CONNECTICUT
Health Strategy

Methodology for Assessing Performance Against the Cost Growth Benchmark

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Acronyms

CMS	Centers for Medicare and Medicaid Services
DOC	Department of Correction
DSS	Department of Social Services
NCPHI	Net Cost of Private Health Insurance
OHS	Office of Health Strategy
PMPM	Per Member Per Month
PMPY	Per Member Per Year
THCE	Total Health Care Expenditures
TME	Total Medical Expense
VHA	Veterans' Health Administration

I. Introduction

This document details the Office of Health Strategy's (OHS) methodology for assessing performance against the healthcare cost growth benchmark. This document will be updated on an annual basis to reflect any methodological changes. For more information on OHS' cost growth benchmark initiative and Insurer data submission instructions, see OHS' webpage.

II. Methodology for Assessing Performance Against the Healthcare Cost Growth Benchmark

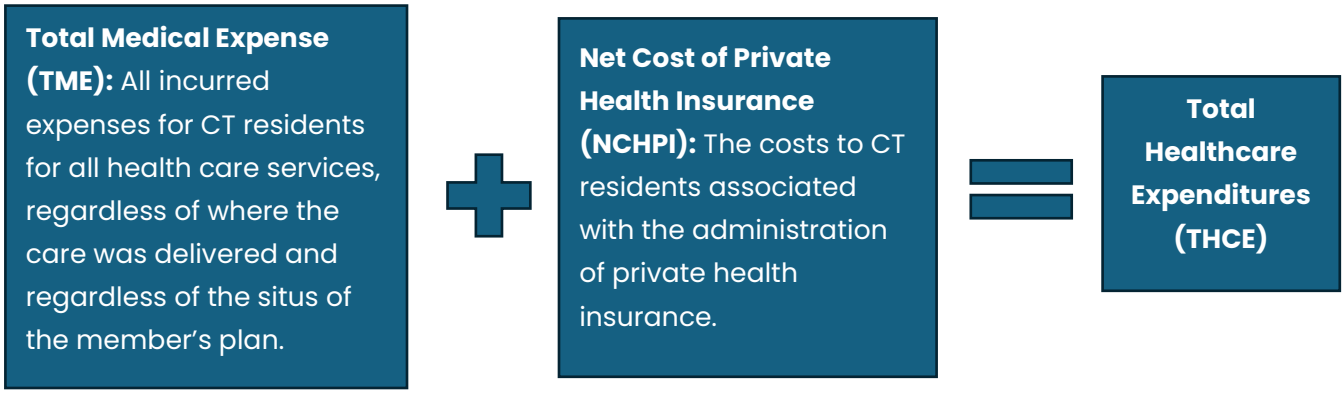
As directed in Connecticut General Statute 19a-754g et. Seq., OHS annually reports performance relative to the healthcare cost growth benchmark at four levels: (1) the State, (2) health insurance market (e.g., Medicare, Medicaid and commercial), (3) individual payer by market, and (4) Advanced Network by market. This section contains the methodology for measuring the growth in healthcare spending at each level, including the data sources, and which calculations are performed and reported at each level.

A. Definition of Total Health Care Expenditures (THCE) and Total Medical Expense (TME)

OHS reports cost growth benchmark performance at the state level using total health care expenditures (THCE). OHS reports cost growth benchmark performance at the market, payer and Advanced Network levels using total medical expense (TME).

THCE includes both medical expenses (TME) and administrative costs (i.e., the net cost of private health insurance, or NCPHI). **Figure 1** below defines and demonstrates the relationship between THCE and TME.

Figure 1. TME, NCPHI, and THCE



The defining specifications of THCE are as follows.

THCE includes:

- Spending on behalf of Connecticut residents who are insured by Medicare, Medicaid or commercial carriers, as well as residents who obtain coverage from self-insured employers.
- Spending on behalf of Connecticut residents who receive care from any provider in or outside of Connecticut, inclusive of those patients who seek care in border states, who may be Connecticut residents but spend part of their time living in another state (i.e., students or "snowbirds"), or those who received care in another state while traveling.
- Spending for Connecticut residents who receive healthcare coverage through the Veterans Health Administration.
- Spending for Connecticut residents incarcerated in a state correctional facility.
- Spending on covered healthcare services/benefits.
- Spending for all insurance market segments, including public and private payers listed in this manual, fully and self-insured, and student insurance.

THCE excludes:

- Non-medical spending, even if such spending is made by a payer (e.g., gym memberships).
- Spending for out-of-state residents receiving care from in-state providers.
- Spending for uninsured individuals or provider resources applied in the delivery of care for uninsured Connecticut residents.
- Vision and dental spending, except in instances where vision and dental services are covered as a commercial medical benefit or under Medicaid and Medicare.

Other defining specifications of THCE are as follows:

- THCE represents the total Allowed Amount, which is inclusive both of amounts covered by payers and member out-of-pocket spending associated with insured medical expenditures (e.g., copays, coinsurance and deductibles). To avoid double counting expenditures, healthcare premium payments are not included. Also, due to the lack of available data, spending not recorded by

insurance carriers or public payers are not included (e.g., spending for medical care by Connecticut residents who privately purchase healthcare services).

- TME data are only collected from a payer when it is the primary payer for a claim. The primary payer will report on the Allowed Amount, which is the total amount covered by the insurance benefit, even if other payers contribute to payment. If the secondary payer of the claim were to report, it would cause double counting of a portion of the Allowed Amount by the primary payer.
- TME is adjusted to account for any pharmacy rebates received by the payer, by subtracting the rebates (revenue) from the payer's total medical expense. The exceptions to this practice are with Medicare FFS spending, as the Centers for Medicare and Medicaid Services (CMS) will not share this information at the state level, and with Advanced Network level spending.

B. Data Sources

Data for THCE come from several sources. Payers report TME for all lines of business and, in some instances, payers also report data for OHS to calculate the NCPHI. Other data sources include CMS, the Department of Social Services (DSS), the Connecticut Department of Correction (DOC) and the Veterans Health Administration (VHA). **Table 1** below outlines the data source by THCE category.

Table 1. Data Sources for THCE

THCE Category	Category Description	Data Source
Expenditures from Payers		
Payer full claims	Comprehensive claims (i.e., no estimation necessary) submitted by healthcare providers to commercial and Medicare Advantage payers for all services rendered, detailing diagnoses, procedures, medications, and payment amounts.	TME reported by payers
Payer partial claims	Claims where carriers can only report payments for a subset of medical services due to benefit design carve-outs, such as pharmacy or behavioral health services, managed separately by the contracting employer. In these cases, carriers may not have access to the payment information for the carved-out services or bear the insurance risk for them, but they are still required to estimate the total spending for the partial claim population.	TME reported by payers, with estimates produced by payers
Payer non-claims payments	Payments made by commercial and Medicare Advantage payers that are not tied to specific claims for services, such as capitation payments, pay-for-performance incentives, care management fees, and other value-based payments.	TME reported by payers
Expenditures from Public Programs		
Medicaid claims and non-claims spending	Payments made by Medicaid for healthcare services (claims) and additional non-claims expenditures that support program operations.	DSS

THCE Category	Category Description	Data Source
Medicare FFS claims spending (Parts A, B and D)	Spending on healthcare services and prescription drugs covered under Medicare's fee-for-service model, including hospital (Part A), outpatient (Part B), and prescription drug (Part D) benefits.	CMS
Department of Correction (DOC) spending	Healthcare-related expenses incurred by the DOC for providing medical, mental health, and substance use services to incarcerated individuals in Connecticut.	DOC
Veterans' Health Administration (VHA) spending	Federal expenditures for healthcare services provided to Connecticut veterans through the VHA.	VHA
Pharmacy Rebates		
Insurance carriers' pharmacy rebates	Discounts or refunds negotiated by insurance carriers with pharmaceutical manufacturers.	Pharmacy rebate data reported by payers
Medicaid pharmacy rebates	Mandatory discounts or refunds that pharmaceutical manufacturers must provide to state Medicaid programs as part of federal and state agreements.	Pharmacy rebate data reported by DSS
Net Cost of Private Health Insurance		
Insurer Net Cost of Private Health Insurance (NCPHI)	Costs to Connecticut residents associated with the administration of private health insurance in the commercial and Medicare Advantage markets.	Calculated from regulatory reports submitted by the insurance carriers or obtained through public sources
Population statistics		
Connecticut population	Total population of members as reported by payers.	Member months reported by payers, CMS, DOC and VHA, with adjustments to account for duplication across data sources

C. Public Reporting of Cost Growth Benchmark Performance

OHS reports performance against the cost growth benchmark at multiple levels. **Table 2** below outlines the minimum levels at which OHS publicly reports performance. When reporting TME, OHS reports on a per member per year (PMPY) or per member per month (PMPM) basis, which calculates the average amount of spending per member for a particular market segment. OHS reports on a PMPY basis at the state and market level because CMS provides Medicare FFS enrollment data rather than Medicare FFS member months. OHS performs age and sex adjustment and truncation adjustments to payer and Advanced Network-level spending and conducts statistical testing on payer and Advanced Network benchmark performance. OHS' age/sex adjustment, truncation, and statistical analysis methodologies are detailed later in this guide.

Table 2. Levels of Public Reporting of Performance Against the Cost Growth Benchmark

Level of Reporting	THCE/TME Components
State Level	
State level	• Report THCE net of rebates PMPY, including DOC and VHA spending • Report total spending and PMPY amounts • Compare PMPY rate of change against benchmark
Market Level	
Commercial market	• Report TME net of rebates PMPY • Compare PMPY rate of change against benchmark
Medicare market	• Report TME net of rebates PMPY • Compare PMPY rate of change against benchmark
Medicaid market	• Report TME net of rebates PMPY • Compare PMPY rate of change against benchmark
Payer Level	
Insurance carrier	• Compare age/sex adjusted, truncated TME (net of rebates) PMPM rate of change against the benchmark by market • Conduct statistical testing on benchmark performance
Advanced Network Level	
Advanced Network	• Compare age/sex adjusted, truncated TME (gross of rebates) PMPM rate of change against benchmark by market • Conduct statistical testing on benchmark performance

III. Truncation Methodology

The claims-based spending used to assess payer and Advanced Network cost growth benchmark performance is truncated for high-cost outliers. "Truncation" means that for a given member in a given year, the dollars above the truncation point are excluded from analysis.

OHS applies truncation to prevent outliers from driving up cost growth rates for which payers and providers will be held accountable. For example, if a provider cares for a member with hemophilia during the cost growth benchmark performance year, this could result in the provider exceeding benchmark, despite meeting benchmark for all other patients. OHS does not intend to deter entities from serving high-acuity patients and thus uses truncation in its cost growth benchmark analysis.

OHS asks payers to apply truncation to member-level total spending, inclusive of all medical and pharmacy spending. Truncation points for each market are in **Table 3** below. OHS collects the following data points from payers at the market level and at the Advanced Network level by Insurance Category Code, for the purposes of truncation.

Total Spending before Truncation is Applied: OHS collects the annual total claims-based spending attributed to each member participating in a plan each month with a medical benefit. These dollars are included in state and market level reporting.

Count of Members whose Spending was Truncated: OHS collects the number of members whose spending was above the truncation threshold applicable to the Insurance Category Code and Advanced Network to which the member was attributed. This variable is collected by Insurance Category Code for each Advanced Network. This category does not include any non-claims spending categories.

Total Spending After Applying Truncation at the Member Level: OHS collects the total claims-based spending after truncation attributed to each member participating in a plan each month with a medical benefit. This category is after member-level truncation is applied using the truncation points listed in Table 3 below. This category does not include any non-claims spending categories.

Some Insurers attribute members to Advanced Networks on a monthly basis. If a member is attributed to more than one Advanced Network during the year, the

member's spending above the truncation point will differ for each Advanced Network and will differ from the member's total spending across all Advanced Networks. To address this issue, payers "reset the clock" by calculating total spending attributed to the Advanced Network for all Advanced Networks to which the member was reported and identify the total spending above the truncation point by each Advanced Network *(see inset below for example calculation)*.

For Insurers reporting in Insurance Category Code 4 (Partial Claims, Adjusted), the member level truncation is applied after estimating carve-out spending, so that truncation is being applied to an estimate of individual members' total claims spending *(see inset below for example calculation.)*

Total Dollars Excluded from Spending After Applying Truncation at the Member Level: OHS collects the sum of all dollars that were removed from total spending after applying truncation at the member level for data validation purposes.

"Reset the Clock" Approach: How Payers Handle Truncation When Members Are Attributed to More than One Advanced Network During the Calendar Year

Example with a $160,000 truncation point:

- A member in Insurance Category Code 1 was attributed to Advanced Network X for 8 months with $200,000 in claims.
- The member is then attributed to Advanced Network Y for 4 months with $175,000 in claims.
- Advanced Network X's spending above the truncation would be $40,000 while Advanced Network Y's spending above the truncation would be $15,000.
- Since the member cost to the payer is $375,000 in total, the total dollars above the truncation point for the payer would be $215,000.

Table 3. Truncation Points for Insurer and Advanced Network Claims Expenses

For members who are attributed to more than one Advanced Network during the year, Insurers are asked to "reset the clock" and calculate truncated spending for the member for each of the Advanced Networks and for the Insurer as a whole. This is done by first calculating the member's total spending that is attributed to each Advanced Network, and then separately applying truncation to the member's spending within each Advanced Network.

Insurance Category Code	Definition	Per Member Truncation Point
1	Medicare Expenses for Non-Dual Eligible Members	$160,000
2	Medicaid Expenses for Non-Dual Eligible Members	$250,000
3	Commercial: Full Claims	$190,000
4	Commercial: Partial Claims	$190,000
5	Medicare Expenses for Medicare/Medicaid Dual Eligible	$160,000
6	Medicaid Expenses for Medicare/Medicaid Dual Eligible	$250,000

IV. Age/Sex Adjustment Methodology

OHS adjusts total medical expenses (TME) data when evaluating performance against the Cost Growth Benchmark at the insurance carrier (i.e., "Insurer") and Advanced Network levels. OHS uses age/sex adjustment rather than clinical adjustment because the health status of a full population is typically stable between consecutive years. Research from the Massachusetts Health Policy Commission (HPC) found significant growth in adjustment factors across most commercial payers from 2013-2018, while changes in health status remained relatively constant (see Slide 48 from the HPC's December 2022 Board Meeting). In contrast, clinical adjustment factors can change annually without changes in the population's underlying health due to improved documentation of patient condition on claims. Rhode Island, Washington, Oregon, New Jersey, and California are also using age/sex adjustment in their cost growth benchmark programs rather than clinical adjustment. Massachusetts is in the process of moving away from clinical adjustment after extensive publicly reported analyses on the limitations of clinical adjustment factors.

Adjustment is done for age and sex by Insurance Category Code (see **Table 4** below for Insurance Category Code definitions), using standard weights developed by OHS. To develop the weights, OHS collects TME data and member months data by age/sex bands (see **Table 5** below for age bands) at the Insurer and Advanced Network levels and calculates two set of weights for each Insurance Category Code (one set at the Insurer level and one set at the Advanced Network level). OHS calculates two sets of weights (one set at the Insurer level and one set at the Advanced Network level) because for members who are attributed to more than one Advanced Network during the year, insurance carriers "reset the clock" and calculate truncated spending for the member for each of the Advanced Networks, and for the Insurer as a whole, which may result in different truncated spending amounts. See Section IV of this document for further details on the "reset the clock" methodology. These standard weights are applied uniformly across all Insurers and Advanced Networks respectively within each Insurance Category Code.

This section outlines how OHS calculates standard weights and develops Insurer and Advanced Network-specific age/sex adjustment factors.

A. Calculation of Standard Weights

For each Insurance Category Code, using base year data (for the 2023-2024 analysis, this would be 2023 data):

- OHS calculates the statewide claims-based, truncated TME (see **Table 6** in Section IV below for truncation points) and member months within each age/sex band by combining data across Insurer submissions. Non-claims-based spending is **NOT** included in this calculation.
- OHS then calculates statewide per member per month (PMPM) spending for each age/sex band by dividing the statewide claims-based, truncated TME by the statewide member months.
- To calculate standard weights for each age-sex band, OHS divides the PMPM spending for an age-sex band by the overall PMPM spending.
- This is conducted separately at the Insurer and at the Advanced Network level (note that spending data at the Insurer and Advanced Network levels do not necessarily align due to the "reset-the-clock" approach for truncating claims).

B. Calculation of Insurer Age/Sex Adjustment Factors

OHS calculates an age/sex adjustment factor for each Insurer being reported on, stratified by Insurance Category Code. To do this, using Insurer level data for each Insurance Category Code:

- OHS calculates the population distribution of attributed members across age/sex bands for each Insurer by dividing the member months for each age/sex band by the total member months for the Insurer.
- OHS then multiplies the standard Insurer weights for the age-sex band calculated in **Section A** above to the respective population distribution.
- OHS then sums the values calculated above across age/sex bands for Insurer. This is the Insurer's adjustment factor for the specific Insurance Category Code.

C. Calculation of Advanced Network Age/Sex Adjustment Factors

Within each Insurer's submission, OHS calculates an age/sex adjustment factor for each Advanced Network being reported on, stratified by Insurance Category Code. To do this, within an Insurer submission, for each Insurance Category Code and for each Advanced Network:

- OHS calculates the population distribution of attributed members across age/sex bands for the Advanced Network by dividing the member months for each age/sex band by the member months for the Advanced Network.
- OHS then applies the standard Advanced Network weights for the age-sex band calculated in **Section A** above to the respective population distribution.
- OHS then sums the products calculated above across age/sex bands for each Advanced Network. This is the Advanced Network's age/sex adjustment factor for the specific Insurance Category Code.

D. Application of Insurer and Advanced Network Age/Sex Adjustment Factors to Spending Data

To calculate the age/sex-adjusted spending PMPM for each Insurer, OHS divides the unadjusted, truncated claims spending PMPM for the Insurer by Insurance Category Code by the Insurer age/sex adjustment factors developed in **Section B** above and adds its respective non-claims spending PMPM. To calculate the age/sex-adjusted spending for each Advanced Network, within each Insurer's submission for each Insurance Category Code and for each Advanced Network, OHS divides the unadjusted, truncated claims spending for each Advanced Network by the Advanced Network's age/sex adjustment factor developed in **Section C** above and adds its respective non-claims spending. OHS does not sum adjusted Advanced Network level spending to derive adjusted Insurer level spending, as this approach does not consider the "reset-the-clock" methodology for truncated spending (see **Section III. Truncation** above for further details on the reset-the-clock methodology).

Table 4. Insurance Category Code Definitions for TME Reporting

Insurance Category Code	Definition
1	Medicare Managed Care (excluding Medicare/Medicaid Dual Eligibles)
2	Medicaid including CHIP (excluding Medicare/Medicaid Dual Eligibles)
3	Commercial — Full Claims
4	Commercial — Partial Claims
5	Medicare Expenditures for Medicare/Medicaid Dual Eligibles
6	Medicaid Expenditures for Medicare/Medicaid Dual Eligibles
7	Other

Table 5. Age Bands

Age Band Code	Description
1	0 to 1 year old
2	2 to 18 years old
3	19 to 39 years old
4	40 to 54 years old
5	55 to 64 years old
6	65 to 74 years old
7	75 to 84 years old
8	85 + years old

E. Sample Age-Sex Adjustment Factor Calculation Using Mock Data

The following text provides examples of calculating and applying age/sex factor weights using the methodology described above with mock data. Please note that, for simplicity, the example below uses different age band codes.

Age Band Codes (for example only)

Age Band Code	Age Group
1	0-18
2	18-64
3	65+

Sex Band Codes

Sex Band Code	**Sex**
1	Female
2	Male

Payers are requested to submit member month and spending data disaggregated by age and sex bands. In the simplified example above, there are six age/sex bands (females 0-18, females 18-64, females 65+, males 0-18, males 18-64, and males 65+).

Hypothetical Membership and Spending by Age/Sex Band for a Baseline Year

Payer	**Insurance Category Code**	**Age Code**	**Sex Code**	**Member Months**	**Unadjusted, Truncated PMPM Spending**
Payer A	3	1	1	3,040	$400
Payer A	3	2	1	3,980	$310
Payer A	3	3	1	1,500	$650
Payer A	3	1	2	2,860	$420
Payer A	3	2	2	4,000	$310
Payer A	3	3	2	1,200	$700
Payer B	3	1	1	2,650	$330
Payer B	3	2	1	3,750	$230
Payer B	3	3	1	850	$720
Payer B	3	1	2	2,490	$380
Payer B	3	2	2	3,790	$240
Payer B	3	3	2	820	$790

Payer Overall PMPMs for the Baseline Year

Payer	Aggregate Truncated Spending	Member Months	Unadjusted, Truncated PMPM
Payer A	$6,706,000	16,580	$404
Payer B	$4,852,600	14,350	$338
Total	**$11,558,600**	**30,930**	**$374**

Calculation of Standard Weights

Age/sex factor weights are generated for each age/sex band by comparing the PMPM spending within that band to the average spending for individuals within the same Insurance Category Code. These factor weights are calculated using data from all payers combined.

The following example demonstrates how the age/sex factor weight would be calculated for females ages 0-18:

1. Calculating PMPM for all members across all payers:

   Overall truncated spend for all members: $11,558,600

   Total member months: 30,930

   Cross-payer overall PMPM: **$374**

2. Calculating age/sex factor weight for females ages 0-18 across payers:

   Overall truncated spend for females 0-18 (all payers): $2,090,500

   Member months for females 0-18 (all payers): 5,690

   Truncated PMPM for females 0-18: **$367**

3. Age/Sex Factor Weight Calculation for females 0-18:

   Age/Sex Factor Weight = (Age/Sex Band PMPM) / (Overall PMPM)

   Age/sex factor weight calculation for females 0-18:

   $367 / $374 = 0.98

Combined Payer, Single Insurance Category Code PMPMs for the Baseline Year

Age Code	Sex Code	Aggregate Truncated Spend	Member Months	Truncated PMPM	Age/Sex Factor Weight (Age-Sex Band PMPM / Overall PMPM)
1	1	$2,090,500	5,690	$367	0.98
2	1	$2,096,300	7,730	$271	0.73
3	1	$1,587,000	2,350	$675	1.81
1	2	$2,147,400	5,350	$401	1.07
2	2	$2,149,600	7,790	$276	0.74
3	2	$1,487,800	2,020	$737	1.97
	Total	**$11,558,600**	**30,930**	**$374**	**1.00**

Applying Age/Sex Factor Weights to Develop Age/Sex Adjustment Factors for the Baseline Year

Age/sex factor weights are applied to a payer's population distribution to generate an adjustment factor. The adjustment factor is calculated as the sum of the products of the population distribution and the corresponding age/sex factor weights. Each payer for each category code will have a calculated age/sex adjustment factor.

In the calculation below, we found adjustment factors of 1.02 and 0.97 for Payers A and B, respectively, for the baseline year. Since Payer A's adjustment factor is below 1.0, its population consists of lower spending members compared to the overall population. Conversely, Payer B's adjustment factor above 1.0 indicates a population with likely higher spending compared to the overall population.

Calculating an Age/Sex Adjustment Factor for Payer A (Baseline Year)

Age Code	Sex Code	Member Months	Population Distribution for Payer	Age/Sex Factor Weights	Payer Weights * Population Distribution
1	1	3,040	0.18	0.98	0.18
2	1	3,980	0.24	0.73	0.17
3	1	1,500	0.09	1.81	0.16
1	2	2,860	0.17	1.07	0.19
2	2	4,000	0.24	0.74	0.18
3	2	1,200	0.07	1.97	0.14
				Payer A Adjustment Factor:	**1.02**

Calculating an Age/Sex Adjustment Factor for Payer B (Baseline Year)

Age Code	Sex Code	Member Months	Population Distribution for Payer	Age/Sex Factor Weights	Payer Weights * Population Distribution
1	1	2,650	0.18	0.98	0.18
2	1	3,750	0.26	0.73	0.19
3	1	850	0.06	1.81	0.11
1	2	2,490	0.17	1.07	0.19
2	2	3,790	0.26	0.74	0.20
3	2	820	0.06	1.97	0.11
				Payer B Adjustment Factor:	**0.97**

Application of Insurer and Advanced Network Age/Sex Adjustment Factors to Spending Data

To assess year-over-year spending growth, the age/sex factor weights from the baseline year are applied to the performance year. Please note that spending,

member months, and the population distribution for the performance year are used in this calculation, while only the baseline age/sex factor weights are carried over.

Calculating an Age/Sex Adjustment Factor for Payer A (Performance Year)

Age Code	Sex Code	Member Months	Population Distribution for Payer	Age/Sex Factor Weights	Factor Weights * Population Distribution
1	1	3,070	0.18	0.98	0.18
2	1	4,060	0.24	0.73	0.17
3	1	1,550	0.09	1.81	0.17
1	2	2,950	0.17	1.07	0.19
2	2	4,020	0.24	0.74	0.18
3	2	1,230	0.07	1.97	0.14
				Payer A Adjustment Factor:	**1.03**

Calculating an Age/Sex Adjustment Factor for Payer B (Performance Year)

Age Code	Sex Code	Member Months	Population Distribution for Payer	Age/Sex Factor Weights	Payer Weights * Population Distribution
1	1	2,890	0.19	0.98	0.19
2	1	3,900	0.26	0.73	0.19
3	1	900	0.06	1.81	0.11
1	2	2,760	0.18	1.07	0.20
2	2	3,910	0.26	0.74	0.19
3	2	830	0.05	1.97	0.11
				Payer B Adjustment Factor:	**0.97**

An individual payer's spending for the year is divided by the payer's age/sex adjustment factor. Below is the calculation for Payer A's age/sex-adjusted spending in the baseline year:

Payer A's Baseline Year Unadjusted, Truncated PMPM Spending: $404

Payer A's Baseline Year Age/Sex Adjustment Factor: 1.02

Payer A's Baseline Year Age/Sex Adjusted PMPM Spending:

$404 / 1.02 = **$395**

Because Payer A's population was deemed to have higher age and sex band spending, their spending was adjusted downwards.

Applying Age/Sex Adjustment Factors to Spending in the Baseline Year

Payer	Unadjusted, Truncated PMPM Spending (Baseline Year)	Age/Sex Adjustment Factor (Baseline Year)	Age/Sex Adjusted PMPM Spending (Baseline Year)
Payer A	$404	1.02	$395
Payer B	$338	0.97	$348

Applying Age/Sex Adjustment Factors to Spending in the Performance Year

Payer	Unadjusted, Truncated PMPM Spending (Performance Year)*	Age/Sex Adjustment Factor (Performance Year)	Age/Sex Adjusted PMPM Spending (Performance Year)
Payer A	$413	1.03	$402
Payer B	$353	0.97	$362

* Please note that aggregate spending values for the hypothetical performance year are not included in this document.

To calculate age/sex adjusted spending growth, the performance year's age/sex adjusted PMPM spending is divided by the baseline year's age/sex adjusted PMPM spending.

Assessing Year Over Year Unadjusted, Truncated PMPM Spending Growth

Payer	Unadjusted PMPM Spending (Baseline Year)	Unadjusted PMPM Spending (Performance Year)	Unadjusted PMPM Spending Trend
Payer A	$404	$413	2.0%
Payer B	$338	$353	4.2%

*Please note that rounding conventions may result in slight discrepancies between the figures shown and independently calculated results.

Assessing Year Over Year Age/Sex Adjusted PMPM Spending Growth

Payer	Age/Sex Adjusted PMPM Spending (Baseline Year)	Age/Sex Adjusted PMPM Spending (Performance Year)	Age/Sex Adjusted PMPM Spending Trend
Payer A	$395	$402	**1.8%**
Payer B	$348	$362	**4.1%**

*Please note that rounding conventions may result in slight discrepancies between the figures shown and independently calculated results.

In this example, prior to age/sex adjustment, Payers A and B were estimated to have spending growth of 2.0% and 4.2%, respectively. However, after applying age/sex adjustment, spending growth was determined to be 1.8% for Payer A and 4.1% for Payer B.

If the adjusted trend increases from its unadjusted trend, the payer's population is estimated to be somewhat healthier than in the baseline year. Conversely, if adjusted spending is lower, the payer's performance year population is perceived to be less healthy compared to the baseline population.

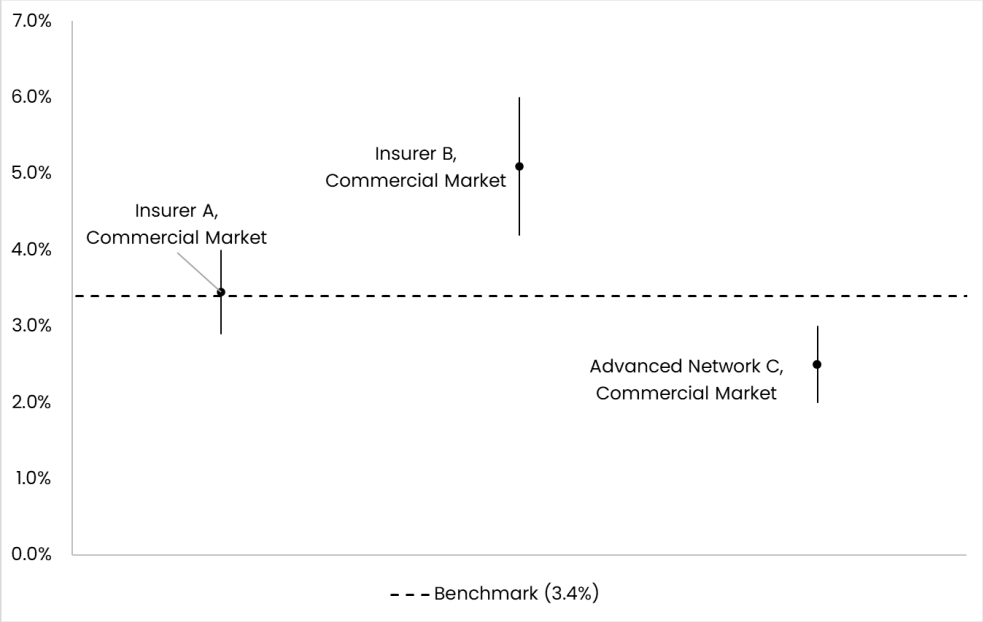
To calculate age/sex adjusted values for Advanced Networks, the same methodology is applied using Advanced Network reported member months and age/sex band stratifications.

V. Statistical Testing Methodology

OHS conducts statistical significance testing to assess insurance carriers' and provider entities' performance against the cost growth benchmark. This involves developing confidence intervals around each Insurer's and Advanced Network's cost growth, and determining whether the confidence interval intersects with the benchmark. OHS categorizes insurers and Advanced Networks as described and illustrated in **Figure 2** below:

- **Confidence interval intersects with benchmark** – under this circumstance, OHS would be unable to determine whether an Insurer's or Advanced Network's performance did or did not meet the benchmark. (Insurer A in the illustration below)
- **Lower confidence interval is fully above the benchmark** – indicates that the Insurer or Advanced Network exceeded the benchmark. (Insurer B in the illustration below)
- **Upper confidence interval is fully below the benchmark** – indicates that the Insurer or Advanced Network has achieved the benchmark. (Advanced Network C in the illustration below)

Figure 2. Confidence Intervals and Cost Growth Benchmark Performance



OHS uses average TME PMPY, the number of members/attributed patients, and the standard deviation information to calculate the confidence intervals for the following measures:

- **Per member healthcare cost growth, by market, for each Insurer.** Each Insurer reports the standard deviation by market, thus OHS does not need to pool standard deviations.
- **Per member healthcare cost growth, by market, for an Advanced Network whose data are listed in multiple insurance carriers' data submission**. OHS pools the standard deviations (i.e., take a weighted average) for each Advanced Network by market such that each market's spending, i.e., commercial and Medicare Advantage each has a pooled standard deviation, but Medicaid has a standard deviation. Then OHS pools the standard deviations across multiple years within each market to calculate the confidence intervals of the Advanced Network's commercial growth. This is repeated to calculate the confidence interval for the Advanced Network's Medicare Advantage growth and its Medicaid growth.

A. Formulae for Calculating Confidence Intervals

The following text describes the formulas needed to pool variances and calculate confidence intervals.

Table 6. Notations Used in Formulas for Calculating Pooled Variance

Notations	
i	Year index, 1 = prior year, 2 = current year
df	Degrees of freedom
N_i	Population size for year i (or number of member months for year i)
V_i	Variance for year i
σ_i	Standard deviation (when squared it equals variance)
$\bar{X}_i$	Mean per member per month cost for year i (population-level mean)
R_i	Age-sex adjustment factor for year i

All standard deviations are age/sex adjusted using the following formula:

$$\sigma_{R_i,\,X_i} = \frac{\sigma_{X_i}}{R_{X_i}^2}$$

The formula for pooling the variance is as follows:

$$V_{pool} = \frac{\sum_i N_{X_i}\sigma^2_{R_i,\,X_i}}{\sum_i N_{X_i}} + \frac{\sum_{i<j} N_{X_i}N_{X_j}\left(\bar{X}_i - \bar{X}_j\right)^2}{\left(\sum N_{X_i}\right)^2}$$

OHS uses the following formula for calculating confidence intervals with unequal variances:

$$CI = \frac{\bar{X}_1\bar{X}_2 \pm \sqrt{\bar{X}_1^2\bar{X}_2^2 - \left(\bar{X}_1^2 - t^2_{\widehat{df},\alpha}\frac{V_1}{n_1}\right)\left(\bar{X}_2^2 - t^2_{\widehat{df},\alpha}\frac{V_2}{n_2}\right)}}{\bar{X}_1^2 - t^2_{\widehat{df},\alpha}\frac{V_1}{n_1}}$$

Where $t_{\widehat{df},\alpha}$ equals the t statistic given the degrees of freedom ($\widehat{df}$) and the value of alpha (α). For 95% confidence, the alpha value is 0.05, which means:

$t_{\widehat{df},0.05}$ = 1.644861 (when using a one-sided test)

B. Sample Calculations Using Mock Data

The following text walks through examples of calculating growth rates and confidence intervals around the growth rates using the above formula with mock data.

Table 7. Hypothetical Spending and Standard Deviation Data for Insurer A

Year	Paid entity	Market	Average PMPM Spending	Member Months	Standard Deviation
2022	Advanced Network 1	Medicare	$416.67	240,000	$166.67
	Advanced Network 1	Commercial	$666.67	660,000	$250.00
	Advanced Network 2	Medicare	$66.67	93,000	$29.17
	Advanced Network 2	Commercial	$83.33	384,000	$39.59
	Overall	Medicare	$318.92	333,000	$211.93
	Overall	Commercial	$452.11	1,044,000	$292.32
2023	Advanced Network 1	Medicare	$458.33	204,000	$165.71
	Advanced Network 1	Commercial	$650.00	720,000	$375.00
	Advanced Network 2	Medicare	$70.83	72,000	$41.67
	Advanced Network 2	Commercial	$175.00	480,000	$56.25
	Overall	Medicare	$357.24	276,000	$223.47
	Overall	Commercial	$460.00	1,200,000	$426.63

Table 8. Hypothetical Spending and Standard Deviation Data for Insurer B

Year	Paid entity	Market	Average PMPM Spending	Member Months	Standard Deviation
2022	Advanced Network 1	Medicare	$398.22	125,000	$128.79
	Advanced Network 1	Commercial	$635.13	300,000	$224.08
	Advanced Network 2	Medicare	$70.12	50,000	$67.24
	Advanced Network 2	Commercial	$65.12	201,000	$42.71
	Overall	Medicare	$304.48	175,000	$233.08
	Overall	Commercial	$406.44	501,000	$274.83
2023	Advanced Network 1	Medicare	$415.24	105,000	$174.78
	Advanced Network 1	Commercial	$640.51	380,000	$387.83
	Advanced Network 2	Medicare	$75.25	45,000	$50.84
	Advanced Network 2	Commercial	$100.35	223,000	$82.92
	Overall	Medicare	$313.24	150,000	$230.74
	Overall	Commercial	$440.75	603,000	$396.03

From the Insurer-submitted data, OHS calculates weighted spending averages for Advanced Network PMPM TME ($\overline{X}$) for each market each year. The weighted spending averages are calculated by summing all claims and non-claims spending for an Advanced Network in a given market and dividing by the total number of corresponding member months.

At the Insurer level, OHS calculates spending growth using the payer's *PMPM TME*. Growth in Insurer A's PMPM spending from 2022 to 2023 is calculated as follows:

Medicare spending growth = ($357.25 / $318.92) - 1 = 12.0%

Commercial spending growth = ($460.00 / $452.11) - 1 = 1.7%

Calculating Confidence Intervals for Each Insurer by Market

The confidence intervals for the Insurer's PMPM growth in Medicare spending is calculated as follows:

Confidence Interval for Medicare Growth

$$= \frac{\bar{X}_1\bar{X}_2 \pm \sqrt{\bar{X}_1^2\bar{X}_2^2 - \left(\bar{X}_1^2 - t^2_{df,\alpha}\frac{V_1}{n_1}\right)\left(\bar{X}_2^2 - t^2_{df,\alpha}\frac{V_2}{n_2}\right)}}{\bar{X}_1^2 - t^2_{df,\alpha}\frac{V_1}{n_1}}$$

$$= \frac{318.92 \times 357.25 \pm \sqrt{\left(318.92^2 \times 357.25^2\right) - \left(318.92^2 - 1.644861^2\,\frac{211.93^2}{333{,}000}\right)\left(357.25^2 - 1.644861^2\,\frac{223.47^2}{276{,}000}\right)}}{318.92^2 - 1.644861^2\,\frac{211.93^2}{333{,}000}}$$

= 11.7% to 12.3%

Calculating Confidence Intervals for Each Advanced Network by Market

At the provider level, OHS calculates growth using TME. Using the above data, the weighted average of Advanced Network 1's Medicare spending and pooled variance for 2022 and 2023 are calculated as follows:

Advanced Network 1's weighted average PMPM spending for Medicare:

For 2022 = ($416.67 x 240,000 + $398.22 x 125,000) / (240,000 + 125,000) = $410.35

For 2023 = ($458.33 x 204,000 + $415.24 x 105,000) / (204,000 + 105,000) = $443.69

Pooled variance for 2022 Medicare:

First section + Second Section

$$V_{pool} = \frac{\sum_i N_{X_i}\sigma^2_{X_i}}{\sum_i N_{X_i}} + \frac{\sum_{i<j} N_{X_i}N_{X_j}\left(\bar{X}_i - \bar{X}_j\right)^2}{\left(\sum N_{X_i}\right)^2}$$

For 2022 Medicare , first section: $\frac{\left(240{,}000 \times 166.67^2\right) + (125{,}000 \times 128.79^2)}{240{,}000 + 125{,}000}$

For 2022 Medicare , second section: $\frac{240{,}000 \times 125{,}000\ (416.67 - 398.22)^2}{(240{,}000 + 125{,}000)^2}$

For 2022 Medicare , first and second section sum: 24,022.81

Pooled variance for 2023 Medicare:

For 2023 Medicare , first section= $\frac{\left(204{,}000 \times 165.71^2\right) + \left(105{,}000 \times 174.78^2\right)}{204{,}000 + 105{,}000}$

For 2023 Medicare , second section= $\frac{204{,}000 \times 105{,}000\ (458.33\text{-}415.24)^2}{(204{,}000+105{,}000)^2}$

For 2023 Medicare , all sections combined: 28,925.95

Using the above formula for calculating confidence intervals, the confidence interval for Advanced Network 1's Medicaid cost growth is as follows:

$$= \frac{410.35 \times 443.69 \pm \sqrt{\left(410.35^2 \times 443.69^2\right) - \left(410.35^2 - 1.644861^2 \frac{24{,}022.81}{365{,}000}\right)\left(443.69^2 - 1.644861^2 \frac{28{,}925.95}{309{,}000}\right)}}{410.35^2 - 1.644861^2 \frac{24{,}022.81}{365{,}000}}$$

$$= \frac{182{,}068.19 \pm \sqrt{77{,}702.63}}{168{,}383.94} = 8.0 \text{ to } 8.3$$

Thus, the growth rate from 2022 to 2023 was 8.1% and the 95% confidence interval range is 8.0% and 8.3%. Therefore, we can say with 95% certainty that Advanced Network 1's growth in Medicare costs did not meet the cost growth benchmark by growing more than 3.4%. This calculation would then be repeated for Advanced Network 1's commercial spending.