COMMONWEALTH OF MASSACHUSETTS
HEALTH POLICY COMMISSION

TECHNICAL APPENDIX 2
TRENDS IN SPENDING AND CARE DELIVERY

ADDENDUM TO 2022 COST TRENDS REPORT

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1 Summary

This appendix describes the Health Policy Commission's (HPC) approach to examining broad trends in health care spending, value, and performance in Massachusetts in 2020.

2 Data Sources

To examine changes in overall spending and enrollment by payer (Exhibit 2.1- Exhibit 2.5), the HPC used the Center for Health Information and Analysis (CHIA) annual reports. Sources for national data to compare trends between the U.S. and Massachusetts (Exhibit 2.4 and Exhibit 2.5) are from the Centers for Medicare and Medicaid Services (CMS). See details in the notes and sources under each exhibit.

For commercial spending analysis by category of service, the HPC used CHIA's All-Payer Claims Database V10.0 (APCD). Analyses using the APCD's medical claims (Exhibit 2.6-Exhibit 2.8) include data from five commercial payers in the state: Blue Cross Blue Shield, Tufts Health Plan, Harvard Pilgrim Health Care, AllWays (formerly Neighborhood Health Plan[1]), and Anthem (including Unicare, a GIC offering). Due to lack of pharmacy claims, Anthem data are excluded in prescription drug claim analyses (Exhibit 2.6, Exhibit 2.9-Exhibit 2.11).

3 Analyses

3.1 Commercial spending by category

3.1.1 Commercial spending by category

For **Exhibit 2.6 Commercial spending per member per year by category, 2018-2020**, the HPC combined professional and facility spending by categories of care. Total spending by categories of care were calculated and divided by member years in the APCD to create per member per year amounts.

Categories of care	Data
Inpatient	APCD inpatient facility claims and inpatient professional claims (place of service code 21)
HOPD	APCD HOPD facility claims and HOPD professional claims (place of service codes 19, 22 and 24)
ED	APCD ED facility claims and ED professional claims (place of service code 23)

[1] On January 1, 2019 Neighborhood Health Plan officially became AllWays Health Partners. This transition reflects a redirected business strategy following the 2012 acquisition of Neighborhood Health Plan by Partners HealthCare.

Office	APCD office professional claims (place of service code 11)
Pharmacy	APCD pharmacy claims; rebate amounts are from CHIA's 2022 annual report

3.1.2 HOPD spending by type of services

For **Exhibit 2.7. Commercial HOPD spending per member per year by type of services, 2018-2020,** the HPC further categorized HOPD spending by type of services using the Restructured BETOS Classification System (RBCS). RBCS is a taxonomy that groups CPT codes into clinically meaningful categories and subcategories. RBCS is updated annually by a technical expert panel, and this analysis is based on the 2021 version of RBCS.

The RBCS contains the following categories: Anesthesia, Evaluation and Management (E&M), Imaging, Procedures, Tests, Treatments, DME and Other. The HPC largely followed this categorization, though some category names were changed for clarity (e.g., "Tests" to "Diagnostic tests and labs"). Treatments category was divided into three buckets of spending using the RBCS subcategories: chemotherapy and radiation oncology, injections and infusions (nononcologic), and other medical treatments. Spending on DME and Other were not shown in the exhibit as they were two much smaller categories of spending.

Given that the updates for the 2021 RBCS used 2019 Medicare data, the taxonomy misses some crucial CPT codes that were introduced in 2020, such as codes for COVID testing. The HPC worked with a clinical consultant and manually categorized the following CPT codes, which had either large volume (1,000 claim lines or more in any APCD year) or large spending impact ($100,000 in total spending in the APCD). Other unclassified CPT codes were excluded from the analysis.

CPT code	Adapted BETOS category
S0201	E & M
S9480	E & M
S9485	E & M
74221	Imaging
77061	Imaging
77062	Imaging
78429	Imaging
78431	Imaging
78830	Imaging
78832	Imaging

93356	Imaging
S8037	Imaging
15769	Procedures and surgeries
15771	Procedures and surgeries
62328	Procedures and surgeries
S4015	Procedures and surgeries
80230	Diagnostic tests and labs
86328	Diagnostic tests and labs
86769	Diagnostic tests and labs
87635	Diagnostic tests and labs
95700	Diagnostic tests and labs
95708	Diagnostic tests and labs
95715	Diagnostic tests and labs
95719	Diagnostic tests and labs
C9803	Diagnostic tests and labs
G2023	Diagnostic tests and labs
G2024	Diagnostic tests and labs
G2066	Diagnostic tests and labs
U0001	Diagnostic tests and labs
U0002	Diagnostic tests and labs
U0003	Diagnostic tests and labs
U0004	Diagnostic tests and labs
U0005	Diagnostic tests and labs
90738	Injections and infusions (nononcologic)
C9061	Injections and infusions (nononcologic)
C9062	Chemotherapy and radiation oncology
Q5118	Chemotherapy and radiation oncology
Q5119	Injections and infusions (nononcologic)
S0020	Injections and infusions (nononcologic)
S0028	Injections and infusions (nononcologic)
Any unclassified codes between J90000-J9999	Chemotherapy and radiation oncology
Any unclassified codes between J0120-J8999	Injections and infusions (nononcologic)
T codes	E&M

3.1.3 Identifying clinician-administered drug spending

The HPC identified clinician-administered drug spending using the following two RBCS subcategories: Chemotherapy, injections and infusions (nononcologic). These subcategories include the CPT codes for provider drug administration, but the HPC estimates that they make up for a small share of total spending in this category (~16%).

In this analysis, the HPC focused on office and HOPD settings, where the majority of clinician-administered drug spending occurs. Other sites of care, such as dialysis centers, were excluded.

3.2 Pharmacy spending

3.2.1 Cost-sharing for selected classes of drugs

For **Exhibit 2.11 Average cost sharing per prescription (30-day supply) in selected classes of drugs, 2017-2020**, the HPC selected three chronic conditions for which patients rely primarily on branded drugs for treatment: Multiple Sclerosis (MS), Arthritis, Diabetes. Diabetes drugs were further divided into insulin and non-insulin diabetes drugs. The APCD pharmacy claims were used for this analysis, thus excluding clinician-administered drugs for these conditions (which are in the APCD medical claims.)

Drugs	Sources
MS: Avonex, Betaseron, Copaxone (brand and generic), Extavia, Kesimpta, Plegridy, Rebif, Aubagio, Bafiertam, Gilenya Mavenclad, Mayzent, Ponvory, Tecfidera (brand and generic), Vumerity, Zeposia	https://www.nationalmssociety.org/Treating-MS/Medications#section-1
Antiarthritics: Orencia, Humira, Kineret Olumiant, Cimzia, Enbrel, Simponi, Taltz, Kevzara, Cosentyx, Actemra, Xeljanz, Rinvoq, Stelara	https://www.rheumatology.org/Portals/0/Files/2021-ACR-Guideline-for-Treatment-Rheumatoid-Arthritis-Early-View.pdf; https://www.arthritis.org/drug-guide/biologics/biologics
Non-insulin diabetes: Nesina, Vipidia, Onglyza, Tradjenta, Januvia, Steglatro	https://professional.diabetes.org/sites/professional.diabetes.org/files/media/10.00-

Farxiga, Invokana, Jardiance, Bydureon, Byetta, Trulicity, Ozempic, Saxenda, Victoza 3-Pak, Victoza 2-Pak, Adlyxin	11.15_inzucchi_panel_discussion_on_new_medications.pdf
Insulin: Novolog, Apidra, Apida Solosar, Humalog, Humalog, Afrezza, Humulin R, Humulin N, Levemir, Lantus, Basaglar, Toujeo Solostar, Humulin R U-500, Tresiba Flextouch, Tresiba, Humulin 70/30, Novolin 70/30, Novolog Mix 70/30, Humalog Mix 50/50, Humalog Mix 75/25, Ryzodeg, Suliqua, Xultophy, Admelog, Lyumjev, Fiasp, Semglee	https://diabetesjournals.org/care/article/45/Supplement_1/S125/138908/9-Pharmacologic-Approaches-to-Glycemic-Treatment; https://www.aafp.org/pubs/afp/issues/2018/0101/p29.html; https://professional.diabetes.org/sites/professional.diabetes.org/files/media/10.00-11.15_inzucchi_panel_discussion_on_new_medications.pdf

3.3 Affordability

The HPC used the 2016 –2021 Current Population Survey's (CPS) Annual Social and Economic Supplement (ASEC) to identify total healthcare spending and total compensation for U.S. and Massachusetts families. This supplement adds detailed questions covering social and economic characteristics of U.S. families and households to existing data collection on labor force statistics compiled by the CPS. In particular, the supplement collects health insurance characteristics, such as coverage, plan type, payer, out-of-pocket (OOP) medical spending and employee health insurance premium contributions. For this analysis, the HPC used the ASEC longitudinal files provided by IPUMs.[2]

For this analysis, HPC identified U.S. middle-class families with commercial, employer-sponsored insurance (ESI). "Middle class" was defined using occupational prestige scores (Socioeconomic Index, or SEI) based on the General Social Survey (GSS; U. of Chicago).[3] Families were assigned to middle class if the occupation of the family reference person scored between 25 and 75 on the 0 to 100 scale. Occupations within this range include fire fighters, social workers, medical and health services managers, and construction laborers.

The ASEC distinguishes between households (primary family and any related sub-families) and families (primary family). For this analysis, the HPC defined family as the primary family only. Families were further restricted to those with (1) a family reference person and a spouse, (2)

[2] Integrated Public Use Microdata Series: https://cps.ipums.org/cps/about.shtml

[3] The General Social Survey (GSS): https://gss.norc.org/; https://usa.ipums.org/usa-action/variables/SEI#description_section

single family reference person and at least one child in the family under the age of 18, or (3) a family reference person, spouse and child under 18. Single persons without children, households with a senior reference person or spouse, those living in group quarters, and those without ESI coverage were excluded. The population was further restricted to those families between 300 percent and 500 percent of the Federal Poverty Level (FPL). FPL guidelines were applied at the state level to account for differences in Hawaii and Alaska.

Income, out-of-pocket medical spending, and premium contributions were reported in dollars. Income and spending values were adjusted for differences in prices using state-level regional price parity (RPP) data from the U.S. Bureau of Economic Analysis.[4] Additionally, state-level income and spending were normalized to the mean occupational prestige score (annual basis) to account for differences between states.

Total health care spending was defined as medical OOP spending (over the counter and all other non-premium spending on medical care and equipment) plus total health care premiums (employee and employer share). Total compensation was defined as family income plus the employer share of premiums only. State-level data on premium contributions were obtained from the Medical Expenditure Panel Survey (MEPS).[5]

[4] Regional price parities: https://www.bea.gov/data/prices-inflation/regional-price-parities-state-and-metro-area
[5] MEPS state data: https://datatools.ahrq.gov/meps-hc