MYERS AND STAUFFER LC
CERTIFIED PUBLIC ACCOUNTANTS

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# Guidance for Texas DSRIP Risk-Adjusted Measures

## Overview of Observed and Expected Readmissions

For risk-adjusted measures, providers will be required to obtain both observed and expected readmissions. These are defined as follows:

- Observed readmissions are the number of index admissions resulting in one or more readmissions within 30 days from the date of the index admission discharge.

- Expected readmissions are the likelihood of the observed index admissions readmitting within 30 days of discharge, based on certain factors, such as age, comorbidity, and severity of illness.

An index admission is the discharge (with a principal diagnosis of a specified condition for certain measures) that meets the criteria for inclusion and exclusion and is the basis for determining the likelihood of a readmission occurring within 30 days. This discharge is considered the start of the readmission "chain." An admission that occurs within 30 days of an index admission discharge is considered a readmission and is part of the initial index admission's chain. A readmission is not considered an index admission and only one readmission per index admission is counted. Multiple readmissions within 30 days of the index admission discharge are counted as one readmission and are all considered part of the same chain.

### *Observed Readmissions (Numerator)*

To determine the number of observed readmissions, providers will first need to determine the total number of index admissions for the given measurement period. Providers will then need to determine which index admissions resulted in a readmission to the same facility within 30 days of the date of discharge. This result is the total number of observed readmissions (numerator).

### *Expected Readmissions (Denominator)*

Based on the total number of index admissions, providers will determine the likelihood of each index admission readmitting within 30 days of discharge. Depending on the methodology used to determine likelihood of readmission, a normative value will be assigned to each index admission. These normative values are used to determine the expected number of readmissions (denominator).


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*Risk-Adjusted Readmission Rate*

The final risk-adjusted rate of readmission is calculated as follows:

**Risk-Adjusted Readmission Rate = Observed Number of Index Admissions Resulting in a Readmission/Expected Number of Readmissions**

The resulting observed and expected numbers are compared as a ratio. A ratio of 1 indicates that the provider's readmission rate is what would be expected given the provider's current mix of the patient case mix. A ratio greater than 1 indicates that patients are readmitting more frequently than what is expected. A ratio less than 1 indicates that the provider would expect a higher rate of readmissions compared to what is currently taking place. This is the more desirable scenario as it indicates that patients are not readmitting at the rate that would be expected given the current case-mix factors.

## Description of Data Sources and Methodology

Providers that have selected a risk-adjusted readmission measure may use any of the following sources to determine the final rate. The same data sources and methodology must be used across all demonstration years to ensure consistency and comparability among all measurement years.

**Vendor Supported:** Providers may use vendor supported systems to calculate risk-adjusted readmission rates. Examples of vendors are 3M Health Information Systems, Thomson Reuters, Premier, Truven Health Discovery, and MIDAS. Additional vendors not listed are also acceptable. If a provider chooses to use a vendor, providers should have access to the data used to determine the final risk-adjusted rate less the internal risk adjustment algorithms used to determine the normative values assigned to each index admission. This information is considered proprietary by vendors and is not required to be submitted to support the final rate. However, providers are required to inform vendors of any specific DSRIP reporting requirements, such as the calculation of the final rate and specific measurement periods. It is possible for the methodology used by the vendor to vary. Therefore, comparison across providers using different vendors should not be made. Provider should ensure that the chosen vendor uses the same methodology across all DSRIP years.

**Internally applied algorithm:** Providers are allowed to use internally developed algorithms for measuring risk adjusted readmissions (e.g., multivariate logistical regression). The algorithm must meet DSRIP reporting requirements, including reporting both observed and expected readmissions. Note that HHSC may request system validation and reliability data to ensure accuracy of data reporting.

**Indirect Standardization:** This methodology allows providers a standardized yet flexible approach to risk-adjusting if a vendor-supported system or internal algorithm is not available.

This method allows the provider to apply available normative values to index admissions in order to determine the probability of readmission based on the provider's own internal data. For additional guidance on Indirect Standardization, please see later sections of this document.

The following are some examples of data sources with available normative values:

- Vendor provided normative data (Obtained by Provider)
- Texas PPR Medicaid Norms (Provided by HHSC)
- Provider-based Historical Data Norms (Obtained by Provider)

## Recordkeeping Guidance

The data source and methodology used by the provider will determine the type of data that should be retained. **Providers using a vendor should retain, at a minimum, the following patient level data used to determine the observed and expected number of readmissions**:

- Patient and encounter identifiers
- Admit and discharge dates
- Dates of birth
- Discharge code
- Diagnosis at discharge (if condition-specific measure is chosen)
- Normative values assigned to each index admission, if available from the vendor

It should be communicated to vendors that the provider will need the ability to retrieve the patient-level data. It is not required that providers have access to case-mix factors due to the proprietary nature of this data. However, providers using vendor software should, if possible, keep the normative values assigned to each index admission. In addition, the information obtained by a provider using a vendor or vendor software should show the final number of observed readmissions, number of expected readmissions, and the total index admissions.

In addition to the patient-level information listed above, providers using internally applied algorithms should maintain documentation that supports the development of the algorithm, including the variables and data points that were used. In addition to the minimum patient level data listed above, the provider should be able to show how the expected readmissions were determined.

Providers using indirect standardization should, in addition to the patient-level data listed above, keep all documentation related to how index admissions and readmission chains were identified and the results of the process (see Guidance on Indirect Standardization below). Also, providers should keep documentation related to how the expected number of readmissions were determined, including the following:

- Discharges flagged as index admissions

- Index admissions flagged as starting a readmission chain
- List of readmissions that are part of the readmission chain
- Case-mix factors (and weights or risk scores for each factor, if applicable)
- Normative value assigned to each index admission

Providers should also maintain the original normative tables containing the coefficients, weights, or risk scores that were used to determine the final case-mix values for each index admission. The provider will be required to use the same tables for the measurement of subsequent performance years.

## Guidance on the Use of Indirect Standardization

The indirect standardization methodology allows providers to determine risk-adjusted rates if vendor information or an internally validated and tested system is not available. The indirect standardization methodology allows providers to develop a "homegrown" approach by selecting from HHSC-supplied normative values, other available normative weights and values from measure stewards, or values based on the provider's historical data. The following sources are the most commonly used in determining risk-adjusted rates for Texas DSRIP measures:

- *Texas PPR Medicaid Norms:* The Texas PPR Medicaid normative data is available from HHSC and is based on Medicaid claims from hospital providers participating in the 1115 Transformation Waiver (UC and DSRIP). 3M Potentially Preventable software was used to calculate the norms. The normative values are based on a patient's case-mix that includes diagnosis (APR-DRG), severity of illness (SOI), age, and mental health flag.

- *Provider-based Historical Data Norms:* Providers that do not have access to APR-DRG or SOI may develop internal normative values based on the provider's own historical readmission data.

Myers and Stauffer LC (MSLC) has developed a tool to assist providers that use the indirect standardization approach (see "Risk Adjusting Template" document). **In order to use the template, providers will need all patient and encounter information related to the measurement period that will be reported.** Specific data fields needed include the following:

- Patient Identifier
- Encounter Identifier
- Encounter Admit Date
- Encounter Discharge Date
- Patient Date of Birth
- Encounter Discharge Code

- Diagnosis Code or DRG (applicable to condition-specific measures only. Not required for all-cause readmission measure)
- Normative Value for each index admission (see Steps 5 and 6 below for guidance on determining normative values

After the information above is entered, the template will identify index admissions and any associated readmission chains. The template will also calculate the final number of observed readmissions based on the readmission chains. Since the template will determine the eligible index admissions, the provider can use the list of index admissions to assist in determining expected number of readmissions. For further guidance on determining normative values and expected number of readmissions, see Steps 5 and 6 below. After the normative values have been determined for each index admission, the values can be added back to the template which will then calculate the expected number of readmissions and, in combination with the observed number of readmission, the final rate for the measure.

The template created by MSLC is based on the steps listed below. **Providers are strongly encouraged to use the template.** However, if use of the template is not feasible, providers may complete the indirect standardization using the following steps:

## Steps to Complete Indirect Standardization

Step 1: Identify all potentially eligible index admissions (encounters for individuals discharged alive from the facility) and group by patient identifier. If the measure is specific to condition (e.g. CHF), eligible cases would be only those with the specified diagnosis upon discharge.

Step 2: Identifying Readmissions Chains: Determine which index admissions resulted in a readmission within 30 days of discharge. Note that the readmission within 30 days is NOT counted as an index admission. An index admission with multiple readmissions in 30 days is counted as one index admission resulting in a readmission. Table 1 is an example of how to count index admissions and readmission chains for a single patient.

Step 3 (Numerator): To determine the observed number of readmissions, total the number of readmission chains. This is the numerator in the final rate. In the example in Table 1, the observed number of readmissions is one.

Step 4: To determine the total number of index admissions, total all the index admissions that have the potential to start a readmission chain and are not identified as readmissions. Index admissions that were counted in Step 3 as starting a readmission chain are counted in the index admission total. In the example in Table 1, the total number of index admissions is three.

**Example**

| Table 1: Identifying Readmission Chains for Patient A | | | |
|---|---|---|---|
| **Encounter IDs for Patient A** | **Date of Discharge** | **Index Admission Count** | **Readmission Chains** |
| **Encounter #1** | 10/5/2013 | 1 | 1 |
| **Encounter #2** | 10/11/2013 | 0 | N/A - Part of 10/5 Chain |
| **Encounter #3** | 10/20/2013 | 0 | N/A - Part of 10/5 Chain |
| **Encounter #4** | 11/12/2013 | 1 | 0 |
| **Encounter #5** | 2/17/2014 | 1 | 0 |
| **Total** | | 3 | 1 |

Step 5: Categorize each index admission identified in Step 4 based on the chosen case-mix factors. This will depend on the source of the normative values. Table 2 below shows how to categorize encounters using Texas PPR Medicaid case-mix factors. If the provider is unable to obtain case-mix values (APR-DRG, SOI, mental health), the provider may calculate norms based on historical data.[1]

Step 6: Use the normative data to determine the expected likelihood of readmission for each index admission by assigning the appropriate normative value for the case-mix combination of each index admission.[2] Table 2 is an example showing how to assign a normative value to each resulting case-mix in the far right corner.

Step 7 (Denominator): Sum the normative values (likelihood of readmission) assigned to all index admissions in Step 6 to determine the number of expected readmissions.

Step 8: To calculate the final risk-adjusted rate, divide the number of observed readmissions (Step 3) by the number of expected readmissions (Step 7).

For reporting purposes, the numerator is the observed number of index admissions resulting in a readmission and the denominator is the expected number of readmissions given the current mix of patients.

[1] See section on Guidance for using Historical Data.

[2] See below for guidance in applying normative values in Steps 5 and 6 using Texas PPR Medicaid norms and historical data.

## Guidance on the Use of TX PPR Medicaid norms

Providers that can identify case-mix factors and choose to use the TX PPR Medicaid norms to calculate the expected number of readmissions should complete the following steps:

Step 1: Complete Steps 1-4 of Indirect Standardization Guidance above. Identify all the index admissions in the measurement year that have the potential to start a readmission chain and are not identified as readmissions.

Step 2: To complete Step 5 of the Indirect Standardization steps, extract the required case-mix factors for each eligible index admission from the E.H.R. (See Table 2). Required case-mix factors for TX PPR Medicaid norms include:

- APR-DRG
- Severity of illness (SOI)
- Age
- Mental health flag

**Example**

**Table 2: Patient-Level Detail and Categorized Case-Mix Factors**

| Index Admission | APR-DRG | Severity of Illness | Age Group | Mental Health | TX PPR Medicaid Normative Value[3] |
|---|---|---|---|---|---|
| **#1** | 194 | 4 | 18-84 | 1 | 0.448954 |
| **#2** | 194 | 2 | GT84 | 0 | 0.123053 |
| **#3** | 194 | 4 | GT84 | 1 | 0 |

Step 3: To Complete Step 6 of the Indirect Standardization steps, assign the normative value from the TX PPR Medicaid norms to all identified index admissions based on the combination of case-mix factors in the patient-level detail (Table 3). If the combination of case-mix factors in the patient-level detail is not found in the TX PPR Medicaid norms, assign a value of zero to the index admission.

Table 3 is an excerpt from the TX PPR Medicaid tables for APR-DRG 194 and shows the normative value for various case-mix combinations.

[3] See Table 3 for normative values.

| Table 3: TX PPR Medicaid Normative Values for APR-DRG 194 | | | | |
|---|---|---|---|---|
| **APR-DRG** | **Severity of Illness** | **Age Group** | **Mental Health** | **TX PPR Normative Value** |
| **194** | 1 | 18-84 | 0 | 0.158111 |
| **194** | 1 | GT84 | 0 | 0.121497 |
| **194** | 1 | LT18 | 0 | 0.131793 |
| **194** | 1 | 18-84 | 1 | 0.306574 |
| **194** | 2 | 18-84 | 0 | 0.160136 |
| **194** | **2** | **GT84** | **0** | **0.123053** |
| **194** | 2 | LT18 | 0 | 0.133481 |
| **194** | 2 | 18-84 | 1 | 0.310501 |
| **194** | 3 | 18-84 | 0 | 0.193819 |
| **194** | 3 | GT84 | 0 | 0.148936 |
| **194** | 3 | LT18 | 0 | 0.161557 |
| **194** | 3 | 18-84 | 1 | 0.37581 |
| **194** | 3 | LT18 | 1 | 0.341734 |
| **194** | 4 | 18-84 | 0 | 0.231542 |
| **194** | 4 | LT18 | 0 | 0.193001 |
| **194** | **4** | **18-84** | **1** | **0.448954** |

Step 4: Continue with Steps 7-8 on the Indirect Standardization Guidance steps to determine the number of expected readmissions and the final risk-adjusted rate.

## Guidance on the use of historical data norms

Providers that are unable to use vendors or obtain the required case-mix factors needed to use published normative values can choose to use historical data to calculate a risk-adjusted rate of readmission. To determine the normative values that will be assigned to index admissions in Step 5 and 6 of the Indirect Standardization approach, complete the following steps:

Step 1: Extract data for all discharges occurring at least two years prior to the beginning of the measurement period. Provider will be required to submit support including the data elements listed in the recordkeeping guidance.

Step 2: Complete Steps 1-5 of the Indirect Standardization Guidance using the historical data. Providers can choose which case-mix factor(s) to consider when calculating normative values. Providers can choose one or more case-mix factors based on the availability of data elements. The most common case-mix factors are MS-DRG and MDC. The example in Table 4 uses MS-DRG as the case-mix factor for determining normative values.

**Example**

**Table 4: Identifying Case-Mix Factors using Historical Data**

| Historical Encounter ID | MS-DRG | Index Admission Count | Readmission Chains |
|---|---|---|---|
| **Historical Encounter #1** | 291 | 1 | 1 |
| **Historical Encounter #2** | 292 | 0 | 0 |
| **Historical Encounter #3** | 291 | 1 | 0 |
| **Historical Encounter #4** | 292 | 1 | 0 |

Step 3: To calculate normative values using historical data, divide the total index admissions resulting in a readmission for each case-mix factor grouping by the total index admissions for the same grouping to calculate a value for that unique case-mix combination. The example in Table 5 has grouped all encounters by MS-DRG:

**Example**

**Table 5: Calculating Normative Values using Historical Data**

| MS-DRG | Sum of Index Admissions | Sum of Readmission Chains | Normative Value |
|---|---|---|---|
| **291** | 2 | 1 | 0.50 |
| **292** | 1 | 0 | 0 |

Step 4: Assign the normative values calculated in Step 3 to each index admission in the measurement year (Step 6 on the Indirect Standardization Guidance) based on the case-mix factors chosen. Table 6 below shows an example of assigning normative values by MS-DRG (determined from Table 5) to measurement year index admissions. If the combination of case-mix factors for an index admission in the measurement year is not found in the historical data normative calculations, assign a value of zero to the index admission.

**Example**

| Table 6: Measurement Year Index Admissions with Assigned Normative Values | | | | |
|---|---|---|---|---|
| **Encounter ID** | **Date of Discharge** | **MS-DRG** | **Index Admission Count** | **Normative Value from Historical Data** |
| **Encounter #1** | 10/1/2013 | 291 | 1 | 0.50 |
| **Encounter #2** | 12/31/2013 | 292 | 1 | 0 |
| **Encounter #3** | 4/1/2014 | 190 | 1 | 0 |

Step 5: Continue with Steps 7 and 8 from the Indirect Standardization guidance to calculate the final rate for the measurement year.