

**COMMONWEALTH OF MASSACHUSETTS
HEALTH POLICY COMMISSION**



**TECHNICAL APPENDIX B4
PROVIDER ORGANIZATION PERFORMANCE
VARIATION: SPENDING VARIATION FOR CLINICALLY
SIMILAR POPULATIONS**

Table of Contents

- 1 Summary 3
- 2 Patient attribution methodology 3
 - 2.1 Data 3
 - 2.2 Provider file 3
 - 2.3 Attribution methodology 3
- 3 Study population 4
 - 3.1 Identifying clinically similar patient subgroups 4
 - 3.2 Provider organizations 4
- 4 Analyses 5
 - 4.1 Spending estimates 5
 - 4.2 Risk adjustment 5
 - 4.3 Categories of spending 5
 - 4.4 Services delivered in a hospital outpatient department 5
 - 4.5 Drivers of spending: price and utilization 5
 - 4.5.1 Non-PCP visits 5
 - 4.5.2 Procedure-based Encounters 6
 - 4.6 Downstream indicators of proper medical management for individuals with diabetes 6

1 Summary

This appendix describes the Health Policy Commission's (HPC) approach to the analyses contained in **Chapter 5: "Provider Organizations Performance Variation: Spending Variation for Clinically Similar Populations"** of the 2018 Cost Trends Report.

2 Patient attribution methodology

2.1 Data

The HPC used the 2015 Registration of Provider Organizations (RPO) and the SK&A Information Services by IQVIA (SK&A) Office Based and Hospital Based Providers dataset to identify providers and create a "Provider File." The HPC then used the 2015 Massachusetts All-Payer Claims Database (APCD) to attribute patients observed in the APCD to provider organizations in Massachusetts. The HPC's APCD has data from three of the largest commercial payers in the state: Blue Cross Blue Shield, Tufts Health Plan, and Harvard Pilgrim Health Care.

2.2 Provider file

These steps describe the creation of the provider file used in the provider attribution methodology. As described below, the member attribution process requires a file of all providers and their National Provider Identifiers (NPIs), as well as a list of only the primary care providers (PCPs) and their NPIs.

Overall provider file:

To create the overall provider file, the HPC combined 2015 RPO data with December 2015 SK&A data. After excluding any providers missing NPIs and removing duplicate entries of providers who appear in both files, the final provider file includes 27,969 providers, 21,693 from RPO and 6,276 from SK&A.

Primary care provider file:

The HPC defined primary care providers from this list as follows. For the providers in RPO, the HPC included all providers who self-report that they practice as a primary care provider, a pediatrician, or both. The HPC identified PCPs from the SK&A file by using these self-reported specialties: Family practitioner, General practitioner, Internal medicine, Pediatrician, IMP. The PCP file also includes Nurse Practitioners from SK&A (NPs are not included in the RPO data) who self-reported their primary care specialty.

The final PCP file includes 8,635 PCPs, 6,816 from RPO and 1,819 from SK&A.

2.3 Attribution methodology

These steps describe the attribution methodology that relies on the primary care provider file created in 2.2 above.

Individuals with a pre-specified PCP in the member eligibility file:

There are 2,454,903 unique members in the HPC's 2015 commercial analytic file of the APCD (v5.0). The member eligibility file enables assignment of 65% (1,601,572) of members who have an identifiable PCP in their record.

Step-wise PCP assignment using the medical claim file and pharmacy claim file:

The remaining 853,331 unassigned members were then linked to their medical claims to identify primary providers of well visits, sick visits, and most frequent prescriber in the pharmacy claim file. Well visits are defined as any claims with the following procedure codes: G0439, V2020, V2030,

V7000, V7030, V7050, V7060, V7080, V7090, 99381-99387, 99391-99397, 99401-99404, 99411-99412, 99420-99429, 99432-99461. Sick visits are defined as any claims with the following procedure codes: 99201-99205, 99211-99215. Claims that were identified as either well or sick visits were limited to sites of service where patients would be expected to see a PCP [excluding 01 (pharmacy), 17 (retail clinic), 20 (urgent care), 21 (inpatient hospital), 23 (emergency department), 41 (ambulance), 42 (air ambulance), 51 (inpatient psychiatric facility), 52 (psychiatric facility, partial hospitalization), 53 (community mental health), 55 (residential SUD treatment), 56 (psychiatric residential treatment), 57 (non-residential SUD facility), 62 (outpatient rehab facility), 65 (end stage renal disease facility), 81 (independent lab)].

In total, there are 2,058,640 (84%) individuals attributed.

3 Study population

The study population for this work was further limited beyond members who were successfully attributed in the aforementioned attribution methodology (2,058,640). Members were excluded if they were under eighteen, or lacked information about their age (470,247). Members were excluded if they lacked information about their risk score (52,484) or gender (3,139). Members were excluded if they did not have continuous commercial enrollment for all 12 months of 2015 (208,565). 1,323,775 members remained in the study population. Of these eligible for study, the HPC further limited to a universe of members attributed to either an AMC-anchored organization or a physician-led organization (see 3.2 below for more information about the specific provider organizations), and had a final sample of 791,904 individuals under study.

3.1 Identifying clinically similar patient subgroups

Claims-based chronic disease indicators enable construction of clinically-similar cohorts. HPC analytic files contain indicators for AIDS/HIV, asthma, arthritis, cancer, cardiovascular disease, diabetes (either type 1 or type 2), epilepsy, hypertension, mood disorder, multiple sclerosis, psychosis, and kidney disease through the Johns Hopkins DRG grouper. For this work, the HPC studied three cohorts that are clinically similar: 1) a healthy cohort with 500,098 members that has no major chronic diseases on record, 2) a cardiometabolic cohort with 158,970 members who have at least one cardiometabolic condition (cardiovascular disease, hypertension, or diabetes), and 3) a diabetes cohort with 10,403 members who have diabetes and no other major chronic diseases. The diabetes cohort is a subset of the cardiometabolic cohort. All clinical cohorts are limited to individuals with a risk score <5, with the exception of the healthy cohort that is further restricted to individuals with a risk score <2.

3.2 Provider organizations

The analyses in Chapter 5 compare spending trends by organization type for clinically similar patient subgroups across two types of provider organizations. The HPC categorized the organizations into two groups by their organizational structure: provider organizations that include an academic medical center (AMC), or AMC-anchored, and provider organizations that include no hospitals, or physician-led. For more on the definitions of hospital types, please see the Center for Health Information and Analysis FY16 Hospital Profiles Technical Appendix (<http://www.chiamass.gov/assets/docs/r/hospital-profiles/2016/Massachusetts-Hospitals-Profiles-Technical-Appendix-FY16.pdf>). Boston Medical Center was excluded from analysis in the AMC-anchored group, due to data abnormalities.

AMC-ANCHORED

Beth Israel Deaconess Care Organization (BIDCO)
Partners Healthcare
Wellforce
UMass Medical Center

4 Analyses

4.1 Spending estimates

Spending estimates are calculated by summing all claims lines attributed to individual members over the course of a year. A small portion of these individual claim lines do not have accurate price estimates because they are paid under capitation (rather than fee-for-services) so prices do not reflect actual transaction amounts, but instead often reflect estimates provided by payers. The HPC performed several tests analyses that suggest that total amounts paid for care across all claims do accurately reflect amounts paid in the aggregate, including comparing our spending estimates to reported total medical expenditure (TME) amounts reported to CHIA for patients in HMO or POS plans – the latter do not rely on summation of individual claim lines, but include total payments to providers by payers on behalf of members in HMO or POS plans.

4.2 Risk adjustment

Risk scores are assigned to each patient in the APCD using the Johns Hopkins Adjusted Clinical Groups Case-Mix System (ACG®) software. The spending measures presented in Chapter 5 are adjusted by the average risk score of the provider organization’s attributed patient population in Exhibit 5.2, but not in any other exhibits. Risk scores of AMC-anchored and physician-led comparison groups become almost identical after assembling clinically similar cohorts, and risk adjusting produces indiscernible differences.

4.3 Categories of spending

Total spending is categorized into inpatient, outpatient, professional, and prescription spending using the Health Care Cost Institute (HCCI) methodology. This methodology allows the HPC to further subset spending into lab/pathology, radiology, and outpatient surgery categories, which may sum spending for procedures in multiple sites of service. Some similar services may be billed in either the professional or hospital outpatient categories, depending on the site of care used by, or the billing practices of a particular provider organization.

4.4 Services delivered in a hospital outpatient department

Procedures were identified as having occurred in a hospital outpatient department if they had a facility fee occurring in a hospital outpatient department or a professional claim with a site of service equal to “22” or “23.”

4.5 Drivers of spending: price and utilization

4.5.1 Non-PCP visits

“Non-PCP visits” are any visits with a physician or other licensed care provider that have not been identified as primary care. This could include physician specialists as well as other providers such as occupational therapists. “Preventive Visits” includes CPT codes 99381-99387, 99391-99397, 99401-99404, 99429, G0402.

4.5.2 Procedure-based encounters

Clinical encounters within the APCD were defined as the same person, the same procedure code, and on the same day, to capture all spending related to an individual procedure. Analyses related to price and utilization were pursued after constructing an encounter.

4.6 Downstream indicators of proper medical management for individuals with diabetes

The HPC was able to compare inpatient stays, ED visits, and potentially avoidable ED visits for the diabetes cohort across the AMC-anchored group and physician-led group.

Inpatient stays

Inpatient stays are identified as the inpatient claims at Massachusetts acute care hospitals.

Emergency Department Utilization

An emergency department (ED) visit is defined as at least one medical claim for a patient on one day, with a site of service equal to “23,” or emergency department.

To identify potentially avoidable ED visits, the HPC applied the NYU Center for Health and Public Service Research Billings algorithm (“Billings”) on the ED medical claims from the APCD to categorize each patient’s primary procedure code. Avoidable visits include Billings categories of non-emergent and emergent, primary care treatable.