

Re-evaluated Total Per Capita Cost Measure

Draft Cost Measure Methodology

October 2018 Field Testing



Table of Contents

1.1	Measure Name	3
1.2	Measure Description.....	3
1.3	Measure Rationale	3
1.4	Beneficiary Exclusion Criteria	4
1.5	Measure Numerator.....	4
1.6	Measure Denominator	4
1.7	Data Sources.....	4
2.0	Overview of Measure Calculation.....	6
3.0	Detailed Measure Calculation Methodology	7
3.1	Identify Candidate Events.....	7
3.2	Construct Risk Windows.....	7
3.3	Exclude Clinicians Based on Service Category Exclusions.....	8
3.4	Attribute Months to TINs and TIN-NPIs.....	8
3.5	Calculate Payment-Standardized Monthly Observed Costs.....	8
3.6	Risk-Adjust Monthly Costs.....	9
3.7	Calculate TPCC Measure	10
Appendix A. Stakeholder Input		11
Appendix B. Refinements to the TPCC Measure		12
Appendix C. Example of Measure Calculation.....		13

Introduction

This document details the draft methodology for the re-evaluated Total Per Capita Cost (TPCC) measure and should be reviewed along with the TPCC Draft Measure Codes List file, which contains the medical codes used in constructing the measure. These documents have been shared as part of field testing, where clinicians and clinician groups attributed at least 20 beneficiaries for the TPCC measure received TPCC Field Test Reports containing measure performance information.

Field testing allows the Centers for Medicare & Medicaid Services (CMS) and the measure development contractor Acumen, LLC (referred to as “Acumen”) to gather feedback on new episode-based cost measures and re-evaluated measures from clinicians and other stakeholders.¹ All stakeholders have the opportunity to provide feedback on the draft measure specifications and a Mock Field Test Report by reviewing this document and other supplemental documentation that are publicly posted.

We are collecting stakeholder feedback from **October 3, 2018 to October 31, 2018**. To provide feedback on any aspect of field testing please navigate to [this feedback survey](https://www.surveymonkey.com/r/2018-macra-cost-measures-field-testing):
<https://www.surveymonkey.com/r/2018-macra-cost-measures-field-testing>

1.1 Measure Name

Total Per Capita Cost (TPCC)

1.2 Measure Description

The re-evaluated TPCC measure is a payment-standardized, risk-adjusted measure that evaluates the overall cost of care provided to beneficiaries attributed to clinicians, as identified by a unique Taxpayer Identification Number and National Provider Identifier pair (TIN-NPI) or to a clinician group, as identified by a TIN. The TPCC measure can be attributed at the TIN or TIN-NPI level.

1.3 Measure Rationale

The TPCC measure is an important means of measuring Medicare spending, as health expenditures continue to increase in the United States. Total health care spending is estimated to have increased by 4.6 percent in 2017, reaching \$3.5 trillion.² Spending for Medicare, which is still predominantly paid on a fee-for-service (FFS) basis, grew by 3.6 percent, reaching \$672.1 billion. Spending on services for physicians and other health professionals totaled \$69.9 billion and accounted for 15 percent of Medicare FFS spending in 2016.³

As background to this re-evaluated measure, a version of the TPCC measure has been part of the Merit-based Incentive Payment System (MIPS) cost performance category since the 2017 MIPS performance period. Prior to this current use in MIPS, CMS used a version of the TPCC measure in the Value Modifier Program and reported it in annual Quality and Resource Use Reports (QRURs) until MACRA ended the Value Modifier Program. The TPCC measure is currently undergoing re-evaluation to address stakeholder feedback received via prior public comment periods. As part of measure re-evaluation, the TPCC measure has been refined through stakeholder input and is now being field tested. Refinements to the TPCC measure

¹ CMS worked with Acumen to develop and re-evaluate cost measures for potential use in the Merit-based Incentive Payment System (MIPS).

² “National Health Expenditure Projections, 2017-2026.” US Centers for Medicare & Medicaid Services, 2018.

³ “Report to the Congress: Medicare Payment Policy.” MedPAC, 2018.

have focused on attribution, to identify the clinicians responsible for the primary care management of patients during the measurement period. In particular, these refinements aim to account for the timing and pattern of care delivery in identifying a primary care relationship and allowing multiple clinicians and clinician groups to be attributed responsibility for a patient's primary care management.

1.4 Beneficiary Exclusion Criteria

Beneficiaries are excluded from the population measured if they meet any of the following conditions:

- They were not enrolled in both Medicare Part A and Part B for every month during the measurement period, unless part year enrollment was the result of new enrollment or death.
- They were enrolled in a private Medicare health plan (e.g., a Medicare Advantage or a Medicare private FFS plan) for any month during the measurement period.
- They resided outside the United States or its territories during any month of the measurement period.

All remaining Medicare beneficiaries who received Medicare-covered services and are attributed to a TIN or TIN-NPI during the measurement period are considered for the calculation of the TPCC measure. Beneficiary attribution follows a multi-step process that assigns a beneficiary to any clinicians that are not excluded from attribution, based on service category exclusions, and had a candidate event with the beneficiary that resulted in a risk window that overlaps the measurement period.

1.5 Measure Numerator

The numerator for the measure is the sum of the risk-adjusted, payment-standardized⁴ Medicare Part A and Part B costs across all episodes attributed to a TIN or TIN-NPI during the measurement period. An episode is a month (4-week block) associated with a beneficiary during the measurement period that is attributable to a clinician (attribution is described in Section 3.0).

1.6 Measure Denominator

The denominator for the measure is the number of episodes attributed to a TIN or TIN-NPI during the measurement period.

1.7 Data Sources

The TPCC measure uses the following data sources:

- Medicare Parts A and B claims data from the Common Working File (CWF),
- Enrollment Data Base (EDB),
- Long Term Care Minimum Data Set (LTC MDS), and
- Provider Enrollment, Chain and Ownership System (PECOS).

The measurement period for October 2018 field testing is from October 1, 2016 through September 30, 2017. Specifically, attributable months in the year-long measurement period are

⁴ Claim payments are standardized to account for differences in Medicare payments for the same service(s) across Medicare providers. Payment standardized costs remove the effect of differences in Medicare payment among health care providers that are the result of differences in regional health care provider expenses measured by hospital wage indexes and geographic price cost indexes (GPCIs) or other payment adjustments such as those for teaching hospitals. For more information, please refer to the "CMS Price (Payment) Standardization - Basics" and "CMS Price (Payment) Standardization - Detailed Methods" documents posted on QualityNet: <http://www.qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic/Page/QnetTier4&cid=1228772057350>

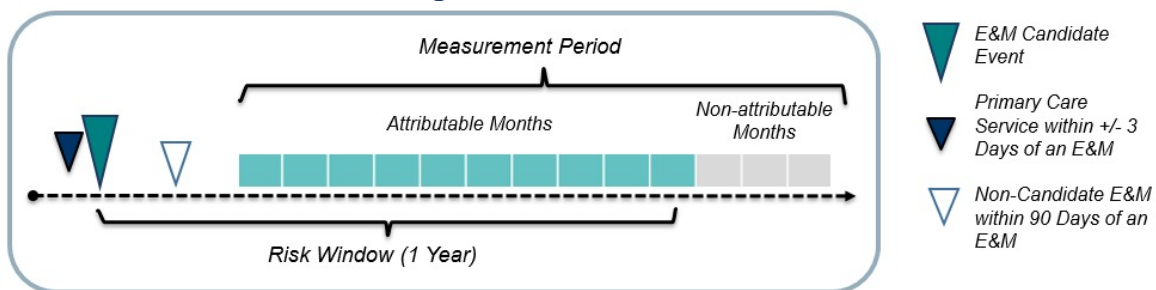
included in the calculation of the TPCC measure. The year-long measurement period is broken up into 13 four-week blocks.

2.0 Overview of Measure Calculation

There are two broad processes in calculating TPCC measure scores: attribution (Steps 1-4) and measure calculation (Steps 5-7). This section provides a brief summary of these processes for the TPCC measure, and Section 3.0 describes these processes in detail.

1. **Identify candidate events.** Candidate events are defined as primary care evaluation and management (E&M) services that trigger the opening of a risk window, during which beneficiary costs are attributed to the TIN or TIN-NPI that performed the E&M service. Candidate events indicate that a clinician provided primary care to a beneficiary.
2. **Construct risk windows.** For each candidate event, the risk window, during which a beneficiary's costs are attributable to a clinician, begins on the date of the candidate event and continues until one year after the date of the candidate event.
3. **Exclude clinicians based on service category exclusions.** Clinicians are excluded from attribution if they meet the criteria for one or more service exclusions in the following categories: surgery, anesthesia, therapeutic radiation, and chemotherapy.
4. **Attribute months to TINs and TIN-NPIs.** All beneficiary costs that occur during covered months are attributed to a TIN or TIN-NPI that is eligible for attribution after applying the service category exclusions. For TIN-NPI reporting, only the TIN-NPI responsible for the plurality of candidate events provided to the beneficiary within the TIN is attributed that beneficiary's costs.⁵

Figure 1. TPCC Attribution



5. **Calculate payment-standardized monthly observed costs.** Monthly observed costs are payment standardized to account for payment factors that are unrelated to care provided. Standardized observed costs that occur during partially covered months are pro-rated, based on the portion of the month covered by the risk window.
6. **Calculate risk-adjusted monthly costs.** Risk adjustment accounts for beneficiary-level risk factors that can affect medical costs, regardless of the care provided. After costs are risk-adjusted, statistical techniques are applied to reduce the effect of outliers. Monthly costs are further adjusted to account for differences in expected costs based on the number of clinician groups to which a beneficiary is attributed in a given month.
7. **Calculate the measure score.** Calculate the average risk-adjusted monthly costs across all episodes in the measurement period attributed to a TIN or TIN-NPI for the measure score.

⁵ In the current MIPS TPCC measure, there is a two-step attribution process where a beneficiary is attributed to the primary care clinician who provided the most number of primary care services, and when there is a tie, to the clinician who provided the service most recently. If no primary care clinician is found, any clinician who provided the primary care services is then attributed. For more detail about differences between the current and re-evaluated measures, please see Appendix B.

3.0 Detailed Measure Calculation Methodology

This section details the two broad processes in calculating TPCC measure scores in more detail: Sections 3.1 through 3.4 describe attribution and Sections 3.5 through 3.7 describe measure calculation.

3.1 Identify Candidate Events

Candidate events are defined as primary care E&M services found on Part B Physician/Supplier (Carrier) (PB) claims that trigger the opening of a risk window, during which monthly beneficiary costs are attributed to the TIN-NPI that performed the E&M service. Candidate events indicate that a clinician provided primary care to a beneficiary. A primary care E&M service is considered a candidate event if one or both of the following criteria is met:

- Another, non-E&M primary care service is provided **from any TIN** within +/- 3 days of the E&M service.
- A second primary care E&M or another, non-E&M primary care service is provided **from the same TIN** during the 90 days following the first E&M service.

Primary care services can fall into the following service categories:

- DME and Supplies
- Electrocardiogram
- Laboratory - Chemistry and Hematology
- Other Diagnostic Procedures (Interview, Evaluation, Consultation)
- Other Diagnostic Radiology and Related Techniques
- Prophylactic Vaccinations and Inoculations
- Routine Chest X-ray⁶
- Clinical Labs⁷
- Preventive Services⁸

See the “Prim_Care_E&Ms” and the “Prim_Care_Services” tabs of the TPCC Draft Measure Codes List file for the list of the Current Procedural Terminology/Healthcare Common Procedure Coding System (CPT/HCPCS) codes that identify primary care E&M services and non-E&M primary care services, respectively.

3.2 Construct Risk Windows

For each candidate event, the risk window, during which a beneficiary’s costs are attributable to a clinician, begins on the date of the candidate event and continues until one year after the candidate event date. In the event a risk window closes before the end of a month, then only the covered portion of the month is considered for measure calculation.

⁶ The primary care service categories DME and supplies, Electrocardiogram, Laboratory - Chemistry and Hematology, Other diagnostic procedures (interview, evaluation, and consultation), Other diagnostic radiology and related techniques, and Prophylactic vaccinations and inoculations are defined using the [Clinical Classifications Software](#) (CCS) categories developed by the Agency for Healthcare Research and Quality (AHRQ).

⁷ The Clinical Labs primary care service category is defined using a subset of services included in the [Clinical Laboratory Fee Schedule](#).

⁸ The Preventive Services primary care service category is defined using the set of services CMS considers to be part of the [primary care service benefit](#).

3.3 Exclude Clinicians Based on Service Category Exclusions

Once a risk window is constructed, service category exclusions are used to remove non-attributable clinicians. For the list of CPT/HCPCS codes used for each of the service exclusions described below, please see the following tabs of the TPCC Draft Measure Codes List file, respectively: “HCPCS_Surgery,” “HCPCS_Anesthesia,” “HCPCS_Ther_Rad,” and “HCPCS_Chemo.”

Clinicians are excluded from attribution if they meet any of the four service category exclusion criteria:

- They performed at least one major 90-day global surgery in the calendar years overlapping the measurement period; and 15 percent or more of their candidate events had a 10-day or 90-day global surgery with the same beneficiary and were performed by the same clinician within +/- 180 days of the candidate event.
- They performed at least one anesthesia service in the calendar years overlapping the measurement period; and 5 percent or more of their candidate events had an anesthesia service provided to the same beneficiary and were performed by the same clinician within +/- 180 days of the candidate event.
- A clinician performed at least one therapeutic radiation service in the calendar years overlapping the measurement period; and 5 percent or more of a clinician’s candidate events had a therapeutic radiation service provided to the same beneficiary and were performed by the same clinician within +/- 180 days of the candidate event.
- A clinician performed at least one chemotherapy service in the calendar years overlapping the measurement period; and 10 percent or more of a clinician’s candidate events had a chemotherapy service provided to the same beneficiary and were performed by the same clinician within +/- 180 days of the candidate event.

3.4 Attribute Months to TINs and TIN-NPIs

Only MIPS-eligible clinicians are considered for attribution (please see the “Eligible_Clinicians” tab of the TPCC Draft Measure Codes List file for CMS specialty codes used to identify eligible clinicians).

For the TIN-level, all beneficiary costs that occur during covered months are attributed to a TIN if the TIN is eligible for attribution after applying the service category exclusions in Section 3.3. In other words, all beneficiary costs that fall within one year of the candidate event and occur during the measurement period are attributed to the TIN.

For the TIN-NPI-level, all beneficiary costs that occur during covered months are attributed to a TIN-NPI if the TIN-NPI is eligible for attribution after applying the service category exclusions in Section 3.3. Additionally, a TIN-NPI is only eligible for attribution of a beneficiary’s costs during the measurement period if the TIN-NPI is responsible for the plurality of candidate events provided to that beneficiary within the TIN. If two or more TIN-NPIs in a TIN provide the same proportion of candidate events to a beneficiary, then the beneficiary is attributed to the TIN-NPI that provided the earliest candidate event.

3.5 Calculate Payment-Standardized Monthly Observed Costs

Monthly costs are payment standardized to take into account payment factors that are unrelated to the care provided (such as payments supporting larger Medicare program goals like indirect medical education add-on payments, or geographic variation in Medicare payment policies).

This allows for a more equitable comparison across clinicians.⁹ Standardized costs that occur during partially covered months are pro-rated, based on the portion of the month covered by the risk window.

3.6 Risk-Adjust Monthly Costs

Risk adjustment accounts for beneficiary-level risk factors that can affect medical costs, regardless of the care provided. The measure of beneficiary risk used is the beneficiary's risk score from the CMS Hierarchical Condition Category Version 22 (CMS-HCC V22) 2016 Risk Adjustment model. To ensure that the model measures the influence of health status (as measured by diagnoses) on the treatment provided (costs incurred), rather than capturing the influence of treatment on a beneficiary's health status, the risk adjustment model uses prior year risk factors.

The CMS-HCC V22 model generates a risk score for each beneficiary that summarizes the beneficiary's expected cost of care relative to other beneficiaries. Separate CMS-HCC models exist for new enrollees, continuing enrollees, and enrollees in long-term institutional settings:

- The new enrollee model accounts for each beneficiary's age, sex, disability status, original reason for Medicare entitlement (age or disability), and Medicaid eligibility, and is used for beneficiaries with less than 12 months of Medicare medical history.
- The community model is used for beneficiaries with at least 12 months of Medicare medical history. The community model includes the same demographic information as the new enrollee model but it also accounts for clinical conditions as measured by HCCs.
- The institutional model is used for beneficiaries in long-term institutional settings. The institutional model includes demographic variables, clinical conditions as measured by HCCs, and various interaction terms.

The "HCC_Risk_Adjust" tab of the TPCC Draft Measure Codes List file lists all variables included in the new enrollee, community, and institutional versions of the CMS-HCC V22 risk adjustment model.

A CMS-HCC risk score of 1 indicates risk associated with expenditures for the average beneficiary nationwide. A beneficiary risk score greater than 1 indicates above average risk and a risk score less than 1 indicates below average risk.

Risk-adjusted total costs are then calculated for each covered month at the TIN or TIN-NPI level.

- First, a CMS-HCC risk score is calculated for each beneficiary for each month in the measurement period. This risk score is normalized by dividing by the average risk score for all beneficiary months. A normalized CMS-HCC risk score of 1 indicates risk associated with expenditures for the average beneficiary nationwide. A normalized beneficiary risk score greater than 1 indicates above average risk, and a risk score less than 1 indicates below average risk.
- Second, observed costs for each episode are divided by the normalized risk score to obtain risk-adjusted monthly costs. Risk-adjusted costs are pro-rated in the same manner described in Section 3.5.

⁹ More information on the payment standardization algorithm is available in an overview document titled "CMS Price (Payment) Standardization - Basics" and a more detailed document titled "CMS Price (Payment) Standardization - Detailed Methods," available here: <http://www.qualitynet.org/dcs/ContentServer?c=Page&pagename=QnetPublic/Page/QnetTier4&cid=1228772057350>.

- Third, risk-adjusted monthly costs are trimmed at the 99th percentile by assigning the 99th percentile of monthly costs to all attributable months at or above the 99th percentile of costs.
- Finally, monthly costs are normalized to account for differences in expected costs based on the number of clinician groups to which a beneficiary is attributed in a given month.¹⁰

3.7 Calculate TPCC Measure

After completing the steps described in Section 3.6 for each month attributed to a TIN or TIN-NPI, calculate the average monthly costs across all episodes attributed to a TIN or TIN-NPI to calculate the TPCC measure. The measure can be equivalently expressed in the manner implied by the numerator and denominator in Section 1.0: The sum of risk-adjusted total costs across all attributed episodes for a TIN or TIN-NPI (depending on the level of reporting), divided by the number of attributed episodes for the TIN or TIN-NPI.

The clinician-level or clinician group practice-level average risk-adjusted cost for any attributed clinician (or clinician group practice) “*j*” can be represented mathematically as:

Figure 2: TPCC Measure Score Formula

$$Measure\ Score_j = \frac{1}{n_j} \sum_{i \in \{I_j\}} \frac{P_{ij}}{G_i}$$

where:

P_{ij}	is the risk-adjusted, outlier-trimmed costs for episode <i>i</i> and attributed clinician (or clinician group practice) <i>j</i>
G_i	is the adjustment factor for the total number of attributed clinician groups associated with episode <i>i</i>
n_j	is the number of episodes for clinician (or clinician group practice) <i>j</i>
$i \in \{I_j\}$	is all episodes <i>i</i> in the set of episodes attributed to clinician (or clinician group practice) <i>j</i>

A lower measure score indicates that the observed episode costs are lower than or similar to expected costs for the care provided for the particular patients and episodes included in the calculation, whereas a higher measure score indicates that the observed episode costs are higher than expected for the care provided for the particular patients and episodes included in the calculation.

¹⁰ Specifically, monthly costs are divided by the cube root of the number of clinician groups (TINs) to which a beneficiary is attributed for a month.

Appendix A. Stakeholder Input

Acumen gathers stakeholder feedback as part of the measure re-evaluation process. A technical expert panel (TEP) provides high-level guidance for the overall project and considered stakeholder feedback provided through public comment at meetings in August 2017 and May 2018.¹¹ The TEP consists of 19 members representing a diverse range of perspectives, including clinicians, healthcare providers, academia, and patient advocacy organizations.

¹¹ For more information on the TEP in-person meetings that were held in August 2017 and May 2018, please refer to the meeting summary reports available on the CMS Measures Management System website: <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/MMS/TEP-Current-Panels.html>

Appendix B. Refinements to the TPCC Measure

This appendix summarizes differences between the TPCC measure used in the 2017 MIPS performance period and the re-evaluated TPCC measure. The re-evaluated measure differs from the MIPS version of the measure in three broad ways. First, the attribution method allows for the attribution of beneficiaries to multiple clinicians and clinician categories. Second, the re-evaluated measure has a refined attribution logic that requires the provision of other, non-E&M primary care services or a follow-up E&M primary care service with the same clinician group. Third, the re-evaluated measure excludes clinicians who frequently provide non-primary care services.

Table B-1: Comparison of MIPS TPCC Measure Attribution and Re-evaluated Measure Attribution

TPCC measure currently in use for MIPS	Re-evaluated TPCC measure
<ul style="list-style-type: none"> • A beneficiary is attributed to the TIN-NPI from whom the beneficiary received the most primary care services (PCS). • If two TIN-NPIs tie for largest share of a beneficiary's PCS, the beneficiary is attributed to the TIN-NPI that provided the PCS most recently. • If the beneficiary did not receive a PCS from a primary care provider, the beneficiary is attributed to the non-primary care clinicians who provided the most PCS. 	<p>New attribution method better identifies the existence of a primary care relationship between multiple clinician groups and beneficiaries. Specifically, the attribution has been refined as follows:</p> <ul style="list-style-type: none"> • It requires E&M services to have an associated primary care service or follow up E&M service from the same clinician group. • It allows for the attribution of episodes to multiple clinicians and clinician groups over the course of a performance period. • Each attributable event initiates a one-year risk window during which a beneficiary's costs may be attributable to a clinician. • It excludes clinicians who frequently perform certain non-primary care services (e.g., major surgeries) from attribution. For example, a clinician would be excluded from attribution if the clinician performs a 10-day or 90-day global surgery on a beneficiary within +/- 180 days of an E&M event associated with the same clinician and beneficiary for at least 15 percent of the clinician's E&M events.

Appendix C. Example of Measure Calculation

1. Calculate the observed cost of each episode by summing all payment-standardized Medicare claims payments during the episode window.
2. Calculate the CMS-HCC risk score for each episode using CMS-HCC V22 Risk Adjustment Model, then normalize the risk score.
3. Calculate the risk-adjusted cost of that episode by dividing the observed cost of each episode by the normalized risk score.
4. Trim risk-adjusted costs for episodes exceeding the 99th percentile.
 - If the normalized risk score is equal to 1, this indicates risk associated with expenditures for the average beneficiary nationwide. A beneficiary risk score greater than 1 indicates above average risk and a risk score less than 1 indicates below average risk.
 - For example, if an episode's observed cost is \$10,000 and the episode's normalized risk score is 1.3, then the risk-adjusted cost will be $\$10,000 / 1.3 = \$7,692.31$.
 - If the 99th percentile of risk-adjusted cost is \$7,000, then the risk-adjusted costs above are trimmed down to \$7,000.
5. Further calibrate risk-adjusted costs for each episode based on the number of total clinician groups to which the beneficiary is attributed during the episode.
 - This step is used to account for the higher cost associated with beneficiary episodes attributed to multiple clinician groups simultaneously. This final measure constitutes the risk-adjusted episode cost.
6. Take the average of the risk-adjusted episode cost from Step 5 across all episodes for a clinician or clinician group to obtain the overall measure score.