COMMONWEALTH OF MASSACHUSETTS
HEALTH POLICY COMMISSION

TECHNICAL APPENDIX 3
CHANGES IN AMBULATORY CARE DURING THE COVID-19 PANDEMIC

ADDENDUM TO 2022 COST TRENDS REPORT

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1 Section 3A: Changes in ambulatory care use among commercially insured pediatric residents

1.1 Summary

This appendix describes the Health Policy Commission's (HPC) approach to examining 2020 ambulatory care use among children in the Commonwealth, including changes from prior years in use of preventive visits, problem-based visits, immunizations, and blood lead level screenings, as well as disparities by community income level and geography.

1.2 Data sources

The HPC used the Center for Health Information and Analysis All-Payer Claims Database v10.0 (APCD) to measure preventive visit use, problem-based visit use, and blood lead level screenings among Massachusetts children in 2020, including comparisons to utilization in 2018 and 2019. The HPC's APCD includes data from five commercial payers in the state: Blue Cross Blue Shield, Tufts Health Plan, Harvard Pilgrim Health Care, AllWays (formerly Neighborhood Health Plan), and Anthem (including Unicare, a GIC offering).

The HPC used pediatric vaccination data collected by the Massachusetts Department of Public Health (DPH) Massachusetts Immunization Information System (MIIS)[i] to measure trends in administration of combined diphtheria, tetanus, and acellular pertussis (DTaP), combined measles, mumps, and rubella (MMR), and influenza immunizations.

1.3 Study population

1.3.1 Pediatric population

Individuals included in this analysis were those ages 0-17 by the end of each calendar year from 2018-2020, with 12 full months of enrollment in health insurance with any of the five payers included in the APCD. These criteria result in excluding many children born during each calendar year. However, the subset of children under one year old with a full 12 months of enrollment is sufficiently large for analysis: 909 in 2018, 819 in 2019, and 827 in 2020.

1.3.2 Chronic condition cohort

To better understand changes in pediatric ambulatory care utilization in 2020, the HPC conducted a sub-analysis examining problem-based visits among children with chronic conditions who would be expected to have continued accessing care outside of preventive care visits.

The HPC identified chronic condition cohorts as children with diagnoses of cancer, cardiovascular disease, diabetes, or epilepsy, who had been diagnosed at least one year prior to the examination year. For example, a pediatric member with an epilepsy diagnosis in 2019 and 12 months of membership coverage in 2020 would be part of the 2020 study cohort. This prior-year approach to identifying chronic conditions was necessary due to decreased health care

system interactions and decreased ability to accurately identify children with chronic condition diagnoses in 2020. Study cohorts were created for 2019 (using diagnoses as of 2018) and 2020 (using diagnoses as of 2019), including 8,681 children in 2019 and 8,248 children in 2020.

1.4 Exclusions

To ensure inclusion of only ambulatory services, inpatient facility claims were excluded for this analysis, as were emergency department, inpatient, and residential sites of service (professional claim site of service codes 13, 14, 21, 23, 31, 33, 34, 51, and 61), as well as facility claims with Health Care Cost Institute's outpatient facility category 1 (emergency department).[1]

1.5 Analyses

1.5.1 APCD-based analysis

1.5.1.1 Defining preventive visits and recommended preventive visit utilization

The HPC identified preventive visits using current procedural terminology (CPT) codes 99381-99384, 99391-99394, 99460-99464, 99441-99450, and 98966-98969. Episodes were created by collapsing claim-lines in which services were provided on the same day, to the same patient, with the same CPT code, into preventive visits.

The American Academy of Pediatrics (AAP)[ii] and the National Committee for Quality Assurance (NCQA)[iii] recommend that all children under the age of 18 see a medical provider regularly to monitor growth and development, and to provide essential immunizations and screenings. The recommended frequency of pediatric preventive visits varies by patient age. The AAP recommends preventive visits at 1, 2, 4, 6, 9, 12, 15, 18, 24, and 30 months of life, with annual well visits for children ages three and older. NCQA recommends at least 6 well visits in the first 15 months of life, at least two well visits between 15 and 30 months of life, and at least one well visit for children ages three and older.

The HPC built on these recommendations to develop criteria for whether children of different ages had received the recommended number of preventive visits per calendar year. Because the HPC measures patient age at year-end rather than age at time of service, any children under age one at the end of each calendar year were considered to have received the recommended number of preventive visits if they had at least four visits during the year, with at least three visits for children who were age one at the end of the year, and at least one visit for children ages two and older.

[1] For more information on the Health Care Cost Institute's claim type categorization please see: https://healthcostinstitute.org/images/pdfs/HCCI_2018_Methodology_public_v1.pdf.

1.5.1.2 Defining problem-based visits

The HPC identified problem-based visits using CPT codes 99201-99215 and 99241-99245. Episodes were created by collapsing claim-lines in which services were provided on the same day, to the same patient, with the same CPT code, into problem-based visits.

1.5.1.3 Defining blood lead level screenings

The HPC identified blood lead level screenings using CPT code 83655. Massachusetts requires blood lead level screenings for all children ages 3 and younger,[iv] and children ages 1-3 were retained for analysis of lead screening utilization.

1.5.1.4 Defining telehealth use

Services provided via telehealth were identified using a combination of professional claim site of service codes, CPT codes, and CPT code modifiers. A claim line with any of the following was identified as indicating a telehealth service:

Professional claim site of service code	2
CPT code	G0406
	G0407
	G0408
	G0425
	G0426
	G0427
	G0508
	G0509
	G2010
	G2012
	G0071
	Q3014
	T1014
	98966
	98967
	98968
	98969
	98970
	98971
	98972
	99358
	99359

	99421
	99422
	99423
	G2061
	G2062
	G2063
	99441
	99442
	99443
	99444
	G2025
	G0459
	0188T
CPT code modifier	GT
	95
	GQ
	G0

1.5.1.5 Defining community income level groups

Income level groups, defined as quintiles or deciles, were constructed using a population-weighted ACS file including population and median family income from the 5-year estimates of the 2019 American Community Survey for Massachusetts. Members were categorized into income quintiles and deciles using their zip code tabulation area (ZCTA)-linked median income (ACS 2019). Community income levels were categorized by total state-weighted population to construct community income deciles and quintiles for use in analyses.

1.5.1.6 Children with no medical spending

To calculate the percentage of commercially insured children in Massachusetts with no medical spending, the HPC defined children with no medical spending in 2018 and 2020 as those with 12 full months of enrollment and with zero dollars of medical spending each year.

1.5.1.7 Children without recommended preventive visits for two consecutive years

The HPC measured rates of children who had fewer than the recommended number of preventive visits for two consecutive years. For this sub-analysis, the HPC retained 190,514 children with 24 continuous months of commercial health insurance enrollment and consistent community income level data from 2018-2019, and 178,045 children with 24 continuous months of commercial health insurance enrollment and consistent community income level data from 2019-

2020. The criteria detailed in 5.1.1 were used to identify children in each two-year period who lacked recommended preventive visit utilization for two years in a row, measured both as a share of the total and by community income quintile.

1.5.1.8 Pediatric problem-based visits by site

E&M visits were classified using Healthcare Common Procedure Coding System (HCPCS) codes 99201-99205, 99211-99215, and included codes 99281-99285 for E&M visits that took place in an emergency room. Sites of care were identified using a combination of Centers for Medicare and Medicaid Services (CMS) Place of Service codes, Health Care Cost Institute (HCCI) Service Categories, and HCSPCS/Current Procedural Terminology (CPT) codes.

Identifying non-telehealth sites of care

Site of care	Claim line type	Place of service code (professional claims)	HCCI service category (outpatient claims)
Office	Professional	11	N/A
HOPD	Professional or outpatient	19 or 22	2 to 11
Urgent care	Professional	20	N/A
ED	Professional or outpatient	23	1

Identifying telehealth site of care

See section 1.5.1.4.

Other notes

BH, therapy, and counseling-related E&M visits were identified using CCSR MBD001-MBD034 and HCSPCS codes 99401-99412 and 90832-908308, respectively, and excluded.

E&M visits were created by collapsing claim-lines in which services were provided on the same day, to the same patient, with the same site of service.

1.5.1.9 Problem-based visit utilization among chronic condition cohort

The HPC examined claims for the 2019 and 2020 chronic condition cohorts as defined in section 3.2 to measure problem-based visit utilization and utilization of telehealth for problem-based visits from March 15 through December 31 of 2020 for the 2020 cohort, and from March 15 through December 31 of 2019 for the 2019 cohort as a baseline comparison. Total problem-

based visits were measured, as well as the share of children with chronic conditions with any problem-based visit utilization and the share of children with chronic conditions with any problem-based visits via telehealth for children in the lowest and highest income quintile communities.

The share of pediatric members with any problem-based visit use in both the highest- and lowest- income quintiles declined by 11% from 2019-2020.

1.5.2 MIIS-based analysis

Children should receive five doses of DTaP between two months and six years of age, and should receive two doses of MMR between 12 months and six years of age.[v] All children six months old or older should receive annual flu vaccines.[vi] For each year from 2019-2021, the HPC analyzed the number of DTaP and MMR vaccines administered to children ages 7 and younger, and analyzed the number of influenza vaccines administered to children ages 17 and younger, as well as change over time.

2 Section 3B: Changes in ambulatory care use among commercially insured adult residents

2.1 Summary

This appendix describes the Health Policy Commission's (HPC) approach to examining 2020 ambulatory care use among adults in the Commonwealth, including changes from prior years in use of preventive visits, problem-based visits, and screenings for cancer and diabetes, as well as disparities by community income level.

2.2 Data Sources

The HPC used the Center for Health Information and Analysis All-Payer Claims Database v10.0 (APCD) to measure preventive visit use, problem-based visit use, and screenings for cancer and diabetes among Massachusetts adults in 2020, including comparisons to utilization in 2018 and 2019. The HPC's APCD includes data from five commercial payers in the state: Blue Cross Blue Shield, Tufts Health Plan, Harvard Pilgrim Health Care, AllWays (formerly Neighborhood Health Plan and Anthem (including Unicare, a GIC offering).

2.3 Study population

2.3.1 Adult population

Individuals included in this analysis were those ages 18-64 by the end of each calendar year from 2018-2020, with 12 full months of enrollment in health insurance with any of the five payers included in the HPC's APCD analytic files.

2.3.2 Chronic condition cohort

To better understand changes in adult ambulatory care utilization in 2020, the HPC conducted a sub-analysis examining problem-based visits among adults with chronic conditions. These subpopulations would have been expected to seek care with the health care system and would be expected to continue access care during 2020.

The HPC identified chronic condition cohorts as adults with cardiometabolic diseases or asthma, who had been diagnosed at least one year prior to the examination year. For example, an adult member with an asthma diagnosis in 2019 and 12 months of membership coverage in 2020 would be part of the 2020 study cohort. This prior-year approach to identifying chronic conditions was necessary due to decreased health care system interactions and decreased ability to accurately identify adults with chronic condition diagnoses in 2020. Study cohorts were created for 2019 (using diagnoses as of 2018) and 2020 (using diagnoses as of 2019).

2.4 Analyses

2.4.1 APCD-based analysis

2.4.1.1 Defining preventive visits and problem-based visits

The HPC identified problem-based visits using current procedural terminology (CPT) codes 99201-99205 and 99211-99215. Preventive visits were identified using CPT codes 99385-99386 and 99395-99396.

2.4.1.2 Defining telehealth use

Services provided via telehealth were identified using a combination of professional claim site of service codes and CPT code modifiers. A discharge was identified as telehealth if it had one of the following codes:

Professional claim site of service code	2
CPT code modifier	GT
	95
	GQ
	G0

2.4.1.3 Defining community income level groups

Income level groups, defined as quintiles or deciles, were constructed using a population-weighted ACS file including population and median family income from the 5-year estimates of the 2019 American Community Survey for Massachusetts. Members were categorized into

income quintiles and deciles using their zip code tabulation area (ZCTA)-linked median income (ACS 2019). Community income levels were categorized by total state-weighted population to construct community income deciles and quintiles for use in analyses.

2.4.1.4 Adults with no medical spending

To calculate the percentage of commercially insured adults in Massachusetts with no medical spending, the HPC defined adults with no medical spending in 2018 and 2020 as those with 12 full months of enrollment and with zero dollars of medical spending each year.

2.4.1.5 Adult preventive visits and other preventive services

The HPC examined several high-value services including cancer screenings and hemoglobin A1c (HbA1c) testing for individuals with diabetes in 2019 and 2020. For age restrictions, 45 was chosen as the cutoff for mammogram and colon cancer screenings based on American Cancer Society guidelines.[vii]

Explicit breast cancer screening mammogram codes 77067 and 77063 were used to first identify procedure codes that were unambiguously for preventive screening and not breast cancer diagnostic services. Other mammography codes used were 76641 76642 78800 77048 77049 77046 77047 77053 77054 C8903 C8905 C8906 C8908. Because these mammogram screening codes can be used for either preventive screening or diagnostic purposes, the HPC used a Centers for Medicare & Medicaid Services (CMS) algorithm to separate diagnostic services from preventive screening services.[viii]

We excluded mammogram encounters where the woman had a diagnosis for a complication of a breast implant up to 9 months previously (any diagnosis code starting with T854), if the woman had a breast cancer diagnostic service up to 3 months previously (procedure codes 77065 77066 77061 77062 G0279), and if the woman had a previous diagnosis for breast cancer during the year-long lookback period (any diagnosis code starting with C50).

The unit of analysis was: for every 100 women over age 45, the number who received at least one mammogram in each calendar year. Codes for the mammogram analysis were identified from CMS.[ix]

Colon cancer screening is a combined index of explicit screening colonoscopies and fecal occult blood tests, with codes identified from CMS[x] and Blue Cross Blue Shield.[xi]

The codes used to identify colon cancer screenings were: G0104, G0105, G0121, G0106, G0120, G0122, G0327, G0104, G0121, and G0122.

The codes used to identify fecal occult blood tests were: 81528, 82270, 82272, 82274, G0464, G0107, G0328.

The unit of analysis was: for every 100 patients over age 45, the number who received at least one colon cancer screening in each calendar year.

Using hemoglobin A1c (HbA1c) as a metric for diabetes preventive services was taken from the Center for Disease Control's recommended Diabetes Care Schedule.[xii] Patients with diabetes were identified using The Johns Hopkins ACG® System © 1990, 2017, Johns Hopkins University. All Rights Reserved. The procedure code to identify HbA1c tests was 83036.

The unit of analysis is: for every 100 patients with diabetes, the number who received at least one HbA1c test in each calendar year.

2.4.1.6 Adult problem-based visits by site of care

Exhibit 3B.4 Identifying problem-based visits per 1,000 member months used additional criteria to identify potential switching sites of care for telehealth and also included Emergency Department E&M codes.

E&M visits were classified using Healthcare Common Procedure Coding System (HCPCS) codes 99201-99205, 99211-99215, and 99281-99285. Sites of care were identified using a combination of CMS Place of Service codes, Health Care Cost Institute (HCCI) Service Categories, and HCSPCS/Current Procedural Terminology (CPT) codes.

Identifying non-telehealth sites of care

Site of care	Claim line type	Place of service code (professional claims)	HCCI service category (outpatient claims)
Office	Professional	11	N/A
HOPD	Professional or outpatient	19 or 22	2 to 11
Urgent care	Professional	20	N/A
ED	Professional or outpatient	23	1

Identifying telehealth site of care

Services provided via telehealth were identified using a combination of professional claim site of service codes, CPT codes, and CPT code modifiers. A claim line with any of the following was identified as indicating a telehealth service:

Professional claim site of service code	2
CPT code	G0406

	G0407
	G0408
	G0425
	G0426
	G0427
	G0508
	G0509
	G2010
	G2012
	G0071
	Q3014
	T1014
	98966
	98967
	98968
	98969
	98970
	98971
	98972
	99358
	99359
	99421
	99422
	99423
	G2061
	G2062
	G2063
	99441
	99442
	99443
	99444
	G2025
	G0459
	0188T
CPT code modifier	GT
	95
	GQ
	G0

Other notes

Behavioral health (BH), therapy, and counseling-related E&M visits were identified using CCSR MBD001-MBD034 and HCSPCS codes 99401-99412 and 90832-908308, respectively, and excluded.

E&M visits were created by collapsing claim-lines in which services were provided on the same day, to the same patient, with the same site of service.

3 Section 3C: Psychotherapy use among commercially insured residents

3.1 Summary

This appendix describes the Health Policy Commission's (HPC) approach to examining 2020 ambulatory care use among residents in the Commonwealth, including changes from prior years in use of psychotherapy visits and disparities by community income level, sex and geography.

3.2 Data Sources

The HPC used the Center for Health Information and Analysis All-Payer Claims Database v10.0 (APCD) to measure psychotherapy visits among Massachusetts residents in 2020, including comparisons to utilization in 2018 and 2019. The HPC's APCD includes data from five commercial payers in the state: Blue Cross Blue Shield of Massachusetts, Tufts Health Plan, Harvard Pilgrim Health Care, AllWays (formerly Neighborhood Health Plan), and Anthem (including Unicare, a GIC offering).

3.3 Study population

3.3.1 Pediatric population

Individuals included in this analysis were those ages 0-17 by the end of each calendar year from 2018-2020, with 12 full months of enrollment in health insurance with any of the five payers included in the APCD.

3.3.2 Adult population

Individuals included in this analysis were those ages 18-64 by the end of each calendar year from 2018-2020, with 12 full months of enrollment in health insurance with any of the five payers included in the APCD.

3.3.3 Mental health condition cohort

To better understand changes in mental health utilization in 2020, the HPC conducted a sub-analysis examining psychotherapy visits among residents who were diagnosed with a mental

health condition in the first two months of the year, and who had at least two visits in that period, one of which was in February.

The HPC identified mental health condition cohorts as residents with the diagnosis codes with the prefix of 'F', and T1491XA. Claims with substance use diagnoses are not available in the HPC's analytic file for the APCD, so these analyses exclusively examined claims with mental health diagnoses.

3.4 Exclusions

To ensure inclusion of only ambulatory services, inpatient facility claims were excluded for this analysis, as were emergency department, inpatient, and residential sites of service (professional claim site of service codes 13, 14, 21, 23, 31, 33, 34, 51, and 61), as well as facility claims with HCCI outpatient facility category 1 (emergency department).[2]

3.5 Analyses

3.5.1 Defining psychotherapy visits

The HPC identified preventive visits using current procedural terminology (CPT) codes 90832-90834, 90836-90837. Therapy encounters were created by collapsing claim-lines in which services were provided on the same day, to the same patient, with the same CPT code, into psychotherapy visits.

3.5.2 Defining telehealth use

Services provided via telehealth were identified using a combination of professional claim site of service codes, CPT codes, and CPT code modifiers. A claim line with any of the following was identified as indicating a telehealth service:

Professional claim site of service code	2
CPT code	G0406
	G0407
	G0408
	G0425
	G0426
	G0427
	G0508
	G0509
	G2010

[2] For more information on the Health Care Cost Institute's claim type categorization please see: https://healthcostinstitute.org/images/pdfs/HCCI_2018_Methodology_public_v1.pdf.

	G2012
	G0071
	Q3014
	T1014
	98966
	98967
	98968
	98969
	98970
	98971
	98972
	99358
	99359
	99421
	99422
	99423
	G2061
	G2062
	G2063
	99441
	99442
	99443
	99444
	G2025
	G0459
	0188T
CPT code modifier	GT
	95
	GQ
	G0

3.5.3 Defining community income level groups

Income level groups, defined as quintiles or deciles, were constructed using a population-weighted ACS file including population and median family income from the 5-year estimates of the 2018 American Community Survey for Massachusetts. Members were categorized into income quintiles and deciles using their zip code tabulation area (ZCTA)-linked median income (ACS 2018). Community income levels were categorized by total state-weighted population to construct community income deciles and quintiles for use in analyses.

[i] Massachusetts Immunization Information System (MIIS), data as of 5/31/2022.
[ii] Recommendations for Preventive Pediatric Health Care. Bright Futures/American Academy of Pediatrics. Available at: https://downloads.aap.org/aap/pdf/Periodicity_schedule.pdf
[iii] Healthcare Effectiveness Data and Information Set (HEDIS) Measures. Child and Adolescent Well-Care Visits (W30, WCV). National Committee for Quality Assurance (NCQA). Available at https://www.ncqa.org/hedis/measures/child-and-adolescent-well-care-visits/
[iv] Massachusetts Department of Public Health Childhood Lead Poisoning Prevention Program. Learn about lead screening and reporting requirements. Available at: https://www.mass.gov/service-details/learn-about-lead-screening-and-reporting-requirements
[v] Centers for Disease Control and Prevention. Recommended Child and Adolescent Immunization Schedule for ages 18 years or younger. 2022. Available at https://www.cdc.gov/vaccines/schedules/downloads/child/0-18yrs-child-combined-schedule.pdf
[vi] Centers for Disease Control and Prevention. Vaccine for flu (influenza). 2019. Available at https://www.cdc.gov/vaccines/parents/diseases/flu.html
[vii] American Cancer Society. Guidelines for the early detection of cancer. https://www.cancer.org/healthy/find-cancer-early/american-cancer-society-guidelines-for-the-early-detection-of cancer.html#:~:text=Women%20age%2045%20to%2054,10%20more%20years%20or%20longer.
[viii] Centers for Medicare & Medicaid Services. Billing and Coding: Breast Imaging Mammography/Breast Echography (Sonography)/Breast MRI/Ductography. https://www.cms.gov/medicare-coverage-database/view/article.aspx?articleid=56448&ver=13&.
[ix] Wernli KJ, Callaway KA, Henderson LM, Kerlikowske K, Lee JM, Ross-Degnan D, Wallace JK, Wharam JF, Zhang F, Stout NK. Trends in screening breast magnetic resonance imaging use among US women, 2006 to 2016. Cancer. 2020 Dec 15;126(24):5293-302.
[x] Centers for Medicare & Medicaid Services. Billing and Coding: Colorectal Cancer Screening – Medical Policy Article. https://www.cms.gov/medicare-coverage-database/view/article.aspx?articleid=52378&ver=52.
[xi] Blue Cross Blue Shield of Alabama. Fecal Occult Blood Testing (FOBT). https://providers.bcbsal.org/portal/documents/10226/306297/Fecal+Occult+Blood+Testing+%28FOBT%29.pdf/777d4067-6aec-4149-bb53-01300598c6b8?t=1462290435397.
[xii] Centers for Disease Control and Prevention. Your Diabetes Care Schedule. Available at https://www.cdc.gov/diabetes/managing/care-schedule.html.