

Minnesota Regional Variation Analysis

Final Report

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Executive Summary

The State of Minnesota, Department of Human Services (DHS) has engaged Truven Health Analytics to study the regional variation in costs for Home and Community Based Services (HCBS) resulting from the 2013 Minnesota Statutes, section 256B.4914.¹ Specifically, this task required that Truven Health (1) develop a methodology and calculate regional rate adjustment indices for the Disability Waiver Rate Setting (DWRS) frameworks and (2) estimate the impacts of the recommended methodology.

This report presents the Truven Health methodological approach to calculating indices, in addition to providing data sources, assumptions, and other pertinent background considerations used in the study. We include a study of the historical impact of the index, demonstrating how historical payments would have been affected by the implementation of the index. We conclude with a set of recommendations for the Minnesota DHS to consider that are based on the results of this study.

¹ The Statutes can be found at <https://www.revisor.mn.gov/statutes/?id=256B.4914&year=2013>

Section 1: Background

Statute Overview

The 2013 Minnesota Statutes, subdivisions 10 (b) and (g), require that the commissioner conduct analyses that addresses differences in the cost of providing Home and Community Based Services (HCBS) throughout the state:

Subdivision 10 (b): “The commissioner shall, within available resources, conduct research and gather data and information from existing state systems or other outside sources on the following items: differences in the underlying cost to provide services and care across the state.”

Subdivision 10 (g): “The commissioner shall implement a regional adjustment factor to all rate calculations in subdivisions 6 to 9. . . . Prior to implementation, the commissioner shall consult with stakeholders on the methodology to calculate adjustment.”²

In accordance with this Statute language, the State of Minnesota, Department of Human Services (DHS) has engaged Truven Health Analytics to study the regional variation in costs for HCBS. Specifically, this task required that Truven Health develop a methodology and calculate regional rate adjustment indices for the Disability Waiver Rate Setting (DWRS) frameworks as well as estimate the impacts of the recommended methodology. Subdivision 5 of the Statutes describes in detail how to calculate base wages, generally on the basis of a blend of median wage data from related Standard Occupation Codes (SOCs). These base wages are calculated for a set of staff performing different types of HCBS. Payment for HCBS, described in Subdivisions 6–9, is determined by framework models that build off the base rates for a set of additional overhead expenses. Some of these expenses include supervision, sick and vacation time, taxes, workers’ compensation, transportation, and other types of facility-related expenses.

Truven Health relied heavily on the Statutes to determine the overall methodology for the study. We have discussed any deviations from the Statutes with the Minnesota DHS and document them in this report.

Stakeholder Engagement

The Statutes require consultation with stakeholders to allow them input on the study and methodology for calculating indices. To this end, Truven Health has participated in two primary stakeholder engagements:

- Minnesota Advisory Committee Meeting
- Minnesota DWRS Regional Index Questionnaire sent in January 2015

Minnesota Advisory Committee Meeting

The Minnesota Advisory Committee Meeting on November 20, 2014, was structured to allow Truven Health to explain the preliminary methodology for calculating indices to capture cost variation across the state. After a presentation of the methodology, there was time for questions and answers regarding the overall study and methodology. We outline below the primary issues and concerns raised during this meeting, along with a brief response or acknowledgement:

1. **Use of historical wage data as basis for determination of future payments.** One stakeholder was concerned that if historical wages are used to determine the impact on future payments, areas where

² 2013 Minnesota Statutes, 256B.4914, Subdivisions 10(b) and 10(g). Available at <https://www.revisor.mn.gov/statutes/?id=256B.4913>

wages need to be increased may not receive the funding necessary to adequately reimburse providers. This methodology would not account for the fact that current wages may be inadequate to provide services and attract practitioners or to pay for the right mix of practitioners. Furthermore, this methodology may actually exacerbate the underlying issue by further diminishing rate reimbursement in these areas.

Response: This is a valid concern that is addressed in the recommendations section of our report.

2. **Use of utilization counts to weight service categories within broader service buckets.** A stakeholder expressed some concern that using utilization patterns for each region to model individual service framework costs may weight some regions in a disadvantageous manner.

Response: In our methodology, statewide service count weights are applied within the service models, not region by region. This approach will help ensure that variation in the index is driven by regional cost disparity rather than by regional case mix.

3. **Application of budget neutrality.** One stakeholder did not think that budget neutrality should be maintained during the application of the index.

Response: We interpreted the Statutes as meaning that budget neutrality should be maintained in our methodology. The methodology we have used has been calculated so that if Fiscal Year 2014 experience were repeated *with* the application of our index, reimbursements by region would be different but there would be no aggregate fiscal impact on the state.

4. **Concern for using wages as the only measure for cost variation.** Multiple stakeholders expressed concern that the proposed methodology accounts for variations only in wages, although other elements significantly affect the cost of providing services. Some of the other cost elements such as transportation costs, insurance costs, and facility costs should also be considered.

Response: Truven Health agrees that non-wage-based cost elements should ultimately be considered. Given the scope of the study and the language in the Statutes, it is only prudent to apply a wage-based cost index. We address this concern in the recommendations section of this report.

5. **Concern that Metro Region wages dwarf those in the rest of the state.** This stakeholder was concerned that the index would cause non-metro regions to subsidize the higher costs found in metropolitan regions.

Response: Truven Health looked into this issue now that the index has been calculated. Although the Metro Region does have indices higher than 1.0, the index does indicate variations in wages throughout the state. For many service categories, the metro region did not have the highest base wages or the resulting highest wage index. Furthermore, we have recommended that a cap be applied to the resulting index to diminish the impact on reimbursements across the state.

Minnesota DWRS Regional Index Questionnaire

Truven Health and the Minnesota DHS developed a list of questions to be asked of a select group of HCBS providers to gain a better understanding of how this index may affect them. Although over 20 providers representing different HCBS, ownership models, and regions were selected to participate, we received only 3 responses from providers. Below are the questions and general responses:

1. Rank your familiarity with the DWRS frameworks used to determine rates (low/medium/high).

Response: All responders indicated a high familiarity with the DWRS frameworks.

2. What are the top three costs to your business?

Response: All responders indicated that staffing costs (including wages, payroll taxes, benefits, and training costs) were the most significant costs to their business. Transportation was the second most significant cost, followed by building expenses. One responder referenced the high cost of administrative oversight due to regulatory and compliance changes.

3. Would your agency's cost of doing business be different in another region of the state? If so, what costs would be different?

Response: All responders believed that their cost of doing business would be similar in other regions of the state. One responder indicated that the top three costs would be consistent, but the magnitude of those costs would change depending on where the facility was located. There was general consensus that most costs would be higher for facilities in the Metro Area.

4. Has your agency's cost of doing business changed significantly in the past 1 to 2 years? If so, what costs have changed?

Response: Two of the three responders indicated that their agency's costs had increased over the past 1 to 2 years, for the following reasons:

- Staffing costs have increased because of the Affordable Care Act 29-hour rule, the minimum wage increase, and an improved staffing market leading to increased turnover despite higher wages.
- Training costs have increased because of changes associated with 2014 Minnesota Statutes Chapter 245D. More training has been required to accommodate the needs of increasing numbers of higher-need clients.
- Worker's Compensation rates are increasing.
- Rule and policy changes have made previously billable indirect service time no longer billable.

5. What changes to your agency's cost of doing business do you expect in the next 1 to 2 years?

Response: Responders indicated that in addition to continued effects of the increased costs described in response to question 4, lower revenue collections are expected in the coming years.

6. The Statute requires the State of Minnesota to develop and implement a regional rate variation factor, which would change payments to providers depending on where they provide services throughout the state. The regional rate variation factor will increase rates in some parts of the state and reduce them in others. This survey is part of the research on the development of the regional rate variation factor. How do you believe implementation of a regional rate variation factor would affect your agency?

Response: Responders indicated that there are issues with the underlying methodology for calculating rate reimbursement. For instance, one responder indicated that they incur significant losses because of their inability to bill for time spent transporting staff to clients for the services that are provided in the client's family home. Another reported issue is the lack of compensation for indirect-service-related staff time, which is not billable.

Another responder anticipates an increase in revenue because of the implementation of a regional rate variation factor, which would enable them to be funded at more appropriate levels.

Section 2: Core Analysis

Study Framework

This section defines the methodology used to calculate regional adjustment factors to be applied to HCBS in Minnesota. The resulting adjustment factors, or indices, will be applied to the payment to providers for HCBS. Several key elements of our methodology need to be defined in order to build the structure for our methodology. These elements are:

- **Costs:** Which factors are taken into account to determine regional variation in HCBS costs?
- **Regions:** How are Minnesota regions determined for the purposes of this study?
- **Services:** How are HCBS categorized for the purpose of developing indices capturing regional variation?

Costs

Many factors affect the cost of providing HCBS, but the primary drivers of cost are employee wages, facility costs, insurance, and transportation. Of these, wages is the predominant cost driver. Unfortunately, capturing all cost factors and considering each unique provider and facility characteristic in the development of regional variation indices is not feasible. The Statutes describe a methodology for determining indices that accounts for variation only in wages throughout Minnesota. Although wages capture the majority of the HCBS costs, we believe the regional indices should capture any cost factors that adequately demonstrate variation across the state, within available resources. We applied two primary criteria to determine our indices to ascertain whether any nonwage elements of cost should be used in the study:

- Rationale and evidence that a particular cost factor varies by region
- Sufficient, reliable, and credible data to demonstrate a meaningful regional variation in cost

For a data source to be considered sufficient, it must pass minimum standards to be useful for the current study. In this context, sufficient cost data must be provided at the county level in order to provide valuable information about all regions of the state and enable aggregation to the Metropolitan Statistical Area (MSA) level. A reliable data source is one that produces stable and consistent results. This implies that if an alternate source measuring the same cost factor were identified, replication of our study with the new measure would reach the same conclusions. Credible data provide an accurate or valid representation of the true variation characterizing the underlying distribution of values. This requires that each regional cost estimate be constructed from a large enough sample to reasonably represent individual data points drawn at random from within the region.

At this time, wages is the only cost element that has been identified to meet these criteria. The Minnesota Department of Employment and Economic Development (DEED) provides wages for Standard Occupation Codes (SOCs) by MSA region. From our review of these data, we found that wages demonstrate statistically significant variation across Minnesota regions. With additional study, we believe that transportation costs could be used to determine cost variation within Minnesota.

Regions

We used MSAs to define regional boundaries for the purpose of developing regional indices. MSAs are defined by the U.S. Office of Management and Budget (OMB) and consist of one or more counties as well as any adjacent counties that have a high degree of social and economic integration, as measured by commuting to work, with the urban core. OMB establishes and maintains the delineations of MSAs solely for statistical purposes and cautions that they should not be used to develop and implement federal, state, and local nonstatistical programs and

policies without full consideration of the effects of using these delineations for such purposes.³

MSAs have been used to define regions within Minnesota for the purpose of creating regional indices because reliable wage data are compiled and readily accessible at the MSA level. Additionally, wage data are available for four county-based “balance-of-state” regions to group counties not included in one of the eight OMB-defined MSAs in Minnesota. Table 1 shows the 12 MSAs in Minnesota and the corresponding counties within each MSA.

Table 1. Minnesota Metropolitan Statistical Areas and Corresponding Counties

Region	MSA Region Name	Counties Within Region
1	Metro Area	Anoka, Carver, Chisago, Dakota, Hennepin, Isanti, Ramsey, Scott, Sherburne, Washington, Wright
2	Duluth Area	Carlton, St Louis
3	St. Cloud Area	Benton, Stearns
4	Rochester Area	Dodge, Olmsted, Wabasha
5	Mankato Area	Blue Earth, Nicollet
6	Lacrosse WI Area	Houston (MN)
7	Grand Forks ND Area	Polk (MN)
8	Fargo ND Area	Clay (MN)
9	Northeast ^a	Aitkin, Cook, Itasca, Kanabec, Koochiching, Lake, Mille Lacs, Pine
10	Northwest ^a	Becker, Beltrami, Cass, Clearwater, Crow Wing, Douglas, Grant, Hubbard, Kittson, Lake of the Woods, Leach Lake (Tribe), Mahnomon, Marshall, Morrison, Norman, Otter Tail, Pennington, Pope, Red Lake, Roseau, Stevens, Todd, Traverse, Wadena, White Earth (Tribe), Wilkin
11	Southeast ^a	Brown, Faribault, Fillmore, Freeborn, Goodhue, Le Sueur, Martin, Mower, Rice, Sibley, Steele, Waseca, Watonwan, Winona
12	Southwest ^a	Big Stone, Chippewa, Cottonwood, Jackson, Kandiyohi, Lac qui Parle, Lincoln, Lyon, McLeod, Meeker, Murray, Nobles, Pipestone, Redwood, Renville, Rock, Swift, Yellow Medicine

^a These regions include the balance of all other counties not specified in regions 1–8.

Services

The organization of HCBS was critical to our study, because our indices needed to be calculated for each service element and region. Minnesota currently uses a set of 21 rate-setting framework models⁴ to calculate HCBS costs for provider reimbursement. The Statutes divided these framework models into four service “buckets”:

1. Day
2. Residential
3. Unit Without Programming
4. Unit With Programming

This grouping of services provides adequate differentiation, while not providing an overly complex structure from which to determine indices. In addition, the Statutes define categories for staff wages used as inputs within the various framework models. Table 2 shows the alignment of service buckets, wage categories, and framework

³ For additional details, please see OMB Bulletin 13-01, Revised Delineations of Metropolitan Statistical Areas, Micropolitan Statistical Areas, and Combined Statistical Areas, and Guidance on Uses of the Delineations of These Areas. Available at: <http://www.whitehouse.gov/sites/default/files/omb/bulletins/2013/b13-01.pdf>.

⁴ Service Frameworks can be accessed here: <http://mn.gov/dhs/partners-and-providers/continuing-care/reform-initiatives/rate-setting/rate-setting-frameworks.jsp>

models that we used in the study:

Table 2. Service Organization by Bucket

Service Bucket	Wage Category	Framework Model
Day	Day Services Staff	AdultDayCare15Min.xls
	Day Services Staff	AdultDayCareDaily.xls
	Day Services Staff	DTH15minutes.xls
	Day Services Staff	DTHdaily.xls
	Day Services Staff	PrevocDay.xls
	Day Services Staff	PrevocHourly.xls
	Day Services Staff	StructuredDay15Min.xls
	Day Services Staff	StructuredDayDaily.xls
Residential	Residential–Customized	CustomizedLivingandResidentialCareSerives.xls
	Residential Direct Care Staff	FosterCareSupportedLivingCorporate.xls
	Residential Direct Care Staff	FosterCareSupportedLivingFamily.xls
Unit w/out Program	Personal Support Staff	PersonalSupport.xls
	Night Supervision Staff	NightSupervision.xls
	Respite Staff	Respite15minutes.xls
	Respite Staff	RespiteDaily.xls
Unit w/Program	Behavior Program Staff	BehaviorSupport.xls ^a
	Housing Access Coordination Staff	HousingAccessCoorindation.xls
	In Home Family Support Staff	InHomeFamilySupport.xls
	Independent Living Skills Staff	ILSTraining.xls
	Supportive Living Services Staff	SLS15Min.xls
	Supported Employment Staff	SupportedEmployment.xls

^a Behavior Support has three different rates for different staffing levels: professional, specialist, and analyst.

This organizational structure serves as the basis for calculating indices by region.

Data

The determination of wage-based indices requires several sources of data. These data sources and their uses in our study are described below:

- **Minnesota Department of Employment and Economic Development (DEED) occupational employment statistics (OEM) wage data:** DEED provides median wages collected for all providers, by SOC and by MSA region, updated to first quarter 2014.⁵ For each wage, DEED also provides the sample size and mean wage, as well as wage percentiles. Specific SOCs to be used in this study are defined in the Statutes, subdivision 5. These wages form the basis for cost variation in our study.
- **Bureau of Labor Statistics (BLS):** The wage data provided by BLS is similar to DEED wage data but also includes historical SOC median wages, which enables a historical analysis to better understand how wages have changed over time across MSA regions. The BLS historical wage data do not include all of the MSA regions that were used for this study.

⁵ The Statutes specify in Subdivisions 6–9 that “personnel hourly wage rate must be based on the 2009 Bureau of Labor Statistics Minnesota-specific rates or rates derived by the commissioner as provided in subdivision 5.” BLS data are derived from DEED data, and DEED provides data that are more current and include additional MSA regions. Therefore we chose to use DEED as our source of data. In addition, we used wages from the first quarter of 2014, because that provided a more current depiction of wage variation.

- **Minnesota Medicaid Management Information System (MMIS) database:** Minnesota MMIS provides paid amounts that can be aggregated by region and framework model. We used fiscal Year (FY) 2014 claims data in the core analysis to weight framework services within service buckets. In addition, we used FY 2011 through FY 2014 paid amounts in the historical analysis.
- **Rates Management System (RMS):** The web-based RMS determines framework service rates for residential, day, and unit-based services. These rates can be used to understand how payment rates are currently determined and how an applied index would affect the payment. Additionally, RMS data show actual historical inputs that were used to develop provider reimbursements. We used average inputs statewide in RMS to populate the framework models for hours by staffing level, staffing ratios, and other nonwage data. More information regarding these inputs can be found in the Appendix.

Assumptions

Several assumptions were required during the course of this study. We made all these assumptions with input from the Minnesota DHS and other external sources, with the ultimate goal of providing indices that reflect true regional variation in HCBS costs. Wherever possible, Truven Health aimed to develop and implement an index methodology that reflects the empirical wage data.

Budget Neutrality

Our methodology assumes that the indices should be created in a cost-neutral manner within each service bucket. Although services within a given region will be paid more or less than they were previously for comparable services, aggregate total costs remain the same. We accomplished this by using a normalized index reference point that takes into account historical costs by region. To ensure budget neutrality, we multiplied our resulting indices (by region and service bucket) by FY 2014 paid amounts and then aggregated them for all regions. We then validated these aggregate amounts by comparing them with FY 2014 paid amounts prior to application of the index.

Missing Wage Data

Although DEED proved to be a valuable source of wage data for our study, SOCs do not have a median wage reported within MSA regions in which the sample size of wage data points is not statistically significant to report a median wage. To handle this issue, we made an assumption to populate these missing data points that aims to capture the average increase or decrease in other SOC wages in the region against the statewide median wage for those SOCs. Our rationale for this assumption is that it seems reasonable to assume that if five or six of the other SOCs average 2.5% higher than the state median wage, the missing median wage would likely be similar. To make this assumption, we created a table of indices by comparing all populated regional SOC median wages with the Minnesota statewide median wage for each SOC. Then, within each region, we calculated the average of all indices. This average regional index factor was multiplied by the state wide average for the SOC of the missing data point, resulting in the assumed median wage for the given region and SOC.

We used Psychiatric Technicians (29-2053), an SOC that did not have a statistically significant number of data points in any MSA region, to calculate average wages for many models in our study. We set median wages equal to the average variation in wages seen in Mental Health Counselors (21-1014). Thus, if the median wage for Mental Health Counselors was 1% above the statewide median wage in the Metro region, we assumed that Psychiatric Technicians would also be 1% higher than the state median wage in that region. We consulted with the Minnesota DHS regarding possible solutions to the missing wage data, and we agree that these assumptions make the best use the available data.

Finally, some median wages appeared to be extremely high or low. These outlier median wages could drive significant increases or decreases to future reimbursements—some of which could be financially catastrophic to

providers. Furthermore, we inferred that some of these outliers may be caused by data collected from providers that are providing care for primarily non-HCBS populations, which may explain why they require such high wages. To limit the overall impact of any particularly high or low median wage, we capped all wages at 10% above or below the statewide median wage for an SOC.

Model Adjustments

Several inputs are required within the framework services models. Because these inputs are usually for a particular service with its own circumstances, we aimed to capture the most common values for these various inputs, where possible. For example, several models require the application of staffing ratio. In those cases, we applied the most prevalent staffing ratio for each framework model, based on a query run in the RMS database.

The Statutes indicate that transportation costs apply to the residential and day buckets; however, transportation costs were not included in the indices methodology. Given the feedback from stakeholders, we thought it was most prudent to apply a wage-based index to the wage-based reimbursement amounts. For most services and corresponding framework models, transportation costs were not included in the formula, so no adjustments were necessary. For residential services, we adjusted the index calculated in this study so that it would affect only the wage-based reimbursement value. This adjustment was based on the proportion of the total reimbursement that is wage based versus transportation.

For day services, the Statutes refer to transportation costs as additive expenses after the rates have been multiplied by the appropriate index. Therefore, the indices should not account for any regional variation for transportation costs. Specific adjustments and assumptions for all framework models are captured in the Appendix.

Application of Index Within Framework Models

A key component of this study is understanding how wages flow through the various framework models and ultimately affect the calculation of the resulting reimbursement. Generally, the models take base wages from a specified mix of staff and then apply several overhead costs to arrive at a figure within the model. Then, a budget neutrality factor and finally a series of cost-of-living adjustments (COLAs) are made outside the model to arrive at a final reimbursement amount. We consulted with the Minnesota DHS to discern the optimal place to insert the wage index in this calculation. Ultimately, we recommend that this index be applied as an out-of-model adjustment and that the adjustment be made after the budget neutrality factor and before the COLAs. This decision was made on the basis of five factors identified in conjunction with the Minnesota DHS:

1. Adherence to the Statutes
2. Ease of implementation, programming, and maintenance
3. Budget neutrality
4. Calculation accuracy
5. Methodology transparency

This placement of the wage index in the calculation is favorable for all five factors. As indicated in the Statutes, it is an out-of-model adjustment. According to the Minnesota DHS, this placement of the index is the simplest for implementation, programming, and maintenance. By using the correct outputs from the framework models, Truven Health has been able to ensure that there is no impact on budget neutrality due to the index and that the calculation appropriately and accurately captures the cost variation due to wages. Finally, this solution provides transparency, because the index will be applied in an explicit manner where its impact on reimbursement will direct.

Upper and Lower Bounds for Index

Once the indices were calculated, we analyzed the results to understand the future impact once the index is applied. Because some regions will have relatively large increases or decreases in reimbursement, the Minnesota DHS requested that a cap be placed on the index so that no indices would be greater than 1.03 or less than 0.97. This index was then also calculated to be budget neutral.

Methodology

The final product of this analysis yields indices for four service buckets within the 12 MSA regions in Minnesota. The methodology is based on showing the variation in wages across the state. Other cost elements are not reflected in the calculations at this time. Because median wage data are provided by SOC and MSA region, the methodology must crosswalk these base wages into an overall structure organized by service buckets that are aggregated from multiple service framework models. The methodology used in this study, detailed below, achieves this goal through a series of weighting calculations.

These are the six primary steps for calculating the HCBS regional index area:

1. Determine base wages by service category
2. Convert composite base wages into pre-COLA service payment rates within framework models
3. Create a rate index by region and framework model
4. Develop bucket weights for each framework model
5. Develop final wage-based index for all regions and buckets
6. Check for budget neutrality

These steps are detailed below. We used the calculation of residential services for the purpose of demonstrating the methodology, and in many cases the data are illustrative and do not show the actual calculation. We used this methodology for the other service buckets as well. Each of the steps described below was repeated for each region and service bucket in order to create the HCBS regional index across the 12 defined regions.

Step 1: Determine base wages by service category

The initial step in determining the index is to calculate composite wages by category, as defined by Subdivision 5 of the Statutes. Minnesota uses 21 different Microsoft® Excel-based service framework models that take inputs, such as base wages, and then apply a series of overhead costs to provide gross rates for care reimbursement. The Statutes provide guidance on how to determine base wages by weighting median wages from specific SOCs.

This calculation can be seen in Table 3, using Residential Direct Care Staff as an illustrative example. First, SOC wages (column A) are mapped to component categories, with the corresponding component values (column B) and percentage of median wage (column C) as defined in the statutes. Median wages for each SOC are multiplied by component values and percentage of median wage weights ($[A] \times [B] \times [C]$) to calculate weighted median wages (column D). Within each category, weighted median wages are aggregated to be used in Step 2, where they are used as inputs for the framework models. In the example in Table 3, the weighted median wage for one region and one category is calculated. This process is repeated for all 12 regions and 14 different service categories.

Table 3. Illustrative Example for Calculating Base Wages for Residential Direct Care Staff

Base Wages: Residential Direct Care Staff			[A]	[B]	[C]	[D]
Component	SOC	Occupation Description	Median Wage, \$	Component Value, %	Median Wage, %	Weighted Median Wage, \$ [A] x [B] x [C]
1.i	21-1093	Social and Human Services Aide	13.89	15%	20%	0.42
1.i	31-1012	Nursing Aide	13.02	15%	30%	0.59
1.i	39-9021	Personal and Home Health Aide	10.34	15%	50%	0.78
Subtotal: Component 1.i					100%	1.78
1.ii	21-1093	Social and Human Services Aide	13.89	85%	20%	2.36
1.ii	29-2053	Psychiatric Technician	13.76	85%	20%	2.34
1.ii	31-1011	Home Health Aide	10.75	85%	20%	1.83
1.ii	31-1012	Nursing Aide	13.02	85%	20%	2.21
1.ii	39-9021	Personal and Home Health Aide	10.34	85%	20%	1.76
Subtotal: Component 1.ii					100%	10.50
Total: Residential Direct Care Staff Category						\$12.28

Step 2: Convert composite base wages into pre-COLA service payment rates within framework models

To complete this step, each framework model is modified to reflect the most prevalent inputs used in Minnesota. In addition to the weighted base wages calculated in Step 1, several other inputs are updated. These additional inputs are defined in the assumptions of this document. From base wages, these models apply overhead costs such as supervision, vacation, sick leave, training, taxes, workers compensation, general and administrative expenses, program plan and related support, and other absence. The overhead reflected in the models varies by service bucket and component values and follows definitions from the Statutes. Outside the model, budget neutrality factors and cost-of-living adjustments are made to the rates. Because the index will be applied just before the COLAs, rates captured in this step reflect the output at this point in the calculation. This ensures accuracy in the application of the index to the final reimbursement calculation. Once each framework model is populated with all inputs, the resulting pre-COLA rates are captured from all models, for each region.

Step 3: Create a rate index by region and framework model

Step 2 yields a table of payment rates for all framework models and regions. Because the framework services calculate payment amounts by different time denominations (e.g., some are daily, some are every 15 minutes), the rates from Step 2 vary significantly between framework models. Because these service model rates need to be rolled up into service buckets through a weighting mechanism (Step 4), it is critical that the magnitude of payments not distort the aggregation process. Therefore, each regional service payment amount has been divided by the average payment across all regions, thus creating an index in which all payments are shown relative to the average payment.

Step 4: Develop non-normalized service bucket index

In this step, to roll up framework models into the four service buckets, paid amounts from FY 2014 Minnesota MMIS data are used to generate weights. To do this, aggregate paid amounts that pertain to each framework model are collected. The percentage of paid amounts for each framework model within a bucket can be applied as weights to the index calculated in Step 3.

Indices for each framework service and region are multiplied by the bucket weights. This calculation will yield a table of values that can be aggregated by bucket to determine the non-normalized index.

Step 5: Develop final wage-based index for all regions and buckets

Step 4 provides an index that has not been normalized to account for budget neutrality. To normalize the indices, they must be compared with the statewide weighted average indices for each bucket, in which paid amounts by region and bucket are used as the weights. This calculation accounts for variation in services by region. First, the statewide average indices must be calculated. This is done by aggregating the product of each non-normalized regional index from Step 4 by the total paid amounts for that bucket and region. This aggregation of products is done for each of the four buckets. Next, each of the non-normalized indices is divided by the statewide weighted average indices for its respective bucket. This series of calculations yields a final table of normalized indices to be applied to future reimbursements.

Minnesota DHS requested that a cap be applied to the resulting index, because some of the regions will be receiving significant increases or decreases on the basis of the results of the calculation. Truven Health has provided an alternate index in which indices have been capped at an increase or decrease of 3%. The capping of the indices is documented in the assumptions section of the report, and both capped and uncapped indices are provided as results. For the capped results, statewide weighted average indices had to be recalculated.

Step 6: Check for budget neutrality

The final step in the methodology is to check to make sure that the index was calculated in a way that ensures budget neutrality. We did this by multiplying the final index for each bucket and region by the FY 2014 total paid amount in the corresponding bucket and region. This total paid amount by bucket should be equal before and after the application of the index. We completed this check for our final index and validated that the calculation was budget neutral for both the capped and uncapped indices.

Results

Table 4 represents the budget neutral, wage-based index by service bucket and MSA region.

Table 4. Uncapped Indices by Service Bucket and Metropolitan Statistical Area Region

Bucket		Region											
		Metro Area	Duluth Area	St. Cloud Area	Rochester Area	Mankato Area	Lacrosse WI Area	Grand Forks ND Area	Fargo ND Area	Northeast	Northwest	Southeast	Southwest
1.0	Residential	1.024	0.973	0.993	1.009	1.020	1.001	0.976	1.010	0.985	0.956	0.969	0.976
2.0	Day	1.023	0.966	0.961	0.988	1.063	1.049	0.963	1.001	1.001	0.947	0.959	0.963
3.0	Unit w/Program	1.024	0.979	0.957	1.015	1.078	1.040	0.958	0.976	1.002	0.948	0.947	0.946
4.0	Unit w/out Program	1.017	0.961	0.991	1.016	0.955	0.941	0.956	1.021	0.911	0.913	0.919	0.911

Table 5 represents the budget neutral, wage-based index by service bucket and MSA region, with application of a ±3% cap.

Table 5. Capped Indices by Service Bucket and Metropolitan Statistical Area Region

Bucket		Region											
		Metro Area	Duluth Area	St. Cloud Area	Rochester Area	Mankato Area	Lacrosse WI Area	Grand Forks ND Area	Fargo ND Area	Northeast	Northwest	Southeast	Southwest
1.0	Residential	1.023	0.971	0.991	1.007	1.018	1.000	0.975	1.009	0.983	0.970	0.970	0.974
2.0	Day	1.019	0.970	0.970	0.984	1.030	1.030	0.970	0.997	0.997	0.970	0.970	0.970
3.0	Unit w/Program	1.019	0.974	0.970	1.009	1.030	1.030	0.970	0.970	0.997	0.970	0.970	0.970
4.0	Unit w/out Program	1.007	0.970	0.981	1.006	0.970	0.970	0.970	1.011	0.970	0.970	0.970	0.970

Section 4: Supporting Analysis

In this section, we explore the following research questions:

- If regional variations are observed, how likely are these variations to be exhibited in the future?
- If a regional rate adjustment were applied to the DWRS frameworks today, what would be the fiscal impact of this change? By framework, what would be the range of percent change? What would be the average rate increase (or decrease)?
- What impact might a new regional rate formula have on providers and consumers, statewide and regionally?

We address the first question in the Historical Analysis subsection and cover the last two questions in the Fiscal Impact subsection.

Historical Analysis

To gain perspective on how likely it is that regional variations in wages will be exhibited in the future, Truven Health analyzed the historical movement in wages across counties. We used wage data gathered from BLS during years 2008 and 2013 to investigate the historical impact of regional rate indices. On the basis of the analysis, the regional variation in wage rates exhibited currently and in 2008 were of similar magnitudes and are highly likely to occur in future years. Our analysis was limited to the eight regions based on specific MSA regions and excluded the four balance-of-state regions because BLS data do not contain information on these regions and DEED data do not contain readily available historical information. Nevertheless, we feel that the data publicly available through BLS provide an accurate picture of the historical variation in regional wage levels in the state of Minnesota. Truven Health anticipates that wage variation of this magnitude will continue to be prevalent in the future.

Fiscal Impact

We designed the indices to produce statewide budget neutrality by using statewide paid amounts by bucket to weight the regional indices. Therefore, provided that utilization patterns are unchanged, we anticipate no statewide fiscal impact of implementing the regional rate indices. Any variation observed in statewide paid amounts in future years would be due solely to fluctuations in the utilization patterns over time. The fiscal impact of the indices by region is illustrated in the regional index values themselves. For example, if the Metro Area region has an index value of 1.024 in the residential bucket, the state of Minnesota can expect to increase paid amounts in the region by 2.4%. Alternatively, the residential bucket index value of 0.973 in the Duluth Area region indicates a 2.7% decrease in paid amounts in the region. A summary of the fiscal impact by bucket can be seen in Tables 6 and 7 below.

Table 6. Index Summary by Bucket

Service Bucket	Average	Min	Max
Residential	0.991	0.956	1.024
Day	0.990	0.947	1.063
Unit w/Program	0.989	0.946	1.078
Unit w/o Program	0.959	0.911	1.021

Table 7. Index Summary by Bucket, With After-Model Cap

Service Bucket	Average	Min	Max
Residential	0.991	0.970	1.023
Day	0.990	0.970	1.030
Unit w/Program	0.990	0.970	1.030

Unit w/o Program	0.980	0.970	1.011
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Tables 6 and 7 show that the average index value does not exhibit significant variation between the capped and uncapped models, other than for the unit without program bucket. The minimum and maximum columns show that the index with the after-model cap effectively limits the fiscal impact to a 3% positive or negative change in paid amounts, although the maximum increase cap is not necessary in the residential or unit without program buckets. Alternatively, we could examine fiscal impact regionally by looking at the same summary information for each of the 12 regions. These results are displayed in Tables 8 and 9 below.

Table 8. Index Summary by Region

Region	Average	Minimum	Maximum
Metro Area	1.022	1.017	1.024
Duluth Area	0.970	0.961	0.979
St. Cloud Area	0.976	0.957	0.993
Rochester Area	1.007	0.988	1.016
Mankato Area	1.029	0.955	1.078
Lacrosse WI Area	1.008	0.941	1.049
Grand Forks ND Area	0.963	0.956	0.976
Fargo ND Area	1.002	0.976	1.021
Northeast	0.975	0.911	1.002
Northwest	0.941	0.913	0.956
Southeast	0.949	0.919	0.969
Southwest	0.949	0.911	0.976

Table 9. Index Summary by Region, With After-Model Cap

Region	Average	Minimum	Maximum
Metro Area	1.017	1.007	1.023
Duluth Area	0.971	0.970	0.974
St. Cloud Area	0.978	0.970	0.991
Rochester Area	1.002	0.984	1.009
Mankato Area	1.012	0.970	1.030
Lacrosse WI Area	1.007	0.970	1.030
Grand Forks ND Area	0.971	0.970	0.975
Fargo ND Area	0.997	0.970	1.011
Northeast	0.987	0.970	0.997
Northwest	0.970	0.970	0.970
Southeast	0.970	0.970	0.970
Southwest	0.971	0.970	0.974

Tables 8 and 9 display substantial variation by region across the four different buckets. The Metro Area region was the only region with index values greater than one for all four buckets. Five of the remaining 11 regions had index values both above and below one, meaning that some of their buckets would receive rate increases and others will be subject to rate reductions. The lowest index values can be found in the four balance-of-state regions, with rate decreases greater than 8%. The maximum rate increase was found in the Mankato Area at 7.8%. The index summary in Table 9 shows that the after-model cap was used far more often to limit the rate reductions in the various regions to 3% than it was used to cap rate increases across the state.

Additional Considerations

Implementing an index to capture variation in costs of HCBS will cause a reaction by the market. Although it was not within the scope of this study to investigate these consequences, we anticipate that some providers will migrate to other regions where indices are higher. This will be particularly true for providers near borders between regions with significantly different indices. This situation is more likely to occur if the index model without an after-model cap were implemented.

Also, moving local wages away from equilibrium could create labor shortages and surpluses, which could affect quality of services. If rate reductions due to the regional variation index prohibit providers from offering competitive wages, they may be forced to choose between providing lower quality services and not providing the services at all in the region. This could exacerbate a shift in utilization of HCBS from regions with index values less than one to regions with index values greater than one, further distorting the underlying regional wage variation that the index aims to resolve.

Section 5: Recommendations

Recommendation 1

Truven Health recommends that the Minnesota DHS implement the wage-based index resulting from this study. We also recommend that capped indices be used to limit significant fiscal impact to providers, particularly those with resulting decreases to reimbursements. This capped implementation will allow the Minnesota DHS to monitor the impact to providers; that monitoring will inform measured decision making on how best to modify the index in the future. This index is shown in Table 10.

Table 10. Capped Indices by Service Bucket and Metropolitan Statistical Area Region

Bucket		Region											
		Metro Area	Duluth Area	St. Cloud Area	Rochester Area	Mankato Area	Lacrosse WI Area	Grand Forks ND Area	Fargo ND Area	Northeast	Northwest	Southeast	Southwest
1.0	Residential	1.023	0.971	0.991	1.007	1.018	1.000	0.975	1.009	0.983	0.970	0.970	0.974
2.0	Day	1.019	0.970	0.970	0.984	1.030	1.030	0.970	0.997	0.997	0.970	0.970	0.970
3.0	Unit w/Program	1.019	0.974	0.970	1.009	1.030	1.030	0.970	0.970	0.997	0.970	0.970	0.970
4.0	Unit w/out Program	1.007	0.970	0.981	1.006	0.970	0.970	0.970	1.011	0.970	0.970	0.970	0.970

As discussed in the assumptions section, the index calculated in this report does not apply to transportation and other non-wage-based cost components, because they were isolated from our calculations. The rating frameworks are geared primarily toward capturing and accounting for the wages, plus overhead expenses.

Recommendation 2

In accordance with the Statutes, Truven Health recommends that this study be repeated periodically to capture shifts in wages.

Recommendation 3

Truven Health recommends that the Minnesota DHS perform a study to better understand payment adequacy across Minnesota HCBS providers. The present study relies on historical wage data as a determination of how future payments should vary by region. As one stakeholder commented, for providers that are forced to pay low wages in order to maintain solvency, the application of this index could exacerbate circumstances that are already a fiscal challenge.

Recommendation 4

Truven Health recommends that the state of Minnesota perform a study on the other cost elements to be built into the index calculation. We recommend that the frameworks be modified to include a more accurate way of capturing other substantial components of cost in the calculation. Although it is more practical to capture some elements than others, our observations are presented below.

Transportation

Transportation costs are currently included in the DWRS with the intent of capturing the actual cost of the vehicles. We recommend adding an adjustment to allow for other transportation cost elements such as gas cost/mileage to be taken into account. Two options for these adjustments are described below.

- Option 1: Incorporate transportation factors into an index through county-level gas prices.** This method would be similar to the current process for calculating wage-based indices. This could either be implemented separately from the wage index or be incorporated into the wage index for buckets with transportation components such as residential and day services. Gas price data by county could be incorporated from publicly available online data such as automotive.com, which lists the lowest price within a county. These prices could be aggregated to match the regional areas by taking the average across multiple counties in a region.

- **Option 2:** Incorporate transportation expenses into rates by using the General Services Administration (GSA) mileage reimbursement rate for privately owned vehicles. The GSA mileage reimbursement rate incorporates the fixed and variable costs of operating a car (gasoline, insurance, wear and tear, etc.). This option would simplify the transportation reimbursement and remove it from the regional variation index completely. Mileage reimbursement rates are adjusted annually and applied by the federal government across the country. The primary concern with this strategy is that the rate may be too low considering the type of vehicles used for transportation services by providers compared with the vehicles factored into the GSA rate-setting process. For this reason, it may be necessary to use the transportation reimbursement method currently in practice in addition to mileage reimbursements. The current GSA reimbursement rate is \$0.565 per mile.

Insurance Costs

Malpractice insurance rates may vary regionally. Because we did not find data for all regions of the state, we were not able to investigate this possibility thoroughly. Malpractice insurance is generally set up in specialties, and some specialties are more expensive than others. After identifying all types of specialty insurance required for HCBS providers, the state could either attempt to locate county-level data for specialty malpractice insurance rates in Minnesota or request insurance quotes from a large insurance provider for identical coverage in the various regions of the state.

Facility Costs

The three primary components of facility costs that likely affect the costs of HCBS are outlined below:

- **Property cost:** Commercial real estate values and cost-per-square-foot estimates for commercial space in Minnesota have been investigated. This factor may be incorporated into the indices with the assistance of a realtor specializing in commercial property and a committee tasked with determining the average property needs of HCBS providers. We recommend that a committee be formed that would be responsible for creating standard property parameters for the variable factors necessary to conduct a thorough market search. The realtor could provide value estimates based on comparable properties on and off the market in each region.
- **Maintenance**
- **Utilities:** Data supporting utility costs were not easily identified except by looking specifically at utility providers in each county. Similar to the issues explored related to property costs above, a committee would need to determine the appropriate utility mix and the number of units of each utility to ensure comparable cost estimates.

Appendix: Framework Model Documentation

The table below indicates any assumptions or inputs applied to the different framework service models.

Bucket	RMS Service	Excel Model	Model Notes
Day	Adult Day 15 Minute	AdultDayCare15Min.UNL	<ul style="list-style-type: none"> STAFFING RATIO: Used 1:5, because this was most prevalent in RMS RN and LPN Options set to 'No' because these were entered less than 5% in RMS
Day	Adult Day Daily	AdultDayCareDaily.UNL	<ul style="list-style-type: none"> STAFFING RATIO: Used 1:8, because this was most prevalent in RMS RN and LPN Options set to 'No' because these were entered less than 5% in RMS No meals or snacks included in calculation
Day	DT&H 15 Minutes	DTH15minutes.UNL	<ul style="list-style-type: none"> STAFFING RATIO: Used 1:8, because this was most prevalent in RMS RN and LPN Options set to 'No' because these were entered less than 5% in RMS
Day	DT&H Daily	DTHdaily.UNL	<ul style="list-style-type: none"> STAFFING RATIO: Used 1:4, because this was most prevalent in RMS TRANSPORTATION: Kept transportation expense at \$0. Per MN, transportation expenses are added on as an out-of-model adjustment. Index should not be affected by any transportation costs. Applied Average LPN and RN hours from RMS data
Day	Prevocational Services Daily	PrevocDay.UNL	<ul style="list-style-type: none"> STAFFING RATIO: Used 1:8, because this was most prevalent in RMS Applied Average LPN and RN hours from RMS data
Day	Prevocational Services Hourly	PrevocHourly.UNL	<ul style="list-style-type: none"> STAFFING RATIO: Used 1:8, because this was most prevalent in RMS Applied Average LPN and RN hours from RMS data
Day	Structured Day 15 Minutes	StructuredDay15Min.UNL	<ul style="list-style-type: none"> STAFFING RATIO: Used 1:3, because this was most prevalent in RMS RN and LPN Options set to 'No' because these were entered less than 5% in RMS
Day	Structured Day Daily	StructuredDayDaily.UNL	<ul style="list-style-type: none"> STAFFING RATIO: Used 1:2, because this was most prevalent in RMS Applied Average LPN and RN hours from RMS data
Residential	Customized Living Services	CustomizedLivingandResidentialCareServices.UNL	<ul style="list-style-type: none"> This model is set up differently than other Residential models, and SOCs are not mapped to wage inputs. Recommend that this model receive the same index developed for the other Residential models, with the assumption that it will use a similar mix of services and corresponding wage variance across the state. Index will be applied based on other two Residential models and applied to the Customized Living model.
Residential	Foster Care Corporate Daily	FosterCareSupportedLivingCorporate.UNL	<ul style="list-style-type: none"> HOURS: Used Average hours per day from RMS/MMIS data to get an accurate mix of hours between different staff types (i.e., awake/asleep, LPN/RN hours, individual remote). These numbers

			<p>were averages combined from the foster care and SLS corporate daily models.</p> <ul style="list-style-type: none"> • # of RESIDENTS: Used four as the number of residents input, because this is the mode of the # of residents from MMIS/RMS data from "RMS_NUM_RESIDENTS" field • TRANSPORTATION: set to \$1,680/year, indicating use of a standard vehicle. This was the choice seen in RMS/MMIS data for about 80% of the entries. • Index applied was adjusted to affect only the wage-based portion of the reimbursement calculation.
Residential	Foster Care Family Daily	FosterCareSupportedLivingFamily.UNL	<ul style="list-style-type: none"> • HOURS: Used Average hours per day from RMS/MMIS data to get an accurate mix of hours between different staff types (i.e., awake/asleep, LPN/RN hours, individual remote). These numbers were averages combined from the foster care and SLS family daily models. • # of RESIDENTS: Used four as the number of residents input, because this is the mode of the # of residents from MMIS/RMS data from "RMS_NUM_RESIDENTS" field • TRANSPORTATION: set to \$1,680/year, indicating use of a standard vehicle. This was the choice seen in RMS/MMIS data for about 80% of the entries. • Index applied was adjusted to affect only the wage-based portion of the reimbursement calculation.
Unit w/out Program	Personal Support	PersonalSupport.UNL	
Unit w/out Program	Respite Care Services 15 Minute	Respite15minutes.UNL	
Unit w/out Program	Respite Care Services Daily	RespiteDaily.UNL	<ul style="list-style-type: none"> • Room and Board Amount set to \$0
Unit w/out Program	Respite Care Services Daily	NightSupervision.UNL	
Unit w/Program	Behavioral Support	BehaviorSupport.UNL	
Unit w/Program	Housing Access Coordination	HousingAccessCoordination.UNL	
Unit w/Program	In Home Family Support	InHomeFamilySupport.UNL	
Unit w/Program	Independent Living Skills Training	ILSTraining.UNL	<ul style="list-style-type: none"> • Shared Staff Ratio set to 1:1
Unit w/Program	SLS 15 Minute	SLS15Min.UNL	
Unit w/Program	Supported Employment Services	SupportedEmployment.UNL	<ul style="list-style-type: none"> • Shared Staff Ratio set to 1:1

Abbreviations: DT&H, day training and habilitation; LPN, licensed practical nurse; MMIS, Medicaid Management Information System; RMS, Rates Management System; RN, registered nurse; SOC, standard occupational code.

Additional notes:

- RMS/MMIS Data—This data merges adjoining records in MMIS and the RMS systems to capture inputs into framework models. Data from this source was captured from January 1, 2014, through November 4, 2014. Because this is not a full year of data and there is little or no runout period for claims, this is not a good source of information to capture aggregate costs for the purpose of understanding financial impacts, budget neutrality, or weighting of services within buckets. This is primarily used to understand predominant inputs into the various models.
- No customization was used for deaf or hard of hearing, because these were used very infrequently within RMS/MMIS data.
- Staffing Ratios were set to the most prevalent input observed in the RMS/MMIS data.
- The table below shows wages that do not vary based on region. These wages are static in the framework models and do not change with region.

Components Not Based on Occupational Wage Data

Category	Wage, \$
Residential Asleep–Overnight Staff	7.66
Residential Asleep–Overnight Staff	2.88
Supervisory Staff	17.43
Supervisory Staff	30.75
Registered Nurse	30.82
Licensed Practical Nurse	18.64