is a condition-specific autism screening tool.

Table I.2.e: Well-child Visit – Developmental Assessment

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Member Age								Significance	
	Group 1		Group 2		Group 3					
	1-4 Years (N = 149)		5-11 Years (N = 77)		12-20 Years (N = 81)		TOTAL (N = 307)			
	n	%	n	%	n	%	n	%	p-value	Difference
Developmental Surveillance										
Development assessed during visit	126	85%	61	79%	65	80%	252	82%	n.s.	
Of whom:	**(n = 126)**		**(n = 61)**		**(n = 65)**		**(n = 252)**			
The following elements of surveillance were performed:										
Discussion of developmental milestones and/or general surveillance	125	99%	59	97%	60	92%	244	97%	**0.036**	Grp1>Grp3
Assessment of parental concerns	62	49%	31	51%	19	29%	112	44%	**0.016**	Grp1,Grp2>Grp3
Domains of surveillance addressed:										
Social Emotional	106	84%	44	72%	50	77%	200	79%	n.s.	
Cognitive	110	87%	56	92%	47	72%	213	85%	**0.005**	Grp1,Grp2>Grp3
Language	112	89%	44	72%	20	31%	176	70%	**<0.001**	Grp1>Grp2>Grp3
Motor	112	89%	44	72%	38	58%	194	77%	**<0.001**	Grp1>Grp2,Grp3
Developmental Screening										
Among all members:	**(n = 149)**		**(n = 77)**		**(n = 81)**		**(n = 307)**			
Formal developmental screening tool documented	21	14%	5	6%	3	4%	29	9%	n/a	
of whom:	**(n = 21)**		**(n = 5)**		**(n = 3)**		**(n = 29)**			
Members with a global developmental screening tool:	1	5%	1	20%	0	0%	2	7%	n/a	
Parents' Evaluation of Developmental Status (PEDS)	1	5%	1	20%	0	0%	2	7%	n/a	
Members with other[1] screening tool:	20	95%	4	80%	3	100%	27	93%	n/a	
Modified Checklist for Autism in Toddlers (M-CHAT)[2]	14	67%	0	0%	0	0%	14	48%	n/a	
Other Developmental Screening Tool[2,3]	4	19%	3	60%	3	100%	10	34%	n/a	
UTD[2,4]	2	10%	1	20%	0	0%	3	10%	n/a	
Among all members:	**(n = 149)**		**(n = 77)**		**(n = 81)**		**(n = 307)**			
Overall type of developmental assessment:										
Members with a formal standardized screening tool	1	1%	1	1%	0	0%	2	1%	n/a	

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Member Age								Significance	
	Group 1		Group 2		Group 3					
	1-4 Years (N = 149)		5-11 Years (N = 77)		12-20 Years (N = 81)		TOTAL (N = 307)			
	n	%	n	%	n	%	n	%	p-value	Difference
Members with other[1] formal screening tool	20	13%	4	5%	3	4%	27	9%	n/a	
Members with only developmental surveillance	107	72%	57	74%	62	77%	226	74%	n/a	
Members with neither surveillance nor formal screening	21	14%	15	19%	16	20%	52	17%	n/a	

[1] Other Screening tools may include standardized developmental screening tools that do not cover all domains (Motor, Cognitive, Language and Social) or may not meet CHIPRA specifications for reliability, validity, sensitivity and specificity.

[2] The denominator used in the calculation of these rates includes all members with any formal developmental screening tool documented.

[3] Other Developmental Screening tool included: Denver and Denver Development II Screen, Perkins Adolescent Risk Screen, Bellefonte Pediatric Development, IH Adolescent Questionnaire, Lansky Performance and CHADIS.

[4] UTD: Unable to determine.

n.s. – Not significant.

n/a – Significance test not performed due to small sample size.

Vision Screening (Table I.2.f)

Age-appropriate vision screening was conducted during 34% of visits for members younger than 3 years of age and for 38% of visits for those ages 3 years and older. Though not significantly different, the age groups with the highest percentage of vision screens were the 3-4 year (43%) and 5-11 year age group (42%). Vision referrals were given to 8 out of 307 members in Cohort I.

Table I.2.f: Well-Child Visit – Vision Screening

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Age Group								Significance	
	Group 1 1-4 Years (N = 149)		Group 2 5-11 Years (N = 77)		Group 3 12-20 Years (N = 81)		TOTAL (N = 307)			
	n	%	n	%	n	%	n	%	p-value	Difference
Well-Child Visit – Vision Screening										
Among members **under 3 years of age:**	**(n = 102)**		**(n = 0)**		**(n = 0)**		**(n = 102)**			
Members received age-appropriate vision screening[1], which occurred on the date of the WCV	35	34%					35	34%	n/a	
Of those that did not have screen on date of WCV:	**(n=67)**		**(n = 0)**		**(n = 0)**		**(n=67)**			
Members received age-appropriate vision screening[1], which occurred within 7 days of the date of the WCV	0	0%					0	0%	n/a	
Among members **ages 3 years and older:**	**(n = 47)**		**(n = 77)**		**(n = 81)**		**(n = 205)**			
Members received age-appropriate vision screening[2] which occurred on the date of the WCV	20	43%	32	42%	26	32%	78	38%	n.s.	
Of those that did not have screen on date of WCV:	**(n=27)**		**(n=45)**		**(n=55)**		**(n=127)**			
Members received age-appropriate vision screening[2] which occurred within 7 days of the date of the WCV	0	0%	2	4%	0	0%	2	2%	n/a	
Among all members:	**(n = 149)**		**(n = 77)**		**(n = 81)**		**(n = 307)**			
Member referred to eye health professional	2	1%	4	5%	2	2%	8	3%	n.s.	

[1] Age-appropriate vision screen for those **under 3 years of age** includes: observation/exam/responses; picture test such as Allen cards; Universal cover test; responses to visual stimuli.

[2] Age-appropriate vision screen for those **3 years of age and older** includes: distance visual acuity via Snellen wall chart; ocular alignment via unilateral cover test or random dot.

n.s. – Not significant.

n/a – Significance test not performed due to small sample size.

Hearing Screening (Table I.2.g)

Age-appropriate hearing screening was performed in 14% of visits for members younger than 3 years of age and 26% of visits for those 3 years and older. The age group with the statistically highest percentage (p = 0.014) of hearing screens was the 5-11 year age group (36%). Follow-up hearing referrals were provided to a total of three members out of 72 members with a hearing screen.

Table I.2.g: Well-Child Visit – Hearing Screening

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Age Group								Significance	
	Group 1		Group 2		Group 3					
	1-4 Years (N = 149)		5-11 Years (N = 77)		12-20 Years (N = 81)		TOTAL (N = 307)			
	n	%	n	%	n	%	n	%	p-value	Difference
Well-Child Visit – Hearing Screening										
Among members **under 3 years of age:**	**(n = 102)**		**(n = 0)**		**(n = 0)**		**(n = 102)**			
Members received age-appropriate hearing screening[1] which occurred on the date of the WCV	14	14%					14	14%	n/a	
Of those that did not have screen on date of WCV:	**(n = 88)**		**(n = 0)**		**(n = 0)**		**(n =88)**			
Members received age-appropriate hearing screening[1] which occurred within 7 days of the date of the WCV	1	1%					1	1%	n/a	
Among members **ages 3 years and older:**	**(n = 47)**		**(n = 77)**		**(n = 81)**		**(n = 205)**			
Members received age-appropriate hearing screening[2] which occurred on the date of the WCV	6	13%	28	36%	20	25%	54	26%	**0.014**	Grp1<Grp2
Of those that did not have screen on date of WCV:	**(n =41)**		**(n = 49)**		**(n = 61)**		**(n = 151)**			
Members received age-appropriate hearing screening[2] which occurred within 7 days of the date of the WCV	2	5%	1	2%	0	0%	3	2%	n/a	
Among all members who received any age-appropriate hearing screen on or within 7 days of the date of the WCV:	**(n = 23)**		**(n = 29)**		**(n = 20)**		**(n = 72)**			
Members referred to audiology related health professional	1	4%	1	3%	1	5%	3	4%	n/a	

[1] Age-appropriate hearing screening for those **under 3 years of age** includes: observation/exam/responses to auditory stimuli.

[2] Age-appropriate hearing screening for those **ages 3 years and older** includes: pure tone audiometry and tympanometry testing performed.

n.s. – Not significant.

n/a – Significance test not performed due to small sample size.

Developmental Screening Code (CPT 96110) Validation

In accordance with AAP periodicity schedule, only the age group 1-4 in Cohort I was considered for validation of CPT 96110 since standardized developmental screening tests should be administered at the 9, 18, and 24-30 months visits. Developmental surveillance was also identified in the medical record review in relation to 96110.

For ages 1-4, ten out of 149 records were associated with code 96110. Of those visits with the administrative developmental screening CPT code 96110, five members (50%) had documented screening with a formal developmental screen, while no visits included documentation that a global standardized screening tool was used that met CHIPRA specifications. Fifty percent of visits using code 96110 had only developmental surveillance documented.

Table I.3 Validation of Developmental Screening Code (CPT 96110)

MEDICAL RECORD REVIEW: Developmental Screen Code Validation	Cohort I by Age Group: Group 1, 1-4 Years (N = 149) n	%	Significance: p-value	Difference
Developmental Surveillance				
Members with a CPT 96110 code	10	7%	n/a	
Of whom:	**(n = 10)**			
Development assessed during visit	10	100%	n/a	
Developmental Screening				
Members with a CPT 96110 code	10	7%	n/a	
Of whom:	**(n = 10)**			
Formal developmental screening tool documented	5	50%	n/a	
of whom:	**(n = 5)**			
Members with a global standardized screening tool	0	0%	n/a	
Members with other[1] formal screening tool:	5	100%	n/a	
Modified Checklist for Autism in Toddlers (M-CHAT)[2]	4	80%		
UTD[2,3]	1	20%		
Members with a CPT code 96110:	**(n = 10)**			
Of those members who had a developmental screening code CPT 96110:			n/a	
Members with a global standardized screening tool	0	0%		
Members with other[1] formal screening tool	5	50%		
Members with only developmental surveillance	5	50%		
Members with neither surveillance nor formal screening	0	0%		

[1] Other Screening tools may include standardized developmental screening tools that do not cover all domains (Motor, Cognitive, Language and Social) or may not meet CHIPRA specifications for reliability, validity, sensitivity and specificity.

[2] The denominator used in the calculation of these rates includes all members with any formal developmental screening tool documented.

[3] UTD: Unable to determine.

n/a – Significance test not performed due to small sample size.

Vision Screening Code Validation

In order to determine if vision screening codes 99173 and 99174 accurately reflect age-appropriate vision screening, documentation of vision screening was reviewed in the medical record. Claims using vision screening codes 99173 and 99174 occurred for 9% of visits. Of those members with a vision screening claim, 84% of those ages 3 years and older received age-appropriate vision screening, and 100% of those younger than 3 years of age received age-appropriate vision screening.

Table I.4: Validation of Vision Screening Code

MEDICAL RECORD REVIEW: Vision Screen Code Validation	Cohort I by Age Group								Significance	
	Group 1 1-4 Years (N = 149)		Group 2 5-11 Years (N = 77)		Group 3 12-20 Years (N = 81)		TOTAL (N = 307)			
	n	%	n	%	n	%	n	%	p-value	Difference
Vision Claim Validation										
Members with a vision screening code (99173, 99174) on the date of the WCV or within 7 days[1] of the WCV	10	7%	8	10%	9	11%	27	9%	n.s.	
Of whom:										
Among members **under 3 years of age:**	**(n = 2)**		**(n = 0)**		**(n = 0)**		**(n = 2)**			
Members received age-appropriate vision screening[2]	2	100%					2	100%	n/a	
Among members **ages 3 years and older:**	**(n = 8)**		**(n = 8)**		**(n = 9)**		**(n = 25)**			
Members received age-appropriate vision screening[3]	4	50%	8	100%	9	100%	21	84%	n/a	

[1] Considering that screenings may not be completed at the first attempt, visits with vision screenings that occurred within 7 days of the documented WCV were allowed to accommodate repeat office visits to complete the screening.

[2] Age-appropriate vision screen for those **under 3 years of age** includes: observation/exam/responses; picture test such as Allen cards; Universal cover test; responses to visual stimuli

[3] Age-appropriate vision screen for those **3 years of age and older** includes: distance visual acuity via Snellen wall chart; ocular alignment via unilateral cover test or random dot

n.s. – Not significant.

n/a – Significance test not performed due to small sample size.

Hearing Screening Code Validation

In order to determine if hearing screening codes 92551, 92552, and 92567 accurately reflect age-appropriate hearing screening, documentation of hearing screens was reviewed in the medical record. Claims using hearing screening codes occurred for 10% of visits. Of the 30 visits with a hearing screening code, 23 received age-appropriate screening. The 5-11 year age group had a significantly higher ($p < 0.001$) percentage of visits with a hearing screening claim (21%) than the 1-4 year age group (4%).

Table I.5: Validation of Hearing Screening Code

MEDICAL RECORD REVIEW: Hearing Screen Code Validation	Cohort I by Age Group								Significance	
	Group 1		Group 2		Group 3					
	1-4 Years (N = 149)		5-11 Years (N = 77)		12-20 Years (N = 81)		TOTAL (N = 307)			
	n	%	n	%	n	%	n	%	p-value	Difference
Hearing Claim Validation										
Members with a Hearing Screening code (92551, 92552, 92567)	6	4%	16	21%	8	10%	30	10%	**<0.001**	Grp1<Grp2
Of whom:										
Among members **under 3 years of age:**	**(n = 2)**		**(n = 0)**		**(n = 0)**		**(n = 2)**			
Members received age-appropriate hearing screening[1]	1	50%					1	50%	n/a	
Among members **ages 3 years and older:**	**(n = 4)**		**(n = 16)**		**(n = 8)**		**(n = 28)**			
Members received age-appropriate hearing screening[2]	1	25%	13	81%	8	100%	22	79%	n/a	

[1] Age-appropriate hearing screening for those under 3 years of age includes: observation/exam/responses to auditory stimuli.
[2] Age-appropriate hearing screening for those ages 3 years and older includes: pure tone audiometry and tympanometry testing performed.
n/a – Significance test not performed due to small sample size.

Cohort I Group Comparison

This section is a summary of the most relevant frequency distributions compared by gender, EMR documentation, and location types. Detailed frequencies for each group are located in the appendix of the report.

Rates for individual MCOs are presented in Appendix B, but, due to small sample sizes, frequencies by MCO could not be compared.

Comparison by Gender (Appendix C)

Mental Health, Depression, and Substance Abuse Assessment (Table C.1)

- A significantly higher percentage (p = 0.003) of members, who had at least one form of mental health assessment performed and a mental health risk identified, were male (37%). Fifteen percent of females who had at least one form of mental health assessment performed had a mental health risk identified.

Developmental Assessment (Table C.1)

- Gender differences for assessment of social-emotional and language domains were statistically significant (p = 0.030 and p = 0.020). Female members were assessed for social-emotional developmental domains as documented in 85% of visits while males were assessed for this domain as documented in 74% of visits. Additionally, an assessment of language development was documented more frequently for females (77%) than males (63%).

Comparison by EMR (Appendix D)

Preventive Medicine Services (Table D.1)

- For a composite WCV, at least 1, 2, and 3 components were documented significantly more (p < 0.001) with the use of an EMR-based chart than those without an EMR-based chart.
- Providers documented BMI percentiles using an EMR-based chart for members older than 2 years of age (64%) significantly more (p < 0.001) than those not using an EMR-based chart (33%).
- Elements of the physical exam were documented statistically more frequently within EMR-based charts than non-EMR-based charts. Please see Table D.1 for p-values and proportions.

Anticipatory Guidance (Table D.1)

- For EMR-documented visits, anticipatory guidance was noted significantly more often than visits without EMR documentation across the following categories:
    - Nutrition and diet (p = 0.004)
    - Safety/Injury Prevention (p<0.001)
    - Physical activity/Screen Time (p=0.005)
    - Development/Mental Health/Emotional Well-being (p=0.042)

Developmental Assessment (Table D.1)

- Developmental surveillance was documented significantly more often (p < 0.001) with the use of an EMR (91%) than without an EMR (63%).

Comparison by Location Type (Appendix E)

Preventive Medicine Services (Table E.1)

- Providers documented BMI percentiles for urban-residing members older than 2 years of age (58%) significantly more (p = 0.025) than rural members (43%).

Developmental Assessment (Table E.1)

- Providers assessed the developmental surveillance language domain among urban members (75%) significantly more often (p=0.020) than for rural members (60%).

Mental Health, Depression, and Substance Abuse Assessment (Table E.1)

- Providers performed at least one form of assessment of urban members' mental health (52%) significantly more often (p = 0.015) than that of rural (37%) members.
- Providers of urban members (10%) used CPT II code 2014-F significantly more often (p = 0.006) than those of rural members (1%).

Anticipatory Guidance (Table E.1)

- Among urban members (59%), anticipatory guidance on nutrition and diet occurred significantly more often (p = 0.042) than for rural members (47%).
- Guidance on development/mental health/emotional well-being was performed significantly more often (p = 0.030) among urban members (45%) than rural members (26%).

Vision Screening (Table E.1)

- Providers performed age-appropriate vision screening among urban members of all ages during 41% of visits, which is significantly more often (p=0.041) than for rural members (29%).

Cohort II

Member Characteristics

Cohort II includes ages 1 through 3 years. Members aged 1 year were the majority, represented with 57 members out of the 86 member cohort. When separated by plan membership, the higher percentage of records was associated with members of Passport (35%). As analyzed by age group, the higher percentage of those members aged 1 year (42%) were members of CoventryCares. A large number of members aged 2 years were split between Passport and WellCare at 44%, and the majority of 3 year olds were members of WellCare (75%).

Upon review of the medical records, 65 out of 86 records did not identify the race of the member (data not shown) and claims data were used to identify member race. The majority of the study population was identified as White/Caucasian (80%) from the claims data. Black/African American comprised 13% of the study sample, 'Other' race which combined the values for American Indian and Alaska Native, Asian, Hawaiian or Other Pacific Islander, Multiple Races, and Other Races, included 5%, while 2% of race was unreported. Administrative data were not available for ethnicity, and medical record abstraction revealed that 95% of the records did not include documentation of ethnicity, while 1% of members were identified as Hispanic.

The primary language spoken by parents or guardians was unable to be determined (UTD) from 80% of the submitted medical records. English was the primary language as documented in 15% of the records, while Spanish was documented as the primary language in 3% of the records. Interpreter services were provided for one member in the study population. For 83% of records for which language was unknown or not specifically identified as English, there was no documentation indicating whether an interpreter was provided.

The study population included 49% female members and 51% male members. A majority (65%) of providers used an electronic medical record for well-child visits.

Table II.1: Cohort II Member Characteristics

MEDICAL RECORD REVIEW/ADMINISTRATIVE DATA: Member Characteristics	Cohort II by Age							
	1 Year N = 57		2 Years N = 25		3 Years N = 4		TOTAL N = 86	
	N	%	N	%	N	%	N	%
Plan								
CoventryCares of Kentucky	24	42%	3	12%	1	25%	28	33%
Humana CareSource	0	0%	0	0%	0	0%	0	0%
Passport Health Plan	19	33%	11	44%	0	0%	30	35%
WellCare of Kentucky	14	25%	11	44%	3	75%	28	33%
Race								
White	47	82%	19	76%	3	75%	69	80%
Black	6	11%	5	20%	0	0%	11	13%
Other[1]	3	5%	1	4%	0	0%	4	5%
Unreported[2]	1	2%	0	0%	1	25%	2	2%
Ethnicity								
Hispanic	1	2%	0	0%	0	0%	1	1%
Non-Hispanic	2	4%	0	0%	1	25%	3	3%
Unreported	54	95%	25	100%	3	75%	82	95%
Gender								

MEDICAL RECORD REVIEW/ADMINISTRATIVE DATA: Member Characteristics	Cohort II by Age							
	1 Year N = 57		2 Years N = 25		3 Years N = 4		TOTAL N = 86	
	N	%	N	%	N	%	N	%
Female	27	47%	13	52%	2	50%	42	49%
Male	30	53%	12	48%	2	50%	44	51%
Primary language spoken by the parent or guardian documented								
English	13	23%	0	0%	0	0%	13	15%
Spanish	2	4%	1	4%	0	0%	3	3%
Other	0	0%	0	0%	1	25%	1	1%
UTD (No documentation on language)	42	74%	24	96%	3	75%	69	80%
Interpreter services provided for the parent or guardian that accompanied the child to the visit documented								
Yes	1	2%	0	0%	0	0%	1	1%
No	3	5%	1	4%	0	0%	4	5%
UTD[3]	43	75%	24	96%	4	100%	71	83%
NA[4]	10	18%	0	0%	0	0%	10	12%
Medical record documentation was EMR								
Yes	37	65%	18	72%	1	25%	56	65%
No	20	35%	7	28%	3	75%	30	35%

[1]Other includes values for the following races: American Indian and Alaska Native, Asian, Hawaiian or Other Pacific Islander, Multiple Races, and Other Races.
[2]Unreported was selected when the member's race was not documented in administrative data.
[3]UTD: English is NOT the primary language AND there is no documentation indicating whether an interpreter was provided.
[4]NA: the primary language is English or it is documented that an interpreter is not needed.

Developmental Assessment

The Cohort II segment of the study aimed to determine the use of the CPT code 96110: Developmental Testing, limited with interpretation and report, relative to the elements performed as part of a developmental assessment. CPT code 96110 indicates developmental screening, with interpretation and report, per standardized developmental screening tool of a limited nature.[12]

Developmental Surveillance (Table II.2.a)

As outlined in the 2006 AAP policy statement Identifying Infants and Young Children with Developmental Disorders in the Medical Home, which was reaffirmed in 2010, there are 5 components of developmental surveillance: inquiry of parental concerns about their child's development, up-to-date documentation of a developmental history, accurate observations of the child, identification of risk and protective factors, completion of an accurate record of the process and findings.[10]

Among Cohort II members for whom an administrative claim for Developmental Screening (CPT code 96110) was submitted, developmental surveillance was documented for 92% of members. Developmental surveillance was performed primarily through discussion of developmental milestones and/or general surveillance (99%). Parental concerns were also assessed for 39% of members. For members who had surveillance performed, developmental surveillance elements were categorized by social-emotional, cognitive, language, and motor skills. Assessment of motor development was the least commonly documented (3%), especially among members aged 1 and 3 years (0%). Risk factors, such as family genetic

history, in utero drug/alcohol exposure, or preterm birth that may be associated with developmental delay, were evaluated for 24% of members. Of those visits using the CPT code 96110, 28% had only developmental surveillance performed upon review of the documentation, with no formal developmental screen (Table II.2.b).

Table II.2.a: Developmental Assessment – Surveillance

MEDICAL RECORD REVIEW: Developmental Assessment	Cohort II by Age								Significance	
	1 Year N = 57		2 Years N = 25		3 Years N = 4		TOTAL N = 86			
	N	%	N	%	N	%	N	%	p-value	Difference
Developmental Surveillance										
Development surveillance documented	52	91%	23	92%	4	100%	79	92%	n/a	
Of whom:	**(n = 52)**		**(n = 23)**		**(n = 4)**		**(n = 79)**			
The following elements of surveillance were performed:										
Discussion of developmental milestones and/or general surveillance	51	98%	23	100%	4	100%	78	99%	n/a	
Assessment of parental concerns	19	37%	11	48%	1	25%	31	39%	n/a	
Assessment of risk factors for developmental delay	13	25%	6	26%	0	0%	19	24%	n/a	
Domains of surveillance addressed:										
Social Emotional	49	94%	21	91%	4	100%	74	94%	n/a	
Cognitive	51	98%	20	87%	4	100%	75	95%	n/a	
Language	51	98%	22	96%	4	100%	77	97%	n/a	
Motor	0	0%	2	9%	0	0%	2	3%	n/a	

n/a – Significance test not performed due to small sample size.

Developmental Screening (Table II.2.b)

At least one standardized developmental screening test was performed on 71% of members for whom an administrative claim for Developmental Screening (CPT code 96110) was submitted. None of the members aged 3 years had a standardized screen documented, although 100% of these members had some form of developmental surveillance performed. Of those members with at least one developmental screening test performed, 25% had a global screening test that measures development of all four domains as mentioned in Cohort I results. These tests included Parents' Evaluation of Developmental Status (PEDS) and Parents' Evaluation of Developmental Status-Dev Milestones (PEDS-DM).

Overall, the Modified Checklist for Autism in Toddlers (M-CHAT) was the most frequently used (64%) screening test, but this test is condition-specific and is not a global developmental screening tool. Among those members with an administrative claim for CPT code 96110, 53% had a developmental screening test that targets less than four developmental domains or the tools did not meet other criterion for CHIPRA DEV numerator compliance. Another screening tool used for 6 of the 86 assessed members included the Denver II Test. All six of these members were in the 1 year age group at the time of the screen.

Table II.2.b: Developmental Assessment – Formal Screening

MEDICAL RECORD REVIEW: Developmental Assessment	Cohort II by Age								Significance	
	1 Year N = 57		2 Years N = 25		3 Years N = 4		TOTAL N = 86			
	N	%	N	%	N	%	N	%	p-value	Difference
Developmental Screening										
Among all members:	**(n = 57)**		**(n = 25)**		**(n = 4)**		**(n = 86)**			
Formal developmental screening tool performed on or within 7 days of the preloaded date	39	68%	22	88%	0	0%	61	71%	n/a	
of whom:	**(n = 39)**		**(n = 22)**		**(n = 0)**		**(n = 61)**			
Members with a global developmental screening tool:	7	18%	8	36%			15	25%	n/a	
Parents' Evaluation of Developmental Status (PEDS)	6	15%	7	32%			13	21%		
Parents' Evaluation of Developmental Status-Dev Milestones (PEDS-DM)	1	3%	1	5%			2	3%		
Members with other[1] screening tool:	32	82%	14	64%			46	75%	n/a	
Modified Checklist for Autism in Toddlers (M-CHAT)[2]	25	64%	14	64%			39	64%		
Other Developmental Screening Tool[1,2]	6	15%	0	0%			6	10%		
UTD[2,3]	1	3%	0	0%			1	2%		
Among all members:	**(n = 57)**		**(n = 25)**		**(n = 4)**		**(n = 86)**			
Of those members who had a developmental screening code, CPT 96110:									n/a	
Members with a global developmental screening tool	7	12%	8	32%	0	0%	15	17%		
Members with other[4] screening tool	32	56%	14	56%	0	0%	46	53%		
Members with only developmental surveillance	17	30%	3	12%	4	100%	24	28%		
Members with neither surveillance nor formal screening	1	2%	0	0%	0	0%	1	1%		

[1] Other Screening tools may include standardized developmental screening tools that do not cover all domains (Motor, Cognitive, Language, and Social) or may not meet CHIPRA specifications for reliability, validity, sensitivity, and specificity.
[2] The denominator used in the calculation of these rates includes all members with any formal developmental screening tool documented.
[3] UTD: Unable to determine.
[4] Other Developmental Screening tools include: Denver Developmental II.
n/a – Significance test not performed due to small sample size.

Cohort II Group Comparison

This section is a summary of the most relevant frequency distributions compared by gender and EMR documentation. Detailed frequencies for these groups, and those of gender and location type, are located in the appendix of the report.

Rates for individual MCOs are presented in Appendix F, but, due to small sample sizes, frequencies by MCO could not be compared.

Comparison by Gender (Appendix H)

- Of those members tested with a global standardized screening tool, females (40%) were tested significantly more frequently ($p = 0.006$) than males (10%).
- Of those members tested with other screening tools, males (90%) were tested significantly more frequently ($p = 0.006$) than females (60%).
  Of those members tested with other screening tools, M-CHAT was documented statistically more frequently ($p = 0.006$) among males (81%) than females (47%).

Comparison by Electronic Medical Records (Appendix I)

- Of those visits where an EMR was used, parental concerns were assessed during 55% of visits with an EMR as compared to 11% of visits without an EMR. ($p < 0.001$)
- Risk factors associated with developmental delay were also assessed during a greater percentage of visits with an EMR (33%) as compared to visits without an EMR (7%). ($p = 0.009$)
- There was a significant difference ($p= 0.002$) between the use of any formal screening tool when using an EMR (82%) as compared to visits without an EMR (50%).

Discussion

EPSDT services are intended to screen, diagnose, and treat Medicaid-eligible children at early, regular intervals in order to avoid or minimize childhood illnesses.[4] Studies have shown that EPSDT screenings have not been performed as recommended in this population. In fact, the US Department of Health and Human Services, Office of the Inspector General reported in 2010 that, in nine states reviewed, three out of four children did not receive all required medical, vision, and hearing screenings. Forty-one percent of children did not receive any required medical screenings at all, even though each state had identified and implemented strategies to improve the completeness of EPSDT screenings.[4] In order to clarify the receipt of EPSDT services among KY MMC members, this EPSDT clinical focused study sought to validate WCV-related claim codes and compare administrative performance data with the care documented during WCV. In line with other studies reviewing EPSDT services, this study found that many children did not receive the expected tests and services during WCV.

Cohort I

Member Characteristics

Cohort I includes members ages 1 through 20 years. Out of 310 members, those aged 1-4 years represented 152 members. When separated by plan membership, the larger percentage of records was associated with members of Passport (34%). There were a few records (13) submitted by Humana, precluding comparison of rates among MCOs.

According to the Census 2010, Whites/Caucasians comprise 87.8% of the total population and Hispanics make up 3.1% of the total population in KY.[14] The study sample for Cohort I, where Whites make up 71% of the study population and Hispanics were reported in 3%, is reflective of the relative homogeneity of the KY population. Primary language was not well documented in medical records, although the majority of records were EMRs. Documentation of potential language barriers is a required component to meet Stage 1 Meaningful Use standards for the Medicare and Medicaid Electronic Health Record (EHR) Incentive Programs.[15] The lack of diversity within the population may also contribute to poor documentation on this element. Geographical differences were noted for some elements of EPSDT services, but there are many factors that could have impacted this finding, such as provider setting.

Preventive Medicine Services

KY aligns its EPSDT-required services with AAP guidelines. These components include a health history, developmental assessment, complete physical examination, and anticipatory guidance at each WCV. In addition to thorough examination and laboratory screenings, WCVs present an opportunity for communication on normal development, nutrition, safety, and social concerns impacting the child's well-being, as well as what the parent should expect at each age. Screenings, like those for hearing and vision, ensure early detection that is crucial for the child's development, academic performance, and functioning through adulthood. Mental health and substance abuse screenings are also key opportunities to implement intervention for risky behaviors and dysfunctional social environments. Upon review of components documented in the medical record for WCVs identified from claim codes, this study determined that WCV exams, screenings, and counseling were not always consistent with those required for EPSDT services or recommended by national clinical guidelines.

For the purposes of this study, the documentation of four components of a WCV (health history, developmental history, comprehensive physical examination, and anticipatory guidance) was considered to determine a basic composite WCV. The results show variations of combined elements for each component that were performed during the visit reviewed but very few (4%) had all elements of each component documented. Fifty-eight percent of the visits with documentation consistent with the WCV claim date of service had at least two components of the WCV fully documented. A statistical difference was noted between visits with two more components fully documented, with the youngest age group (1-4 years) having a higher rate of two or more components than adolescents. Although there was no significant difference between adolescents and younger age groups for visits consistent with the WCV claim date of service being identified as well-visits in the record, it is possible that acute care visits were used as an opportunity to provide EPSDT services, which may have been less complete as a result. There have been reports that adolescents have unmet need for well-visits, such as a 2009 study in which caregivers of nearly 8,500 teens reported that only 38% had a preventive care visit in 12 months. Low-income and uninsured status presented an increased risk for lack of well-child care.[16]

This study found that BMI percentile measurement and assessment was lacking in spite of known health risks associated with overweight and obesity, such as high blood pressure, high cholesterol, type 2 diabetes, fatty liver disease, and psychosocial problems persisting into adulthood.[17] The member's BMI percentile was calculated significantly more often with the use of an EMR, which may automatically calculate BMI percentile; however, there was no statistical difference between visits with EMR documentation and those without EMR documentation for the percentages of visits in which the BMI percentile was assessed by the provider to determine weight status. As EMR systems continue to adapt to the needs of patients and providers alike, BMI percentile assessments may be performed more frequently. In fact, a recent study, published in the American Journal of Medical Quality, showed a statistically significant increase in diagnosis of childhood obesity, after the implementation of point-of-care clinical decision support alerts.[18] Geographic location also appeared to affect BMI measurement. Urban members had a BMI percentile calculated more often than rural members' visits. There are many other factors that may contribute to differences in urban vs. rural BMI measurement, such as penetration of EMR, which as noted above had higher rates of BMI percentile calculation in this study. There may also be more hospital-based or systems-based practices in urban settings where educational support and QI programs may be more prevalent. In addition, access and availability of centers and professionals that treat childhood obesity may be an issue limiting weight assessment among rural members.[19]

Although BMI assessments were not frequently performed, hypertension screening was measured in a high percentage of members aged 3 years and older. As per the AAP periodicity schedule, blood pressure screening should be performed annually starting at 3 years of age. Similar to BMI percentile measurements, the use of an EMR for visit documentation was significantly associated with a higher percentage of members with a blood pressure measurement. The National Heart, Lung and Blood Institute's Expert Panel on Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children and Adolescents recommends annual blood pressure screening beginning at age 3 as part of a comprehensive screening strategy, and cites evidence that hypertension and pre-hypertension are increasing among children and adolescents.[20] In spite of insufficient evidence supporting a conclusive recommendation for screening, the United States Preventive Services Task Force (USPSTF) also acknowledges rising prevalence of hypertension in pediatric populations, perhaps attributable to increasing childhood overweight and obesity.[21] Another rationale for blood pressure screening is to identify hypertension associated with an underlying cause, such as renal parenchymal disease or renal vascular disease.[21]

Although most elements of a complete physical exam were performed, examination of the spine, musculoskeletal system, and genitalia needs improvement. During the pubescent years, sexual development and physical signs of sexually transmitted infections (STIs) is especially important to assess during the WCV. Early detection of precocious puberty or delays in sexual development, as well as timely diagnosis of STIs helps prevent consequences of short stature, poor self-esteem, infertility, and transmission of STIs. Sexual maturity staging and examination of the genitalia provides an opportunity to discuss normal pubertal development, safe sex practices, and pregnancy prevention.

Overall, only half of the study population received an oral health assessment by their PCP during the WCV. Access to dental care has been a well-documented challenge for Medicaid populations. In fact, a KY Department of Public Health Title V Fact Sheet showed that only 28 of KY's 120 counties had a pediatric dentist.[22] As per the Healthy Smiles Initiative in KY, 50% of all KY children had tooth decay with 47% of children ages 2-4 years suffering from untreated dental problems in 2004.[23] In addition to pain and periodontal infections, untreated dental caries affects a child's eating, speech, play, and learning capabilities.[24] As a required component of EPSDT services, the oral assessment performed during a WCV may be the only opportunity to identify untreated dental disease, refer for appropriate dental services and educate the family on appropriate dental hygiene. The AAP periodicity schedule[25] recommends that an oral assessment should be performed at the 3 year and 6 year visits with at least a risk assessment done at 6, 9, 12, 18, 24, and 30-month visits.

Mental Health, Depression, and Substance Abuse

Screenings for mental health disorders were not routinely conducted among the Cohort I study population. As noted in the 2013 CMS Informational Bulletin: *Prevention and Early Identification of Mental Health and Substance Use Conditions*, a concerning number of teens with mental health disorders go unrecognized and do not receive necessary services for their condition. Less than half of adolescents (47%) in Cohort I were evaluated for any mental health issue and only 38% were asked about depression symptoms. Screening for substance abuse is also an opportunity for improvement, since there was documentation that only 51% of adolescents were assessed for tobacco use and fewer were assessed for alcohol or drug use (36% and 28% respectively). Although the EPSDT benefit program includes further assessment or referral for any positive screening, only two of the four members identified as tobacco users received counseling and there was no documentation of follow-up for identified alcohol or drug abuse. These findings highlight a potential focus area for

improvement consistent with that identified in the CMS informational bulletin. Increased awareness and providing tools to facilitate mental health and substance abuse screening in EPSDT services could help ensure that children at risk are identified and appropriately treated. For provider education, AAP Bright Futures offers a comprehensive toolkit for mental health assessment and treatment. AAP also released guidance to its members providing Screening, Brief Intervention and Referral to Treatment (SBIRT). Another valuable resource, which includes recommendations for mental health and substance use screening, was released by the American Medical Association titled, *Guidelines for Adolescent Preventive Services (GAPS)*.

The CPT II code 2014-F: Mental Status Assessed was documented in 7% of Cohort I visits, with highest rates of use among Passport members. The documentation of a code for mental status assessment without accompanying documentation of the result of screening or what type of screening was conducted is difficult to interpret with regard to the type of mental health assessment it represents.

Anticipatory Guidance

In a 2011 HHS report on *Quality of Care for Children in Medicaid and CHIP*, adolescents were noted to have the lowest rate of WCVs among all age groups, with only 47% of those aged 12-21 years receiving at least 1 preventive care visit.[26] Lower rates of WCVs among this age group may limit opportunities for adolescents to receive recommended counseling and advice. Unintentional injuries, suicide, and homicide topped the national leading causes of death in 2010 for age 10-24 years.[27] The 2011 Youth Risk Behavior Surveillance System (YRBSS) results[28] show that a considerable number of students are engaging in drug and alcohol use, at risk for drunk driving, carrying weapons, and have considered or attempted suicide. Thirty-four percent of YRBSS respondents were sexually active and of those, 60% used condoms during last sexual intercourse. Twenty-eight percent were overweight/obese. PCPs are in a position to assess and intervene in high risk behaviors, encourage appropriate health behaviors and identify adolescents at risk for mental health issues. However, as noted above, mental health assessment, depression screening, and screening for substance abuse were not routinely conducted. Further, only 40% of teens in this study received advice on mental health development and emotional well-being, 30% were counseled on social interactions with peers, and 54% on risk reductions. Guidance regarding nutrition and injury prevention were also opportunities for improvement, with only 44% of adolescents receiving guidance on nutrition and diet and only 49% counseled regarding safety and injury prevention.

Anticipatory guidance provides health professionals with an opportunity to identify relevant health promotion topics, create a teachable moment, and give personalized guidance based on the family's needs and concerns. The AAP Bright Futures Pocket Guide offers providers information on age-appropriate anticipatory guidance topics for each scheduled visit.[29] Because anticipatory guidance is based on the discretion and communication style of the healthcare provider as well as the family's needs and concerns, the frequency results vary across age group, gender, and geographical location. For the purposes of this study, examples provided for this study's medical record review of each anticipatory guidance category included:

- **Nutrition/Diet (all ages):** For very young, includes feeding advice, e.g., breastfeeding/bottle-feeding status, eating cereals vs. solid foods. Healthy eating; nutritious snacks; fast food restrictions; avoiding sugary beverages; fruit and vegetable intake; balanced diet; portion control; concerns about weight gain/loss.

- **Safety/Injury Prevention (all ages)** (This category includes violence and abuse): Safe cribs; car seats; safe toys; falls; water safety; bike helmets; fire safety; dealing with strangers; after-school activities; driving; seat belts; avoiding riding with drinkers; rough-housing; sport safety; guns; dating abuse.

- **Physical Activity/Screen Time (as of 2 years):** Limit TV time/TV alternatives/no TV in room; time for exercise every day; family activities; engagement in sports.

- **Development/Mental Health/Emotional Well Being (as of 5 years):** Anger management; family time; appropriate discipline/praise; independence and responsibility; role model; discuss puberty; know peers/friends; expect age-related behaviors; mood changes; dealing with stress; decision-making.

- **School Readiness/Academic/Social (as of 5 years):** friends/peer pressure; bullying; communication with teachers; after school activities; homework routines; academic performance; interest in school work; respect for authority; planning for future; hobbies; community involvement.

- **Risk Reduction/Physical Development (as of 12 years)** (may have overlapped with other categories; if so, both were counted): Body image; oral care; balanced diet/physical activity; safe dating; conflict resolution; physical, emotional, or sexual abuse; tobacco, drugs/prescription drugs, sex; peer pressure; protective gear; protect hearing.

Developmental Assessment

Early detection and treatment of developmental delays has a great impact on a child's health and functional outcomes. According to the National Center for Birth Defects and Developmental Disabilities, many children with developmental delays are identified late, resulting in a delay in treatment. These missed opportunities may affect school readiness and social interactions leading to longstanding difficulties.[30]

The AAP recommends that age-appropriate developmental monitoring or surveillance be conducted at every preventive care visit. Since development is dynamic, and there are limits to surveillance and screening, the AAP recommends that developmental screening with a standardized screening tool be conducted for all children at 9 months, 18 months and 24-30 months of age. If concerns about delayed or disordered development are noted during routine surveillance, screening may be conducted more often. The AAP notes that broad screening tools should address domains including fine and gross motor, language and communication, problem solving/adaptive behavior and personal-social skills.[10] Addressing all four of these domains is also specified in the CHIPRA Developmental Screening measure as a required criterion for screening tools to be numerator compliant. In addition, screening tools meeting CHIPRA specifications must have established reliability, measures of validity, and sensitivity/specificity.

Overall, developmental surveillance was conducted across all age groups with the youngest ages more commonly surveyed. Each domain was appropriately assessed; however, an assessment of language skills appeared to drop off in the adolescent age group. This is not surprising since most delays in verbal and receptive communication skills should already be identified and addressed during the elementary school period. It is interesting to note the gender differences in developmental surveillance. Social-emotional and language development were evaluated significantly more frequently in females than males. Since the study population was comprised of a comparable number of males and females, this could represent some gender bias in developmental surveillance.

The validation of code 96110 focused on 2 contexts: 1) validation of the use of standardized developmental screening tools as part of EPSDT services and 2) the validity of CPT code 96110 relative to the CHIPRA developmental screening measure specification. As part of developmental assessment at ages 9, 18, and 24-30 months, AAP Bright Futures recommends developmental screenings using a standardized tool. In addition to the use of a structured developmental screen, an autism specific screen should be administered at the 18 month and 24 month visit. The M-CHAT is an autism screening tool and, overall, it was the most commonly documented standardized tool in the reviewed records. There were no visits identified that documented both the M-CHAT and an additional standardized developmental screening tool (data not shown). The M-CHAT, as an autism specific screen, does not address all 4 developmental domains: motor, language, cognitive and social-emotional.

The coding guidance from the AAP Bright Futures and Preventive Medicine Coding Fact Sheet, updated January 2014, provides a list of sample screening tools that are appropriate for coding with CPT 96110, including the M-CHAT. Until the 2014 update, AAP guidance also instructed providers to use modifier 59 if more than 1 screen is performed during the visit.[12] It should be noted that the CPT® 2013 Professional Code Book does not identify specific tools that are represented by the code 96110, which is described as "Developmental screening, with interpretation and report, per standardized instrument". Therefore, it appears there is some discrepancy between CHIPRA developmental screening specifications, AAP guidance, and the CPT code description. Providers appear to be using the code consistent with AAP guidance, including coding the M-CHAT with 96110, which is not consistent with CHIPRA measure specifications but is not inappropriate. Few records documented a developmental screening tool meeting CHIPRA specifications as determined by the measure steward.

Vision Screening

The AAP periodicity schedule recommends annual vision screening between ages 3 to 6 years then every other year thereafter. A risk assessment should be performed every year, starting from the newborn period, with appropriate action

to follow, if positive. For the purposes of this study, age-appropriate vision screen for children under 3 years was considered observation and/or examination of ocular structures and responses to visual stimuli, picture test such as Allen cards, and Universal Cover Test. Age-appropriate screening for members 3 years and older included distance visual acuity via Snellen wall chart or ocular alignment via unilateral cover test or random dot-E stereo test.[25]

Approximately one-third (37%) of members received age-appropriate vision screening even though this is a required component of EPSDT services. The 3-4 year and 5-11 year age groups appeared to receive the greatest percentage of vision screening tests in Cohort I. Reviews published in *Pediatrics* and *Clinical Opinions in Ophthalmology* state that low rates of screening may be due to poor cooperation of children with this form of testing or lack of time .[31, 32] Those members seen in urban counties had significantly higher rates of screening than those in rural counties (Appendix E, Table E.1). Another factor that may affect screening rates documented by the PCP is the availability of school health-based vision and hearing screening examinations. As per KY State Regulation KRS 156.160 and 702 KAR 1:160, the KY Board of Education requires preventative health care examinations before first enrollment into public school and within one year prior to entrance into 6th grade. This exam includes vision and hearing screening. If these exams were performed by a school-based clinic, the student's vision screen would not have been captured in this study.

Vision screening codes 99173 and 99174 do not appear to correlate well with the provision of age-appropriate vision screening in this study. Only 27 out of 115 documented vision screens applied these codes. (Table I.2.f, Table I.4) Of these 27 visits, 23 visits for which a vision screen code was submitted had documentation of vision screening in the medical record.

Hearing Screening

The prevalence of hearing loss increases among school-age children due to late-onset, late-identified, and acquired hearing loss.[33] Many hearing screening programs have targeted and subsequently, improved rates of universal newborn hearing screening, but detection of hearing loss among older children remains a concern. Hearing assessment is crucial for early intervention optimizing speech/language development and referrals for treatment and educational services.

According to the AAP periodicity schedule, age-appropriate hearing screens should be performed at birth, annually between ages 4 and 6 years then again at 8 and 10 years of age. A risk assessment should be performed annually with appropriate action to follow, if positive. For the purposes of this study, an age-appropriate hearing screen for children under 3 years was considered observation/exam/responses to auditory stimuli. Age-appropriate screening for members 3 years and older included pure tone audiometry and tympanometry testing. Again, there was poor evidence documenting the performance of hearing screens and the predominate age group that received testing was the 5-11 age group. Low rates of hearing screening may be due to poor cooperation of children with this form of testing, similar to an identified barrier for vision screening, or an inadequate testing environment.[33] As stated above, hearing testing in this age group is often a part of health screening and evaluation documentation required by schools; therefore, the availability of school health-based vision and hearing screening examinations may also lower PCP-documented screening rates. For further evaluation of reasons for lack of hearing screenings among eligible children, additional studies could focus on surveying providers to evaluate additional barriers to screenings.

Hearing screening codes 92551, 92552, and 92567 also did not correlate well with age-appropriate hearing testing in this study. Only one-tenth of visits (30) applied these hearing screening codes while 72 out of 307 visits had a hearing screen documented in the medical record. Further, not all members for whom a hearing code claim was submitted had documentation of an age-appropriate hearing screen in the record.

Cohort II

Member Characteristics

Similar to cohort I, the study sample for cohort II where Whites make up 80% of the study population is reflective of the homogeneity of the KY population. Primary language was not well reported upon review of the medical records.

Developmental Assessment

The CHIPRA "Developmental Screening in the First Three Years of Life" measure examines the percentage of children screened for risk of developmental, behavioral, and social delays using a standardized screening tool in the 12 months preceding their first, second, or third birthday. Oregon Health and Science University, the measure steward, warns that the use of CPT code 96110 has been shown to have questionable validity in states that do not have policies clarifying how the 96110 code should be used, consistent with global developmental screening.[13] Tools that are listed in the measure as examples of appropriate developmental standardized tools are:

- Ages and Stages Questionnaire (ASQ) - 4months to 60 months
- Ages and Stages Questionnaire -3rd Edition (ASQ-3) – 1 month to 66 months
- Battelle Developmental Inventory Screening Tool (BDI-ST) – Birth to 95 months
- Bayley Infant Neuro-developmental Screen (BINS) - 3 months to 24 months
- Brigance Screens-II – Birth to 90 months
- Child Development Inventory (CDI) – 18 months to 6 years
- Infant Development Inventory – Birth to 18 months
- Parents' Evaluation of Developmental Status (PEDS) – Birth to 8 years
- Parent's Evaluation of Developmental Status -Developmental Milestones (PEDS-DM) – Birth to 8 years, with additional measures for older children and adolescents

These specified tools are among those that meet the following criteria:

1. Developmental domains: The following domains must be included in the standardized developmental screening tool: motor, language, cognitive and social-emotional.
2. Established Reliability: Reliability scores of approximately 0.70 or above.
3. Established Findings Regarding the Validity: Validity scores for the tool must be approximately 0.70 or above. Measures of validity must be conducted on a significant number of children and using an appropriate standardized developmental or social-emotional assessment instrument(s).
4. Established Sensitivity/Specificity: Sensitivity and specificity scores of approximately 0.70 or above.

As discussed for Cohort I, validation of 96110 can occur in the context of appropriate use of the code and use of the code relative to CHIPRA developmental specifications. In this validation study, 71% of Cohort II members had at least one Formal developmental screening tool performed, but nearly 30% of visits with CPT code 96110 submitted had only developmental surveillance documented. Therefore, code 96110 does not appear to wholly reflect developmental screening using at least one standardized screening tool. Additionally, the use of 96110 to collect data for the CHIPRA Measure: DEV does not reflect the use of a global developmental screening tool meeting CHIPRA technical specifications. Only 17% of visits with any formal screening tool applied documented a CHIPRA-specified screening test, so administrative data does not appear to be reliable for reporting the CHIPRA developmental screening measure.

The purpose of establishing a second cohort for evaluation, cohort II, was to validate the use of CPT code 96110 both as a reflection of developmental screening, with interpretation and report, with a standardized instrument, and also to evaluate the potential of using administrative data, i.e. CPT code 96110, to report the CHIPRA developmental screening measure, which is required for reporting by states. Cohort II was selected based on submission of a claim for developmental screening; therefore, results may reflect higher percentages of developmental screening among this cohort than among Cohort 1, which was selected based on codes for well child visits.

An important limitation of using 96110 to identify cases that are numerator compliant with CHIPRA specifications is that providers may be using other screening tools to satisfy the AAP guideline for screening at 9 month, 18 month and 30 month visits. This evaluation of Cohort II found that of those visits for which there was documentation of a formal screening tool, only 24% of the tools met CHIPRA specifications. Tools that did not meet the specifications for the CHIPRA DEV measure were used more often and the most commonly used tool was the M-CHAT (64%). AAP provides Bright Futures as a guide to providers to meet recommendations on preventive care visits. In the guide, the M-CHAT, among other tools for autism screening, is recommended along with a structured developmental screen, at the 18-month and 24 month visit.[34] The M-CHAT does not, however, meet the CHIPRA global screening tool criteria measuring developmental, behavioral, and social delays. As discussed for Cohort I, differences between coding guidelines published by AAP and the intended application of CPT code 96110 as described in the technical specifications for CHIPRA Measure: DEV may lead to inaccuracies in reporting this performance measure using solely administrative data. CHIPRA DEV measure guidance for reporting suggests that state policies clarifying criteria for use of the CPT 96110 code should be in place prior to reporting this measure using administrative data.[13]

The AAP Coding Guidelines Fact Sheet notes that CPT code 96110 is intended for reporting the administration of developmental screening instruments such as the Ages and Stages Questionnaire, M-CHAT, PEDS, Pediatric Symptom Checklist, and Vanderbilt ADHD rating scales.[13] These tools can be administered by non-physician members of the medical team during preventive medicine services or other office visits. Interpretation and report should accompany any administered screening tool. Scoring assessment may be included in a score legend of the tool itself, but the provider should acknowledge the score in the progress note and document discussion of the result and any necessary follow-up/referral with the patient's parent/caregiver. The AAP: Bright Futures *Coding for Pediatric Preventive Care 2012* states that "Clinical staff (e.g., registered nurse) typically administers and scores the completed instrument while the physician incorporates the interpretation component into the accompanying E/M service".[35] In order to increase rates of developmental assessment, providers can be trained to alter their workflow and enhance the roles and responsibilities of other available staff. Staff can be instructed to administer select developmental screening tools and then flag results with irregularities for the provider to address during the preventive care visit.

The use of an EMR may help improve the use of developmental screening tools since there was a significant difference (p= 0.002) between the use of any formal screening tool when using an EMR (82%) as compared to visits without an EMR (50%). Screening tools may be pre-loaded and documented in the EMR system and clinical decision support systems may be built to remind providers to administer these tools in a timely manner. The 2006 Commonwealth Fund report, "Developmental Screening In Primary Care: The Effectiveness Of Current Practice and Recommendations for Improvement", urged the development of screening tools that were available in the public domain and compatible with EMRs.[36]

When analyzed by MCOs, Passport had the highest percentage of members (90%) with any screening tool used during a visit with a CPT code 96110 (Appendix G – Table G.1). As analyzed in the 2014 Compliance Review, this plan's instructions to providers follows AAP/Bright Futures recommendations, making reference to the use of screening tools and the periodicity schedule in the provider manual, EPSDT Orientation Kit, the plan's provider portal website, and in-person provider training sessions. These practices may be useful as strategies to improve developmental screening.

Limitations

- Study results represent documentation in the components of medical records that were submitted; it is possible that some services were not documented or provided in submitted records.
- Significance testing and interpretation of results was limited by small cell counts, especially in the study sample provided by Humana.
- Due to incomplete chart retrieval from Humana, Cohort II only describes the experience of members from the other 3 MCOs.
- Age groups were determined by the age calculated in the abstraction database using date of birth and the date of the visit. These groups reflect the ages of members at the date of the visit in whole years; therefore, months of age were unable to be determined for analysis of developmental screening performance at 9 months, 18 months, and 24-30 months. The exact timing of developmental screening in accordance with AAP guidelines cannot be measured.
- Vision and hearing screenings may also be conducted in other community settings, such as volunteer screening events or school health centers, and may not be documented in the PCP's medical record. Only hearing and vision screenings documented by the PCP would have been captured in this study.
- Medical records from January 1 to April 30, 2013 were reviewed for a single visit or service as per submitted claim codes, and the study did not include a look-back period to determine if screenings were conducted in the previous year. Certain screenings like vision and hearing may have occurred at other visits or in other care settings and not identified in this review.

Conclusion

This study compared administrative encounter data and medical record documentation to validate claim codes relevant to the receipt of EPSDT screening by pediatric members enrolled in KY MMC.

Cohort I represented a stratified random sample of 110 eligible children for each of the four KY MCOs, as available, for whom an administrative claim for a WCV was submitted. For this cohort, the contents of WCVs relative to recommended EPSDT services were evaluated. Cohort II, on the other hand, represented a stratified random sample of 100 eligible

children among the four KY MCOs for whom an administrative claim for Developmental Screening (CPT code 96110) was submitted. This second cohort was used to evaluate the accuracy of the administrative developmental screening code, i.e., whether medical record documentation confirms that the screening was conducted as the claim would indicate.

Overall, encounter codes evaluated in each cohort do not wholly reflect the provision of a comprehensive WCV or developmental screening, as described in standard clinical guidelines or EPSDT requirements. While some screenings were more consistent than others, the performance of weight assessments, developmental screenings, oral health assessments, mental health screenings, and vision and hearing screenings needs improvement. A solely administrative review of preventive services claims, CPT code 96110, mental health screening claims, and hearing/vision claims would not capture an accurate account of the performance of recommended screenings during a WCV.

Summary of Cohort I Findings

- Performance of WCV components varies across age groups. Of note, there were lower percentages in performance of spinal and genitalia exams, mental health assessments and follow-ups, and anticipatory guidance among the adolescent age group.
- BMI percentile measurement and assessment was lacking. Visits associated with EMR-documentation and urban county residence appears to have higher percentages of BMI percentile measurement.
- Blood pressure was measured in a high percentage of members aged 3 years and older. The members with a visit documented by an EMR had significantly higher rates of blood pressure measurements.
- Only half of Cohort I received an oral health assessment by their PCP.
- Less than half of adolescents in Cohort I were evaluated for any mental health issue, slightly over a third were asked about depression symptoms, and slightly over half were screened for any substance abuse. Half of members identified as tobacco users in this study were not referred for any additional counseling, treatment, or follow-up.
- Anticipatory guidance varied across age group, gender, and geographical location. Rates decreased among older age groups, especially for adolescents.
- Developmental surveillance was performed across all age groups with the youngest ages more commonly surveyed. Each of the 4 developmental domains was assessed; however, an assessment of language skills appeared to drop off, as expected, in the adolescent age group. Social-emotional and language development were significantly assessed more frequently in females than males.
- Only 9% of visits documented the use of at least 1 standardized developmental screening tool. M-CHAT was used most often.
- Cohort I study results do not correlate the use of CPT code 96110: Developmental screening with interpretation and report, with a standardized instrument with the performance of developmental screening using a standardized screening tool. The use of code 96110 as a proxy for the use of global standardized developmental screening instruments for purposes of reporting the CHIPRA measure does not appear to be valid.
- Approximately one-third of members received age-appropriate vision screening even though this is a required component of EPSDT services. The 3-4 year and 5-11 year age groups appeared to receive the greatest percentage of vision screening tests in Cohort I. Members residing in urban counties were screened at higher percentages. Vision screening codes 99173 and 99174 do not appear to correlate with the provision of age-appropriate vision screening in this study.
- Overall, 23% of members were screened for hearing loss. (Appendix A, Table A.1) The age group that received the largest percentage of hearing screens was the 5-11 age group. Hearing screening codes 92551, 92552, and 92567 did not correlate well with age-appropriate hearing testing in this study.

Summary of Cohort II Findings

- Similar to Cohort I findings, the use of the CPT code 96110 does not appear to reflect developmental screening using a standardized screening tool that evaluates all 4 developmental domains and meets other criterion for CHIPRA DEV numerator compliance.
- This validation study showed that 71% of Cohort II members had a Formal developmental screening tool performed, yet nearly 30% of visits with CPT code 96110 had only developmental surveillance documented.
- Providers used a global developmental screening tool in 25% of those visits where a formal screening was performed. M-CHAT is not a global developmental screening tool, yet it was the most commonly used tool for screening.

- There was a significant difference (p= 0.002) between the use of any formal screening tool when using an EMR as compared to visits (82%) without an EMR (50%).

Recommendations

Recommendations for Managed Care Organizations

- Collaborate with providers to assess barriers to screenings. Encourage access to screening tools, academic detailing, and coordinating follow-up for children with identified concerns. Encourage the use of the AAP Bright Futures toolkits and pocket guides to reinforce elements of a WCV and EPSDT preventive screening services. These materials can be adopted as a reference for clinician manuals and policy development.
- Consider auditing EPSDT visits through medical record review to monitor receipt of mental health screenings, oral health assessment, and hearing/vision screens.
- Encourage EMR implementation to include the incorporation of standardized screening tools with interpretation and clinical decision support systems that remind providers of timely administration of preventive health screens. EMRs can also be used to generate office-based registries to track members who are overdue for screenings and those who have been referred for follow-up and treatment of positive findings.
- Collaborate with providers to assess barriers to performing anticipatory guidance and develop systems-based initiatives to address those barriers.
- Consider providing members and their PCPs with lists of overdue screenings and assist members with coordinating these screenings with their preventive health visits in order to improve the documentation of age-appropriate vision and hearing screenings. A performance improvement project could be considered to test systems and process-based interventions around the performance of these screenings.

Recommendations for Kentucky

- Collaborate with health plans, providers and EMR systems to develop strategies to incorporate mental health, substance abuse, and developmental screening tools as well as clinical decision support for timely oral health and vision/hearing screenings into electronic records.
- Collaborate with health plans to promote consistent messaging for providers regarding the importance of developmental screening with a standardized tool and disseminate referral resources.
- Collaborate with providers to ensure consistency of specifications of EMR-reported developmental screening, specifically, specifications that align with CHIPRA specifications.
- Collaborate with AAP regarding ways to align provider coding practices with criteria for appropriate global developmental screening tools as per CHIPRA specifications.
- Consider implementation of policies regarding use of the CPT 96110 code to represent global developmental screening consistent with CHIPRA specifications, including consideration of requiring modifiers to identify single domain or single condition screens such as the M-CHAT.
- Consider health plan reporting of the CHIPRA developmental screening measure augmenting CPT 96110 with medical record specifications.

References

1. Early and Periodic Screening, Diagnosis and Treatment. Available at http://www.medicaid.gov/Medicaid-CHIP-Program-Information/By-Topics/Benefits/Early-Periodic-Screening-Diagnosis-and-Treatment.html. Accessed November 18, 2012.

2. Department of Health and Human Services Centers for Medicare and Medicaid Services. *CMCS Informational Bulletin: Prevention and Early Identification of Mental Health and Substance Use Conditions*; March 27, 2013.

3. United States General Accounting Office, Report to Congressional Requesters. *Medicaid: stronger efforts needed to ensure children's access to health screening services.* July 2001; GAO-01-749. Available at http://www.gao.gov/new.items/d01749.pdf. Accessed October 25, 2010.

4. Department of Health and Human Services. Office of the Inspector General. *Most Medicaid children in nine states are not receiving all required preventive screening services.* May 2010; OIE 05-08-00520, Available at http://oig.hhs.gov/oei/reports/oei-05-08-00520.pdf. Accessed January 24, 2012.

5. Office of Inspector General of Department of Health and Human Services. *Preventive Screenings for Medicaid Children*: https://oig.hhs.gov/newsroom/podcasts/2012/wellness-trans.asp. Downloaded January 8, 2013.

6. Centers for Medicare and Medicaid Services. Medicaid Enrollment and EPSDT Utilization for Children under 21, FY 2009. *Annual EPSDT Report and Medicaid Statistical Information System and Medicaid Statistical Information System*. Available at http://mchb.hrsa.gov/chusa11/state/downloads/pdf/c1170.pdf. Accessed February 8, 2012.

7. Peters, CP. *EPSDT: Medicaid's critical but controversial benefits program for children*. National Health Policy Forum 2006; Issue Brief Number 819. Available at http://www.nhpf.org. Accessed October 25, 2010.

8. Rosenbaum S, Wise PH. *Crossing the Medicaid-private insurance divide: the case of EPSDT*. Health Affairs 2007; 26(2): 382-393.

9. Boyle CA, Boulet S, Schieve L, Cohen RA, Blumberg SJ, Yeargin-Allsopp M, Visser S, Kogan MD. *Trends in the Prevalence of Developmental Disabilities in US Children, 1997–2008.* Pediatrics. 2011 downloaded 1/29/13. http://pediatrics.aappublications.org/content/early/2011/05/19/peds.2010-2989.abstract

10. American Academy of Pediatrics. Council on Children with Disabilities. *Identifying infants and young children with developmental disorders in the medical home: an algorithm for developmental surveillance and screening.* Pediatrics 2006; 118(1): 405-416.

11. Centers for Medicare and Medicaid Services. *Initial core set of children's health care quality measures: technical specifications and resource manual for federal fiscal year 2012 reporting*. Updated November 2012.

12. American Academy of Pediatrics. *Coding for Pediatric Preventive Care 2012.* Available at http://brightfutures.aap.org/pdfs/Coding%20PR%20F0809.pdf. Accessed May 6, 2014.

13. Centers for Medicare and Medicaid Services. *Core Set of Children's Health Care Quality Measures: Technical Specifications and Resource Manual for Federal Fiscal Year 2013 Reporting.* Available at: http://www.medicaid.gov/Medicaid-CHIP-Program-Information/By-Topics/Quality-of-Care/Downloads/Medicaid-and-CHIP-Child-Core-Set-Manual.pdf. Accessed May 6, 2014.

14. United States Census 2010. *2010 Census Interactive Population Search.* http://www.census.gov/2010census/popmap/ipmtext.php?fl=21. Accessed May 6, 2014.

15. CMS.gov: Centers for Medicare and Medicaid Services. *EHR Incentives Program: Meaningful Use.* https://www.cms.gov/Regulations-and-Guidance/Legislation/EHRIncentivePrograms/Meaningful_Use.html. Accessed May 6, 2014.

16. Irwin C, et al. *Preventive Care for Adolescents: Few Get Visits and Fewer Get Services.* Pediatrics. Vol. 123 No. 4 April 1, 2009 pp. e565 -e572. Available at: http://pediatrics.aappublications.org/content/123/4/e565.full. Accessed May 6, 2014.

17. Centers for Disease Control and Prevention. *Basics about Childhood Obesity.* April 27, 2012. Accessed May 6, 2014. http://www.cdc.gov/obesity/childhood/basics.html

18. Shaikh, U, et al. *Impact of Electronic Health Record Clinical Decision Support on the Management of Pediatric Obesity.* American Journal of Medical Quality. 1062860613517926. January 13, 2014. Available at: http://ajm.sagepub.com/content/early/2014/01/13/1062860613517926.abstract.

19. National Rural Health Foundation. *What's Different about Rural Health Care?* Available at: http://www.ruralhealthweb.org/go/left/about-rural-health/what-s-different-about-rural-health-care. Accessed May 6, 2014.

20. National Heart, Lung and Blood Institute. *Expert Panel on Integrated Guidelines for Cardiovascular Health and Risk Reduction in Children and Adolescents Summary Report October 2012.* NIH Publication 12-7486A. Accessed 5/11/14 at http://www.nhlbi.nih.gov/guidelines/cvd_ped/peds_guidelines_sum.pdf

21. United States Preventive Services Task Force. *Screening for Primary Hypertension in Children and Adolescents: Final Recommendation Statement.* AHRQ Publication No. 13-05181-EF-2. May 2013. http://www.uspreventiveservicestaskforce.org/uspstf13/hypechild/hypechldfinalrec.htm. Accessed May 6, 2014.

22. Kentucky Department for Public Health. *Title V Fact Sheet: Access to Dental Care. October 14, 2009.* Available at: http://chfs.ky.gov/NR/rdonlyres/C6688D9C-1EC4-4CA0-986F-9545C03C6D02/0/101409OralHealthAccesstoDentalCare.doc. Accessed May 6, 2014.

23. Kentucky.gov. *What is Healthy Smiles Kentucky?* Available at: http://kidshealth.ky.gov/en/healthysmiles/. Accessed May 6, 2014.

24. Centers for Disease Control and Prevention. Division of Oral Health. *Children's Oral Health.* September 10, 2013. Available at: http://www.cdc.gov/oralhealth/children_adults/child.htm. Accessed May 6, 2014.

25. American Academy of Pediatrics. Bright Futures. *Recommendations for Preventive Pediatric Health Care. Available at:* http://www.aap.org/en-us/professional-resources/practice-support/Periodicity/Periodicity%20Schedule_FINAL.pdf. Accessed May 6, 2014.

26. Sebelius, K. Department of Health and Human Services. *Children's Health Insurance Program Reauthorization Act: 2011 Annual Report on the Quality of Care for Children in Medicaid and CHIP.* Available at: http://www.medicaid.gov/Medicaid-CHIP-Program-Information/By-Topics/Quality-of-Care/Downloads/2011_StateReporttoCongress.pdf. Accessed May 6, 2014.

27. Centers for Disease Control and Prevention. Injury Center: Violence Prevention. *Youth Violence National Statistics*. December 27, 2013. Available at: http://www.cdc.gov/violenceprevention/youthviolence/stats_at-a_glance/lcd_10-24.html. Accessed May 6, 2014.

28. Centers for Disease Control and Prevention. National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention. Division of Adolescent and School Health. *Youth Risk Behavior Surveillance System: 2011 National Overview.* http://www.cdc.gov/healthyyouth/yrbs/pdf/us_overview_yrbs.pdf. Accessed May 6, 2014.

29. Hagan JF, Shaw JS, Duncan P, eds. 2008. *Bright Futures: Guidelines for Health Supervision of Infants, Children, and Adolescents,* Third Edition. *Pocket Guide.* Elk Grove Village, IL: American Academy of Pediatrics. Available at: https://brightfutures.aap.org/pdfs/BF3%20pocket%20guide_final.pdf. Accessed May 6, 2014.

30. Centers for Disease Control and Prevention. Child Development. *Child Developmental Monitoring and Screening*. March 11, 2014. Available at: http://www.cdc.gov/ncbddd/childdevelopment/screening.html. Accessed May 6, 2014.

31. Alley CL. *Preschool Vision Screening: Update on Guidelines and Techniques.* Curr Opin Ophthalmol. 2013;24(5):415-420. Available at: http://www.medscape.com/viewarticle/810097_3. Accessed May 6, 2014.

32. Kemper AR, et al. *Improving the Rate of Preschool Vision Screening: An Interrupted Time-Series Analysis.* Pediatrics. Vol. 128 No. 5 November 1, 2011 pp. e1279 -e1284. Available at: http://pediatrics.aappublications.org/content/128/5/e1279.long. Accessed May 6, 2014.

33. American Academy of Audiology. *Clinical Practice Guidelines: Childhood Hearing Screening.* September 2011. Available at: http://www.audiology.org/resources/documentlibrary/Documents/ChildhoodScreeningGuidelines.pdf. Accessed May 6, 2014.

34. American Academy of Pediatrics. *Bright Futures Guidelines Priorities and Screening Tables.* Available at: http://brightfutures.aap.org/bright_futures_power_point_presentations.html. Accessed April 15, 2014.

35. American Academy of Pediatrics. *Bright Futures: Achieving Bright Futures*. Available at: http://www.aap.org/en-us/professional-resources/practice-support/Periodicity/AllVisits.pdf. Accessed May 6, 2014.

36. Sices L. *Developmental Screening in Primary Care: The Effectiveness Of Current Practice And Recommendations For Improvement*. The Commonwealth Fund Report. December 2007. Available at: http://www.commonwealthfund.org/~/media/Files/Publications/Fund%20Report/2007/Dec/Developmental%20Screening%20in%20Primary%20Care%20%20The%20Effectiveness%20of%20Current%20Practice%20and%20Recommendations%20f/1082_Sices_developmental_screening_primary_care%20pdf.pdf. Accessed May 6, 2014.

Appendices

Appendix A: Cohort I by Age Group

Table A.1: Preventive Medicine Services Validation

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Age Group								Significance	
	Group 1		Group 2		Group 3					
	1-4 Years (N = 149)		5-11 Years (N = 77)		12-20 Years (N = 81)		TOTAL (N = 307)			
	n	%	n	%	n	%	n	%	p-value	Difference
Well-Child Visit Composite										
Members for whom reviewed visit was identified as a well visit in the record	138	93%	71	92%	72	89%	281	92%	n.s.	
Members with visit which includes basic screening components of a WCV. Of the 4 components (patient history, physical exam, anticipatory guidance and developmental screening) the medical record showed evidence of all elements for:										
All components	5	3%	3	4%	4	5%	12	4%	n.s.	
At least 3 components	45	30%	24	31%	15	19%	84	27%	n.s.	
At least 2 components	96	64%	44	57%	38	47%	178	58%	**0.036**	Grp1>Grp3
At least 1 components	125	84%	64	83%	62	77%	251	82%	n.s.	
None	24	16%	13	17%	19	23%	56	18%	n.s.	
Patient History										
Patient had following elements of patient history documented:										
Past Medical History	130	87%	68	88%	75	93%	273	89%	n/a	
Family History	78	52%	44	57%	46	57%	168	55%	n/a	
Social History	102	68%	58	75%	58	72%	218	71%	n/a	
Review of Systems	80	54%	46	60%	56	69%	182	59%	n/a	
Physical Exam										
Among all members:	**(n = 149)**		**(n = 77)**		**(n = 81)**		**(n = 307)**			
Members for whom physical exam included examination of:										
Head	121	81%	60	78%	57	70%	238	78%	n.s.	
Eyes	136	91%	74	96%	71	88%	281	92%	n.s.	
Ears/Nose/Throat	137	92%	75	97%	71	88%	283	92%	n.s.	
Lungs/Respiratory	137	92%	76	99%	75	93%	288	94%	n.s.	
Heart/Cardiovascular	139	93%	74	96%	75	93%	288	94%	n.s.	
Abdomen/GI	139	93%	73	95%	74	91%	286	93%	n.s.	
Skin	123	83%	63	82%	61	75%	247	80%	n.s.	
Spine/Back	61	41%	45	58%	43	53%	149	49%	**0.028**	Grp1<Grp2
Neurologic	121	81%	64	83%	57	70%	242	79%	n.s.	
Extremities/Musculoskeletal	91	61%	52	68%	47	58%	190	62%	n.s.	
Genitalia	110	74%	48	63%	37	46%	195	64%	**<0.001**	Grp1,Grp2>Grp3

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Age Group								Significance	
	Group 1		Group 2		Group 3					
	1-4 Years (N = 149)		5-11 Years (N = 77)		12-20 Years (N = 81)		TOTAL (N = 307)			
	n	%	n	%	n	%	n	%	p-value	Difference
Among members **ages 3 years and older**:	**(n = 47)**		**(n = 77)**		**(n = 81)**		**(n = 205)**			
Children had blood pressure documented	39	83%	68	88%	78	96%	185	90%	**0.039**	Grp1<Grp3
Height and Weight Assessment										
Among all members:	**(n = 149)**		**(n = 77)**		**(n = 81)**		**(n = 307)**			
Patient had height/length and weight documented	137	92%	74	96%	78	96%	289	94%	n.s.	
Among members **ages 2 years and older**:	**(n = 89)**		**(n = 77)**		**(n = 81)**		**(n = 247)**			
Children ages 2 years and older had BMI percentile documented	42	47%	43	56%	47	58%	132	53%	n.s.	
of whom:	**(n =42)**		**(n = 43)**		**(n = 47)**		**(n = 132)**			
Had BMI category[1] documented	10	24%	16	37%	13	28%	39	30%	n.s.	
Oral Health										
Among all members:	**(n = 149)**		**(n = 77)**		**(n = 81)**		**(n = 307)**			
Received an oral health assessment	82	55%	37	48%	36	44%	155	50%	n.s.	
Referred to an oral health provider	15	10%	2	3%	2	2%	19	6%	n/a	
Mental Health Assessment										
Among all members:	**(n = 149)**		**(n = 77)**		**(n = 81)**		**(n = 307)**			
Formal mental health screening tool documented	1	1%	2	3%	2	2%	5	2%	n.s.	
Parental observations/concerns documented	24	16%	22	29%	13	16%	59	19%	n.s.	
Provider inquiry or observation documented	42	28%	42	55%	46	57%	130	42%	**<0.001**	Grp1<Grp2,Grp3
Member received any mental health assessment[2]	52	35%	43	56%	49	60%	144	47%	**<0.001**	Grp1<Grp2,Grp3
of whom:	**(n = 52)**		**(n = 43)**		**(n = 49)**		**(n = 144)**			
Had a mental health problem identified	3	6%	20	47%	15	31%	38	26%	**<0.001**	Grp1<Grp2,Grp3
of whom:	**(n = 3)**		**(n =20)**		**(n = 15)**		**(n = 38)**			
For those members who had mental health problem identified, follow-up care was documented:										
Counseling	0	0%	2	10%	1	7%	3	8%	n/a	
Testing	0	0%	1	5%	0	0%	1	3%	n/a	
Revisit for repeat screening or evaluation	0	0%	2	10%	1	7%	3	8%	n/a	
Medication	1	33%	8	40%	9	60%	18	47%	n/a	
Referral for further evaluation or treatment	0	0%	4	20%	2	13%	6	16%	n/a	
None	2	67%	7	35%	4	27%	13	34%	n/a	

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Age Group								Significance	
	Group 1		Group 2		Group 3					
	1-4 Years (N = 149)		5-11 Years (N = 77)		12-20 Years (N = 81)		TOTAL (N = 307)			
	n	%	n	%	n	%	n	%	p-value	Difference
Among all members:	(n = 149)		(n = 77)		(n = 81)		(n = 307)			
CPT II Code 2014F- Mental Status Assessed	0	0%	7	9%	14	17%	21	7%	n/a	
of whom:	(n = 0)		(n = 7)		(n = 14)		(n = 21)			
Had a mental health assessment			6	86%	12	86%	18	86%	n.s.	
Among all members:	(n = 149)		(n = 77)		(n = 81)		(n = 307)			
Formal mental health screening tool documented	1	1%	2	3%	2	2%	5	2%	n.s.	
of whom:	(n = 1)		(n = 2)		(n = 2)		(n = 5)			
Pediatric Symptom Checklist (PSC-17, PSC – 35)	0	0%	1	50%	0	0%	1	20%	n/a	
Vanderbilt Diagnostic Rating Scales	0	0%	1	50%	0	0%	1	20%	n/a	
Other[3]	1	100%	0	0%	2	100%	3	60%	n/a	
Among members **ages 12-20 years**:	(n = 0)		(n = 0)		(n = 81)		(n = 81)			
A depression screening was performed:										
Informal inquiry					29	36%	29	36%	n/a	
Formal screening					2	2%	2	2%	n/a	
Total					31	38%	31	38%	n/a	
Substance Abuse Screening										
Among members **ages 12-20 years:**	(n = 0)		(n = 0)		(n = 81)		(n = 81)			
Members were assessed for:										
Tobacco use					41	51%	41	51%	n/a	
Alcohol use					29	36%	29	36%	n/a	
Drug use					23	28%	23	28%	n/a	
At least 1 form of substance use					42	52%	42	52%	n/a	
of whom:	(n = 0)		(n = 0)		(n = 42)		(n = 42)			
Formal tool was used for alcohol or drug screening:										
DAST					0	0%	0	0%	n/a	
CRAFFT					0	0%	0	0%	n/a	
CAGE-AID					0	0%	0	0%	n/a	
Other					2	5%	2	5%	n/a	
Among members **ages 12-20 years:**	(n = 0)		(n = 0)		(n = 81)		(n = 81)			
Members were identified with:										
Tobacco use					4	5%	4	5%	n/a	
Alcohol use					1	1%	1	1%	n/a	
Drug use					1	1%	1	1%	n/a	

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Age Group								Significance	
	Group 1		Group 2		Group 3					
	1-4 Years (N = 149)		5-11 Years (N = 77)		12-20 Years (N = 81)		TOTAL (N = 307)			
	n	%	n	%	n	%	n	%	p-value	Difference
Members **ages 12-20 years** who were identified as a tobacco user problem received follow-up care:	**(n = 0)**		**(n = 0)**		**(n = 4)**		**(n = 4)**			
Tobacco counseling/advice to quit					2	50%	2	50%	n/a	
Tobacco referral					0	0%	0	0%	n/a	
Tobacco medication/treatment					0	0%	0	0%	n/a	
Members **ages 12-20 years** who were identified as a alcohol user problem received follow-up care:	**(n = 0)**		**(n = 0)**		**(n = 1)**		**(n = 1)**			
Alcohol counseling/brief intervention					0	0%	0	0%	n/a	
Alcohol referral for treatment					0	0%	0	0%	n/a	
Members **ages 12-20 years** who were identified as a drug user received follow-up care:	**(n = 0)**		**(n = 0)**		**(n = 1)**		**(n = 1)**			
Drug use counseling/brief intervention					0	0%	0	0%	n/a	
Drug use referral for treatment					0	0%	0	0%	n/a	
Anticipatory Guidance										
Among all members:	**(n = 149)**		**(n = 77)**		**(n = 81)**		**(n = 307)**			
Age-appropriate anticipatory guidance provided for:										
Nutrition and Diet	95	64%	39	51%	36	44%	170	55%	**0.012**	Grp1>Grp3
Safety/Injury Prevention	113	76%	43	56%	40	49%	196	64%	**<0.001**	Grp1>Grp2,Grp3
Among members **ages 2 years and older**:	**(n = 89)**		**(n = 77)**		**(n = 81)**		**(n = 247)**			
Physical Activity/Screen Time	51	57%	39	51%	36	44%	126	51%	n.s.	
Among members **ages 5 years and older:**	**(n = 0)**		**(n = 77)**		**(n = 81)**		**(n = 158)**			
Development/Mental Health/Emotional Well Being			30	39%	32	40%	62	39%	n.s.	
School Readiness/ Academic/ Social			28	36%	24	30%	52	33%	n.s.	
Among members **ages 12-20 years**:	**(n = 0)**		**(n = 0)**		**(n = 81)**		**(n = 81)**			
Risk Reduction/Physical Development					44	54%	44	54%	n/a	

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Age Group								Significance	
	Group 1		Group 2		Group 3					
	1-4 Years (N = 149)		5-11 Years (N = 77)		12-20 Years (N = 81)		TOTAL (N = 307)			
	n	%	n	%	n	%	n	%	p-value	Difference
Developmental Surveillance										
Among all members:	**(n = 149)**		**(n = 77)**		**(n = 81)**		**(n = 307)**			
Development assessed during visit	126	85%	61	79%	65	80%	252	82%	n.s.	
of whom:	**(n = 126)**		**(n = 61)**		**(n = 65)**		**(n = 252)**			
The following elements of surveillance were performed:										
Discussion of developmental milestones and/or general surveillance	125	99%	59	97%	60	92%	244	97%	**0.036**	Grp1>Grp3
Assessment of parental concerns	62	49%	31	51%	19	29%	112	44%	**0.016**	Grp1,Grp2>Grp3
Domains of surveillance addressed:										
Social Emotional	106	84%	44	72%	50	77%	200	79%	n.s.	
Cognitive	110	87%	56	92%	47	72%	213	85%	**0.005**	Grp1,Grp2>Grp3
Language	112	89%	44	72%	20	31%	176	70%	**<0.001**	Grp1>Grp2>Grp3
Motor	112	89%	44	72%	38	58%	194	77%	**<0.001**	Grp1>Grp2,Grp3
Developmental Screening										
Among all members:	**(n = 149)**		**(n = 77)**		**(n = 81)**		**(n = 307)**			
Formal developmental screening tool documented	21	14%	5	6%	3	4%	29	9%	n/a	
of whom:	**(n = 21)**		**(n = 5)**		**(n = 3)**		**(n = 29)**			
Members with a global developmental screening tool:	1	5%	1	20%	0	0%	2	7%	n/a	
Parents' Evaluation of Developmental Status (PEDS)	1	5%	1	20%	0	0%	2	7%	n/a	
Members with other formal screening tool[4]:	20	95%	4	80%	3	100%	27	93%	n/a	
Modified Checklist for Autism in Toddlers (M-CHAT)	14	67%	0	0%	0	0%	14	48%	n/a	
Other Developmental Screening Tool[5,6]	4	19%	3	60%	3	100%	10	34%	n/a	
UTD[5,7]	2	10%	1	20%	0	0%	3	10%	n/a	
Among all members:	**(n = 149)**		**(n = 77)**		**(n = 81)**		**(n = 307)**			
Overall type of developmental assessment:										
Members with a global developmental screening tool	1	1%	1	1%	0	0%	2	1%	n/a	
Members with other screening tool[4]	20	13%	4	5%	3	4%	27	9%	n/a	
Members with only developmental surveillance	107	72%	57	74%	62	77%	226	74%	n/a	
Members with neither surveillance nor formal screening	21	14%	15	19%	16	20%	52	17%	n/a	

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Age Group								Significance	
	Group 1		Group 2		Group 3					
	1-4 Years (N = 149)		5-11 Years (N = 77)		12-20 Years (N = 81)		TOTAL (N = 307)			
	n	%	n	%	n	%	n	%	p-value	Difference
Well-Child Visit - Vision Screening										
Among members **under 3 years of age:**	**(n = 102)**		**(n = 0)**		**(n = 0)**		**(n = 102)**			
Members received age-appropriate vision screening[8], which occurred on the date of the WCV	35	34%					35	34%	n/a	
Of those that did not have screen on date of WCV:	**(n = 67)**		**(n = 0)**		**(n = 0)**		**(n = 67)**			
Members received age-appropriate vision screening[8], which occurred within 7 days of the date of the WCV	0	0%					0	0%	n/a	
Among members **ages 3 years and older:**	**(n = 47)**		**(n = 77)**		**(n = 81)**		**(n = 205)**			
Members received age-appropriate vision screening[8] which occurred on the date of the WCV	20	43%	32	42%	26	32%	78	38%	n.s.	
Of those that did not have screen on date of WCV:	**(n = 27)**		**(n = 45)**		**(n = 55)**		**(n = 127)**			
Members received age-appropriate vision screening[8] which occurred within 7 days of the date of the WCV	0	0%	2	4%	0	0%	2	2%	n/a	
Among all members:	**(n = 149)**		**(n = 77)**		**(n = 81)**		**(n = 307)**			
Total members received age-appropriate vision screening[8] which occurred either on the date of the WCV or within 7 days	55	37%	34	44%	26	32%	115	37%	n.s.	
Member referred to eye health professional	2	1%	4	5%	2	2%	8	3%	n.s.	
Well-Child Visit - Hearing Screening										
Among members **under 3 years of age:**	**(n = 102)**		**(n = 0)**		**(n = 0)**		**(n = 102)**			
Members received age-appropriate hearing screening[9] which occurred on the date of the WCV	14	14%					14	14%	n/a	
Of those that did not have screen on date of WCV:	**(n = 88)**		**(n = 0)**		**(n = 0)**		**(n = 88)**			
Members received age-appropriate hearing screening[9] which occurred within 7 days of the date of the WCV	1	1%					1	1%	n/a	
Among members **ages 3 years and older:**	**(n = 47)**		**(n = 77)**		**(n = 81)**		**(n = 205)**			
Members received age-appropriate hearing screening[9] which occurred on the date of the WCV	6	13%	28	36%	20	25%	54	26%	**0.014**	Grp1<Grp2

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Age Group								Significance	
	Group 1		Group 2		Group 3					
	1-4 Years (N = 149)		5-11 Years (N = 77)		12-20 Years (N = 81)		TOTAL (N = 307)			
	n	%	n	%	n	%	n	%	p-value	Difference
Of those that did not have screen on date of WCV:	(n = 41)		(n = 49)		(n = 61)		(n = 151)			
Members **ages 3 years and older** received age-appropriate hearing screening[9] which occurred within 7 days of the date of the WCV	2	5%	1	2%	0	0%	3	2%	n/a	
Among all members:	(n = 149)		(n = 77)		(n = 81)		(n = 307)			
Total members received age-appropriate hearing screening[9] which occurred either on the date of the WCV or within 7 days.	23	15%	29	38%	20	25%	72	23%	**<0.001**	Grp1<Grp2
of whom:	(n = 23)		(n = 29)		(n = 20)		(n = 72)			
Of those members who received any age-appropriate hearing screen, members referred to audiology related health professional	1	4%	1	3%	1	5%	3	4%	n.s.	

n.s. – Not significant.

n/a – Significance test not performed due to small sample size.

1. BMI categories as documented include: Underweight, Normal or Healthy Weight or Normal BMI 5-85th percentile, Overweight, Obese, BMI 85th to less than the 95th percentile, BMI greater than 95th percentile.
2. Mental Health Assessments which qualified for this measure include: Formal Mental Health Screening, Parental observations/concerns documented and Provider inquiry or observation documented.
3. Other formal mental health screening tools includes: a practice-specific adolescent questionnaire, the M-CHAT, and Perkins Adolescent Risk Screen.
4. Other Screening tools may include standardized developmental screening tools that do not cover all domains (Motor, Cognitive, Language and Social) or may not meet CHIPRA specifications for reliability, validity, sensitivity and specificity.
5. The denominator used in the calculation of these rates includes all members with any formal developmental screening tool documented.
6. Other Developmental Screening tool included: Denver Development II Screen, Perkins Adolescent Risk Screen, Bellefonte Pediatric Development, IH Adolescent Questionnaire, Lansky Performance and CHADIS.
7. UTD: Unable to determine.
8. Age-appropriate vision screen for those under 3 years of age includes: observation/exam/responses; picture test such as Allen cards; Universal cover test; responses to visual stimuli. Age-appropriate vision screen for those 3 years of age and older includes: distance visual acuity via Snellen wall chart; ocular alignment via unilateral cover test or random dot.
9. Age-appropriate hearing screening for those under 3 years of age includes: observation/exam/responses to auditory stimuli. Age-appropriate hearing screening for those ages 3 years and older includes: pure tone audiometry and tympanometry testing.

Table A.2: Developmental Screen Code (96110) Validation

MEDICAL RECORD REVIEW: Developmental Screen Code (96110) Validation	Cohort I by Age Group								Significance	
	Group 1 1-4 Years (N = 149)		Group 2 5-11 Years (N = 77)		Group 3 12-20 Years (N = 81)		TOTAL (N = 307)			
	n	%	n	%	n	%	n	%	p-value	Difference
Developmental Surveillance										
Members with a CPT 96110 code	10	7%	2	3%	0	0%	12	4%	n/a	
Of whom:	**(n = 10)**		**(n = 2)**		**(n = 0)**		**(n = 12)**			
Development assessed during visit	10	100%	2	100%			12	100%	n/a	
Developmental Screening										
Among all members:	**(n = 149)**		**(n = 77)**		**(n = 81)**		**(n = 307)**			
Members with a CPT 96110 code:	10	7%	2	3%	0	0%	12	4%	n/a	
of whom:	**(n = 10)**		**(n = 2)**		**(n = 0)**		**(n = 12)**			
Formal developmental screening tool documented	5	50%	1	50%			6	100%	n/a	
of whom:	**(n = 5)**		**(n = 1)**		**(n = 0)**		**(n = 6)**			
Members with a global developmental screening tool:	0	0%	0	0%			0	0%	n/a	
Members with other formal screening tool[1]:	5	100%	1	100%			6	100%	n/a	
Modified Checklist for Autism in Toddlers (M-CHAT)[2]	4	80%	0	0%			4	67%	n/a	
Other Developmental Screening Tool[2,3]	0	0%	1	100%			1	17%	n/a	
UTD[2,4]	1	20%	0	0%			1	17%	n/a	
Members with a CPT 96110 code:	**(n = 10)**		**(n = 2)**		**(n = 0)**		**(n = 12)**			
Of those members who had a developmental screening code, CPT 96110:									n/a	
Members with a global developmental screening tool	0	0%	0	0%			0	0%		
Members with other[4] screening tool	5	50%	1	50%			6	50%		
Members with only developmental surveillance	5	50%	1	50%			6	50%		
Members with neither surveillance nor formal screening	0	0%	0	0%			0	0%		

n/a – Significance test not performed due to small sample size.

1. Other Screening tools may include standardized developmental screening tools that do not cover all domains (Motor, Cognitive, Language and Social) or may not meet CHIPRA specifications for reliability, validity, sensitivity and specificity.
2. The denominator used in the calculation of these rates includes all members with any formal developmental screening tool documented.

3. Other Developmental Screening tool included: Denver Development II Screen, Perkins Adolescent Risk Screen, Bellefonte Pediatric Development, IH Adolescent Questionnaire, Lansky Performance and CHADIS.
4. UTD: Unable to determine.
5. Other Screening tools may include standardized developmental screening tools that do not cover all domains (Motor, Cognitive, Language and Social) or may not meet CHIPRA specifications for reliability, validity, sensitivity and specificity.

Table A.3: Vision Screening Code Validation

MEDICAL RECORD REVIEW: Vision Screening Code Validation	Cohort I by Age Group								Significance	
	Group 1		Group 2		Group 3					
	1-4 Years (N = 149)		5-11 Years (N = 77)		12-20 Years (N = 81)		TOTAL (N = 307)			
	n	%	n	%	n	%	n	%	p-value	Difference
Members with a vision screening code (99173, 99174)	10	7%	8	10%	9	11%	27	9%	n/a	
Of whom:										
Among members **under 3 years of age:**	**(n = 2)**		**(n = 0)**		**(n = 0)**		**(n = 2)**			
Members received age-appropriate vision screening[1]	2	100%					2	100%	n/a	
Among members **ages 3 years and older:**	**(n = 8)**		**(n = 8)**		**(n = 9)**		**(n = 25)**			
Members received age-appropriate vision screening[1]	4	50%	8	100%	9	100%	21	84%	n/a	
Among all members with a vision screening code:	**(n = 10)**		**(n = 8)**		**(n = 9)**		**(n = 27)**			
Total members received age-appropriate vision screening[1]	6	60%	8	100%	9	100%	23	85%	n/a	
Member referred to eye health professional	0	0%	0	0%	0	0%	0	0%	n/a	

n/a – Significance test not performed due to small sample size.
1. Age-appropriate vision screen for those under 3 years of age includes: observation/exam/responses; picture test such as Allen cards; Universal cover test; responses to visual stimuli. Age-appropriate vision screen for those 3 years of age and older includes: distance visual acuity via Snellen wall chart; ocular alignment via unilateral cover test or random dot.

Table A.4: Hearing Screening Code Validation

MEDICAL RECORD REVIEW: Hearing Screening Code Validation	Cohort I by Age Group								Significance	
	Group 1 1-4 Years (N = 149)		Group 2 5-11 Years (N = 77)		Group 3 12-20 Years (N = 81)		TOTAL (N = 307)			
	n	%	n	%	n	%	n	%	p-value	Difference
Members with a hearing screening code (92551, 92552, 92567)	6	4%	16	21%	8	10%	30	10%	**<0.001**	Grp1<Grp2
Of whom:										
Among members **under 3 years of age:**	**(n = 2)**		**(n = 0)**		**(n = 0)**		**(n = 2)**			
Members received age-appropriate hearing screening[1]	1	50%					1	50%	n/a	
Among members **ages 3 years and older:**	**(n = 4)**		**(n = 16)**		**(n = 8)**		**(n = 28)**			
Members received age-appropriate hearing screening[1]	1	25%	13	81%	8	100%	22	79%	n/a	
Among all members with a hearing screening code:	**(n = 6)**		**(n = 16)**		**(n = 8)**		**(n = 30)**			
Total members received age-appropriate hearing screening[1]	2	33%	13	81%	8	100%	23	77%	n/a	
of whom:	**(n = 2)**		**(n = 13)**		**(n = 8)**		**(n = 23)**			
Member referred to audiology related health professional	0	0%	0	0%	0	0%	0	0%	n/a	

n/a – Significance test not performed due to small sample size.

1. Age-appropriate hearing screening for those under 3 years of age includes: observation/exam/responses to auditory stimuli. Age-appropriate hearing screening for those ages 3 years and older includes: pure tone audiometry and tympanometry testing.

Appendix B: Cohort I by MCO

Table B.1 Preventive Medicine Services Validation

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by MCO								Significance	
	Coventry Cares (N = 95)		Humana (N = 13)		Passport (N = 104)		WellCare (N = 95)			
	n	%	n	%	n	%	n	%	p-value	Difference
Well-Child Composite										
Members for whom reviewed visit was identified as a well visit in the record	88	93%	11	85%	97	93%	85	89%	n/a	
Well-Child Composite										
Members with visit which includes basic screening components of a WCV. Of the 4 composite components (patient history, physical exam, anticipatory guidance and developmental screening) members for which the medical record showed evidence of all elements for:										
All components	3	3%	0	0%	7	7%	2	2%	n/a	
At least 3 components	34	36%	2	15%	33	32%	15	16%	n/a	
At least 2 components	66	69%	3	23%	63	61%	46	48%	n/a	
At least 1 component	82	86%	9	69%	92	88%	68	72%	n/a	
None	13	14%	4	31%	12	12%	27	28%	n/a	
Patient History										
History obtained included:										
Past Medical History	89	94%	9	69%	92	88%	83	87%	n/a	
Family History	57	60%	6	46%	61	59%	44	46%	n/a	
Social History	75	79%	8	62%	71	68%	64	67%	n/a	
Review of Systems	70	74%	6	46%	64	62%	42	44%	n/a	
Height and Weight										
Height/length and weight documented	91	96%	11	85%	97	93%	90	95%	n/a	
Among members **ages 2 years and older**:	**(n = 71)**		**(n = 12)**		**(n = 90)**		**(n = 74)**			
Members had BMI percentile documented	33	46%	0	0%	61	68%	38	51%	n/a	
of whom:	**(n = 33)**		**(n = 0)**		**(n = 61)**		**(n = 38)**			
Members who had BMI category[1] documented	8	24%			22	36%	9	24%	n/a	
Physical Exam										
Among all members:	**(n = 95)**		**(n = 13)**		**(n = 104)**		**(n = 95)**			
Members for whom physical exam included examination of:										
Head	73	77%	10	77%	80	77%	75	79%	n/a	
Eyes	86	91%	10	77%	102	98%	83	87%	n/a	
Ears/Nose/Throat	89	94%	9	69%	99	95%	86	91%	n/a	
Lungs/Respiratory	93	98%	10	77%	100	96%	85	89%	n/a	
Heart/Cardiovascular	93	98%	11	85%	101	97%	83	87%	n/a	

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by MCO								Significance	
	Coventry Cares (N = 95)		Humana (N = 13)		Passport (N = 104)		WellCare (N = 95)			
	n	%	n	%	n	%	n	%	p-value	Difference
Members for whom physical exam included examination of (continued):	(n = 95)		(n = 13)		(n = 104)		(n = 95)			
Abdomen/GI	93	98%	11	85%	98	94%	84	88%	n/a	
Skin	79	83%	7	54%	89	86%	72	76%	n/a	
Spine/Back	42	44%	1	8%	62	60%	44	46%	n/a	
Neurologic	75	79%	8	62%	88	85%	71	75%	n/a	
Extremities/Musculoskeletal	64	67%	8	62%	67	64%	51	54%	n/a	
Genitalia	58	61%	8	62%	74	71%	55	58%	n/a	
Among members **ages 3 years and older:**	(n = 54)		(n = 11)		(n = 78)		(n = 62)			
Members had blood pressure documented	50	93%	7	64%	72	92%	56	90%	n/a	
Oral Health										
Among all members:	(n = 95)		(n = 13)		(n = 104)		(n = 95)			
Received an oral health assessment	39	41%	9	69%	54	52%	53	56%	n/a	
Referred to an oral health provider	6	6%	0	0%	6	6%	7	7%	n/a	
Mental Health Assessment										
Among all members:	(n = 95)		(n = 13)		(n = 104)		(n = 95)			
Formal mental health screening tool documented	2	2%	0	0%	3	3%	0	0%	n/a	
Parental observations/concerns documented	21	22%	0	0%	24	23%	14	15%	n/a	
Provider inquiry or observation documented	22	23%	5	38%	56	54%	47	49%	n/a	
Mental health assessment performed[2]	32	34%	5	38%	60	58%	47	49%	n/a	
CPT II Code 2014F- Mental Status Assessed	1	1%	0	0%	17	16%	3	3%	n/a	
of whom	(n = 1)		(n = 0)		(n =17)		(n = 3)			
Had any mental health assessment	0	0%			15	88%	3	100%		
Of those children that had some form of mental health assessment:	(n = 32)		(n = 5)		(n = 60)		(n = 47)			
Members had a mental health problem identified	6	19%	3	60%	22	37%	7	15%	n/a	
of whom:	(n = 6)		(n = 3)		(n = 22)		(n = 7)			
Follow-up care was documented:										
Counseling	0	0%	0	0%	2	9%	1	14%	n/a	
Testing	0	0%	0	0%	1	5%	0	0%	n/a	
Revisit for repeat screening or evaluation	1	17%	0	0%	1	5%	1	14%	n/a	
Medication	3	50%	1	33%	9	41%	5	71%	n/a	
Referral for further evaluation or treatment	1	17%	1	33%	4	18%	0	0%	n/a	

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by MCO								Significance	
	Coventry Cares (N = 95)		Humana (N = 13)		Passport (N = 104)		WellCare (N = 95)			
	n	%	n	%	n	%	n	%	p-value	Difference
Among members **ages 12-20 years**:	**(n = 19)**		**(n = 3)**		**(n = 34)**		**(n = 25)**			
A depression screening was performed:									n/a	
Informal inquiry	6	32%	1	33%	8	24%	14	56%		
Formal screening	1	5%	0	0%	1	3%	0	0%		
Total - Either Formal or Informal	7	37%	1	33%	9	26%	14	56%		
Substance Abuse										
Among members **ages 12-20 years**:	**(n = 19)**		**(n = 3)**		**(n = 34)**		**(n = 25)**			
Members were assessed for:										
Tobacco use	8	42%	2	67%	16	47%	15	60%	n/a	
Alcohol use	5	26%	3	100%	11	32%	10	40%	n/a	
Drug use	4	21%	3	100%	9	26%	7	28%	n/a	
At least 1 form of substance use	8	42%	3	100%	16	47%	15	60%	n/a	
Members were identified with:										
Tobacco use	0	0%	0	0%	2	6%	2	8%	n/a	
Alcohol use	1	5%	0	0%	0	0%	0	0%	n/a	
Drug use	1	5%	0	0%	0	0%	0	0%	n/a	
Among members **ages 12-20 years** who were identified as a tobacco user:	**(n = 0)**		**(n = 0)**		**(n = 2)**		**(n = 2)**			
Members received follow-up care:										
Tobacco counseling/advice to quit					1	50%	1	50%	n/a	
Tobacco referral					0	0%	0	0%	n/a	
Tobacco medication/treatment					0	0%	0	0%	n/a	
Anticipatory Guidance										
Among all members:	**(n = 95)**		**(n = 13)**		**(n = 104)**		**(n = 95)**			
Age-appropriate anticipatory guidance provided for:										
Nutrition and Diet	50	53%	8	62%	59	57%	53	56%	n/a	
Safety/Injury Prevention	59	62%	5	38%	76	73%	56	59%	n/a	
Among members **ages 2 years and older**:	**(n = 71)**		**(n = 12)**		**(n = 90)**		**(n = 74)**			
Physical Activity/Screen Time	38	54%	3	25%	48	53%	37	50%	n/a	
Among members **ages 5 years and older:**	**(n = 42)**		**(n = 7)**		**(n = 67)**		**(n = 42)**			
Development/Mental Health/Emotional Well Being	13	31%	4	57%	32	48%	13	31%	n/a	
School Readiness/ Academic/ Social	13	31%	0	0%	27	40%	12	29%	n/a	
Among members **ages 12-20 years**:	**(n = 19)**		**(n = 3)**		**(n = 34)**		**(n = 25)**			
Risk Reduction/Physical Development	5	26%	2	67%	22	65%	15	60%	n/a	

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by MCO								Significance	
	Coventry Cares (N = 95)		Humana (N = 13)		Passport (N = 104)		WellCare (N = 95)			
	n	%	n	%	n	%	n	%	p-value	Difference
Developmental Surveillance										
Among all members:	**(n = 95)**		**(n = 13)**		**(n = 104)**		**(n = 95)**			
Development assessed during visit	84	88%	9	69%	85	82%	74	78%	n/a	
of whom:	**(n = 84)**		**(n = 9)**		**(n = 85)**		**(n = 74)**			
The following elements of surveillance were performed:										
Discussion of developmental milestones and/or general surveillance	81	96%	9	100%	83	98%	71	96%	n/a	
Assessment of parental concerns	49	58%	1	11%	35	41%	27	36%	n/a	
Domains of surveillance addressed:										
Social Emotional	61	73%	6	67%	69	81%	64	86%	n/a	
Cognitive	64	76%	8	89%	79	93%	62	84%	n/a	
Language	56	67%	5	56%	65	76%	50	68%	n/a	
Motor	66	79%	5	56%	57	67%	66	89%	n/a	
Developmental Screening										
Among all members:	**(n = 95)**		**(n = 13)**		**(n = 104)**		**(n = 95)**			
Formal developmental screening tool documented	13	14%	1	8%	10	10%	5	5%	n/a	
Overall type of development assessment									n/a	
Members with a global developmental screening tool	2	2%	0	0%	0	0%	0	0%		
Members with other[3] screening tool	11	12%	0	0%	4	4%	2	2%		
Members with only developmental surveillance	72	76%	8	62%	77	74%	69	73%		
Members with neither surveillance nor formal screening	10	11%	4	31%	17	16%	21	22%		
Vision Screening										
Among all members:	**(n = 95)**		**(n = 13)**		**(n = 104)**		**(n = 95)**			
Members received age-appropriate vision screening[4], which occurred on the date of the WCV	30	32%	8	62%	43	41%	32	34%	n/a	
Of those that did not have screen on date of WCV:	**(n =65)**		**(n = 5)**		**(n = 61)**		**(n = 63)**			
Members received age-appropriate vision screening[4], which occurred within 7 days of the date of the WCV	0	0%	0	0%	0	0%	2	3%	n/a	
Among all members:	**(n = 95)**		**(n = 13)**		**(n = 104)**		**(n = 95)**			
Member referred to eye health professional	1	1%	2	15%	2	2%	3	3%	n/a	

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by MCO								Significance	
	Coventry Cares (N = 95)		Humana (N = 13)		Passport (N = 104)		WellCare (N = 95)			
	n	%	n	%	n	%	n	%	p-value	Difference
Hearing Screening										
Among all members:	**(n = 95)**		**(n = 13)**		**(n = 104)**		**(n = 95)**			
Members received age-appropriate hearing screening[5] which occurred on the date of the WCV	19	20%	3	23%	31	30%	15	16%	n/a	
Of those that did not have screen on date of WCV:	**(n =76)**		**(n = 10)**		**(n = 73)**		**(n = 80)**			
Members received age-appropriate hearing screening[5] which occurred within 7 days of the date of the WCV	1	1%	0	0%	0	0%	3	4%	n/a	
Of those members who received any age-appropriate hearing screen:	**(n = 20)**		**(n = 3)**		**(n = 31)**		**(n = 18)**			
Members referred to audiology related health professional	1	5%	0	0%	1	3%	1	6%	n/a	

n/a – Significance test not performed due to small sample size.

1. BMI categories as documented include: Underweight, Normal or Healthy Weight or Normal BMI 5-85th percentile, Overweight, Obese, BMI 85th to less than the 95th percentile, BMI greater than 95th percentile.
2. Mental Health Assessments which qualified for this measure include: Formal Mental Health Screening, Parental observations/concerns documented and Provider inquiry or observation documented.
3. Other Screening tools may include standardized developmental screening tools that do not cover all domains (Motor, Cognitive, Language and Social) or may not meet CHIPRA specifications for reliability, validity, sensitivity and specificity.
4. Age-appropriate vision screen for those under 3 years of age includes: observation/exam/responses; picture test such as Allen cards; Universal cover test; responses to visual stimuli. Age-appropriate vision screen for those 3 years of age and older includes: distance visual acuity via Snellen wall chart; ocular alignment via unilateral cover test or random dot.
5. Age-appropriate hearing screening for those under 3 years of age includes: observation/exam/responses to auditory stimuli. Age-appropriate hearing screening for those ages 3 years and older includes: pure tone audiometry and tympanometry testing.

Table B.2 Developmental Screen Code (96110) Validation

MEDICAL RECORD REVIEW: Developmental Screen Code (96110) Validation	Cohort I by MCO								Significance	
	Coventry Cares (N = 95)		Humana (N = 13)		Passport (N = 104)		WellCare (N = 95)			
	n	%	n	%	n	%	n	%	p-value	Difference
Developmental Surveillance										
Members with a CPT 96110 code:	5	5%	1	8%	4	4%	2	2%	n/a	
Of whom:	**(n = 5)**		**(n = 1)**		**(n = 4)**		**(n = 2)**			
Development assessed during visit	5	100%	1	100%	4	100%	2	100%	n/a	
Developmental Screening										
Among all members:	**(n = 95)**		**(n = 13)**		**(n = 104)**		**(n = 95)**			
Members with a CPT 96110 code:	5	5%	1	8%	4	4%	2	2%	n/a	
of whom:	**(n = 5)**		**(n = 1)**		**(n = 4)**		**(n = 2)**			
Formal developmental screening tool documented	4	80%	1	100%	0	0%	1	50%	n/a	
Members with a CPT 96110 code:	**(n = 5)**		**(n = 1)**		**(n = 4)**		**(n = 2)**			
Of those members who had a developmental screening code CPT 96110:									n/a	
Members with a global developmental screening tool	0	0%	0	0%	0	0%	0	0%		
Members with other[1] screening tool	4	80%	1	100%	0	0%	1	50%		
Members with only developmental surveillance	1	20%	0	0%	4	100%	1	50%		
Members with neither surveillance nor formal screening	0	0%	0	0%	0	0%	0	0%		

n/a – Significance test not performed due to small sample size.

1. Other Screening tools may include standardized developmental screening tools that do not cover all domains (Motor, Cognitive, Language and Social) or may not meet CHIPRA specifications for reliability, validity, sensitivity and specificity.

Table B.3 Vision Screening Code Validation

MEDICAL RECORD REVIEW: Vision Screening Code Validation	Cohort I by MCO								Significance	
	Coventry Cares (N = 95)		Humana (N = 13)		Passport (N = 104)		WellCare (N = 95)			
	n	%	n	%	n	%	n	%	p-value	Difference
Members with a vision screening code (99173, 99174)	4	4%	2	15%	16	15%	5	5%	n/a	
Of whom:	**(n = 4)**		**(n = 2)**		**(n = 16)**		**(n = 5)**			
Members received age-appropriate vision screening[1]	3	75%	2	100%	14	88%	4	80%	n/a	
Member referred to eye health professional	0	0%	0	0%	0	0%	0	0%	n/a	

n/a – Significance test not performed due to small sample size.

1. Age-appropriate vision screen for those under 3 years of age includes: observation/exam/responses; picture test such as Allen cards; Universal cover test; responses to visual stimuli. Age-appropriate vision screen for those 3 years of age and older includes: distance visual acuity via Snellen wall chart; ocular alignment via unilateral cover test or random dot.

Table B.4 Hearing Screening Code Validation

MEDICAL RECORD REVIEW: Hearing Screening Code Validation	Cohort I by MCO								Significance	
	Coventry Cares (N = 95)		Humana (N = 13)		Passport (N = 104)		WellCare (N = 95)			
	n	%	n	%	n	%	n	%	p-value	Difference
Members with a hearing screening code (92551, 92552, 92567)	7	7%	0	0%	16	15%	7	7%	n/a	
Of whom:	**(n = 7)**		**(n = 0)**		**(n = 16)**		**(n = 7)**			
Members received age-appropriate hearing screening[1]	6	86%			13	81%	4	57%	n/a	
of whom:	**(n = 6)**		**(n = 0)**		**(n = 13)**		**(n = 4)**			
Member referred to audiology related health professional	0	0%			0	0%	0	0%	n/a	

n/a – Significance test not performed due to small sample size.

1. Age-appropriate hearing screening for those under 3 years of age includes: observation/exam/responses to auditory stimuli. Age-appropriate hearing screening for those ages 3 years and older includes: pure tone audiometry and tympanometry testing.

Appendix C: Cohort I by Gender

Table C.1 Preventive Medicine Services Validation

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Gender				Significance	
	Female (N = 146)		Male (N = 161)			
	N	%	N	%	p-value	Difference
Members for whom reviewed visit was identified as a well-visit in the record	136	93%	145	90%	n.s.	
Well-Child Composite						
Members with visit which includes basic screening components of a WCV. Of the 4 composite components (patient history, physical exam, anticipatory guidance and developmental screening) members for which the medical record showed evidence of all elements for:						
All components	4	3%	8	5%	n.s.	
At least 3 components	44	30%	40	25%	n.s.	
At least 2 components	92	63%	86	53%	n.s.	
At least 1 component	125	86%	126	78%	n.s.	
None	21	14%	35	22%	n.s.	
Patient History						
History obtained included:						
Past Medical History	128	88%	145	90%	n.s.	
Family History	82	56%	86	53%	n.s.	
Social History	105	72%	113	70%	n.s.	
Review of Systems	85	58%	97	60%	n.s.	
Height and Weight						
Height/length and weight documented	139	95%	150	93%	n.s.	
Among members **ages 2 years and older:**	**(n = 112)**		**(n = 135)**			
Member had BMI percentile documented	60	54%	72	53%	n.s.	
of whom:	**(n = 60)**		**(n = 72)**			
Had BMI category[1] documented	20	33%	19	26%	n.s.	
Physical Exam						
Among all members:	**(n = 146)**		**(n = 161)**			
Members for whom physical exam included examination of:						
Head	113	77%	125	78%	n.s.	
Eyes	132	90%	149	93%	n.s.	
Ears/Nose/Throat	134	92%	149	93%	n.s.	
Lungs/Respiratory	135	92%	153	95%	n.s.	
Heart/Cardiovascular	135	92%	153	95%	n.s.	
Abdomen/GI	135	92%	151	94%	n.s.	
Skin	123	84%	124	77%	n.s.	
Spine/Back	71	49%	78	48%	n.s.	

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Gender				Significance	
	Female (N = 146)		Male (N = 161)			
	N	%	N	%	p-value	Difference
Members for whom physical exam included examination of (continued):	(n = 146)		(n = 161)			
Neurologic	115	79%	127	79%	n.s.	
Extremities/Musculoskeletal	83	57%	107	66%	n.s.	
Genitalia	91	62%	104	65%	n.s.	
Among members **ages 3 years and older:**	(n = 93)		(n = 112)			
Members had blood pressure documented	85	91%	100	89%	n.s.	
Oral Health						
Among all members:	(n = 146)		(n = 161)			
Received an oral health assessment	78	53%	77	48%	n.s.	
Referred to an oral health provider	12	8%	7	4%	n.s.	
Mental Health Assessment						
Among all members:	(n = 146)		(n = 161)			
Formal mental health screening tool documented	3	2%	2	1%	n.s.	
Parental observations/concerns documented	30	21%	29	18%	n.s.	
Provider inquiry or observation documented	64	44%	66	41%	n.s.	
Total with a mental health assessment performed[2]	71	49%	73	45%	n.s.	
CPT II Code 2014F- Mental Status Assessed	7	5%	14	9%	n.s.	
of whom:	(n = 7)		(n = 14)			
Had any mental health assessment	6	86%	12	86%		
Of those children that had some form of mental health assessment:	(n = 71)		(n = 73)			
Members had a mental health problem identified	11	15%	27	37%	**0.003**	F<M
of whom:	(n = 11)		(n = 27)			
Follow-up care was documented:						
Counseling	0	0%	3	11%	n/a	
Testing	0	0%	1	4%	n/a	
Revisit for repeat screening or evaluation	1	9%	2	7%	n/a	
Medication	4	36%	14	52%	n/a	
Referral for further evaluation or treatment	3	27%	3	11%	n/a	
Among members **ages 12-20 years:**	(n = 38)		(n = 43)			
A depression screening was performed:						
Informal inquiry	15	39%	14	33%	n.s.	
Formal screening	1	3%	1	2%	n.s.	
Total - Either Formal or Informal	16	42%	15	35%	n.s.	

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Gender				Significance	
	Female (N = 146)		Male (N = 161)			
	N	%	N	%	p-value	Difference
Substance Abuse						
Among members **ages 12-20 years:**						
Members were assessed for:	**(n = 38)**		**(n = 43)**			
Tobacco use	20	53%	21	49%	n.s.	
Alcohol use	16	42%	13	30%	n.s.	
Drug use	14	37%	9	21%	n.s.	
At least 1 form of substance use	21	55%	21	49%	n.s.	
Members were identified with:						
Tobacco use	2	5%	2	5%	n.s.	
Alcohol use	2	5%	0	0%	n/a	
Drug use	1	3%	0	0%	n/a	
Among members **ages 12-20 years** who were identified as a tobacco user:	**(n = 2)**		**(n = 2)**			
Members received follow-up care:						
Tobacco counseling/advice to quit	1	50%	1	50%	n/a	
Tobacco referral	0	0%	0	0%	n/a	
Tobacco medication/treatment	0	0%	0	0%	n/a	
Anticipatory Guidance						
Among all members:	**(n = 146)**		**(n = 161)**			
Age-appropriate anticipatory guidance provided for:						
Nutrition and Diet	58	40%	79	49%	n.s.	
Safety/Injury Prevention	101	69%	95	59%	n.s.	
Among members **ages 2 years and older:**	**(n = 112)**		**(n = 135)**			
Physical Activity/Screen Time	62	55%	64	47%	n.s.	
Among members **ages 5 years and older:**	**(n = 72)**		**(n = 86)**			
Development/Mental Health/Emotional Well Being	28	39%	34	40%	n.s.	
School Readiness/Academic/Social	25	35%	27	31%	n.s.	
Among members **ages 12-20 years**	**(n = 38)**		**(n = 43)**			
Risk Reduction/Physical Development	22	58%	22	51%	n.s.	
Developmental Surveillance						
Among all members:	**(n = 146)**		**(n = 161)**			
Development assessed during visit	121	83%	131	81%	n.s.	
of whom:	**(n = 121)**		**(n = 131)**			
The following elements of surveillance were performed:						
Discussion of developmental milestones and/or general surveillance	117	97%	127	97%	n.s.	
Assessment of parental concerns	51	42%	61	47%	n.s.	

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Gender				Significance	
	Female (N = 146)		Male (N = 161)			
	N	%	N	%	p-value	Difference
Elements of surveillance performed (continued):	(n = 121)		(n = 131)			
Domains of surveillance addressed:						
Social Emotional	103	85%	97	74%	**0.030**	F>M
Cognitive	103	85%	110	84%	n.s.	
Language	93	77%	83	63%	**0.020**	F>M
Motor	98	81%	96	73%	n.s.	
Developmental Screening						
Among all members:	(n = 146)		(n = 161)			
Formal developmental screening tool documented	13	9%	16	10%	n/a	
Overall type of development assessment					n/a	
Members with a global developmental screening tool:	0	0%	2	1%		
Members with other[3] screening tool:	13	9%	14	9%		
Members with only developmental surveillance	108	74%	118	73%		
Members with neither surveillance nor formal screening	25	17%	27	17%		
Vision Screening						
Among all members:	(n = 146)		(n = 161)			
Members received age-appropriate vision screening[4] which occurred on the date of the WCV	56	38%	57	35%	n.s.	
Of those that did not have screen on date of WCV:	(n = 90)		(n = 104)			
Members received age-appropriate vision screening[4] which occurred within 7 days of the date of the WCV	1	1%	1	1%	n.s.	
Among all members:	(n = 146)		(n = 161)			
Member referred to eye health professional	5	3%	3	2%	n.s.	
Hearing Screening						
Among all members:	(n = 146)		(n = 161)			
Members received age-appropriate hearing screening[5] which occurred on the date of the WCV	33	23%	35	22%	n.s.	
Of those that did not have screen on date of WCV:	(n = 113)		(n = 126)			
Members received age-appropriate hearing screening[5] which occurred within 7 days of the date of the WCV	3	3%	1	1%	n.s.	
Of those members who received any age-appropriate hearing screen:	(n = 36)		(n = 36)			
Members referred to audiology related health professional	2	6%	1	3%	n.s.	

n.s. – Not Significant.

n/a – Significance test not performed due to small sample size.

1. BMI categories as documented include: Underweight, Normal or Healthy Weight or Normal BMI 5-85th percentile, Overweight, Obese, BMI 85th to less than the 95th percentile, BMI greater than 95th percentile.

[2] Mental Health Assessments which qualified for this measure include: Formal Mental Health Screening, Parental observations/concerns documented and Provider inquiry or observation documented.

[3] Other Screening tools may include standardized developmental screening tools that do not cover all domains (Motor, Cognitive, Language and Social) or may not meet CHIPRA specifications for reliability, validity, sensitivity and specificity.

[4] Age-appropriate vision screen for those under 3 years of age includes: observation/exam/responses; picture test such as Allen cards; Universal cover test; responses to visual stimuli. Age-appropriate vision screen for those 3 years of age and older includes: distance visual acuity via Snellen wall chart; ocular alignment via unilateral cover test or random dot.

[5] Age-appropriate hearing screening for those under 3 years of age includes: observation/exam/responses to auditory stimuli. Age-appropriate hearing screening for those ages 3 years and older includes: pure tone audiometry and tympanometry testing.

Table C.2 Developmental Screen Code (96110) Validation

MEDICAL RECORD REVIEW: Developmental Screen Code (96110) Validation	Cohort I by Gender				Significance	
	Female (N = 146)		Male (N = 161)			
	N	%	N	%	p-value	Difference
Developmental Surveillance						
Members with a CPT 96110 code:	9	6%	3	2%	n/a	
Of whom:	**(n = 9)**		**(n = 3)**			
Development assessed during visit	9	100%	3	100%	n/a	
Developmental Screening						
Among all members:	**(n = 146)**		**(n = 161)**			
Members with a CPT 96110 code:	9	6%	3	2%	n/a	
of whom:	**(n = 9)**		**(n = 3)**			
Formal developmental screening tool documented	4	44%	2	67%	n/a	
Members with a CPT 96110 code:	**(n = 9)**		**(n = 3)**			
Of those members who had a developmental screening code CPT 96110:					n/a	
Members with a global developmental screening tool:	0	0%	0	0%		
Members with other[1] screening tool:	4	44%	2	67%		
Members with only developmental surveillance	5	56%	1	33%		
Members with neither surveillance nor formal screening	0	0%	0	0%		

n/a – Significance test not performed due to small sample size.

[1] Other Screening tools may include standardized developmental screening tools that do not cover all domains (Motor, Cognitive, Language and Social) or may not meet CHIPRA specifications for reliability, validity, sensitivity and specificity.

Table C.3 Vision Screening Code Validation

MEDICAL RECORD REVIEW: Vision Screening Code Validation	Cohort I by Gender				Significance	
	Female (N = 146)		Male (N = 161)			
	N	%	N	%	p-value	Difference
Members with a vision screening code (99173, 99174)	15	10%	12	7%	n.s.	
Of whom:	**(n = 15)**		**(n = 12)**			
Members received age-appropriate vision screening[1]	12	80%	11	92%	n/a	
Member referred to eye health professional	0	0%	0	0%	n/a	

n.s. – Not Significant.

n/a – Significance test not performed due to small sample size.

1. Age-appropriate vision screen for those under 3 years of age includes: observation/exam/responses; picture test such as Allen cards; Universal cover test; responses to visual stimuli. Age-appropriate vision screen for those 3 years of age and older includes: distance visual acuity via Snellen wall chart; ocular alignment via unilateral cover test or random dot.

Table C.4 Hearing Screening Code Validation

MEDICAL RECORD REVIEW: Hearing Screening Code Validation	Cohort I by Gender				Significance	
	Female (N = 146)		Male (N = 161)			
	N	%	N	%	p-value	Difference
Members with a hearing screening code (92551, 92552, 92567)	15	10%	15	9%	n.s.	
Of whom:	**(n = 15)**		**(n = 15)**			
Members received age-appropriate hearing screening[1]	11	73%	12	80%	n/a	
of whom:	**(n = 11)**		**(n = 12)**			
Member referred to audiology related health professional	0	0%	0	0%	n/a	

n.s. – Not Significant.

n/a – Significance test not performed due to small sample size.

1. Age-appropriate hearing screening for those under 3 years of age includes: observation/exam/responses to auditory stimuli. Age-appropriate hearing screening for those ages 3 years and older includes: pure tone audiometry and tympanometry testing.

Appendix D: Cohort I by EMR

Table D.1 Preventive Medicine Services Validation

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Electronic Medical Record				Significance	
	No (N = 101)		Yes (N = 206)			
	N	%	N	%	p-value	Difference
Well-Child Composite						
Members for whom reviewed visit was identified as a well-visit in the record	80	79%	201	98%	**<0.001**	Yes>No
Well-Child Composite						
Members with visit which includes basic screening components of a WCV. Of the 4 composite components (patient history, physical exam, anticipatory guidance and developmental screening) members for which the medical record showed evidence of all elements for:						
All components	0	0%	12	6%	n/a	
At least 3 components	15	15%	69	34%	**<0.001**	Yes>No
At least 2 components	41	41%	137	67%	**<0.001**	Yes>No
At least 1 component	62	61%	189	92%	**<0.001**	Yes>No
None	39	39%	17	8%	**<0.001**	No>Yes
Patient History						
History obtained included:						
Past Medical History	78	77%	195	95%	n/a	
Family History	33	33%	135	66%	**<0.001**	Yes>No
Social History	49	49%	169	82%	**<0.001**	Yes>No
Review of Systems	35	35%	147	71%	**<0.001**	Yes>No
Height and Weight						
Height/length and weight documented	90	89%	199	97%	**0.009**	Yes>No
Among members **ages 2 years and older**	**(n = 83)**		**(n = 164)**			
Members had BMI percentile documented	27	33%	105	64%	**<0.001**	Yes>No
of whom:	**(n = 27)**		**(n = 105)**			
Members had BMI category[1] documented	9	33%	30	29%	n.s.	
Physical Exam						
Among all members:	**(n = 101)**		**(n = 206)**			
Members for whom physical exam included examination of:						
Head	68	67%	170	83%	**0.003**	Yes>No
Eyes	83	82%	198	96%	**<0.001**	Yes>No
Ears/Nose/Throat	82	81%	201	98%	**<0.001**	Yes>No
Lungs/Respiratory	84	83%	204	99%	**<0.001**	Yes>No
Heart/Cardiovascular	84	83%	204	99%	**<0.001**	Yes>No
Abdomen/GI	85	84%	201	98%	**<0.001**	Yes>No

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Electronic Medical Record				Significance	
	No (N = 101)		Yes (N = 206)			
	N	%	N	%	p-value	Difference
Physical exam included examination of (continued):	(n = 101)		(n = 206)			
Skin	73	72%	174	84%	**0.011**	Yes>No
Spine/Back	41	41%	108	52%	n.s.	
Neurologic	66	65%	176	85%	**<0.001**	Yes>No
Extremities/Musculoskeletal	57	56%	133	65%	n.s.	
Genitalia	55	54%	140	68%	**0.021**	Yes>No
Among members **ages 3 years and older:**	(n = 70)		(n = 135)			
Members had blood pressure documented	57	81%	128	95%	**0.002**	Yes>No
Oral Health						
Among all members:	(n = 101)		(n = 206)			
Received an oral health assessment	48	48%	107	52%	n.s.	
Referred to an oral health provider	7	7%	12	6%	n.s.	
Mental Health Assessment						
Among all members:	(n = 101)		(n = 206)			
Formal mental health screening tool documented	1	1%	4	2%	n.s.	
Parental observations/concerns documented	17	17%	42	20%	n.s.	
Provider inquiry or observation documented	35	35%	95	46%	n.s.	
Total with a mental health assessment performed[2]	40	40%	104	50%	n.s.	
CPT II Code 2014F- Mental Status Assessed	1	1%	20	10%	**0.005**	Yes>No
of whom:	(n = 1)		(n = 20)			
Had a mental health assessment	1	100%	17	85%	n.s.	
Of those children that had some form of mental health assessment:	(n = 40)		(n = 104)			
Members had a mental health problem identified	13	33%	25	24%	n.s.	
of whom:	(n = 13)		(n = 25)			
Follow-up care was documented:						
Counseling	0	0%	3	12%	n/a	
Testing	1	8%	0	0%	n/a	
Revisit for repeat screening or evaluation	1	8%	2	8%	n/a	
Medication	4	31%	14	56%	n/a	
Referral for further evaluation or treatment	2	15%	4	16%	n/a	
Among members **ages 12-20 years:**	(n = 28)		(n = 53)			
A depression screening was performed					n/a	
Yes - informal inquiry	7	25%	22	42%		
Yes - formal screening	2	7%	0	0%		
Total - either Formal or Informal	9	32%	22	42%		

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Electronic Medical Record				Significance	
	No (N = 101)		Yes (N = 206)			
	N	%	N	%	p-value	Difference
Substance Abuse						
Among members **ages 12-20 years:**	**(n = 28)**		**(n = 53)**			
Members were assessed for:						
Tobacco use	10	36%	31	58%	n.s.	
Alcohol use	8	29%	21	40%	n.s.	
Drug use	7	25%	16	30%	n.s.	
At least 1 form of substance use	11	39%	31	58%	n.s.	
Members were identified with:						
Tobacco use	1	4%	3	6%	n.s.	
Alcohol use	1	4%	0	0%	n.s.	
Drug use	1	4%	0	0%	n/a	
Among members **ages 12-20 years** who were identified as a tobacco user:	**(n = 1)**		**(n = 3)**			
Members received follow-up care:						
Tobacco counseling/advice to quit	1	100%	1	33%	n/a	
Tobacco referral	0	0%	0	0%	n/a	
Tobacco medication/treatment	0	0%	0	0%	n/a	
Anticipatory Guidance						
Among all members:	**(n = 101)**		**(n = 206)**			
Age-appropriate anticipatory guidance provided for:						
Nutrition and Diet	44	44%	126	61%	**0.004**	Yes>No
Safety/Injury Prevention	49	49%	147	71%	**<0.001**	Yes>No
Among members **ages 2 years and older:**	**(n = 83)**		**(n = 164)**			
Physical Activity/Screen Time	32	39%	94	57%	**0.005**	Yes>No
Among members **ages 5 years and older:**	**(n = 56)**		**(n = 102)**			
Development/Mental Health/Emotional Well Being	16	29%	46	45%	**0.042**	Yes>No
School Readiness/Academic/Social	15	27%	37	36%	n.s.	
Among members **ages 12-20 years:**	**(n = 28)**		**(n = 53)**			
Risk Reduction/Physical Development	12	43%	32	60%	n.s.	
Developmental Surveillance						
Among all members:	**(n = 101)**		**(n = 206)**			
Development assessed during visit	64	63%	188	91%	**<0.001**	Yes>No
of whom:	**(n = 64)**		**(n = 188)**			
The following elements of surveillance were performed:						
Discussion of developmental milestones and/or general surveillance	63	98%	181	96%	n.s.	
Assessment of parental concerns	26	41%	86	46%	n.s.	

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Electronic Medical Record				Significance	
	No (N = 101)		Yes (N = 206)			
	N	%	N	%	p-value	Difference
Elements of surveillance performed (continued):	(n = 64)		(n = 188)			
Domains of surveillance addressed:						
Social Emotional	50	78%	150	80%	n.s.	
Cognitive	53	83%	160	85%	n.s.	
Language	40	63%	136	72%	n.s.	
Motor	44	69%	150	80%	n.s.	
Developmental Screening						
Among all members:	(n = 101)		(n = 206)			
Formal developmental screening tool documented	9	9%	20	10%	n/a	
Overall type of development assessment					n/a	
Members with a global developmental screening tool	2	2%	0	0%		
Members with other[3] screening tool	7	7%	20	10%		
Members with only developmental surveillance	56	55%	170	83%		
Members with neither surveillance nor formal screening	36	36%	16	8%		
Vision Screening						
Among all members:	(n = 101)		(n = 206)			
Members received age-appropriate vision screening[4] which occurred on the date of the WCV	36	36%	77	37%	n.s.	
Of those that did not have screen on date of WCV:	(n = 65)		(n = 129)			
Members received age-appropriate vision screening[4] which occurred within 7 days of the date of the WCV	0	0%	2	2%	n/a	
Among all members:	(n = 101)		(n = 206)			
Member referred to eye health professional	1	1%	7	3%	n.s.	
Hearing Screening						
Among all members:	(n = 101)		(n = 206)			
Members received age-appropriate hearing screening[5] which occurred on the date of the WCV	17	17%	51	25%	n.s.	
Of those that did not have screen on date of WCV:	(n = 84)		(n = 155)			
Members received age-appropriate hearing screening[5] which occurred within 7 days of the date of the WCV	2	2%	2	1%	n.s.	
Of those members who received any age-appropriate hearing screen:	(n = 19)		(n = 53)			
Members referred to audiology related health professional	1	5%	2	4%	n/a	

n.s. – Not Significant.

n/a – Significance test not performed due to small sample size.

1. BMI categories as documented include: Underweight, Normal or Healthy Weight or Normal BMI 5-85th percentile, Overweight, Obese, BMI 85th to less than the 95th percentile, BMI greater than 95th percentile.

[2] Mental Health Assessments which qualified for this measure include: Formal Mental Health Screening, Parental observations/concerns documented and Provider inquiry or observation documented.

[3] Other Screening tools may include standardized developmental screening tools that do not cover all domains (Motor, Cognitive, Language and Social) or may not meet CHIPRA specifications for reliability, validity, sensitivity and specificity.

[4] Age-appropriate vision screen for those under 3 years of age includes: observation/exam/responses; picture test such as Allen cards; Universal cover test; responses to visual stimuli. Age-appropriate vision screen for those 3 years of age and older includes: distance visual acuity via Snellen wall chart; ocular alignment via unilateral cover test or random dot.

[5] Age-appropriate hearing screening for those under 3 years of age includes: observation/exam/responses to auditory stimuli. Age-appropriate hearing screening for those ages 3 years and older includes: pure tone audiometry and tympanometry testing.

Table D.2 Developmental Screen Code (96110) Validation

MEDICAL RECORD REVIEW: Developmental Screening Code (96110) Validation	Cohort I by Electronic Medical Record				Significance	
	No (N = 101)		Yes (N = 206)			
	N	%	N	%	p-value	Difference
Developmental Surveillance						
Members with a CPT 96110 code:	2	2%	10	5%	n.s.	
Of whom:	**(n = 2)**		**(n = 10)**			
Development assessed during visit	2	100%	10	100%	n/a	
Developmental Screening						
Among all members:	**(n = 101)**		**(n = 206)**			
Members with a CPT 96110 code:	2	2%	10	5%	n.s.	
of whom:	**(n = 2)**		**(n = 10)**			
Formal developmental screening tool documented	0	0%	6	60%	n/a	
Members with a CPT 96110 code:	**(n = 2)**		**(n = 10)**			
Of those members who had a developmental screening code CPT 96110:					n/a	
Members with a global developmental screening tool	0	0%	0	0%		
Members with other[1] screening tool	0	0%	6	60%		
Members with only developmental surveillance	2	100%	4	40%		
Members with neither surveillance nor formal screening	0	0%	0	0%		

n.s. – Not Significant.

n/a – Significance test not performed due to small sample size.

[1] Other Screening tools may include standardized developmental screening tools that do not cover all domains (Motor, Cognitive, Language and Social) or may not meet CHIPRA specifications for reliability, validity, sensitivity and specificity.

Table D.3 Vision Screening Code Validation

MEDICAL RECORD REVIEW: Vision Screening Code Validation	Cohort I by Electronic Medical Record				Significance	
	No (N = 101)		Yes (N = 206)			
	N	%	N	%	p-value	Difference
Members with a vision screening code (99173, 99174)	3	3%	24	12%	**0.012**	Yes>No
Of whom:	**(n = 3)**		**(n = 24)**			
Members received age-appropriate vision screening[1]	2	67%	21	88%	n/a	
Member referred to eye health professional	0	0%	0	0%	n/a	

n/a – Significance test not performed due to small sample size.

1. Age-appropriate vision screen for those under 3 years of age includes: observation/exam/responses; picture test such as Allen cards; Universal cover test; responses to visual stimuli. Age-appropriate vision screen for those 3 years of age and older includes: distance visual acuity via Snellen wall chart; ocular alignment via unilateral cover test or random dot.

Table D.4 Hearing Screening Code Validation

MEDICAL RECORD REVIEW: Hearing Screening Code Validation	Cohort I by Electronic Medical Record				Significance	
	No (N = 101)		Yes (N = 206)			
	N	%	N	%	p-value	Difference
Members with a hearing screening code (92551, 92552, 92567)	8	8%	22	11%	n.s.	
Of whom:	**(n = 8)**		**(n = 22)**			
Members received age-appropriate hearing screening[1]	5	63%	18	82%	n/a	
of whom:	**(n = 5)**		**(n = 18)**			
Member referred to audiology related health professional	0	0%	0	0%	n/a	

n.s. – Not Significant.

n/a – Significance test not performed due to small sample size.

1. Age-appropriate hearing screening for those under 3 years of age includes: observation/exam/responses to auditory stimuli. Age-appropriate hearing screening for those ages 3 years and older includes: pure tone audiometry and tympanometry testing.

Appendix E: Cohort I by Location Type

Table E.1 Preventive Medicine Services Validation

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Location Type				Significance	
	Rural (N = 98)		Urban (N = 209)			
	N	%	N	%	p-value	Difference
Members for whom reviewed visit was identified as a well visit in the record	88	90%	193	92%	n.s.	
Well-Child Composite						
Members with visit which includes basic screening components of a WCV. Of the 4 components (patient history, physical exam, anticipatory guidance and developmental screening) the medical record showed evidence of all elements of:						
All components	3	3%	9	4%	n.s.	
At least 3 components	23	23%	61	29%	n.s.	
At least 2 components	50	51%	128	61%	n.s.	
At least 1 component	77	79%	174	83%	n.s.	
None	21	21%	35	17%	n.s.	
Patient History						
History obtained included:						
Past Medical History	85	87%	188	90%	n/a	
Family History	50	51%	118	56%	n/a	
Social History	66	67%	152	73%	n/a	
Review of Systems	56	57%	126	60%	n/a	
Height and Weight						
Height/length and weight documented	89	91%	200	96%	n.s.	
Among members **ages 2 years and older:**	**(n = 75)**		**(n = 172)**			
Members had BMI percentile documented	32	43%	100	58%	**0.025**	Rural<Urban
of whom:	**(n = 32)**		**(n = 100)**			
those who had BMI category[1] documented	8	25%	31	31%	n.s.	
Physical Exam						
Among all members:	**(n = 98)**		**(n = 209)**			
Members for whom physical exam included examination of:						
Head	77	79%	161	77%	n.s.	
Eyes	87	89%	194	93%	n.s.	
Ears/Nose/Throat	91	93%	192	92%	n.s.	
Lungs/Respiratory	95	97%	193	92%	n.s.	
Heart/Cardiovascular	94	96%	194	93%	n.s.	
Abdomen/GI	95	97%	191	91%	n.s.	
Skin	77	79%	170	81%	n.s.	
Spine/Back	47	48%	102	49%	n.s.	

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Location Type				Significance	
	Rural (N = 98)		Urban (N = 209)			
	N	%	N	%	p-value	Difference
Members for whom physical exam included examination of (continued):	(n = 98)		(n = 209)			
Neurologic	80	82%	162	78%	n.s.	
Extremities/Musculoskeletal	63	64%	127	61%	n.s.	
Genitalia	64	65%	131	63%	n.s.	
Among members **ages 3 years and older:**	(n = 63)		(n = 142)			
Members had blood pressure documented	56	89%	129	91%	n.s.	
Oral Health						
Among all members:	(n = 98)		(n = 209)			
Received an oral health assessment	43	44%	112	54%	n.s.	
Referred to an oral health provider	7	7%	12	6%	n/a	
Mental Health Assessment						
Among all members:	(n = 98)		(n = 209)			
Formal mental health screening tool documented	1	1%	4	2%	n.s.	
Parental observations/concerns documented	17	17%	42	20%	n.s.	
Provider inquiry or observation documented	32	33%	98	47%	**0.019**	Rural<Urban
Total with a mental health assessment performed[2]	36	37%	108	52%	**0.015**	Rural<Urban
CPT II Code 2014F- Mental Status Assessed	1	1%	20	10%	**0.006**	Rural<Urban
of whom:	(n = 1)		(n = 20)			
Had any mental health assessment	1	100%	17	85%	n.s.	
Of those children that had some form of mental health assessment:	(n = 36)		(n = 108)			
Members had a mental health problem identified	6	17%	32	30%	n.s.	
of whom:	(n = 6)		(n = 32)			
Follow-up care was documented:						
Counseling	1	17%	2	6%	n/a	
Testing	0	0%	1	3%	n/a	
Revisit for repeat screening or evaluation	1	17%	2	6%	n/a	
Medication	5	83%	13	41%	n/a	
Referral for further evaluation or treatment	1	17%	5	16%	n/a	
Among members **ages 12-20 years:**	(n = 26)		(n = 55)			
A depression screening was performed:					n/a	
Yes - informal inquiry	11	42%	18	33%		
Yes - formal screening	0	0%	2	4%		
Total - Either Formal or Informal	11	42%	20	36%		

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Location Type				Significance	
	Rural (N = 98)		Urban (N = 209)			
	N	%	N	%	p-value	Difference
Substance Abuse						
Among members **ages 12-20 years:**	**(n = 26)**		**(n = 55)**			
Members were assessed for:						
Tobacco use	14	54%	27	49%	n.s.	
Alcohol use	9	35%	20	36%	n.s.	
Drug use	7	27%	16	29%	n.s.	
At least 1 form of substance use	14	54%	28	51%	n.s.	
Members were identified with:						
Tobacco use	0	0%	4	7%	n/a	
Alcohol use	0	0%	1	2%	n/a	
Drug use	0	0%	1	2%	n/a	
Among members **ages 12-20 years** who were identified as a tobacco user:	**(n = 0)**		**(n = 4)**			
Members received follow-up care:						
Tobacco counseling/advice to quit			2	50%	n/a	
Tobacco referral			0	0%	n/a	
Tobacco medication/treatment			0	0%	n/a	
Anticipatory Guidance						
Among all members:	**(n = 98)**		**(n = 209)**			
Age-appropriate anticipatory guidance provided for:						
Nutrition and Diet	46	47%	124	59%	**0.042**	Rural<Urban
Safety/Injury Prevention	58	59%	138	66%	n.s.	
Among members **ages 2 years and older:**	**(n = 75)**		**(n = 172)**			
Physical Activity/Screen Time	32	43%	94	55%	n.s.	
Among members **ages 5 years and older:**	**(n = 46)**		**(n = 112)**			
Development/Mental Health/Emotional Well Being	12	26%	50	45%	**0.030**	Rural<Urban
School Readiness/Academic/Social	11	24%	41	37%	n.s.	
Among members **ages 12-20 years:**	**(n = 26)**		**(n = 55)**			
Risk Reduction/Physical Development	11	42%	33	60%	n.s.	
Developmental Surveillance						
Among all members:	**(n = 98)**		**(n = 209)**			
Development assessed during visit	83	85%	169	81%	n.s.	
of whom:	**(n = 83)**		**(n = 169)**			
The following elements of surveillance were performed:						
Discussion of developmental milestones and/or general surveillance	81	98%	163	96%	n.s.	
Assessment of parental concerns	34	41%	78	46%	n.s.	

MEDICAL RECORD REVIEW: Preventive Medicine Services Validation	Cohort I by Location Type				Significance	
	Rural (N = 98)		Urban (N = 209)			
	N	%	N	%	p-value	Difference
Elements of surveillance performed (continued):	(n = 83)		(n = 169)			
Domains of surveillance addressed:						
Social Emotional	61	73%	139	82%	n.s.	
Cognitive	65	78%	148	88%	n.s.	
Language	50	60%	126	75%	**0.020**	
Motor	67	81%	127	75%	n.s.	
Developmental Screening						
Among all members:	(n = 98)		(n = 209)			
Formal developmental screening tool documented	7	7%	22	11%	n/a	
Overall type of development assessment					n/a	
Members with a global developmental screening tool	0	0%	2	1%		
Members with other[3] screening tool	7	7%	21	10%		
Members with only developmental surveillance	76	78%	150	72%		
Members with neither surveillance nor formal screening	15	15%	37	18%		
Vision Screening						
Among all members:	(n = 98)		(n = 209)			
Members received age-appropriate vision screening[4], which occurred on the date of the WCV	28	29%	85	41%	**0.041**	Rural<Urban
Of those that did not have screen on date of WCV:	(n = 70)		(n = 124)			
Members received age-appropriate vision screening[4], which occurred within 7 days of the date of the WCV	1	1%	1	1%	n.s.	
Among all members:	(n = 98)		(n = 209)			
Member referred to eye health professional	1	1%	7	3%	n.s.	
Hearing Screening						
Among all members:	(n = 98)		(n = 209)			
Members received age-appropriate hearing screening[5] which occurred on the date of the WCV	23	23%	45	22%	n.s.	
Of those that did not have screen on date of WCV:	(n = 75)		(n = 164)			
Members received age-appropriate hearing screening[5] which occurred within 7 days of the date of the WCV	2	3%	2	1%	n.s.	
Of those members who received any age-appropriate hearing screen:	(n = 25)		(n = 47)			
Members referred to audiology related health professional	3	12%	0	0%	n/a	

n.s. – Not Significant.

n/a – Significance test not performed due to small sample size.

1. BMI categories as documented include: Underweight, Normal or Healthy Weight or Normal BMI 5-85th percentile, Overweight, Obese, BMI 85th to less than the 95th percentile, BMI greater than 95th percentile.

[2] Mental Health Assessments which qualified for this measure include: Formal Mental Health Screening, Parental observations/concerns documented and Provider inquiry or observation documented.

[3] Other Screening tools may include standardized developmental screening tools that do not cover all domains (Motor, Cognitive, Language and Social) or may not meet CHIPRA specifications for reliability, validity, sensitivity and specificity.

[4] Age-appropriate vision screen for those under 3 years of age includes: observation/exam/responses; picture test such as Allen cards; Universal cover test; responses to visual stimuli. Age-appropriate vision screen for those 3 years of age and older includes: distance visual acuity via Snellen wall chart; ocular alignment via unilateral cover test or random dot.

[5] Age-appropriate hearing screening for those under 3 years of age includes: observation/exam/responses to auditory stimuli. Age-appropriate hearing screening for those ages 3 years and older includes: pure tone audiometry and tympanometry testing.

Table E.2 Developmental Screen Code (96110) Validation

MEDICAL RECORD REVIEW: Developmental Screen Code (96110) Validation	Cohort I by Location Type				Significance	
	Rural (N = 98)		Urban (N = 209)			
	N	%	N	%	p-value	Difference
Developmental Surveillance						
Members with a CPT 96110 code:	4	4%	8	4%	n/a	
Of whom:	**(n = 4)**		**(n = 8)**			
Development assessed during visit	4	100%	8	100%	n/a	
Developmental Screening						
Among all members:	**(n = 98)**		**(n = 209)**			
Members with a CPT 96110 code:	4	4%	8	4%	n/a	
of whom:	**(n = 4)**		**(n = 8)**			
Formal developmental screening tool documented	2	50%	4	50%	n/a	
Members with a CPT 96110 code:	**(n = 4)**		**(n = 8)**			
Of those members who had a developmental screening code CPT 96110:					n/a	
Members with a global developmental screening tool	0	0%	0	0%		
Members with other[1] screening tool	2	50%	4	50%		
Members with only developmental surveillance	2	50%	4	50%		
Members with neither surveillance nor formal screening	0	0%	0	0%		

n/a – Significance test not performed due to small sample size.

[1] Other Screening tools may include standardized developmental screening tools that do not cover all domains (Motor, Cognitive, Language and Social) or may not meet CHIPRA specifications for reliability, validity, sensitivity and specificity.

Table E.3 Hearing Screening Code Validation

MEDICAL RECORD REVIEW: Vision Screening Code Validation	Cohort I by Location Type				Significance	
	Rural (N = 98)		Urban (N = 209)			
	N	%	N	%	p-value	Difference
Members with a vision screening code (99173, 99174)	9	9%	18	9%	n.s.	
Of whom:	**(n = 9)**		**(n = 18)**			
Of those members with a vision screening code, members received age-appropriate vision screening[1]	7	78%	16	89%	n/a	
Member referred to eye health professional	0	0%	0	0%	n/a	

n.s. – Not Significant

n/a – Significance test not performed due to small sample size.

1. Age-appropriate vision screen for those under 3 years of age includes: observation/exam/responses; picture test such as Allen cards; Universal cover test; responses to visual stimuli. Age-appropriate vision screen for those 3 years of age and older includes: distance visual acuity via Snellen wall chart; ocular alignment via unilateral cover test or random dot

Table E.4 Hearing Screening Code Validation

MEDICAL RECORD REVIEW: Hearing Screening Code Validation	Cohort I by Location Type				Significance	
	Rural (N = 98)		Urban (N = 209)			
	N	%	N	%	p-value	Difference
Members with a hearing screening code (92551, 92552, 92567)	8	8%	22	11%	n.s.	
Of whom:	**(n = 8)**		**(n = 22)**			
Of those members with a hearing screening code, members received age-appropriate hearing screening[1]	8	100%	15	68%	n/a	
of whom:	**(n = 8)**		**(n = 15)**			
Member referred to audiology related health professional	0	0%	0	0%	n/a	

n.s. – Not Significant.

n/a – Significance test not performed due to small sample size.

1. Age-appropriate hearing screening for those under 3 years of age includes: observation/exam/responses to auditory stimuli. Age-appropriate hearing screening for those ages 3 years and older includes: pure tone audiometry and tympanometry testing.

Appendix F: Cohort II by Age Group

Table F.1 Developmental Assessment

MEDICAL RECORD REVIEW: Developmental Assessment	Cohort II by Age								Significance	
	1 Year N = 57		2 Years N = 25		3 Years N = 4		TOTAL N = 86			
	N	%	N	%	N	%	N	%	p-value	Difference
Developmental Surveillance										
Development surveillance documented	52	91%	23	92%	4	100%	79	92%	n/a	
Of whom:	**(n = 52)**		**(n = 23)**		**(n = 4)**		**(n = 79)**			
The following elements of surveillance were performed:										
Discussion of developmental milestones and/or general surveillance	51	98%	23	100%	4	100%	78	99%	n/a	
Assessment of parental concerns	19	37%	11	48%	1	25%	31	39%	n/a	
Assessment of risk factors for developmental delay	13	25%	6	26%	0	0%	19	24%	n/a	
Domains of surveillance addressed:										
Social Emotional	49	94%	21	91%	4	100%	74	94%	n/a	
Cognitive	51	98%	20	87%	4	100%	75	95%	n/a	
Language	51	98%	22	96%	4	100%	77	97%	n/a	
Motor	0	0%	2	9%	0	0%	2	3%	n/a	
Developmental Screening										
Among all members:	**(n = 57)**		**(n = 25)**		**(n = 4)**		**(n = 86)**			
Formal developmental screening tool performed on or within 7 days of the preloaded date	39	68%	22	88%	0	0%	61	71%	n/a	
of whom:	**(n = 39)**		**(n = 22)**		**(n = 0)**		**(n = 61)**			
Members with a global developmental screening tool:	7	18%	8	36%			15	25%	n/a	
Parents' Evaluation of Developmental Status (PEDS)[1]	6	15%	7	32%			13	21%	n/a	
Parents' Evaluation of Developmental Status-Dev Milestones (PEDS-DM)[1]	1	3%	1	5%			2	3%	n/a	
Members with other[2] screening tool:	32	82%	14	64%			46	75%	n/a	
Modified Checklist for Autism in Toddlers (M-CHAT)	25	64%	14	64%			39	64%	n/a	
Other developmental screening tool[1,3]	6	15%	0	0%			6	10%	n/a	
UTD[1,4]	1	3%	0	0%			1	2%	n/a	

MEDICAL RECORD REVIEW: Developmental Assessment	Cohort II by Age								Significance	
	1 Year N = 57		2 Years N = 25		3 Years N = 4		TOTAL N = 86			
	N	%	N	%	N	%	N	%	p-value	Difference
Among all members:	(n = 57)		(n = 25)		(n = 4)		(n = 86)			
Of those members who had a developmental screening code CPT 96110:									n/a	
Members with a global developmental screening tool	7	12%	8	32%	0	0%	15	17%		
Members with other[2] screening tool:	32	56%	14	56%	0	0%	46	53%		
Members with only developmental surveillance	17	30%	3	12%	4	100%	24	28%		
Members with neither surveillance nor formal screening	1	2%	0	0%	0	0%	1	1%		

n/a – Significance test not performed due to small sample size.

[1] The denominator used in the calculation of these rates includes all members with any formal developmental screening tool documented.

[2] Other Screening tools may include standardized developmental screening tools that do not cover all domains (Motor, Cognitive, Language and Social) or may not meet CHIPRA specifications for reliability, validity, sensitivity and specificity.

[3] Other Developmental Screening tools include: Denver Developmental II.

[4] UTD: Unable to determine.

Appendix G: Cohort II by MCO

Table G.1 Developmental Assessment

MEDICAL RECORD REVIEW: Developmental Assessment	Cohort II by MCO						Significance	
	Coventry Cares N = 28		Passport N = 30		WellCare N = 28			
	N	%	N	%	N	%	p-value	Difference
Developmental Surveillance								
Development surveillance documented	25	89%	29	97%	25	89%	n.s.	
Of whom:	**(n = 25)**		**(n = 29)**		**(n = 25)**			
The following elements of surveillance were performed:								
Discussion of developmental milestones and/or general surveillance	24	96%	29	100%	25	100%	n/a	
Assessment of parental concerns	8	32%	21	72%	2	8%	**<0.001**	Passport > CoventryCares > WellCare
Assessment of risk factors for developmental delay	7	28%	4	14%	8	32%	n.s.	
Domains of surveillance addressed:								
Social Emotional	23	92%	26	90%	25	100%	n/a	
Cognitive	23	92%	27	93%	25	100%	n/a	
Language	24	96%	28	97%	25	100%	n/a	
Motor	24	96%	28	97%	25	100%	n/a	
Developmental Screening								
Among all members:	**(n = 28)**		**(n = 30)**		**(n = 28)**			
Formal developmental screening tool performed on or within 7 days of the preloaded date	21	75%	27	90%	13	46%	**0.001**	CoventryCares, Passport > WellCare
of whom:	**(n = 21)**		**(n = 27)**		**(n = 13)**			
Members with a global developmental screening tool	2	10%	12	44%	1	8%	n/a	
Parents' Evaluation of Developmental Status (PEDS)[1]	1	5%	12	44%	0	0%	n/a	
Parents' Evaluation of Developmental Status-Dev Milestones (PEDS-DM)[1]	1	5%	0	0%	1	8%	n/a	
Members with other[2] screening tool	19	90%	15	56%	12	92%	n/a	
Modified Checklist for Autism in Toddlers (M-CHAT)[1]	13	62%	15	56%	11	85%	n/a	
Other developmental screening tool[1,3]	5	24%	0	0%	1	8%	n/a	
UTD[1,4]	1	5%	0	0%	0	0%	n/a	

MEDICAL RECORD REVIEW: Developmental Assessment	Cohort II by MCO						Significance	
	Coventry Cares N = 28		Passport N = 30		WellCare N = 28			
	N	%	N	%	N	%	p-value	Difference
Among all members:	(n = 28)		(n = 30)		(n = 28)			
Of those members who had a developmental screening code CPT 96110:							n/a	
Members with a global developmental screening tool	2	7%	12	40%	1	4%		
Members with other[2] formal screening tool	19	68%	15	50%	12	43%		
Members with only developmental surveillance	7	25%	2	7%	15	54%		
Members with neither surveillance nor formal screening	0	0%	1	3%	0	0%		

n.s. – Not Significant.

n/a – Significance test not performed due to small sample size.

[1] The denominator used in the calculation of these rates includes all members with any formal developmental screening tool documented.

[2] Other Screening tools may include standardized developmental screening tools that do not cover all domains (Motor, Cognitive, Language and Social) or may not meet CHIPRA specifications for reliability, validity, sensitivity and specificity.

[3] Other Developmental Screening tools include: Denver Developmental II.

[4] UTD: Unable to determine.

Appendix H: Cohort II by Gender

Table H.1 Developmental Assessment

MEDICAL RECORD REVIEW: Developmental Assessment	Cohort II by Gender				Significance	
	Female N = 42		Male N = 44			
	N	%	N	%	p-value	Difference
Developmental Surveillance						
Development surveillance documented	38	90%	41	93%	n.s.	
Of whom:	**(n = 38)**		**(n = 41)**			
The following elements of surveillance were performed:						
Discussion of developmental milestones and/or general surveillance	38	100%	40	98%	n/a	
Assessment of parental concerns	16	42%	15	37%	n.s.	
Assessment of risk factors for developmental delay	9	24%	10	24%	n.s.	
Domains of surveillance addressed:						
Social Emotional	35	92%	39	95%	n.s.	
Cognitive	36	95%	39	95%	n.s.	
Language	37	97%	40	98%	n.s.	
Motor	37	97%	40	98%	n.s.	
Developmental Screening						
Among all members:	**(n = 42)**		**(n = 44)**			
Formal developmental screening tool	30	71%	31	70%	n.s.	
of whom:	**(n = 30)**		**(n = 31)**			
Members with a global developmental screening tool	12	40%	3	10%	**0.006**	Female>Male
Parents' Evaluation of Developmental Status (PEDS)[1]	11	37%	2	6%	**0.004**	Female>Male
Parents' Evaluation of Developmental Status-Dev Milestones (PEDS-DM)[1]	1	3%	1	3%	n.s.	
Members with other[2] formal screening	18	60%	28	90%	**0.006**	Male>Female
Modified Checklist for Autism in Toddlers (M-CHAT)[1]	14	47%	25	81%	**0.006**	Male>Female
Other Developmental Screening Tool[1,3]	4	13%	2	6%	n.s.	
UTD[1,4]	0	0%	1	3%	n/a	

MEDICAL RECORD REVIEW: Developmental Assessment	Cohort II by Gender				Significance	
	Female N = 42		Male N = 44			
	N	%	N	%	p-value	Difference
Among all members:	(n = 42)		(n = 44)			
Of those members who had a developmental screening code CPT 96110:					n/a	
Members with a global developmental screening tool	12	29%	3	7%		
Members with other[2] formal screening tool	18	43%	28	64%		
Members with only developmental surveillance	11	26%	13	30%		
Members with neither surveillance nor formal screening	1	2%	0	0%		

n.s. – Not Significant.

n/a – Significance test not performed due to small sample size.

[1] The denominator used in the calculation of these rates includes all members with any formal developmental screening tool documented.

[2] Other Screening tools may include standardized developmental screening tools that do not cover all domains (Motor, Cognitive, Language and Social) or may not meet CHIPRA specifications for reliability, validity, sensitivity and specificity.

[3] Other Developmental Screening tools include: Denver Developmental II.

[4] UTD: Unable to determine.

Appendix I: Cohort II by EMR

Table I.1 Developmental Assessment

MEDICAL RECORD REVIEW: Developmental Assessment	Cohort II by Electronic Medical Records				Significance	
	No N = 30		Yes N = 56			
	N	%	N	%	p-value	Difference
Developmental Surveillance						
Development surveillance documented	28	93%	51	91%	n/a	
Of whom:	**(n = 28)**		**(n = 51)**			
The following elements of surveillance were performed:						
Discussion of developmental milestones and/or general surveillance	28	100%	50	98%	n/a	
Assessment of parental concerns	3	11%	28	55%	**<0.001**	No<Yes
Assessment of risk factors for developmental delay	2	7%	17	33%	**0.009**	No<Yes
Domains of surveillance addressed:						
Social Emotional	24	86%	50	98%	**0.031**	No<Yes
Cognitive	25	89%	50	98%	n/a	
Language	26	93%	51	100%	n/a	
Motor	26	93%	51	100%	n/a	
Developmental Screening						
Among all members:	**(n = 30)**		**(n = 56)**			
Formal developmental screening tool performed on or within 7 days of the preloaded date	15	50%	46	82%	**0.002**	No<Yes
of whom:	**(n = 15)**		**(n = 46)**			
Members with a global developmental screening tool:	2	13%	13	28%	n/a	
Parents' Evaluation of Developmental Status (PEDS)[1]	2	13%	11	24%	n/a	
Parents' Evaluation of Developmental Status-Dev Milestones (PEDS-DM)[1]	0	0%	2	4%	n/a	
Members with other[2] screening tool:	13	87%	33	72%	n/a	
Modified Checklist for Autism in Toddlers (M-CHAT)[1]	7	47%	32	70%	n/a	
Other Developmental Screening Tool[1,3]	5	33%	1	2%	n/a	
UTD[1,4]	1	7%	0	0%	n/a	

MEDICAL RECORD REVIEW: Developmental Assessment	Cohort II by Electronic Medical Records				Significance	
	No N = 30		Yes N = 56			
	N	%	N	%	p-value	Difference
Among all members:	(n = 30)		(n = 56)			
Of those members who had a developmental screening code CPT 96110:					n/a	
Members with a global developmental screening tool	2	7%	13	23%		
Members with other[2] screening tool:	13	43%	33	59%		
Members with only developmental surveillance	15	50%	9	16%		
Members with neither surveillance nor formal screening	0	0%	1	2%		

n/a – Significance test not performed due to small sample size.

[1] The denominator used in the calculation of these rates includes all members with any formal developmental screening tool documented.

[2] Other Screening tools may include standardized developmental screening tools that do not cover all domains (Motor, Cognitive, Language and Social) or may not meet CHIPRA specifications for reliability, validity, sensitivity and specificity.

[3] Other Developmental Screening tools include: Denver Developmental II.

[4] UTD: Unable to determine.