CONNECTICUT
Health Strategy

CONNECTICUT HEALTHCARE COST DRIVERS DASHBOARD TECHNICAL NOTES

VERSION 3, MAY 2025

Introduction

The Connecticut Healthcare Cost Drivers Dashboard summarizes health care utilization and spending in Connecticut, with the goal of helping state officials understand the factors that are driving growth in health care costs across the state.

Mathematica built the Cost Drivers Dashboard on behalf of and in consultation with Connecticut's Office of Health Strategy and Bailit Health. The dashboard uses the Power BI platform.

This document summarizes the data and methods used to create the Cost Drivers Dashboard.

Data

The dashboard shows key spending and utilization statistics for the commercial, Medicaid, and Medicare Advantage[1] markets for claims from 2018 to 2023. The data source for the dashboard is Extract 6012 from Connecticut's All Payer Claims Database (APCD), with includes claims paid through June 30, 2024.

Analytic population

The Cost Drivers Dashboard uses analytic files produced using medical and pharmacy claims and enrollment data from Connecticut's APCD. The APCD receives claims from the Medicaid, Medicare Advantage, and commercial markets. The commercial market includes fully insured commercial plans, state employee plans, and partnership self-insured plans. Self-insured plans are not required to submit data to the APCD, per the Gobeille v. Liberty Mutual decision.[2] Thus, commercial market data presented in the dashboard are not exhaustive. Medical claims represent payments for medical services and devices only; they exclude retail pharmacy, vision, and dental service claims. Pharmacy claims represent payments for retail pharmacy 30-day equivalent prescriptions.

The following claims are excluded from the analytic population:

1. Medicare fee-for-service (FFS) claims and beneficiaries.
2. Denied, reversed, or non-primary claims (header_status not equal to 01, 19, -1, or -2), with one exception:
    a. Non-primary claims are included in the Medicaid Secondary submarket, which largely represents dual-eligible members, who have both Medicare and

[1] Medicare FFS data are not available in the APCD after 2019 and therefore are not included in the dashboard.

[2] For more information about the Gobeille decision on self-insured plans or plans governed by the Employee Retirement Income Security Act and how it has impacted the APCD, please see https://www.dol.gov/sites/dolgov/files/ebsa/about-ebsa/about-us/state-all-payer-claims-databases-advisory-committee/final-report-and-recommendations-2021.pdf.

Medicaid coverage. These members tend to have most claims paid by Medicare; however, Medicaid usually pays long-term care claims. We include results for the Medicaid secondary market, particularly to avoid excluding long-term care spending on dual-eligible members.

3. Orphaned claims (orphaned_header_flag = Y).
4. Claims with negative paid (paid_amt) or negative cost sharing (copay_amt + coinsurance_amt + deductible_amt) amounts across all claim lines.
5. Commercial and Medicare Advantage claims paid outside of the runout period. That is, claim header records with a paid date after June 30 of the year following the date of service. Because of Medicaid reporting practices, the runout exclusion does not apply to the Medicaid market (primary and secondary).
6. Claims without a matching member month record.
    a. To match a medical claim, the member month record must have the same member (internal_member_id) and payer (medical_submitter_id) and be active during the month when medical services occurred (year_month contains first_service_dt).
    b. To match a pharmacy claim, the member month record must have the same member (internal_member_id) and be active during the month when prescription was filled or when (year_month contains prescription_filled_dt).
7. Claims from Submitter 13749, an Aetna student health plan.

The population is restricted to Connecticut residents (out_of_state_flag = N and member state = CT).

Markets

The tool includes the markets described in Table 1.

Table 1. Market and submarket definitions

Market	Submarket	Product_Type	Enrollment criteria
Commercial	State employees	'COMMERCIAL'	Commercial is primary and insured_group_policy_number IN ('001800', 'SC4848', '4750')
Commercial	Non-state employees	'COMMERCIAL'	Commercial is primary and insured_group_policy_number NOT IN ('001800', 'SC4848', '4750')
Medicaid	Primary	'MEDICAID'	Medicaid is primary payer
Medicaid	Secondary	'MEDICAID'	Medicaid is secondary payer or dual_eligibility_indicator = 'Dual Eligible'
Medicare	Advantage	'MEDICARE'	Payer_name not 'Medicare'[a] and Medicare is primary payer

[a] Payer_Name = 'Medicare' identifies Medicare FFS (or traditional Medicare) claims, which are not current in the APCD and thus are excluded from the Cost Drivers Dashboard. Medicare Advantage claims are submitted and paid by commercial payers such as Aetna and coded as product_type = 'MEDICARE.'

The member_month_detail table in the APCD defines whether a payer is primary or secondary for a given member month. The primary payer definition varies by product and claim category:

- Member months with primary commercial medical coverage have medical_eligibility_id = med_commercial_eligibility_id
- Member months with primary commercial pharmacy coverage have pharmacy_eligibility_id = rx_commercial_eligibility_id
- Member months with primary Medicare medical coverage have medical_eligibility_id = med_medicare_eligibility_id
- Member months with primary Medicare pharmacy coverage have pharmacy_eligibility_id = rx_medicare_eligibility_id
- Member months with primary Medicaid medical coverage have medical_eligibility_id = med_medicaid_eligibility_id
- Member months with primary Medicaid pharmacy coverage have pharmacy_eligibility_id = rx_medicaid_eligibility_id
- Member months with secondary Medicaid medical coverage have (1) non-null med_medicaid_eligibility_id and (2) medical_eligibility_id not equal to med_medicaid_eligibility_id
- Member months with secondary Medicaid pharmacy coverage have (1) non-null rx_medicaid_eligibility_id and (2) pharmacy_eligibility_id not equal rx_medicaid_eligibility_id

Service categories

The Cost Drivers Dashboard shows results by service category. Medical claims categories are defined using claim type, type of setting, and place of setting, as shown

in Table 2. Appendix A from the APCD Data Dictionary provides more details about claim type, type of setting, and place of setting for medical claims.

Not shown in Table 2 are (1) the Other category, which includes all medical claims not otherwise categorized, such as ambulance, home health, and hospice claims and (2) retail pharmacy claims, which are reported separately from medical claims and defined by the presence of a claim in the pharmacy table of the APCD.

Table 2. Service categories

Service category	Claim type ID	Type of setting ID	Place of setting ID
Inpatient hospital	1	1	1, 6, or 14
Outpatient hospital	1	2	7
Outpatient ambulatory surgical center	1	2	8
Professional	2	3	1, 3, 4, 5, 6, 7, 8, 9, 10, 11, or 13
Long-term care	1	1	2, 3, 4, 5, or 15

Units of analysis

Units of analysis, or units, are used to calculate payment per unit (PPU) and the utilization statistic, units per 1,000 members (UPK).

The unit of analysis for the inpatient hospital service category is inpatient discharge (inpatient_discharge_id). The count of inpatient discharge records serves as the denominator for PPU and the numerator for UPK.

The unit of analysis for inpatient long-term care is an inpatient discharge (inpatient_discharge_id). When an inpatient discharge is unavailable for an inpatient long-term care encounter, the unit is a medical claim service line (medical_claim_service_line_id).[3] The count of discharge records and medical claim service lines serves as the denominator for PPU and the numerator for UPK.

The unit of analysis for all other medical, non-pharmacy service categories is a medical claim service line (medical_claim_service_line_id). Each service line represents a service provided during a visit. The count of medical claim service lines serves as the denominator for PPU and the numerator for UPK.

The unit of analysis for the pharmacy service category is a 30-day equivalent (thirty_day_equivalent). The 30-day equivalent variable is a function of days_supply and equals 1 for prescription supplies of fewer than 45 days, 2 for prescription supplies of 45

[3] The incidence of Medicaid inpatient long-term care claims with no associated inpatient discharge decreased significantly in 2020, in turn causing a drop in the number of in the number of Medicaid long-term care units. This affects 2020 to 2021 trends in PPU and UPK.

to 74 days, and 3 for prescription supplies of 75 to 104 days; it increases by 1 for each additional 30 days.

Key measures

The tool shows three key measures that users can view at multiple levels of aggregation and for multiple segments of the population: (1) Per member per month (PMPM) spending, (2) PPU, and (3) UPK. Note that the PPU calculation differs for medical and pharmacy claims.

1. PMPM spending = sum(allowed_amt)/sum(member_months). Allowed_amt includes insurance payments and member payments. Member payments include deductibles, copays, and coinsurance.
2. PPU
    a. For medical claims = sum(allowed_amt)/count(units), for non-pharmacy service categories.
    b. PPU for the pharmacy claims = sum(total_price_30day)/sum(num_rx_claims_line), where:
        i. total_price_30day = sum(allowed_amt/thirty_day_equivalent). Here, payment per 30 day equivalent is first calculated on the claim record, and then summed across records to create the total_price_30day variable.
        ii. num_rx_claims_line = count(pharmacy_claim_service_line_id). This approach produces a PPU result unweighted by the 30-day equivalent variable, thus giving each pharmacy claim equal weight in the PPU calculation.
3. UPK = units/member_equivalents * 1,000, where: member_equivalents = member_months/12.

Comparison of Cost Drivers Dashboard to the Hospital Dashboard

Small differences between the Cost Drivers Dashboard and the Hospital Dashboard in the results for commercial inpatient and outpatient hospital categories are because:

- The Cost Drivers Dashboard includes members of all known and unknown ages and genders, while the Hospital Dashboard is limited to members of a known age and gender. Counts of unknown ages and genders tend to be low and within the cell suppression requirements.
- The Hospital Dashboard aggregates data by hospital and suppresses records with fewer than 11 units. For example, if only 5 hospitalizations occurred at a hospital within a given year, those hospitalizations are excluded from the Hospital

Dashboard. The Cost Driver Tool does not aggregate data by hospital and so these records are included.

- The Cost Drivers Dashboard aggregates data by market and primary payer.[4] Therefore, inpatient stays with two primary payers, such as when the member's insurance coverage changes during the hospitalization, is counted once for each primary payer. These occurrences are rare.
- The Cost Drivers Dashboard aggregates data by month and displays per member per month (PMPM) spending. The Hospital Dashboard aggregates data by year and displays per member per year (PMPY) spending.

Change Log

Version 2. In April 2025, we updated the Cost Driver and Hospital dashboards to bring them into better alignment, implementing the following changes:

- We changed the definition of "units' for the outpatient hospital, professional, and other service categories. There was no impact to inpatient hospital or long-term care units. The former version of the dashboard defined units as a medical claim header, which can contain multiple services. The revised version defines units as a medical claim service line, i.e. it counts each service provided as an individual unit.
- We added "Unknown" gender. Previously the tool was limited to records where gender was either Male or Female.
- We corrected an issue in an input file that was causing some duplication of claims for members with multiple coverage types during a given month, e.g. members with dual Medicare and Medicaid coverage. Correcting this issue caused spending to decrease minimally.

Version 3. In May 2025, we updated the Technical Notes to add detail about long-term care units.

[4] To better assess long-term care spending, which is usually paid by Medicaid for members with primary Medicare coverage and secondary Medicaid coverage, the cost driver tool does show the Medicaid secondary market. However, the commercial and Medicare markets are limited to claims paid by the primary payer.

Appendix A. Reference Table for Claim Type, Type of Setting, and Place of Setting

claim_type_id	claim_type_desc	type_of_setting_id	type_of_setting_desc	place_of_setting_id	place_of_setting_desc	Notes
1	Facility	1	Inpatient	1	Acute inpatient or hospital	First two characters of bill type are in (11, 41)
				14	Acute inpatient or hospital (Part B)	First two characters of bill type are in (12)
				2	Swing bed	First two characters of bill type are in (18, 28, 48, 58)
				3	SNF	First two characters of bill type are in (21, 25, 26, 27, 51, 52)
				15	SNF (Part B)	First two characters of bill type are in (22)
				4	ICF	First two characters of bill type are in (16, 17, 65, 66, 67, 45, 46, 47, 55, 56, 57)
				5	Residential	First two characters of bill type are in (86)
				6	Other	Inpatient subcategory that does not fit into one of the above subcategories
		2	Outpatient	7	Hospital	First two characters of bill type are in (13, 14, 43, 44, 85)
				8	Freestanding ambulatory surgery	First two characters of bill type are in (83)
				9	FQHC	First two characters of bill type are in (77)
				10	Rural health clinic	First two characters of bill type are in (71)
				11	Mental health clinic	First two characters of bill type are in (76)
				3	SNF	First two characters of bill type are in (23, 24)
				4	ICF	First two characters of bill type are in (15)
				6	Other	First two characters of bill type are in (53, 54, 63, 64, 72, 73, 74, 75, 78, 79, 80, 84, 89) (revenue code not between 550 and 609 and not between 100 and 219 and not between 1000 and 1005)

claim_type_id	claim_type_desc	type_of_setting_id	type_of_setting_desc	place_of_setting_id	place_of_setting_desc	Notes
2	Professional	3	Provider	1	Acute inpatient or hospital	Place of service = 21
				3	SNF	Place of service = 31
				4	ICF	Place of service in (32, 33, 54)
				5	Residential	Place of service in (13, 14, 55, 56)
				7	Hospital	Place of service in (19, 22, 23)
				8	Freestanding ambulatory surgery	Place of service = 24
				9	FQHC	Place of service = 50
				10	Rural health clinic	Place of service = 72
				11	Mental health clinic	Place of service = 53
				13	Office	Place of service = 11
				6	Other	Other not listed above
2	Professional	4	Independent labs	12	Not applicable	Based on place of service
2	Professional	5	Ambulance	12	Not applicable	Based on place of service and HCPCS codes specific to ambulance services
2	Professional	6	Dental	12	Not applicable	Based on CDT codes
3	Other services	7	Pharmacy	12	Not applicable	Based on place of service
3	Other services	8	DME	12	Not applicable	Based on place of service and HCPCS codes for DME services
3	Other services	9	Home health	12	Not applicable	Based on type of bill and home health revenue codes—facility claims only
3	Other services	10	Unclassified/other	12	Not applicable	Services that cannot be classified elsewhere
3	Other services	12	Hospice	12	Not applicable	Based on type of bill—facility claims only (hospice professional claims included in Professional/Provider/Other category)

CDT = Current Detail Terminology; DME = durable medical equipment; FQHC = Federally Qualified Health Center; ICF = intermediate care facility; HCPCS = Healthcare Common Procedure Coding System; SNF = skilled nursing facility.