Development of the Preliminary Support Range Framework

Human Services Research Institute
Study 2, Task B11

Prepared for:

Minnesota Department of Human Services
Disability Services Division
PO Box 64967
St. Paul, MN 55164-0967
https://mn.gov/dhs/

Prepared by:

Colleen Kidney, Jami Petner-Arrey, and Emily Saxton
Human Services Research Institute
7690 SW Mohawk St.
Tualatin, OR 97062
503-924-3783
www.hsri.org

This project is sponsored by the Minnesota Department of Human Services, Disability Services Division (DHS/DSD). All opinions expressed herein are solely those of the authors and do not reflect the position or policy of the Department of Human Services.

October 1, 2018

About the Human Services Research Institute

The Human Services Research Institute (www.hsri.org) is a nonprofit, mission-driven organization that works with government agencies and others to improve health and human services and systems, enhance the quality of data to guide policy, and engage stakeholders to effect meaningful systems change.

Contents

Executive Summary

Summary of Findings

In effort to meet multiple goals advanced by the Minnesota Department of Human Services (DHS), Disability Services Division, the Human Services Research Institute (HSRI) developed a unified Support Range Framework for an individual budget methodology using multiple methods and data sources. The purpose of the framework is to assign support ranges to service recipients based on their support need, as identified in their MnCHOICES assessments. The framework applies to all adults receiving services on four waivers—Brain Injury (BI), Community Access for Disability Inclusion (CADI), Community Alternative Care (CAC), and Developmental Disability (DD).

We arrived at this proposed framework after researching the methodologies that other states have pursued to provide individual budgets for service recipients. We also considered the MnCHOICES assessment and our analysis of the data. There are several benefits of the approach that we have detailed below. Chief among these benefits is that this approach can be stable over time since different parts of the framework can be independently adjusted and that this framework can assist DHS to better understand support needs within the service system and more accurately align system responses to meet these support needs. To develop the Support Range Framework, we used statistical analysis and coordinated with an expert panel composed of a range of stakeholders knowledgeable about services in Minnesota.

The Support Range Framework that we propose uses four sections from the MnCHOICES assessment including:

- Activities of Daily Living (ADLs)
- Instrumental Activities of Daily Living (IADLs)
- Psychosocial
- Health

From each of these MnCHOICES sections, we used items that measure the types of support that individuals need to meet each of their assessed needs for general support (ADL & IADL), Health, and Psychosocial. We recoded items, or scored the assessment in each of these areas and then summed those scores to create the support range criteria.

The Support Range Framework includes seven unique support ranges that may be assigned to service recipients. The Support Range Framework is summarized in the

figure below, which contains brief descriptions of each of the seven Support Ranges 1 through E.

Figure 1

Seven unique support ranges

1	Low general support need, typical health and psychosocial support needs
2	Moderate general support need, typical health and psychosocial support needs
3	High general support need, typical health and psychosocial support needs
4	Extensive general support need, typical health and psychosocial support needs
L	Low to moderate general support need, high health and/or high psychosocial support needs
H	High to extensive general support need, high health and/or high psychosocial support needs
E	Extraordinary health and/or psychosocial support needs as determined by an additional process

Since the Support Range Framework is complete, support ranges may be linked to budgets. To determine the budget for each support range, we use service mixes. A service mix is an estimate of the types and amounts of services needed by individuals in each support range, for each living setting, and for adults and children. Once the services mixes are finalized, we can price each service mix to detail the exact budgets for individuals at each support range.

Before the budgets are finalized, we will complete a record review to determine how well they would meet the needs of service recipients in Minnesota.

Findings

In response to established goals of the Department of Human Services (DHS), Human Services Research Institute's (HSRI) proposed a budget methodology that involves the implementation of a support range framework. In this section, we present information about the proposed Support Range Framework including an overview of the framework, an overview of the support range descriptions, the support range criteria including how the assessment was scored, and information on the distribution of support ranges.

Support Range Framework

We developed a unified methodology that can be applied to adults receiving services from one of four waivers: Brain Injury (BI), Community Alternative Care (CAC), Community Access for Disability Inclusion (CADI), and Developmental Disabilities (DD) waivers. We elected to propose a unified framework in keeping with many goals that have been advanced by DHS including a desire to:

- Simplify waiver program information and administration
- Promote equity across waiver programs and participants
- Align benefits across waivers

Collectively, stakeholders and DHS have envisioned a sustainable and streamlined system—one that's easy to understand and navigate, offers flexibility to service users, and meets needs in community and person-centered ways. This goal has been practically expressed by DHS through a long commitment to streamline the waiver system, including the alignment of services and the rates paid for services, as well as efforts to improve access to needed supports. The Disability Waiver Rates System (DWRS) was developed in this vein and other work is currently underway to streamline and simplify service delivery, including the work of this project.

Due to these articulated desires, we set out with a goal to include each of the populations covered under existing waivers, into a unified Support Range Framework. Approaching development of the framework in this way meant that Minnesota would be able to implement the proposed framework regardless of decisions made pertaining to Study 1. That is the proposed framework, being unified across service recipients, is amenable to any reconfiguration effort. This unified framework can help to ensure that individuals served among the four waivers have equal access to services available from DHS. Further setting budgets can allow individuals to choose among a range of services, which they believe are best suited to meet their personal goals.

There are additional benefits of the proposed framework. For one, this approach though considering historical spending and service use, is not wholly reliant on

historical costs. This means that DHS has an opportunity to consider past service use and spending and to thoughtfully preserve those patterns that align with system goals and discontinue those patterns that do not. The framework that we have proposed can be more stable overtime than individualized frameworks that rely exclusively on historical spending. This is because the framework has multiple prongs that can each be altered independently of on another to some extent. The:

- support range descriptions
- support range criteria
- service mixes

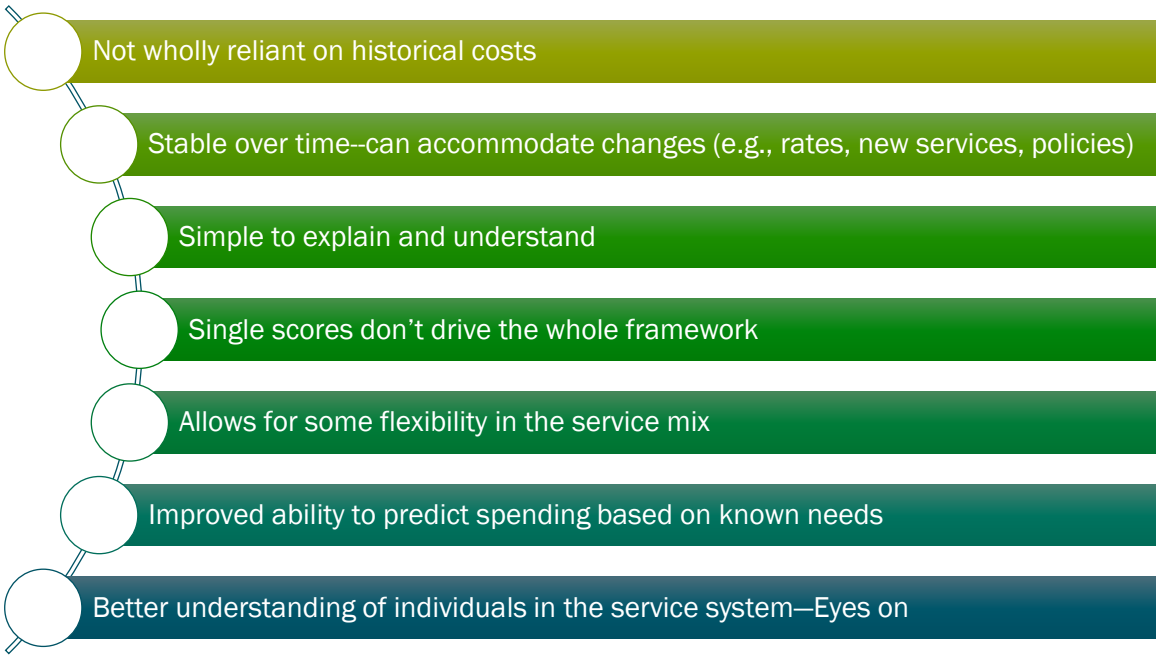
make up each of the prongs.

As a result, the support range descriptions (or the general makeup of the framework), the support range criteria, and the service mixes can accommodate a range of changes such as additions or removals of specific services, new rates that are paid for services, changes to the assessment, and so forth. This may help to promote stability for service recipients who depend on the budget methodology year after year to provide needed supports. This approach can also promote person-centered supports. Because all possible outcomes of the individual budgets can be known at the outset, this framework may be simpler for service recipients and families to understand and apply, allowing service recipients to establish greater authority over their service use.

The Support Range Framework that we propose involves scoring specific sections of the MnCHOICES assessment, meaning that a single question or a few questions are not driving the framework. Instead, support needs are considered more holistically and across a range of sections highlighting the multidimensional aspect of support needs. Individuals who receive budgets through this process can use their budgets to purchase a range of services and are not beholden to specific budgets for specific services. Finally, a Support Range Framework, independent of a budget, can assist DHS to better perceive support needs throughout the state, across programs, and among subpopulations of service users. This can ultimately provide DHS with "eyes on" the system so that it can be responsive to needs and changing needs over time.

Figure 2

Benefits of our approach



While our intent was to develop a unified framework across service recipients, we also planned to review this decision at key points in the development of the framework and intend to continue to revisit this decision throughout the remaining development of the budget methodology. Based on analysis of MnCHOICES data, we chose to exclude children from the Support Range Framework since it would have required us to develop a separate framework from adults due to age-related skip patterns and different items for children in MnCHOICES. MnCHOICES also does not clearly differentiate support needs for different age groups. That is, while MnCHOICES does have different items and responses based on age groups, the groups are not consistent across the instrument. As a result, the following framework applies to only adults who are defined as individuals 18 or older at the time of their MnCHOICES assessment. We did not examine any potential differences among ages in adults.

Overview of the Framework

The Support Range Framework uses the following sections from MnCHOICES data:

- Activities of Daily Living (ADLs)
- Instrumental Activities of Daily Living (IADLs)
- Health
- Psychosocial

These sections are associated with the following constructs of support need that are instrumental to the Support Range Framework.

Figure 3

Support Range Framework Areas

General Support Needs

Support that people need for activities of daily living and instrumental activities of daily living (e.g., eating, bathing, dressing, housework, shopping). General support needs are composed of items from the ADL and IADL sections

Health Support Needs

Support that people need to manage health conditions (e.g., cardiac conditions, therapies, diabetes). Health support needs are composed of items from the health section.

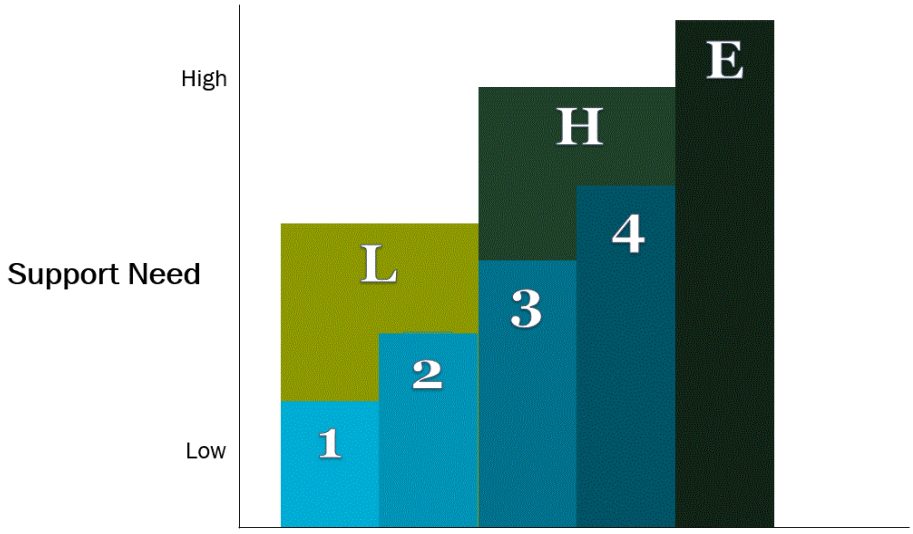
Psychosocial Support Needs

Support that people need to manage psychosocial conditions (e.g., anxiety, verbal aggression, socially unacceptable behavior). Psychosocial support needs are composed of items from the psychosocial section.

Using these sections, we developed a Support Range Framework that includes seven unique support ranges that group individuals with similar general support needs ranging from low to high and individuals with high or extraordinary health and/or psychosocial support needs. Below is a figure that displays the seven support ranges.

Figure 4

Support Range Framework



Support Ranges 1 through 4 include individuals with general support needs that range from low (Support Range 1) to extensive (Support Range 4) with typical (low to

moderate) psychosocial and health support needs. Two support ranges group individuals with high health and/or high psychosocial support needs with low to moderate general support needs (Support Range L) or high to extensive general support needs (Support Range H). The final support range includes individuals with extraordinary psychosocial and/or health support needs (Support Range E).

Figure 5

Support Range Brief Descriptions

1	Low general support need, typical health and psychosocial support needs
2	Moderate general support need, typical health and psychosocial support needs
3	High general support need, typical health and psychosocial support needs
4	Extensive general support need, typical health and psychosocial support needs
L	Low to moderate general support need, high health and/or high psychosocial support needs
H	High to extensive general support need, high health and/or high psychosocial support needs
E	Extraordinary health and/or psychosocial support needs as determined by an additional process

Support Range Framework Descriptions

For each of these support ranges, we developed descriptions that help to broadly conceptualize the framework as a whole. The descriptions provide context or who is supported within the framework. To develop these descriptions, we involved stakeholders, who reviewed information pertaining to each of the support ranges and helped us to describe the framework. We framed the support range descriptions with Charting the LifeCourse Framework (Reynolds & St. John, 2012). See Appendix B for the support range descriptions.

Support Range Framework Criteria

The Support Range Framework is dependent on the ability to assign individuals with MnCHOICES assessments to one of the seven support ranges. Since MnCHOICES is not currently scored, we developed a process to score the assessment and to determine scoring criteria that would enable us to assign each individual to a support range.

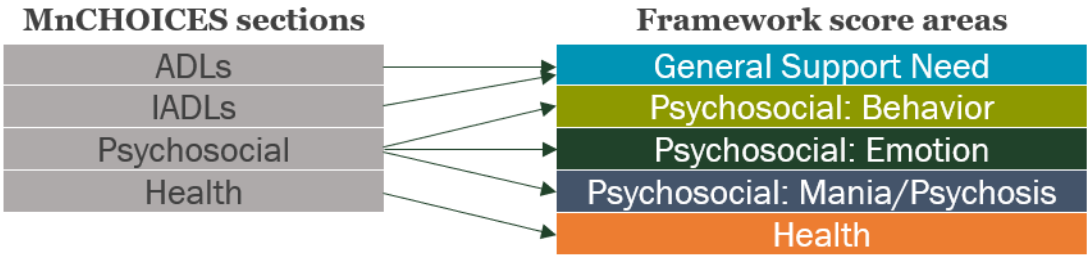
Criteria

Overall, the scoring criteria that we developed includes five areas, for which a sum score is computed. We used four sections from the MnCHOICES assessment, and transformed them into five areas that are scored to determine the final support range.

The figure below displays how the four MnCHOICES sections translate into five areas that are summed for the Support Range Framework criteria.

Figure 6

MnCHOICES sections and framework score areas



We refer to these sum score areas as General Support Need (GSN), PS: Behavior, PS: Emotion, PS: Mania/Psychosis, and Health. In each area a number of items are scored, those scores are summed, and a total sum score is derived for each area. These sum scores are then used to determine, for each individual, which support range the should be assigned.

The figure below shows the scoring criteria. We describe the process for determining scores for specific items and areas below.

Figure 7

Support Range Framework Scoring Criteria

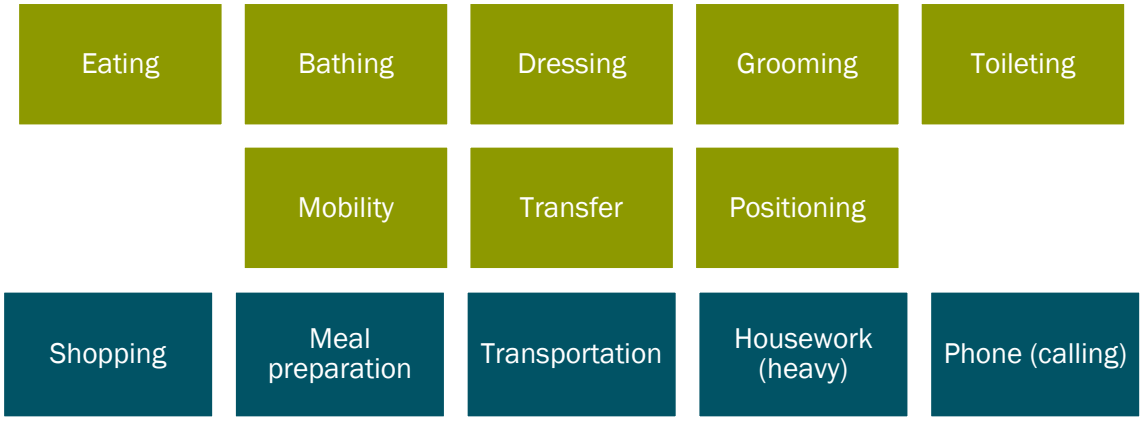
Support Range	GSN	PS: Behavior	PS: Emotion	PS: Mania/Psychosis	Health
1	7 or less	16 or less	5 or less	0 or 1	5 or less
2	8 to 19				
3	20 to 29				
4	30 or higher				
L	19 or less	17 to 29	6 to 11	2 to 4	6 to 19
H	20 or higher				
E	Any score	30 or higher	12 or higher	5 or higher	20 or higher

Scoring the assessment

Since the assessment was not scored, in each area, we first had to recode items to determine item level scores that could later be summed to provide a sum score for each area. We provide information about how each item was recoded, or scored, in this section. We provide information about the included items and the areas in the Methods section.

GSN SCORE

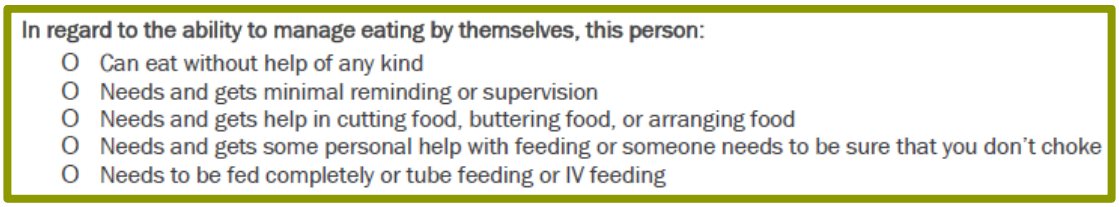
To determine the GSN score, we recoded the responses to several items in the ADL and IADL sections in MnCHOICES, scored those items, and then summed the GSN area as a whole. The ADL and IADL items that we included are shown below (in green and blue respectively).



The items we included from each of the ADLs have a similar root question that is: "In regard to the ability to [ADL item], this person:" The responses for this question include 4 to 6 options that vary by the specific task. The figure below displays an example item.

Figure 8

Support needed for eating



Since the item responses range from 4 to 6 options, we recoded each of the items into a consistent four-point scale so that they could be scored:

0. None
1. Minimal
2. Moderate
3. Extensive

We did this for each item that we used in the ADL section of MnCHOICES. The figure below displays the recoded responses for all of the ADL items included in the framework.

Figure 9

MnCHOICES ADL item responses and recoded values for GSN

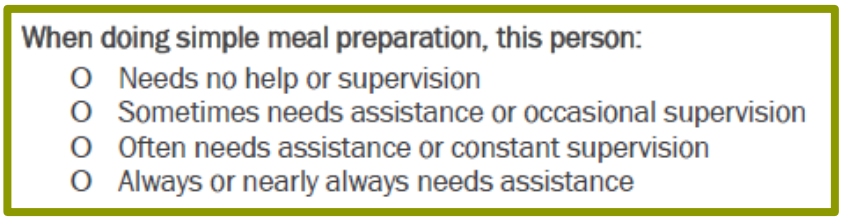
Note that some item responses are truncated to fit the table, indicated with ellipses (…).

Eating		
Can eat without help of any kind	0	None
Needs and gets minimal reminding or supervision	1	Minimal
Needs and gets help in cutting food, buttering food, or arranging food	2	Moderate
Needs and gets some personal help with feeding…	3	Extensive
Needs to be fed completely or tube feeding or IV feeding	3	Extensive
Bathing		
Can bathe or shower without any help	0	None
Needs and gets minimal supervision or reminding	1	Minimal
Needs and gets supervision only	2	Moderate
Needs and gets help getting in and out of the tub	2	Moderate
Needs and gets help washing and drying their body	2	Moderate
Cannot bathe or shower, needs complete help	3	Extensive
Dressing		
Can dress without any help of any kind	0	None
Needs and gets minimal supervision	1	Minimal
Needs some help from another to put clothes on	2	Moderate
Cannot dress themselves; somebody else dresses them	3	Extensive
Is never dressed	0	None
Personal Hygiene/Grooming		
Can comb hair, wash face, shave or brush teeth without help of any kind	0	None
Needs and gets supervision or reminding about grooming activities	1	Minimal
Needs some help from another person	2	Moderate
Is completely groomed by somebody else	3	Extensive
Toilet Use/Continence Support		
Can use the toilet without help, including adjusting clothing	0	None
Needs some help to get to and on the toilet, but doesn't have accidents	1	Minimal
Has accidents sometimes, but not more than once a week	1	Minimal
Only has accidents at night	1	Minimal
Has accidents more than once a week	2	Moderate
Has bowel movements in their clothes more than once a week	2	Moderate
Wets their pants and has bowel movements in their clothes very often	3	Extensive
Mobility – Walking and wheeling		
Walks without help of any kind	0	None
Can walk with help of a cane, walker, crutch, or push wheelchair	1	Minimal
Needs and gets help from one person to help walk	2	Moderate
Need and gets help from two people to help walk	2	Moderate
Cannot walk at all	3	Extensive
Positioning		
Can move in bed without any help	0	None
Needs and gets help sometimes to sit up	1	Minimal
Always needs and gets help to sit up at least daily	2	Moderate
Always needs and gets help to be turned or change positions	3	Extensive
Transfers		
Can get in and out of a bed or chair without help of any kind	0	None
Needs somebody to be there to guide them but they can move in and out…	1	Minimal
Needs one other person to help	2	Moderate
Needs two other people, or a mechanical aid, to help	3	Extensive
Never gets out of a bed or chair	3	Extensive

The IADL items included from the IADL section include a consistent root question across all IADLs. This question is: "When [IADL item], this person:". There are then 4 response options that are the same for each item. The figure below displays an example IADL item.

Figure 10

Support needed for meal preparation



Since the response options are consistent across all 5 IADL items, the recoded scoring was also consistent across items. The figure below displays the IADL response option and recoded values we use for scoring GSN.

Figure 11

MnCHOICES IADL item response and recoded values for GSN

All IADL items		
Needs no help or supervision	0	None
Sometimes needs assistance or occasional supervision	1	Minimal
Often needs assistance or constant supervision	2	Moderate
Always or nearly always needs assistance	3	Extensive

After the ADLs and IADLs are recoded into 4-point scales, they can be summed to compose the total GSN score. Since each item ranges from 0 to 3, and there are 13 items included in the GSN, the GSN total sum score ranges from a possible 0 to 39. Please see the Methods section for more information about how these scores and criteria were established.

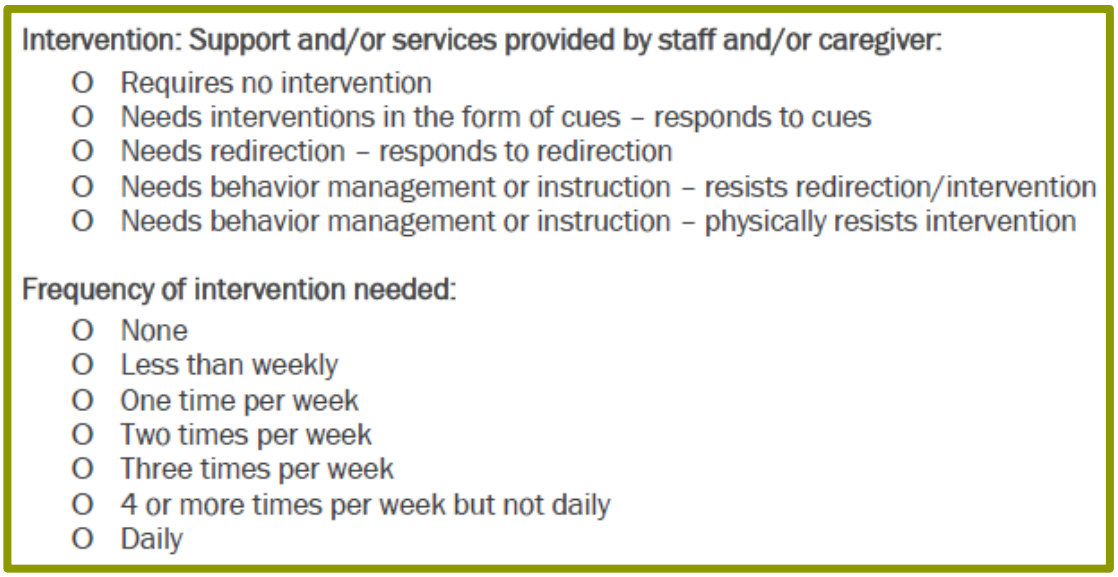
PSYCHOSOCIAL SCORE

As described above, the Psychosocial section of MnCHOICES is summed in three areas including behavior, emotion, and mania/psychosis. Each sum score contributes to support range assignment on its own. The psychosocial items are recoded to a 4-point scale to score each item.

The items included from each of the Psychosocial sections have response options that ask about the seriousness or type of intervention and the frequency of that intervention. The figure below displays the two questions used for each of the psychosocial items.

Figure 12

Psychosocial support need items



Each of these two questions are combined into one item that measures each psychosocial category on a single dimension of support need. The figure below displays how each of the two items above are recoded into a single item for each psychosocial area.

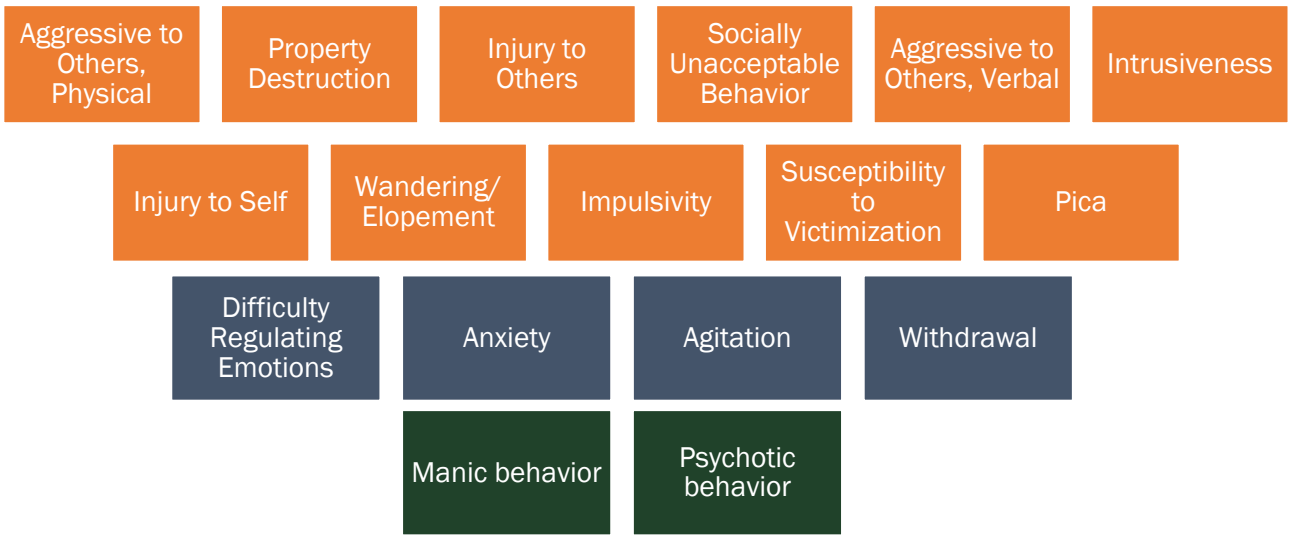
Figure 13

MnCHOICES Psychosocial item response and recoded values for Psychosocial areas

All Psychosocial items			
Frequency	Intervention	Recode	
None	Requires no intervention	0	None
Less than weekly	Any	1	Minimal
One time per week – Daily	Needs interventions or redirection	2	Moderate
One time per week – Daily	Needs behavior management or instruction	3	Extensive

Each category has an introductory question that asks if the person has the behavior, emotion, or mania/psychosis. If the response is "No," the recoded response is 0 for "None."

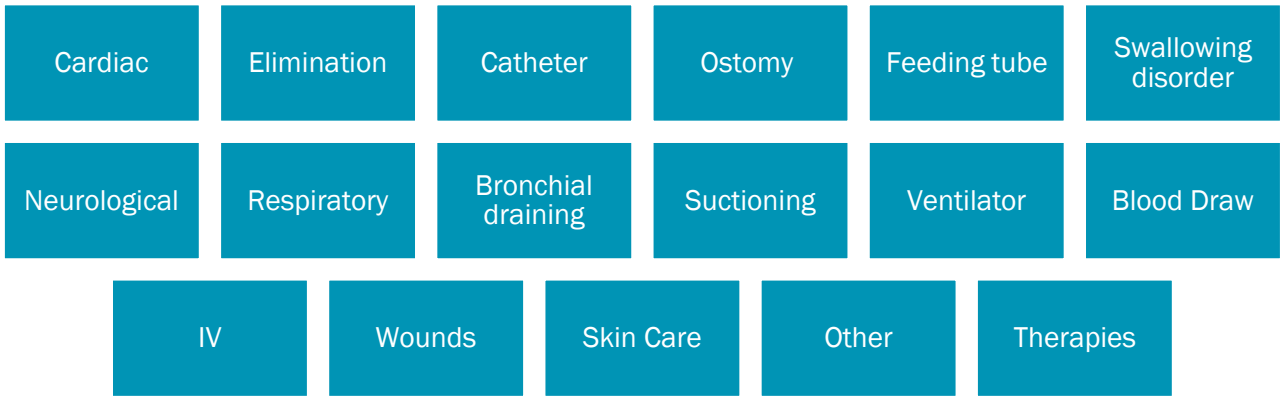
After each of the behavior, emotion, and mania/psychosis items are scored, each psychosocial area scores are summed separately. The PS: Behavior area contains 11 categories that, when summed, range from 0 to 33 (shown in orange below). The PS: Emotion area contains 4 categories that, when summed, range from 0 to 12 (shown in dark blue below). The PS: Mania/Psychosis area contains 2 categories that, when summed, range from 0 to 6 (shown in dark green below).



Please see the Methods section for more information about how these scores and criteria were established.

HEALTH SCORE

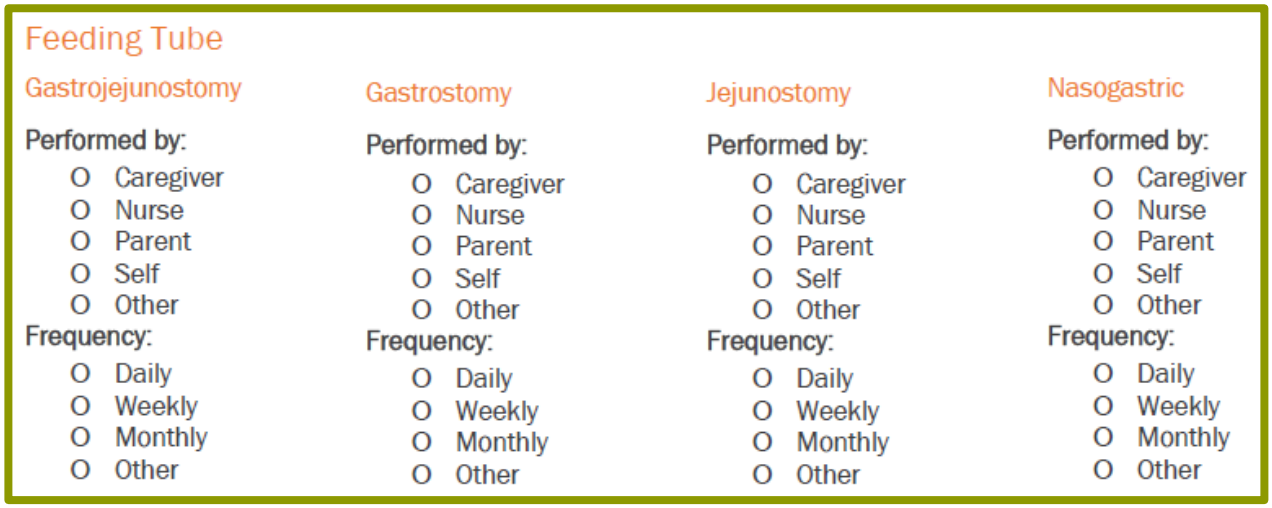
To determine a sum score for Health we considered 17 broad categories of treatment and monitoring in MnCHOICES that were scored and then summed. The 17 categories are:



The items included from each of the treatments cover a varying number of specific health treatments and ask about who performs the treatment and the frequency of the treatment. The figure below displays an example of the specific “treatments” and the “performed by” and “frequency” items for each treatment.

Figure 14

Support needed for feeding tube



Each of the items are first recoded into one item per specific treatment to form the score. The recoded scores are displayed below.

Figure 15

MnCHOICES Health item responses and recoded values for Health area

All Health items			
Performed by	Frequency	Recode	
Self	Any	0	None
Not self	Monthly, Other	1	Minimal
Not self	Weekly	2	Moderate
Not self	Daily	3	Extensive

While most of the Health items follow this same pattern, two categories (neurological and ventilator) have different response questions and response options. These recoded categories are displayed below.

Figure 16

MnCHOICES item responses and recoded values for Neurological and Ventilator are different that other items in Health

Neurological		
Missing	0	None
Requires only observation; no physical assistance and/or intervention	1	Minimal
Requires minimal physical assistance and/or intervention	2	Moderate
Requires significant physical assistance and/or intervention	3	Extensive
Ventilator		
Missing	0	None
Intermittent – not 6 hours per day…	1	Minimal
Intermittent – at least 6 hours per day…	2	Moderate
Continuous…	3	Extensive

Each category has an introductory question about whether the individual requires treatment. When the response to this question is "No," the recoded response for all Health items is 0 for "None."

Once all specific conditions/treatments are recoded, scores can be calculated for each of the 17 broad categories by taking the highest recoded score of the specific conditions/treatments within the category. For example, the Feeding Tube category includes items related to Gastrojejunostomy, Gastrostomy, Jejunostomy, and Nasogastric. Whichever score is highest becomes the score for Feeding Tube. For each of the 17 broad categories the score range is from 0 to 3. Since there are 17 broad categories for Health, the total sum Health score ranges from 0 to 51.

Support Ranges Across the Population

Throughout the development of the framework, we often revisited the distribution of support ranges across the population. This helped to ensure that the framework would be representative of what is known about the population of service recipients and reflective of a logical and practical service system.

The figure below displays the number and percent of adults in each support range. Support Ranges L and 2 contain the most individuals, while Support Ranges 4 and E have the fewest number of individuals.

Figure 17

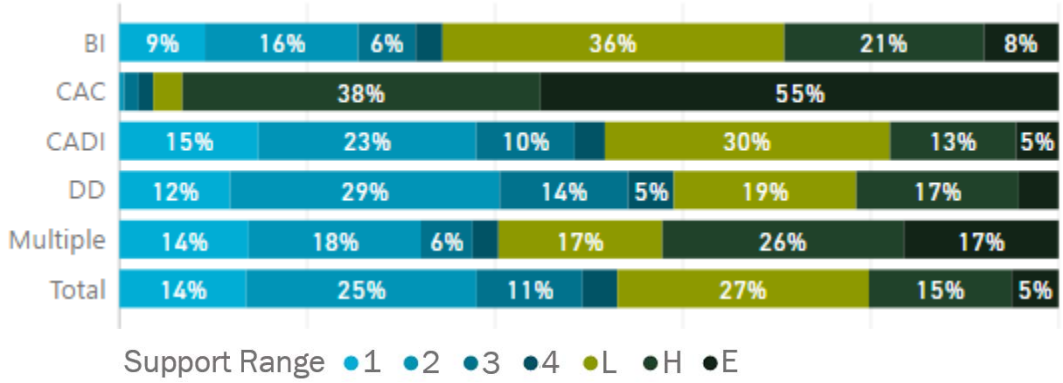
Percent of adults in each support range. n=24,966.

Support Range	n	%
1	3374	14%
2	6124	25%
3	2813	11%
4	927	4%
L	6686	27%
H	3788	15%
E	1254	5%

The figure below displays the percent of adults in each support range by their current waiver. As expected, the majority of individuals on the CAC waiver are in the highest support ranges, Support Ranges H and E. Compared to CAC, CADI, and DD, proportionally more individuals on the BI waiver are in support ranges with high or extraordinary psychosocial or health support needs. Note that percentages less than 4% are not displayed in the figure below due to size constraints.

Figure 18

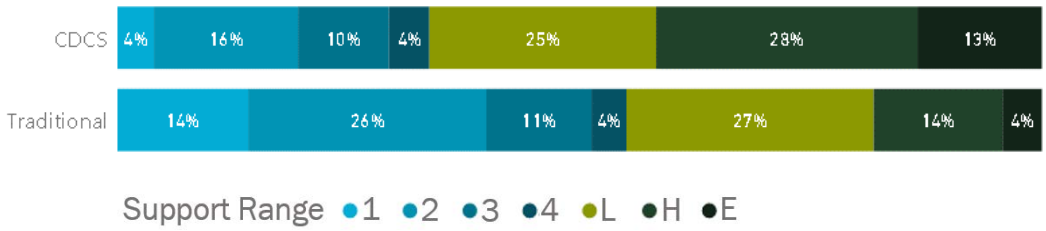
Percent of adults in each support range by waiver. n=24,966.



The figure below displays the percent of individuals in each support range by whether they use CDCS or traditional services. Over half of CDCS users are in Support Ranges L and H.

Figure 19

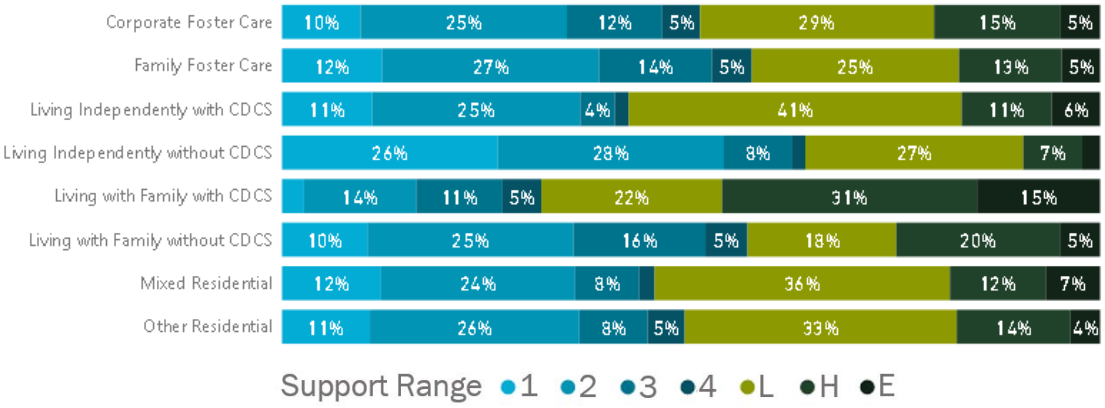
Percent of adults in each support range by CDCS



The figure below displays the percent of adults in each support range by residential setting as determined for analysis of service use and spending (Pawlowski, Petner-Arrey, & Taylor, 2018). Note that percentage values under 4% are too small to display a value.

Figure 20

Percent of adults in each support range by residential setting.



Background and Approach

In this section, we describe the background of the project and outline our general approach, including the explicit tasks used to develop the methodology. More information about this approach and the proposed activities can be found in the individual budget methodology proposal (Kidney, Petner-Arrey, & Agosta, 2018).

Background

In accordance with DHS's goal of developing an individual budget methodology using data from the MnCHOICES assessment, we proposed and competed a number of steps towards the development of this methodology.

The process that we proposed considers multiple data sources, including MnCHOICES data, service expenditure data, expert opinion, and service recipient records. First, we analyzed MnCHOICES data to consider items, developed scores for each item, developed scoring areas and sum scores, and finally developed scoring criteria to determine preliminary support ranges. Next, we collected data using an expert panel to develop support range descriptions and to inform improvements to the preliminary support range framework. Then we began the process to develop service mixes for each of the support ranges. Finally, we will collect data during a record review process to determine whether individual service recipient records comport with the individual budget methodology as proposed, or whether additional changes are warranted.

Our proposal involved nine steps, the first six of which have been completed, that are described briefly below.

Since this report is preliminary, work to develop model services mixes, complete record review, and offer recommendations for recalibration is ongoing. Information pertaining to the tasks described here, as well as the remaining work, will be detailed in a later report.

We proposed a unified methodology to provide a budget for individuals served among each of the four waivers, BI, CAC, CADI, and DD, considered in this project. We opted to exclude children from the support range framework due to:

- Differences in the assessment which would have required us to develop an entirely different framework for children and adults
- Inability to thoroughly account for differences in need based on ages of children within the assessment and scoring of the assessment (e.g., no mechanism to account for the fact that younger children naturally have higher support needs)
- Different methods required to develop the framework

Adults, for the purposes of the support range framework, are defined as individuals aged 18 and above. In each of the tasks described below, only adults are included. Children will, however, be included in the budget methodology, but will be treated as a single group (e.g., they will not be assigned support ranges).

Approach

Below we describe briefly the first 6 steps that we have used to develop the support range framework.

Involving Stakeholders

Stakeholders have been vital to the work performed to date having provided much of the context for our current understanding of the service system. As a result, our proposal involved several opportunities for them to continue to participate. Specifically, we met with stakeholders to present information about our proposal and to gain their feedback and we included several stakeholders in an expert panel that directly contributed to project activities. In the methods section, stakeholder involvement is captured through the activities that they participated in, and in the ways that they participated—primarily through their involvement in the development of support range descriptions, the development of the framework criteria, and providing input into service mixes. Their involvement will lend credibility to the final budget methodology and has meaningfully impacted the work that we have completed to date.

Determine Preliminary Support Ranges

We planned to determine preliminary support ranges that could be refined through additional tasks and analyses. To determine these preliminary support ranges, we conducted a number of analysis. We identified MnCHOICES items that could be used

in the support range framework, then we conducted analysis to determine how the items worked together. After that, we used analysis to determine the number of support ranges that we should have and to determine what the criteria for each support range was—that is what scores from the assessment would be included in each support range. This preliminary support range framework accounted for general support needs (GSN), psychosocial support needs, and health support needs, just as the current framework does. We assigned each individual to a support range and conducted descriptive analyses to describe their support needs. These preliminary support ranges included all of the current support ranges, with the exception of E. We withheld developing criteria for E, opting to collect more information to determine who should be included in this support range.

Develop Descriptions

Next, we planned to develop support range descriptions, since these help to describe the framework as a whole. To develop the support range descriptions, we used the analyses that we conducted in the previous task and provided it to several expert panel members. They reviewed the analysis and were asked a number of questions pertaining to the kinds of support that individuals who were assigned to each support range might need. For this activity, we used the Charting the LifeCourse (CLTC)[1] as a lens to consider support needs in a variety of life domains. We provided a training to expert panel members to describe the data and our expectations for them completing the activity. After they provided responses, we merged the responses to form the support range descriptions (See Appendix A for full descriptions) and adjusted specific wording for cohesion. We also opted to use first person voice for the support ranges based on the responses of one expert panel member. This task in the methods section is referred to as Develop Support Range Descriptions since we opted to call this framework the Support Range Framework.

Conduct Support Range Membership Survey

When the support range descriptions were complete, we used the descriptions to ask expert panel members to consider the support needs of service recipients in Minnesota. To complete this task, we first developed MnCHOICES profiles for 800 service recipients in Minnesota. We used items from their MnCHOICES assessment to compile the profiles. We did not use any personally identifiable information. We then provided training to the expert panel members. We asked that they review a number of profiles to determine support needed for GSN, Psychosocial, and Health. We also asked them to decide which support range they thought the person should be assigned. We collected responses for each service recipient and completed analysis to refine our preliminary framework. This task in the methods section is referred to as Support Range Assignment Exercise, since that is the terminology that we used with the expert panel.

[1] www.lifecoursetools.org

Conduct Support Range Membership Survey Analysis

After we conducted the support range member survey we collected all the responses and analyzed them in comparison to our preliminary support range framework. We specifically compared our support range assignments to those of the expert panel members and considered differences and similarities. We also compared responses for each of the GSN, Psychosocial, and Health areas to our scores for each of those areas. We conducted specific analysis such as reviewing the individuals who were assigned to Support Range E, since our preliminary support range criteria did not include criteria for people to be assigned to Support Range E. This task in the methods section is included under Support Range Assignment Exercise, in keeping with how we referred to the activity with expert panel members.

Determine Framework Criteria

We then used this analysis to refine our preliminary support ranges. In particular, we learned that our preliminary criteria for Support Ranges 1-4, were consistent with the assignments of the expert panel. Expert panel members, however, were more likely to assign individuals to Support Ranges L and H than our preliminary criteria. We adjusted our preliminary criteria so that more individuals could be assigned to those support ranges, with minimal impact to Support Ranges 1-4. We also reviewed the individuals who were assigned to Support Range E, and used the information from that analysis to develop criteria for Support Range E.

Ongoing Tasks

There are three remaining tasks that we will complete to finalize the budget methodology. These include development of model service mixes, record review, and recommendations for recalibration. The development of the model service mixes is a task to determine the anticipated service use of individuals assigned to each support range, by residential setting and age. The model service mix is then priced out using units and average rates to determine the total budgets. After the budgets are complete, the record review will allow us to determine whether the budgets are adequate for service recipients and whether the support range framework meaningfully groups individuals with similar support needs. This will give us information that we may use to make final adjustments to the budget methodology. Finally, we will provide recommendations for adjustments, or recalibration, so that the methodology can account for changes to MnCHOICES, changes to services, changes to rates, and so forth.

The specific analyses that were completed are described in the Methods section.

Method

This section presents the methods we used to develop the preliminary Support Range Framework. It includes more in-depth information pertaining to the tasks that we have completed and the specific analyses that were used to develop the Support Range Framework and documents our decisions and rationale. This section also includes our requirements for consideration that we used to choose the appropriate framework.

Determine Preliminary Support Ranges

As described in our proposal and recapped above, the second task involved determining preliminary support ranges using MnCHOICES data. The purpose of this task was to create a data-informed Support Range Framework, that could be used to develop support range descriptions and assist with later refinements.

To that end, we explored MnCHOICES data to answer the following questions:

1. Which items could be combined to determine sum scores for GSN, Psychosocial support need, and Health support need?
2. What is the most appropriate number of support ranges for the Support Range Framework?
3. What sum scores create support ranges that contain individuals similar to one another and different than individuals in other support ranges?

PARTICIPANTS

DHS provided us with MnCHOICES data from 24,966 individuals. For the purposes of creating a support range framework for adults, we excluded all children. The individuals included in the analysis spanned all four waivers as well as individuals on multiple waivers. Figure 21 below displays the number of individuals on each waiver.

Figure 21

Number of individuals on each waiver. N = 24,966.

WAIVER	n
BI	866
CAC	194
CADI	15,781
DD	8,016
Multiple	109

Total	24,966

For more information about the demographics of the adults included in these analyses, see *Analysis of MnCHOICES* (Kidney, Petner-Arrey, & Agosta, 2018).

For this analysis, we created stratified random samples. Since we initially considered the inclusion of children we stratified by both age group and waiver. The larger dataset was first split into smaller age group by waiver subsets (e.g. adults in the BI waiver, adults in the CAC, etc.). Individuals in each of these age group by waiver subsets were then assigned a random number. Next, a median split based on the random numbers was used to assign individuals to one of two stratified random samples. Finally, the subsets were merged back together to form two approximately equally sized datasets for the purposes of exploratory factor analysis (EFA; n = 12,482) and confirmatory factor analysis (CFA; n = 12,484).

INITIAL EXPLORATORY ANALYSES

To first explore the factor structure of the items that compose the MnCHOICES Activities of Daily Living (ADLs), Instrumental Activities of Daily Living (IADLs), and Psychosocial section, we began by examining the available items for each section. For ADLs, we prioritized the ability items (e.g., "In regard to the ability to bathe or shower, this person…") because these items provide the richest information about ADL support needs including details regarding the specific nature of required support (e.g., "Can bathe or shower without any help" versus "cannot bathe or shower, needs complete help"). Precisely because of the rich detail provided for each ADL support need, all ADL items do not use the same rating scale across in MnCHOICES. To score the assessment, therefore, we,

Analysis Terms

This key clarifies some of the commonly used terms in this report terms for some analyses we may conduct if deemed necessary and best suited for the data.

Factor Analysis identifies the underlying dimensions of a measurement, including relationships between items and whether any items do not relate to the underlying dimensions. We conducted exploratory factor analysis to understand the number of underlying dimensions in the data and how items relate, or whether they should be excluded from measures of support need. Then we conducted confirmatory factor analysis to determine whether the data support the proposed structure of the support need measures and inclusion of items for analysis.

Latent Class Analysis (LCA) is a statistical analysis for identifying class (or group) membership among individuals. LCA uses measured data (i.e., MnCHOICES) to find groups of similar individuals. LCA tests whether the data support a pre-defined number of groups that exist in the data, and which individuals belong to each group. We used LCA to determine the number of support ranges as well as the composition of support ranges.

Score versus Sum Score. The word "score" may refer to the numeric value of a response item or the sum of all responses for that framework area (e.g., bathing score versus GSN). We try to specify "sum score" for the latter in this report.

recoded the original scale into a consistent 4-point scale (e.g., none, minimal, moderate, extensive) across all ADL items. Figure 22 provides an example of how this recoding was completed for the ability item for eating. The final recoding of all items is included in the Findings section of this report.

Figure 22

Example of recoded ADL response scale

ORIGINAL ITEM RESPONSE SCALE	RECODED RESPONSE SCALE
In regard to the ability to manage eating by themselves, this person…	
Can eat without help of any kind	None
Needs and gets minimal reminding or supervision	Minimal
Needs and gets help cutting food, buttering food or arranging food	Moderate
Needs and gets some personal help with feeding or someone needs to be sure that you don't choke	Extensive
Needs to be fed completely or tube feeding or IV feeding	Extensive

Similarly, for IADLs, we selected the items in MnCHOICES that provided the most information about individuals' support needs (e.g., "When doing simple meal preparation, this person…"). No adjustments were made to this response scale because the parallel items across the IADLs used a consistent response scale (i.e., needs no help or supervision, sometimes, often, always), that was consistent with 4-point scale we opted to use in other sections of the assessment.

For the Psychosocial section, we used both the initial introductory items, which inquire whether a particular behavior, emotion, or mania/psychosis is something the individual "engages in or would without intervention" and the intervention items (e.g., "Intervention: Support and/or services provided by staff and/or caregiver"). The response scale was modified so that it would have similar 4-point response format (Figure 23). If the item was skipped because the introductory item indicated that the person did not have that particular behavior, emotion, or mania/psychosis, the item was recoded to "none." When combined, these two items provide information regarding whether the behaviors, emotions, and mania/psychosis represented in the psychosocial section were relevant to the individual, and the kinds of supportive intervention, if any, they needed.

Figure 23

Example of recoded psychosocial response scale

ORIGINAL ITEM RESPONSE SCALE	RECODED RESPONSE SCALE

Requires no intervention	None
Needs interventions in the form of cues – response to cues	Minimal
Needs redirection – response to redirection	Moderate
Needs behavior management or instruction – resists redirection/intervention	Extensive
Needs behavior management or instruction – physically resists intervention	Extensive

After all items were recoded , an initial EFA including all selected ADL, IADL and Psychosocial items was conducted in SPSS 22.0. Eigen values indicated that a seven-factor solution was a good fit to the data explaining 44.8% of the variance. These seven factors were interpretable as:

1. ADL (general: bathing, eating, dressing, grooming, toilet use)
2. ADL (movement: mobility, transfers, positioning)
3. IADLs (general: meal preparation, transportation, shopping, finances)
4. IADLs (housework)
5. IADLs (telephone use)
6. Psychosocial (behaviors)
7. Psychosocial (emotions)

These initial findings suggested that having multiple items for housework and using the telephone was not ideal because of the common underlying activity of these item pairs, therefore, one of each item type (light housework and answering telephone) were removed and another EFA was conducted. This second EFA resulted in a five-factor solution with eigen values indicating that 38.8% of the variance was explained. This analysis demonstrated that removing the second housework and telephone use items made plausible the development of one cohesive scale.

The five factors that resulted from this analysis include those described here. Factor 1, the general ADL factor, was comprised of 5 items that explained 7.1% of the variance with factor loadings from .719 (dressing) to .159 (toilet use). Factor 2, the movement ADL factor, was comprised of 3 items that explained only 3.6% of the variance with factor loadings from .604 (transfers) to .513 (mobility). Factor 3, the IADL factor, was comprised of 6 items that explained 8.1% of the variance with factor loadings from .753 (shopping) to .431 (finances). Factor 4, the Psychosocial Behavior factor, was comprised of 12 items that explained 12.8% of the variance with factor loadings from .793 (physical aggression toward others) to .261 (legal involvement). Finally, the fifth factor, the Psychosocial Emotion factor, was comprised of 6 items that explained 7.1% of the variance with factor loadings from .599 (difficulty regulating emotions) to .338 (manic behaviors). The figure below displays the items and factor loadings of the EFA.

Figure 24

Summary of EFA results

	FACTOR LOADINGS				
ITEM	ADL: general	ADL: movement	IADL	Psychosocial: behavior	Psychosocial: emotion

Dressing	**.719**	.190	.094	-.081	-.090
Grooming	**.703**	.147	.224	.064	-.123
Bathe	**.699**	.153	.190	-.004	-.120
Eat	**.464**	.205	.136	.039	-.123
Toileting	**.159**	.035	.023	-.061	.038
Transfer	.207	**.604**	.056	-.012	-.032
Positioning	.168	**.521**	.037	-.002	-.052
Mobility	.345	**.513**	.114	-.055	-.052
Shopping	.172	.015	**.753**	.086	-.016
Meal Preparation	.175	.059	**.743**	.113	-.033
Transportation	.152	.115	**.654**	.152	-.002
Heavy Housework	-.050	-.097	**.583**	-.050	-.017
Phone (calling)	.259	.150	**.510**	.259	-.111
Finances	.294	.203	**.431**	.294	.006
Aggressive to Others, Physical	-.022	.031	.126	**.793**	.095
Property Destruction	-.043	-.017	.070	**.667**	.138
Injury to Others	.082	-.024	.067	**.628**	.052
Socially Unacceptable Behavior	-.055	.006	.111	**.570**	.224
Aggressive to Others, Verbal	-.116	.067	.098	**.544**	.412
Intrusiveness	-.047	-.037	.110	**.525**	.190
Injury to Self	.018	.001	.088	**.512**	.202
Wandering/Elopement	-.048	-.041	.114	**.483**	.131
Impulsivity	-.117	.004	-.024	**.477**	.423
Susceptibility to Victimization	-.155	.061	.145	**.417**	.301
Pica	.159	-.087	.061	**.296**	-.030
Legal Involvement	-.106	.066	-.133	**.261**	.157
Difficulty Regulating Emotions	-.068	-.013	.042	.428	**.599**
Anxiety	-.028	-.096	-.002	.129	**.597**
Agitation	-.031	.012	.071	.480	**.554**
Withdrawal	-.015	-.088	-.020	-.003	**.547**
Psychotic Behavior	-.098	.020	-.052	.145	**.359**
Manic Behavior	-.032	-.006	-.080	.138	**.338**

MEASURING GSN

We next sought to create a sum score measuring General Support Need or GSN. We define GSN as the overall daily needs a person has, which includes ADLS (e.g., bathing and dressing) and IADLS; e.g., transportation and meal preparation). Prior to summing items in MnCHOICES, we further tested whether the items in the ADL and IADL factors from the exploratory analyses created viable scales using confirmatory factor analysis (CFA) with the R lavaan package version 0.5-20 (Rossell, 2012). These additional analyses were conducted on the separate CFA dataset that had previously

been randomly selected. We evaluated model fit by considering the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), standardized root mean squared residual (SRMR), and item loadings; neither the $\chi 2$ test or the Root Mean Square Error of Approximation (RMSEA) were used because of the sensitivity of the $\chi 2$ test to large sample sizes (Kline, 2011) and the sensitivity of the RMSEA to model size (Breivik & Olsson, 2001; Cheung & Rensvold, 2002). We used these cut points as general guidelines for interpreting model fit: CFI and TLI >.95 is considered good and >.90 is adequate; SRMR <.06 is good and < .08 is adequate (Hu & Bentler, 1999).

First, we tested a single ADL scale, which was preferred over the two factor scale suggested by the EFA because of previous theoretical support for this construct being composed of a collection of activities such as those that are assessed in MnCHOICES. The ADL scale, which was composed of 8 items, demonstrated evidence of good fit (CFI: .96; TLI: .95; SRMR: .04) with item loadings ranging from .849 to .391. The initial IADL scale that was tested, which was composed of 6 items from the EFA, showed evidence of inadequate fit (CFI: .89; TLI: .82; SRMR: .06); both item loadings and correlation residuals suggested that the finances item may be the source of this poor fit. Therefore, a new 5 item IADL scale was tested and resulted in overall evidence of good fit (CFI: .97; TLI: .94; SRMR: .03) with item loadings ranging from .796 to .570. We, therefore, adopted the 6-item ADL and 5-item IADL scale for our computations of the GSN score (Figure 28).

Figure 25

GSN score items for both ADLs and IADLs.

ADL/IADL	Item		Fit
ADL	In regard to the ability to...	Factor Loadings	CFI/TLI/SRMR
Dressing	manage dressing, this person	.849	.96/.95/.04
Bathing	bathe or shower, this person	.842	
Positioning	manage sitting up or moving around, this person	.818	
Grooming	manage grooming activities, this person	.779	
Transfers	Get in and out of bed, this person	.770	
Eating	manage eating by themselves, this person	.686	
Mobility	walk, this person	.685	
Toilet Use	manage using the toilet, this person	.391	
IADL	When...	Factor Loadings	CFI/TLI/SRMR
Telephone Use	"calling" on the phone, this person	.796	.97/.94/.03
Meal Preparation	doing simple meal preparation, this person	.775	

Transportation	Moving about the community, this person	.668
Housework	Performing “heavy” housekeeping, this person	.609
Shopping	Managing shopping for food or other items, this person	.570

MEASURING PSYCHOSOCIAL SUPPORT NEEDS

Next, we sought to determine how to create a sum score for psychosocial support needs. Using the split half of the dataset created for the CFA, we first tested the 12-item behavior scale and 6-item emotion scale that were identified during our exploratory analyses. However, both the behavior scale (CFI: .90; TLI: .88; SRMR: .04) and the emotion scale (CFI: .91; TLI: .84; SRMR: .05) had borderline inadequate fit to the data suggesting revisions were necessary. We next explored revisions to these scales with the joint goal of improving fit and ensuring scale content was theoretically sound. First, for the psychosocial behavior scale, factor loadings in the initial EFA (.261) and CFA (.148) suggested that legal involvement was an item that should possibly be removed from the scale. In testing an 11-item psychosocial behavior scale (with legal involvement dropped from the scale), model fit improved very slightly (CFI: .91; TLI: .89; SRMR: .04). Second, regarding the psychosocial emotion scale, the factor loadings suggested that manic and psychotic behaviors should perhaps be removed from the scale. In testing the removal of these items, the new 4-item psychosocial emotion scale improved in fit in terms of the CFI, but declined in fit based on the TLI (CFI: .93; TLI: .80; SRMR: .04); the overall conclusion drawn from these analyses is that the psychosocial emotion scale still had inadequate fit to the data. We determined that including frequency, in addition to support need, may address a potential problem of not accurately identifying individuals who need support for behaviors or emotions infrequently.

To explore this potential option, new variables called inclusive support need were created that combined the intervention support and frequency items to simultaneously consider support need and frequency (Figure 27). Next, the psychosocial behavior and emotion scales using the new inclusive support need variable were tested with CFA. The 11-item psychosocial behavioral scale fit remained nearly the same with the new items (CFI: .90; TLI: .88; SRMR: .04), however, the 4-item psychosocial emotion scale (CFI: .94; TLI: .81; SRMR: .04) improved slightly. Despite these scales still having borderline inadequate fit, we decided to move forward in calculating preliminary support range assignments using the sum of the 11 behavior items, 4 emotion items, and a separate sum for the manic and psychotic behavior items. Given that MnChoices is currently being revised, this process should be repeated in the future when MnChoices 2.0 data becomes available to improve model fit

Figure 26

Example combination of frequency and interventions support items to form inclusive support needs variable

Inclusive support need variable	Frequency of intervention	Intervention support
None	None	None
Less than weekly	Less than weekly	Minimal or moderate or extensive
At least weekly minimal or moderate intervention	One time per week *OR* Two times per week *OR* Three times per week *OR* 4 or more times per week but not daily *OR* Daily	Minimal or moderate
At least weekly extensive intervention	One time per week *OR* Two times per week *OR* Three times per week *OR* 4 or more times per week but not daily *OR* Daily	Extensive

MEASURING HEALTH SUPPORT NEEDS

Due to the nature of the MnCHOICES items in the Health section, we took a different approach to determining the Health score. Factor analysis groups items based on how they vary together, however, the majority of variables that are used in the Health section have little to no variance, thus there is nothing to base factor analysis on (McDonald, 2013). Most individuals have no or few of the 17 health condition categories in MnCHOICES.

Instead, we explored alternative means to approximate health support need. Since there was no statistical basis for excluding any health treatments, we were unable to reduce the number of items that contribute to the Health score. Therefore, we included all 17 categories of treatment and monitoring (see Findings section for list of 17 categories).

The categories included from each of the health treatments cover a varying number of specific health conditions/treatments and asks about who performs the specific treatment, as well as the frequency of the treatment. We used responses to these two items to create a 4-point scale that mirrors the 4-point scales in the GSN and PS scores. The figure below displays the recoding of the 15 Health categories that include the performed by and frequency items.

Figure 27

MnCHOICES Health items and recode for Health score

All Health items

Performed by	Frequency	Recode

Self	Any	0	None
Not self	Monthly, Other	1	Minimal
Not self	Weekly	2	Moderate
Not self	Daily	3	Extensive

While most of the Health items follow this same pattern, two items have different response questions and response options than "performed by" and "frequency." The recode for Neurological and Ventilator are displayed below.

Figure 28

MnCHOICES item responses and recoded values for Health area that are different from the majority of items

Neurological		
Missing	0	None
Requires only observation; no physical assistance and/or intervention	1	Minimal
Requires minimal physical assistance and/or intervention	2	Moderate
Requires significant physical assistance and/or intervention	3	Extensive
Ventilator		
Missing	0	None
Intermittent – not 6 hours per day…	1	Minimal
Intermittent – at least 6 hours per day…	2	Moderate
Continuous…	3	Extensive

To create a sum score for each of the 17 broad categories, we determined the best approach to be using the highest of the scores of the items grouped under the condition/treatment. For example, for Feeding Tube, the highest of the scores for Gastrojejunostomy, Gastrostomy, Jejunostomy, and Nasogastric becomes the score for Feeding Tube, since these items are grouped in the Feeding Tube category. Since the specific treatments are recoded to a value of 0 to 3, the broad category score range is from 0 to 3. We adopted this approach since the number of specific treatments under each broad category differs, as well as the complexity and detail of each treatment. Using a mean, median, or mode score for each broad category may result in scores that are not equivalent to one another across the broad categories since there are a different number of items in each category. Since we sought to create a score that estimates the total support needed, using the highest score within each broad category ensures that need is less likely to be underrepresented. Once the 17 broad category scores were determined, we summed them to create a Heal support needs score that ranges from 0 to 51.

NUMBER AND SCORES FOR SUPPORT RANGES

We conducted analyses to explore the groupings of individuals in the MnCHOICES data. We conducted latent class analysis (LCA) to determine the statistical model with the best fit, including identifying the number of classes and best combination of sum scores to include in the framework. Once we determined which model was the best fit, we used the latent class analysis findings on class assignment to determine the best cut-off scores to create support ranges. That is, we used this analysis to determine

how many supports ranges we should have, and which scores would be associated with each support range.

The LCAs indicate—based on the model used in the analysis—which class each person belongs to using the MnCHOICES scales for GSN, Psychosocial, and Health that were created in previous steps. With these in consideration LCA then allows us to determine the criteria for each support range by using the cut-off scores on scales that most closely match the class membership from the LCA model. For clarification in the following discussion: *class* is assigned to an individual by the LCA, and *support range* is assigned to an individual in the framework we created based on the LCA analysis.

We tested models with 3 to 11 classes to determine which number of classes creates a statistically and practically sound framework. In addition to showing good statistical model fit, a framework with only one or two support ranges does not provide distinctions in the service population that would merit differences in individual budgets. A framework containing many groups may be too granular compared to the budgets, rates, and/or service mixes they are meant to be associated with. Further, any small differences in support needs over time or issues with the assessment will become more pronounced when group membership changes due to the small difference. In our past work in other jurisdictions, we found that frameworks with many levels/support ranges were eventually collapsed to make more feasible and meaningfully distinct groups (e.g., an initial framework in one jurisdiction contained 42 levels and was later reduced to 7). Therefore, we recommend—if feasible and statistically sound—a framework containing from 5 support ranges (including extraordinary support need ranges for medical and/or behavioral needs) up to 7 support ranges. However, to ensure that we do not force over-simplicity onto the framework by limiting the potential number of support ranges to 7, we opted to test up to 11 classes. Hence, the models tested contain 3 to 11 classes of measurement of support need.

To determine the best model fit, we tested models using the scales determined as appropriate in the previously described factor analyses. The models differed on the scales included and number of groups (support ranges). The purpose of testing a variety of models is to use this exploratory analysis to determine the best fit model across a variety of options. The figure below displays all of the models tested in the LCAs. Note that we conducted LCA analyses with half of the sample, since the size of the entire sample substantially increased model testing time, and a random split sample had adequate size and representativeness for the analysis.

Figure 29

Scales and Number of Classes Included in Each Analyzed LCA Model

		SCALES INCLUDED				
MODEL #	# OF CLASSES	ADL & IADL	PS: Behavior	PS: Emotion	PS: Mania/ Psychosis	Health
1	11	✓	✓	✓	✓	✓
2	10	✓	✓	✓	✓	✓

3	9	✓	✓	✓	✓	✓
4	8	✓	✓	✓	✓	✓
5	7	✓	✓	✓	✓	✓
6	6	✓	✓	✓	✓	✓
7	5	✓	✓	✓	✓	✓
8	10	✓	✓	✓	✓	
9	9	✓	✓	✓	✓	
10	8	✓	✓	✓	✓	
11	7	✓	✓	✓	✓	
12	6	✓	✓	✓	✓	
13	5	✓	✓	✓	✓	
14	9	✓	✓	✓		
15	8	✓	✓	✓		
16	7	✓	✓	✓		
17	6	✓	✓	✓		
18	5	✓	✓	✓		
19	6	✓				
20	5	✓				
21	4	✓				
22	3	✓				
23	9	✓	✓	✓		✓
24	8	✓	✓	✓		✓
25	7	✓	✓	✓		✓
26	6	✓	✓	✓		✓
27	5	✓	✓	✓		✓

Note that we did not test all variations of included scales for a number of reasons. First, the framework must include statistically grounded groups for GSN. Therefore, all models included ADLs and IADLs. Due to the inability to perform factor analyses with the Health score, we excluded Health from models so that the score didn't create poor model fit due to score construction. Since the PS: mania/psychosis sum score only contained two, we also removed that sum so that it did not affect model fit. After testing 27 models, it was clear that the models including only GSN had best fit. Therefore, we did not test other variations excluding other Psychosocial scales.

MODEL REQUIREMENTS FOR CONSIDERATION FOR LEVEL FRAMEWORK ADAPTATION

Once we tested all models with LCA and differences among classes were explored, we examined the findings in relation to six requirements that we determined would demonstrate which model had optimal fit For consideration as a final model to inform the support level framework, the model must pass each of the below requirements. See *Budget Methodology Proposal* (Kidney, C., Petner-Arrey, J, & Agosta, J., 2018) for more information on these model requirements.

Model shows statistical fit and good entropy
Classes are statistically different from one another
Classes group individuals from low support need to high support need
Classes group individuals in a way that captures the complexity of the population
Classes distribute individuals among levels in practically-sized groups
Classes closely correspond to scores on support need variables

MODEL SELECTION AND ADAPTATION TO LEVEL FRAMEWORK CRITERIA

Once we completed all analyses and applied the model requirements, we selected the most appropriate model to inform the level framework criteria. We then applied the support range criteria and conducted descriptive analyses to illustrate the framework in the dataset. We examined the distribution of subscale and total scale scores by support range, the frequencies of support ranges, and the relationships between support ranges and individual items and sum scores.

Statistical Fit and Entropy. We determined model fit by examining the following indicators (Akaike, 1974; Schwatrz, 1978; Sclove, 1987; Granado, 2015; Colins & Lanzo, 2013).

- Akaike Information Criteria (AIC): measure of goodness of fit of a model in which small values correspond to better fit.
- Bayesian Information Criteria (BIC): another measure of goodness of fit, sensitive to model parameters and the number of observations, in which small values correspond to better fit.
- Sample-size adjusted BIC (SSABIC): a measure of fit similar to the BIC that also considers the effect of sample size. Small values also indicate better fit.
- Entropy: standardized measure ranging from 0 to 1 of the classification accuracy of placing participants into classes. Higher entropy values reflect better classification of individuals. Entropy is often considered a measure of effect size where a minimum of 0.80 indicates good classification.
- Lo-Mendell-Rubin Adjusted Likelihood Ration Test (LMR-LRT): measure of goodness of fit of a model. A non-significant value suggests that the model with one fewer class is a better explanation of the data.

The figure below displays the goodness-of-fit indices for the LCA models. Across all models, the LMR-LRT was statistically significant for most models. The entropy was above 0.80 for all tested models except models 24 and 25. When comparing the AIC, BIC, and SSABIC across all models, models 19 through 22 clearly demonstrate better

model fit than all other models. Among Models 19 through 22, the AIC, BIC, and SSABIC slightly decrease as the number of classes increase, indicating a slight preference for a model with a greater number of classes. However, Model 20 has a lower entropy than Model 21. As the differences in AIC, BIC, SSABIC, and entropy are not substantial among Models 19, 20, and 21, these three models were considered the best fit and used for further analyses.

Figure 30

LCA Goodness-of-Fit Indices for all Tested Models (n=12,482)

Model #	AIC	BIC	SSABIC	Entropy	LMR-LRT
1	317724.852	318334.280	318073.692	0.868	1079.610
2	318656.537	319213.940	318975.598	0.879	1113.238**
3	319763.643	320269.022	320052.926	0.905	1312.358**
4	321071.940	321525.295	321331.443	0.901	4233.583**
5	325328.928	325730.258	325558.652	0.969	5153.642**
6	331118.520	331467.826	331318.465	1.000	14490.680
7	345787.240	346084.522	345957.406	1.000	8715.001**
8	264263.268	264738.919	264535.534	0.879	1149.142**
9	265409.112	265840.171	265655.853	0.904	1299.739**
10	266708.334	267094.801	266929.550	0.900	4009.528**
11	270741.287	271083.161	270936.978	0.969	5101.634**
12	276503.805	276801.087	276673.971	1.000	14490.668
13	291174.513	291427.203	291319.155	1.000	8689.629**
14	270955.871	271312.610	271160.071	0.829	691.075**
15	271651.601	271971.179	271834.529	0.812	724.402*
16	272381.363	272663.781	272543.021	0.805	1054.036**
17	273447.749	273693.007	273588.136	0.801	1630.802**
18	275103.131	275311.228	275222.247	0.820	1454.312**
19	133796.934	133938.143	133877.763	0.876	550.278**
20	134360.660	134479.572	134428.726	0.855	1139.242**
21	135534.163	135630.780	135589.467	0.868	803.038**
22	136359.581	136433.901	136402.122	0.723	2235.496**
23	324777.492	325208.550	325024.232	0.803	661.781*
24	325438.966	325825.432	325660.182	0.797	987.776**
25	326432.196	326774.070	326627.887	0.794	1212.343**
26	327653.961	327951.243	327824.127	0.803	1688.018**
27	329359.807	329612.497	329504.448	0.822	1462.375**

Note: ** p <.01

In summary, these results show that the models that included only ADLs and IADLs showed better fit, and the models with 4, 5, or 6 classes have the best fit. Since all model requirements that must be met extend beyond statistical fit, we did not accept the best model fit prior to conducting more analyses. So while Model 19 showed the best model fit, we needed to conduct more exploration of whether the characteristics of that model were best suited for the Support Range Framework. Further, across all models tested, these three models showed far superior fit than other models and

relatively equal model fit to one another. Therefore, we considered all three models, 19, 20, and 21, for further analysis.

Class Differences. We next conducted univariate general linear models (GLM) to determine whether statistically significant differences exist among the classes. Statistical differences among classes indicate that the classes are distinct from one another, and therefore warrant separate groupings in the Support Range Framework. Since the comparison of LCA models indicated that Models 19, 20, and 21 had notably better fit than the remaining models listed above, we only conducted GLMs with classes from Models 19, 20, and 21.

For the purpose of this analysis, the most important findings from the GLMs are whether the tests supported significant differences and the effect size (strength of the difference, if significant). Effect size in GLMs is measured with partial eta squared, η^2_p. The η^2_p values range from 0 to .99 with larger values indicating greater effect size. While a universal rule of thumb does not exist for what is an adequate partial eta squared value, a value over .30 typically indicates strong effect size, or a high level of confidence in the statistical difference between two groups.

See the figure below for the results of the GLMs. All models resulted in statistical differences among classes Partial eta squares (η^2_p) range from .006 to .953 for Model 19, .004 to .937 for Model 5, and .002 to .882 for Model 6. These effect sizes show that, while significant differences exist across all scales measured, the only strong differences exist with ADLs. This finding is unsurprising given that the LCA models we selected do not differentiate classes by any other scores besides ADLs and IADLs, yet as general support need increases, support needs related to health and psychosocial behaviors likely also slightly increase.

Figure 31

General Linear Model Results of Scores by LCA Model Classes (n=12,482)

LCA Model	Scales	R^2	df	M^2	F	η^2_p
Model 19: ADL/IADL only, 6 classes	ADLs	.953	5	53208.37	50061.60***	.953
	IADLs	.475	5	18947.78	2257.08***	.475
	Health	.043	5	499.41	112.17***	.043
	PS—Behavior	.006	5	676.89	15.83***	.006
	PS—Emotional	.020	5	580.99	51.88***	.020
	PS—Manic/Psychotic	.021	5	83.33	54.46***	.021
Model 20: ADL/IADL only, 5 classes	ADLs	.937	4	65424.13	46365.87***	.937
	IADLs	.473	4	23576.79	2797.18***	.473
	Health	.041	4	601.89	134.98***	.041
	PS—Behavior	.004	4	530.11	12.37***	.004
	PS—Emotional	.021	4	747.56	66.80***	.021
	PS—Manic/Psychotic	.022	4	107.95	70.61***	.022
Model 21: ADL/IADL only, 4 classes	ADLs	.882	3	82154.40	31216.75***	.882
	IADLs	.436	3	28993.23	3216.00***	.436
	Health	.037	3	718.96	160.52***	.037
	PS—Behavior	.002	3	332.88	7.75***	.002

	PS—Emotional	.018	3	845.89	75.35***	.018
	PS—Manic/Psychotic	.021	3	135.89	88.78***	.021

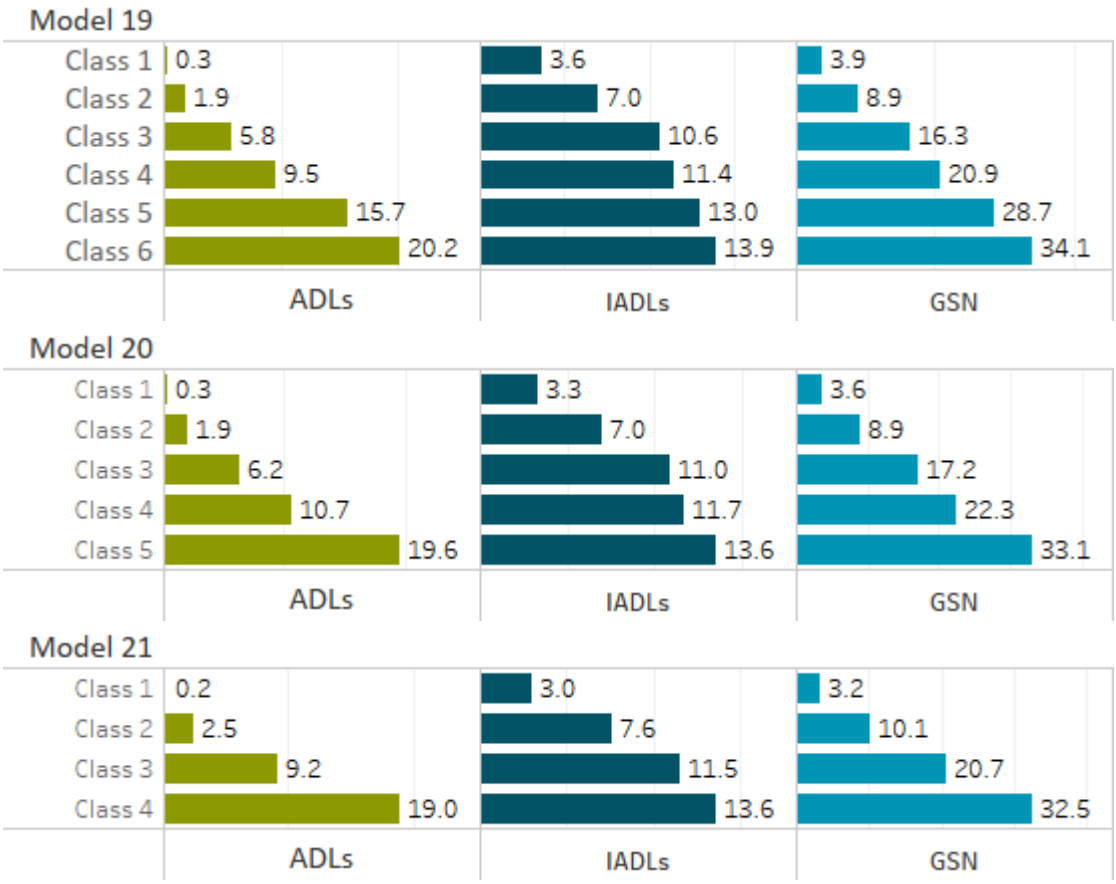
Note: All GLMs significant at $p < .001$.

Low to High Support Need. LCA uses an iterative process to determine class membership to latent, or unmeasured, variables. Observed or measured variables are caused by unobserved or latent phenomena. Applied to this analysis, MnCHOICES measures support need. The LCA tests the patterns of interrelationships among observed variables (MnCHOICES items and scales) to understand, characterize, and classify the underlying latent variable (support need). We tested each model by forcing the variables included and the number of classes so that the LCA determined fit and class membership. LCA, however, cannot consider desired group membership, and uses only measured data to form groups. The classes, therefore, may not logically group into low to high support need, but instead be composed of multidimensional variations of the scales in the analysis. The LCA, then, may find the greatest statistical fit in a model containing groups that are differentiated by particular items or scales. For example, the greatest fit model may comprise one class having high ADL support needs and low IADL support needs, another class with both high ADL and IADL support needs, and a third class of individuals with both low ADL and IADL support needs, with a range of other types of support need within each class. While the statistical significance of the fit of such groupings may be theoretically interesting, such a model is impractical for use in identifying support needs. Therefore, such a model cannot be applied to the Support Range Framework. As a result, we considered only models that displayed support needs ranging from low to high for the Support Range Framework.

As Models 19, 20, and 21 up to this point demonstrated adequacy for the framework development we next considered the descriptives of the individuals comprising the classes to identify whether the classes effectively grouped individuals from low to high GSN. The figure below shows mean scores for each area for each class within each of the three models still under consideration.

Figure 32

Mean Score of GSN scales by Class, Models 19, 20, and 21 (n= 12,482)



This figure illustrates that the three models all group individuals into classes that move from low to high across all the subscales of general support needs. No one model appears to group individuals in a different way. Therefore, all three models also meet the requirement of organizing individuals from low to high support needs.

Captures Complexity of Population. Even though classes must range from low to high need, we also considered the complexity of support needs across the service recipient population. Support needs may not be captured by low, medium, and high on a single continuum, but may be multidimensional considering how need varies by diagnosis, waiver, age, or other variables. The LCA provides initial groups within the data, while practical reasoning can help to determine which model (if any) captures the complexity of the service recipient population in a way that may be helpful for the purposes of a budget methodology. The LCA findings may support low to high need for some subpopulations (e.g., those without mental health needs) but fewer or different qualities for other populations (e.g., those with mental health needs). We conducted exploratory analysis to determine the best preliminary solution that accounts for these multidimensional needs. After determining the best fit was for models 19, 20, and 21 which only include GSN scores, we determined that we should

consider the psychosocial and health scores outside the GSN to address those support needs most frequently associated with higher budgets.

To determine the best way of incorporating the three Psychosocial scores and the Health score into the framework, we first conducted LCAs to determine the best model fit for 3 classes (low, moderate, and high) in each of the three Psychosocial areas and for Health separately. The figure below displays the fit statistics for the LCAs.

Figure 33

LCA Goodness-of-Fit indices for Psychosocial and Health models (n=12,482)

Scale	AIC	BIC	SSABIC	Entropy	LMR-LRT
Behavior	75526.202	75570.794	75551.727	0.91	2068.723***
Emotion	62723.130	62767.723	62748.655	0.80	920.368**
Mania/Psychosis	19661.673	19706.266	19687.198	1.00	11354.131**
Health	51151.939	51196.531	51177.463	0.83	1123.864**

All models displayed adequate model fit based on the above statistics. Therefore, we explored the descriptive statistics of each of the scales to determine whether three groups for each of the scales were appropriate for the framework. First, we examined the scores by class as determined by the LCAs, displayed in the figure below. The LCA did appear to group individuals with low, moderate, and high for all scores. Therefore, we used these groupings to determine appropriate criteria for assigning support range to individuals. We describe the criteria informed by these classes later in Preliminary Criteria Development.

Figure 34

Psychosocial scores and Health score by LCA classes

Note that the scores here reflect the sum scores when individual item scores range from 1 to 4, making the possible Behavior score 11 to 44, Emotion score 4 to 16, and Mania/Psychosis score 2 to 8. These scores were adjusted for the final criteria to be 0 to 33, 0 to 12, and 0 to 6 respectively.

	n	MEAN	MEDIAN	STANDARD DEVIATION	RANGE
PS: Behavior					
PS:B Class 1	9,467	13.4	13.0	2.5	11 – 19
PS:B Class 2	2,270	23.7	23.0	2.8	20 – 29
PS:B Class 3	745	34.6	34.0	3.6	30 – 44
Total	12,482	16.5	14.0	6.6	11 – 44
PS: Emotion					
PS:E Class 1	6,647	5.1	5.0	1.1	4 – 7
PS:E Class 2	3,646	9.3	9.0	1.1	8 – 11
PS:E Class 3	2,189	13.5	13.0	1.5	12 – 16
Total	12,482	7.8	7.0	3.4	4 – 16
PS: Mania/Psychosis					

	PS:MP Class 1	10,166	2.0	2.0	0.2	2–3
	PS:MP Class 2	1,883	4.5	4.0	0.5	4–5
	PS:MP Class 3	433	7.1	7.0	0.9	6 – 8
	Total	12,482	2.6	2.0	1.3	2 – 8
Health						
	Health Class 1	8,003	0.8	1.0	0.8	0 – 2
	Health Class 2	3,436	3.8	4.0	0.8	3 – 5
	Health Class 3	1,043	7.1	7.0	1.2	6 – 13
	Total	12,482	2.1	2.0	2.2	0 – 13

In addition to adopting a framework with greater statistical soundness, this approach of considering each of the scores separately allows for adding to the complexity of the framework. Each sum score is considered separately for the support range framework, which creates opportunities for individuals with different support needs to get assigned higher support ranges if their needs in one of the 5 areas are significant enough to warrant assignment to a higher support range. In particular, this allows for individuals with mental health needs but not behavior needs to be assigned higher support ranges. This approach may be applied to any of the models. Therefore, the model requirement is met by this approach.

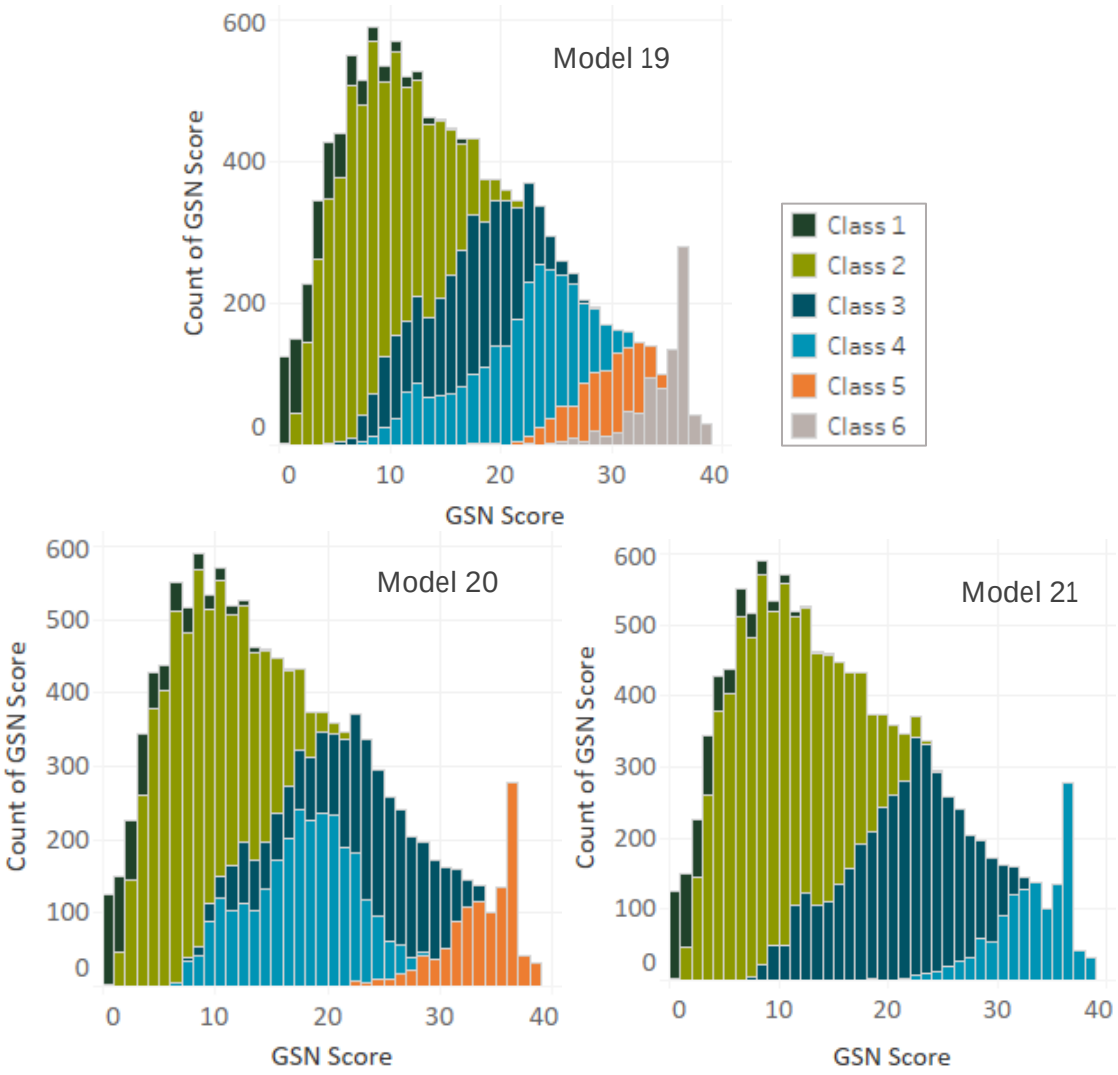
Practical sized groups that correspond to GSN. The next model requirement for determining the best model fit relates to the ease with which ranges of total scores for the GSN correspond directly to classes in the LCA models to create distinct support ranges and are comprised of groups that are practical for the population. This model requirement combines two concepts into one model requirement, since, as illustrated above, they are intertwined for analysis purposes.

The support range framework must be transparent and comprehendible. For this reason, we require the most parsimonious model with clear and consistent criteria. While the LCA and subsequent analyses effectively group individuals into classes, those classes do not neatly correspond to cut-offs for items or scales to be used in the support range criteria. Instead, the analysis considers all variables to group individuals most similar to one another, which may mean slightly higher or lower scores on some of the items or scales than others within the group. These groupings could then inform what score on included items and sum scores on scales best identify support range membership. In this way, we used the LCA findings to inform the framework, not as a methodology for assigning support ranges. The LCA helped us to consider support range criteria, but did not specifically define that criteria.

Since we used class membership to determine how scores and sum scores may inform support range, classes must closely correspond to a sum score of GSN. We examined the combined scores by class membership to determine which scores are associated with each class. The figure below displays histograms of the GSN. Colors indicate the class membership that resulted from each of the three LCA models we considered. Model 19, which include 6 class, is the first histogram. Model 20 included 5 classes, and model 21 included 4 classes.

Figure 35

Histogram of GSN with class membership indicated, Model 19, 20, and 21

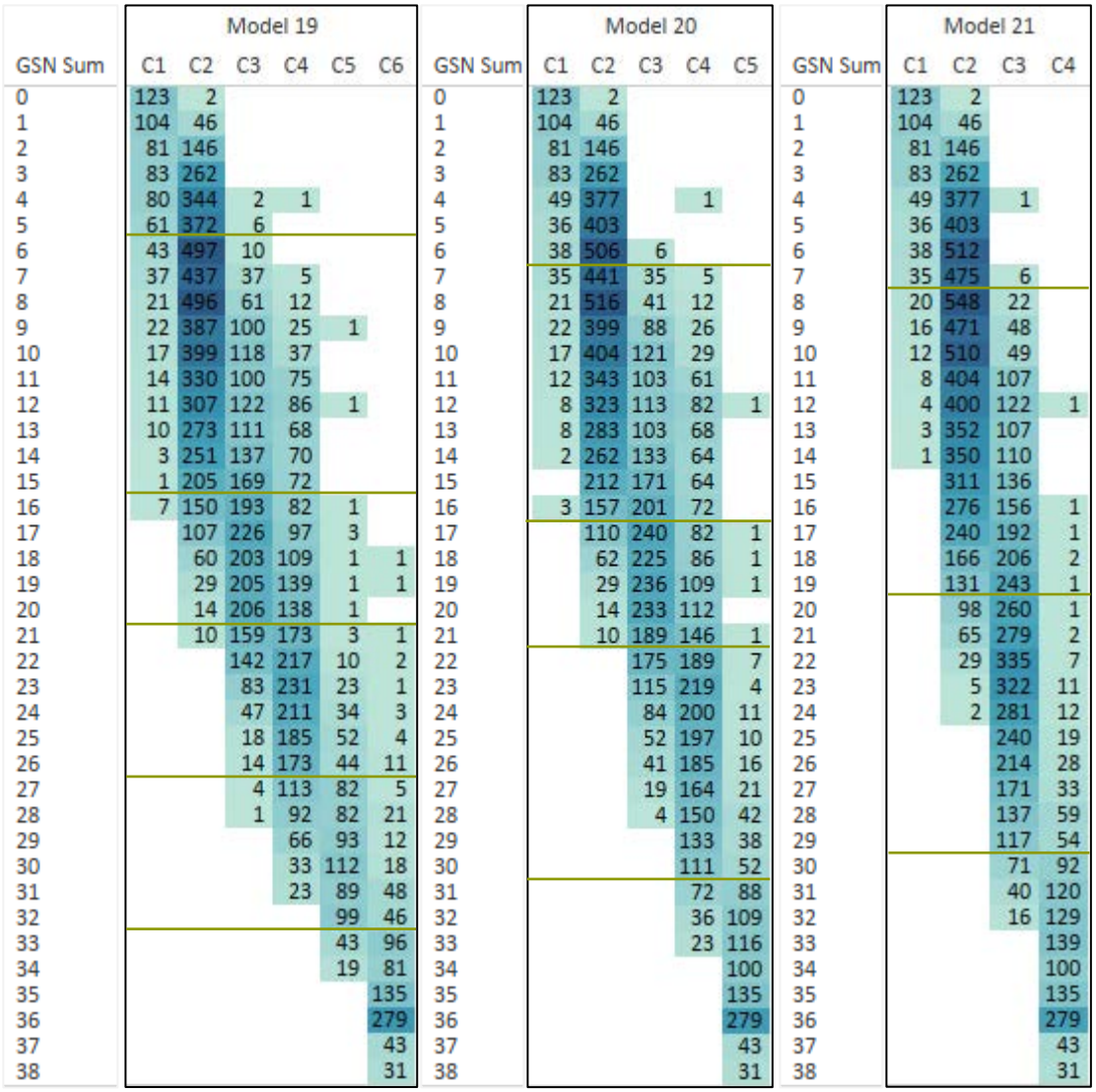


All three histograms illustrate overlapping GSN scores among classes. However, the classes are more distinct from one another in Model 21. That is, clear delineations may be drawn that separate the majority of individuals that comprise each class by specific GSN scores, evident by the "peak" in each color.

To further explore this model requirement, see the following figure. The first column on the left of the figure is the GSN. GSN scores in the sample range from 0 to 38, despite a possible score of up to 39. Across the top of the figure is each model (Model 19, 20, and 21) and the classes within each model generated by the LCA (labeled C1 through C6). Each colored cell of the figure contains the number of individuals in the data with the specific GSN score within the class and LCA model. For example, 123 individuals have a GSN of 0 in class 1 of all three models. The darkness of the cell color increases with higher numbers of individuals in those cells.

Figure 36

GSN sum score by class for Models 19, 20, and 21 with potential cut-off score indicated with green lines



GSN Sum	Model 19 C1	C2	C3	C4	C5	C6	GSN Sum	Model 20 C1	C2	C3	C4	C5	GSN Sum	Model 21 C1	C2	C3	C4
0	123	2					0	123	2				0	123	2		
1	104	46					1	104	46				1	104	46		
2	81	146					2	81	146				2	81	146		
3	83	262					3	83	262				3	83	262		
4	80	344	2	1			4	49	377		1		4	49	377	1	
5	61	372	6				5	36	403				5	36	403		
6	43	497	10				6	38	506	6			6	38	512		
7	37	437	37	5			7	35	441	35	5		7	35	475	6	
8	21	496	61	12			8	21	516	41	12		8	20	548	22	
9	22	387	100	25	1		9	22	399	88	26		9	16	471	48	
10	17	399	118	37			10	17	404	121	29		10	12	510	49	
11	14	330	100	75			11	12	343	103	61		11	8	404	107	
12	11	307	122	86	1		12	8	323	113	82	1	12	4	400	122	1
13	10	273	111	68			13	8	283	103	68		13	3	352	107	
14	3	251	137	70			14	2	262	133	64		14	1	350	110	
15	1	205	169	72			15		212	171	64		15		311	136	
16	7	150	193	82	1		16	3	157	201	72		16		276	156	1
17		107	226	97	3		17		110	240	82	1	17		240	192	1
18		60	203	109	1	1	18		62	225	86	1	18		166	206	2
19		29	205	139	1	1	19		29	236	109	1	19		131	243	1
20		14	206	138	1		20		14	233	112		20		98	260	1
21		10	159	173	3	1	21		10	189	146	1	21		65	279	2
22			142	217	10	2	22			175	189	7	22		29	335	7
23			83	231	23	1	23			115	219	4	23		5	322	11
24			47	211	34	3	24			84	200	11	24		2	281	12
25			18	185	52	4	25			52	197	10	25			240	19
26			14	173	44	11	26			41	185	16	26			214	28
27			4	113	82	5	27			19	164	21	27			171	33
28			1	92	82	21	28			4	150	42	28			137	59
29				66	93	12	29				133	38	29			117	54
30				33	112	18	30				111	52	30			71	92
31				23	89	48	31				72	88	31			40	120
32					99	46	32				36	109	32			16	129
33					43	96	33				23	116	33				139
34					19	81	34					100	34				100
35						135	35					135	35				135
36						279	36					279	36				279
37						43	37					43	37				43
38						31	38					31	38				31

To create the support range criteria, we first created cut-off scores for the GSN that closely aligned with the classes as defined by the LCA. The cut-offs are displayed in the figure above for each of the models with green horizontal lines. We determined potential support range cut-offs for each of the three models by drawing lines where most individuals would move from their class (e.g., class 1) to a potential support range based on GSN corresponding to the same group (e.g., Support Range 1). Where two classes have overlap in GSN (e.g., in Model 19, 123 individuals in class 1 and 2 individuals in class 2 have an GSN of 0), we determined cut-off scores by drawing the line where the fewest individuals had mismatches between class and support range. Upon first determining the placement of the cut-off scores, there is substantially more overlap with Models 19 and 20, to the point where some cut-offs seem quite arbitrary. This aligns with the information in the histograms above where it appears as though GSN score is not in itself related to class membership in the middle classes (the lowest and highest classes are more clearly differentiated).

The cut-off determination provided information on the number of individuals whose support range, if the model was adopted, would align with their LCA class. As the goal of this analysis is to develop support ranges based on data analysis, greater alignment between support range and class is necessary. However, another consideration for cut-off scores is the size of the support range once the cut-off is determined. Across all three models, the size of class 1 is such that if we placed a cut-off to include only the majority of class 1 in Support Range 1, it would include very few individuals proportionate to the population. While this may be the result of the class membership in the LCA, the practical implications of such a cut-off score is a Support Range 1 that contains 5% or less of the population. Since class 2 is the largest class among all models, it seems appropriate to expand the criteria for Support Range 1—to the extent defensible—to include more of the members of class 2 than the model may suggest. Therefore, we artificially increased the mismatch between class and support range for support ranges 1 and 2 to account for the proportionality of the population. See the figure below for the mismatch by model. The mismatch was calculated by summing all individuals whose class membership did not align with the support range designated by the cut-off scores (e.g., individuals in class 2 whose GSN is within the first support range), then dividing that sum by the total number of individuals.

Figure 37

Mismatch between classes and Support Ranges for three potential models and proposed cut-off scores (n = 12,482)

	Mismatch n	Mismatch %
Model 19	4,923	39%
Model 20	5,056	41%
Model 21	4,350	35%

Given the cut-off scores proposed, all models somewhat meet this model requirement. However, Model 21 displays greater alignment between class and support range, which is preferred for the purposes of this analysis. Further, the mismatches between class and Support Range for Model 21 are rarely greater than 1 class higher or lower than if the class and support ranges did match. In the other models, mismatches were more commonly farther apart (e.g., individuals in class 4 assigned to support range 2). While this is partially due to more classes/support ranges adding additional opportunities for farther mismatches, Model 21 does appear to have slightly neater classes designated.

Model selection. Findings from the LCA and additional analyses indicate preference for Models 19 and 21. However, between those two models, there is only slight preference for Model 21. The analyses indicate that a combination of data analyses findings and practical implications that created the model requirements must both be considered for decisions pertaining to the specific Support Range

Framework chosen. The figure below summarizes the findings of the analyses related to each of the model requirements.

Figure 38

Model Requirements by Model Number, Y = Yes, met requirement, S = Somewhat met requirement

Model Requirement	Model Number			
	1-18, 22-27	19	20	21
Statistical fit and entropy	S	Y	Y	Y
Statistically different classes		Y	Y	Y
Low to high support need		Y	Y	Y
Captures complexity		Y	Y	Y
Practically-sized groups that correspond to GSN		S	S	Y

Note: that the model requirements of the black cells were not tested due to the statistical fit of models 1-18 and 22-37 having worse model fit.

As the figure above demonstrates, while Models 19, 20, and 21 meet all of the model requirements at least somewhat, Model 21 is preferable due to its logical and practical proportions of classes within the analysis sample beyond the other tested models, and greater ability to match support ranges to LCA classes. Given the model requirements tested, Model 21 is best suited for GSN. In addition to support ranges based on GSN, the findings from the LCAs with Psychosocial and Health scores should inform the integration of Psychosocial and Heath support needs into the framework.

Adaptation to preliminary criteria development. The LCA analyses indicate the most appropriate model for the scores created from MnCHOICES contains 4 classes of GSN sum scores that range from low to high. For the preliminary framework, we used the cut-off scores determined in the analysis that allowed for the greatest agreement between class and support range while retaining practically proportionate numbers in each support range, selecting Model 21.

We determined the most appropriate way of considering psychosocial and health support needs was to create unique support ranges for individuals with high needs in these areas. Individuals with typical or moderate psychosocial or health support needs should not be considered to require support beyond what is provided with support ranges for individuals with only general support needs. Moderate needs in these areas may require some prompting, interventions, or treatments that individuals providing typical supports may be capable of providing. We are, however, interested in creating support ranges that will provide additional support for individuals who have higher support needs in psychosocial and health areas since these areas are often associated with higher support needs and increased budgets. To determine cut-offs for each of the Psychosocial and Health sum scores, we examined the sum scores for each class defined by the LCAs. For each area, we used cut-offs that encompassed the highest two classes as well as a small proportion of the lowest class. The LCA classes for all areas had much larger low-scoring classes than moderate- and

high-scoring classes. While these groupings were found in the data, we were concerned with assigning a higher support range for individuals with high support needs, and the threshold seemed higher than anticipated when looking at the MnCHOICES items and final score. Therefore, we used the LCA findings to guide these preliminary criteria with the intention to improve upon them in later tasks.

The figure below displays the preliminary framework we developed from the analysis findings. Note that no Extraordinary Support Range (E) existed at this time. We intentionally excluded this support range from the preliminary framework as the analyses to this point did not support criteria for this support range. We planned to use findings in succeeding tasks described below to create criteria for Support Range E. Besides the omission of E, we developed the overarching Support Range Framework at this time. We later made adjustments based on further activities discussed on our proposal, particularly to psychosocial and health scores.

Figure 39

Preliminary framework for assigning support range (NOT final framework)

Note that the scores here reflect the sum scores when individual item scores range from 1 to 4, making the possible Behavior score 11 to 44, Emotion score 4 to 16, and Mania/Psychosis score 2 to 8. These scores were adjusted for the final criteria to be 0 to 33, 0 to 12, and 0 to 6 respectively.

Support Range	GSN	PS: Behavior	PS: Emotion	PS: Mania/ Psychosis	Health
1	7 or lower	17 or less	6 or less	3 or less	9 or less
2	8 to 19				
3	20 to 29				
4	30 or higher				
L	19 or lower	18 or higher	7 or higher	4 or higher	10 or higher
H	20 or higher				

Develop Support Range Descriptions

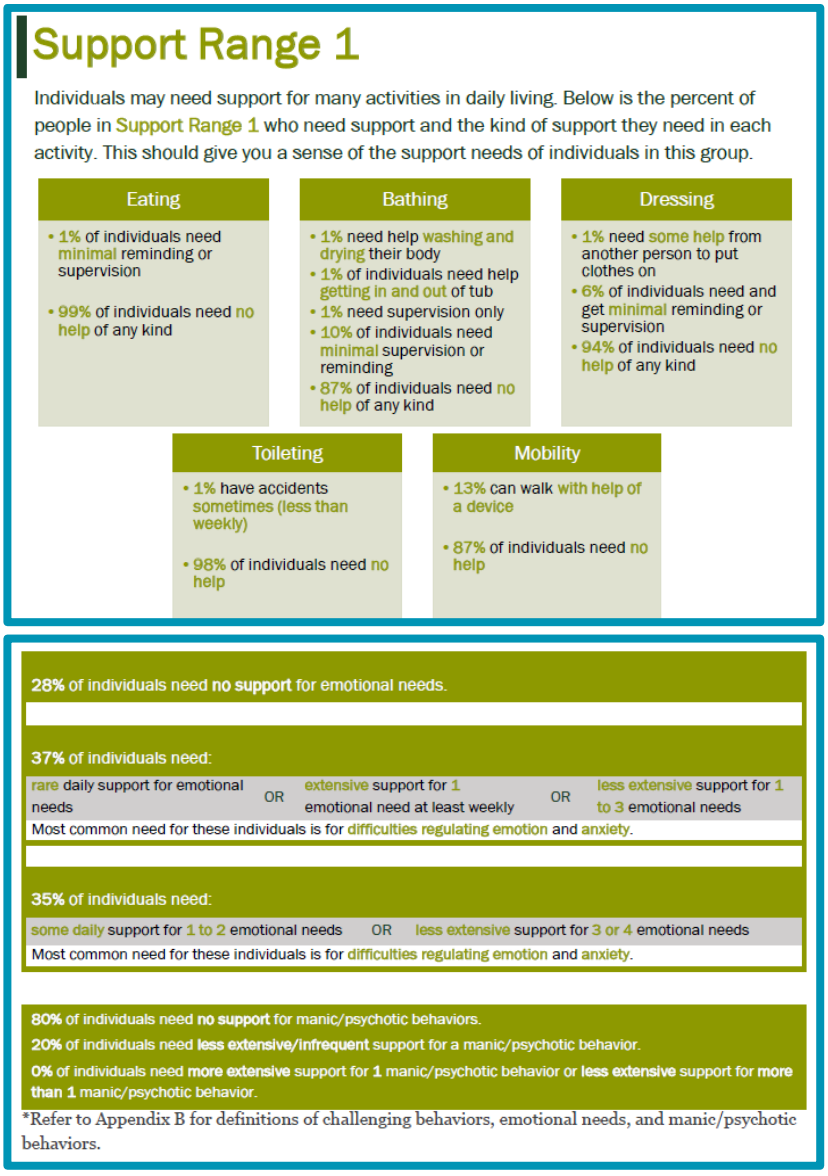
As described in the approach section we proposed developing data-driven Support Range descriptions by meaningfully involving stakeholders in the development of the Support Range Framework. We chose to include these individuals because of their intimate knowledge of the individuals served within Minnesota and for their ability to explain essential system elements. Their participation in this step ensured that we could consider the framework as a whole and refine our preliminary framework criteria. Support Range Descriptions are essential to the framework because they help people understand the support needs of individuals in each Support Range, and the types and amounts of services they may need.

To develop the Support Range Descriptions, we first applied the preliminary criteria to adults with MnCHOICES assessments. We assigned support ranges to all adults and explored descriptive statistics for each support range. We created a document

entitled *Support Range Descriptions Packet* that contained basic information about each preliminary support range for a group of expert panelists so that they could get a sense of the support needs of individuals that comprised each support range. The basic information focused on general support needs, psychosocial support needs, and health support needs. The document also contained additional information to assist the expert panelists in reading and understanding the information on the preliminary support ranges. The figure below displays excerpts of the *Support Range Description Packet*.

Figure 40

Excerpts of the Support Range Description Packet.



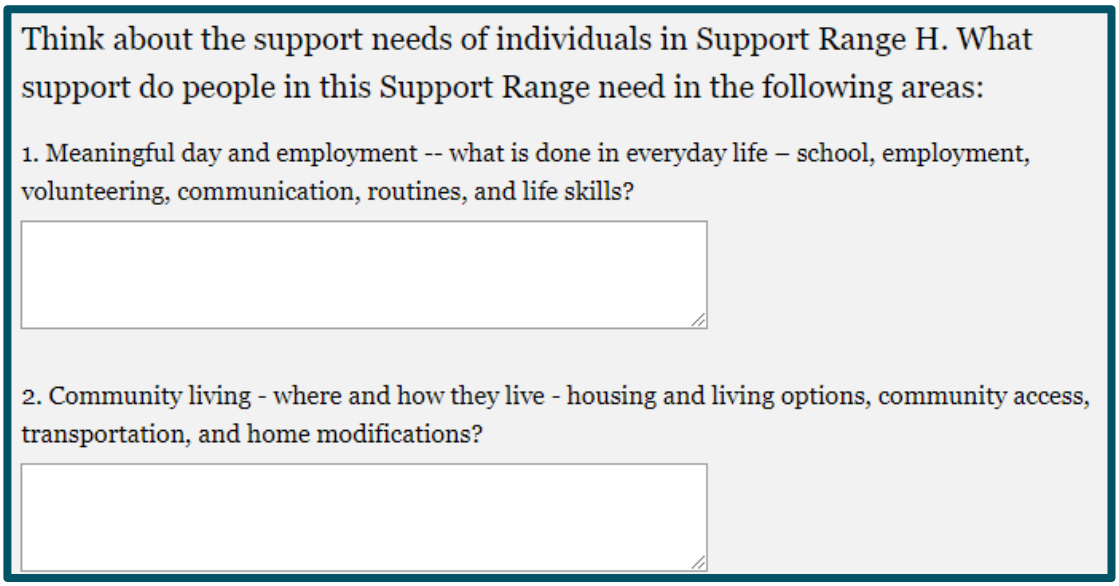
We then hosted an online training for expert panel members completing the Support Range Description Worksheet. We presented the purpose of the overarching study as

well as how to complete the specific activity. We walked through the packet of information and the online worksheet and answered questions from expert panel members. We asked the expert panel to complete the online worksheet within a week of the training.

The expert panel for this task included 16 stakeholders who used data from each Support Range to respond to questions on an online worksheet that probed at the kinds of support individuals in each Support Range may need. Below is a segment of the online worksheet to exemplify the contents of the worksheet.

Figure 41

Screenshot of support range descriptions online worksheet



SUPPORT RANGE WORKSHEET ANALYSIS

We qualitatively analyzed the worksheet responses by finding common themes, descriptors, and ideas across the expert panel within each Support Range. From these summaries we wrote Support Range descriptions.

For the analysis, we first aggregated worksheet responses and used the findings to create the Support Range Descriptions. To provide a meaningful structure and approach to the descriptions, we used the CtLC Framework, described in more detail below. We used the most common descriptors for each Support Range within each "Life Domain" in the CtLC Framework. We first, opted to keep all of the responses that were consistent among multiple members and excluded responses that contradicted what most expert panelists said, that we could not interpret, or that did not describe support need. Finally, we made the descriptions as concise as possible and used words that made descriptions more uniform and understandable across all Support Ranges. In keeping with the descriptions provided by an expert panelist, we

chose to use first person language. CtLC covers the six domains in the figure below. Using this framework expert panel members were able to holistically describe the support needs of each individual across a number of support areas.

Figure 42

Charting the LifeCourse Framework Life Domains

	Meaningful Day & Employment What you do as a part of everyday life -- school, employment, volunteering, communication, routines, life skills
	Community Living Where and how you live - housing and living options, community access, transportation, home modifications
	Safety & Security Saying safe and secure -- emergencies, well-being, guardianship options, legal rights and issues
	Healthy Living Managing and accessing health care and staying well-- medical, mental health, behavior, developmental, wellness and nutrition
	Social & Spirituality Building friendships and relationships, leisure activities, personal networks, faith community
	Citizenship & Advocacy Building valued roles, making choices, setting goals, assuming responsibility, and driving how one's own life is lived

In addition to the CtLC Framework domains, we added a section that summarizes the MnCHOICES data on ADLs, IADLs, Health, and Psychosocial items for each of the preliminary Support Ranges. We used the exact wording indicated in MnCHOICES. This "MnCHOICES" section of the description is a brief summary of the data the expert panelists used to write the remaining sections.

Please also note that the description for Support Range E was not written in the same way as other Support Ranges which were informed by data. At the time of this task, Support Range E did not have criteria for assignment to individuals based on MnCHOICES data. Therefore, no data were available to describe the individuals who would later be a part of this Support Range. The expert panel, instead spoke to their general impressions, experiences, and knowledge of the support needs of individuals with extraordinary support needs. The description in the Appendix also notes this difference and contains no summary of MnCHOICES data as a result.

Conduct Support Range Assignment Exercise

As described previously in the approach section, we proposed using the support range assignment exercise and analyzing the resulting data to consider refinements of the preliminary criteria. We describe how we conducted this activity as well as how we analyzed the data.

SUPPORT RANGE ASSIGNMENT EXERCISE METHOD

First, we created a stratified random sample of 800 individuals by preliminary support range (i.e., 1, 2, 3, 4, L, H). In creating this stratified random sample, we considered the proportions of the larger sample represented in each support range while also ensuring that each support range was represented by no fewer than 100 individuals. Thus, 100 individuals were randomly selected from the two smallest support ranges (i.e., 4 and H), and the largest support range was reduced accordingly. Once this support range assignment exercise dataset was created, 10 to 15 individuals per support range were randomly selected to be included in a reliability study. These individual profiles were then duplicated, assigned new ID numbers, and assigned to one of three reviewers for the purposes of the reliability study. Figure 43 displays the number of individuals that were randomly selected from each support range as well as the number of individuals that were included in the reliability study.

Figure 43

Number of individuals randomly selected from each support range.

Support range	Main sample n	Reliability n
1	144	15
2	196	15
3	129	10
4	100	10
L	131	15
H	100	10
Total	800	75

Expert panel members (n = 29) were recruited to participate in the support range assignment exercise by DHS staff in consultation with HSRI. The reviewers represented services users, direct service providers, non-profit advocacy groups, various county staff from around the state of Minnesota, and DHS staff. A training and live support day were provided as resources for all reviewers who participated in the support range assignment exercise. The training involved reviewing the study and specific tasks, discussing the current exercise, and walking through the process together.

We sent each expert panelist an email containing information pertaining to the workbook, training, contact information, and attachments of necessary materials. The materials necessary for completing the exercise were the *Preliminary Support Range Descriptions* (See Appendix A), *Guide to MnCHOICES items*, and workbooks (See Appendix B) that we customized for each expert panelist.

To conduct the activity, profiles of the selected individuals were created and compiled into the customized workbooks that included instructions on how to complete the support range assignment exercise, McCHOICES profiles, and reviewer responses to a

series of questions. The MnCHOICES profiles included responses to questions about the following MnCHOICES areas: ADLs (5 items), IADLs (2 items), Psychosocial (4 items), and Health (3 items).After reviewing each profile, the reviewers rated the individuals on

1. GSN (ADLs & IADLs) (as none, moderate, high, extensive, or extraordinary)
2. Psychosocial Support Need (as none/typical, high, or extraordinary)
3. Health Support Need (as none/typical, high, or extraordinary).

Upon completing these three evaluations of support need, reviewers were then asked 'what support range should be assigned to the person?' (1, 2, 3, 4, L, H, E). Additionally, reviewers were given the option of noting any comments or concerns (e.g., if they were unsure about their chosen support range assignment or explanations of why they choose a particular rating).

SUPPORT RANGE ASSIGNMENT EXERCISE: RELIABILITY

As previously mentioned, 75 individual profiles were randomly selected and duplicated for inclusion in a reliability study to test the level of agreement between the participating reviewers. Percent agreement, both perfect agreement and agreement within 1 scale point, were calculated for the GSN, Psychosocial, Health, and Support Range ratings (Figure 44). When evaluating perfect agreement, reviewer ratings had insufficient agreement on all ratings except Health (84%). However, when agreement within 1 scale point was evaluated, reviewers had a high level of agreement for the GSN, Psychosocial, and Health ratings, but not for the Support Range rating, which remained low at 55%. This reliability study led us to conclude that the ratings of GSN, Psychosocial, and Health were sufficiently consistent across reviewers to use in future analyses, but the rating of support range was not.

Figure 44

Percent agreement between reviewers in the support range assignment exercise.

Percent Agreement	GSN	Psychosocial	Health	Support Range
Perfect Agreement	50%	69%	84%	27%
Agreement Within 1	96%	100%	99%	55%

SUPPORT RANGE ASSIGNMENT EXERCISE: ANALYSIS

In order to compare our preliminary support range framework with the support range assignments from the reviewers, we first sought to calculate a support range assignment based on the reviewers' ratings of GSN, Psychosocial, and Health needs. After considering several possible ways in which the expert panel reviews could be converted into ratings into a support range assignment, the framework presented in Figure 45 was adopted. For example, if a reviewer rated an individual's GSN as moderate, but determined that they had no or typical Psychosocial or Health needs, then the support range of 2 would be assigned to that person.

Figure 45

Framework for assigning support range based on reviewer ratings of GSN, Psychosocial, and Health needs.

Support range Assignment	GSN	Psychosocial	Health
1	None/low	None/typical	None/typical
2	Moderate	None/typical	None/typical
3	High	None/typical	None/typical
4	Extensive or Extraordinary	None/typical	None/typical
L	None/low	None/typical	None/typical
H	Extensive or Extraordinary	High	High
E	Any	Extraordinary	Extraordinary

After support range assignments were created from the reviewer ratings data, these reviewer-based support range assignments were compared to the support range assignments that were created from our preliminary framework. As can be seen from the teal diagonal, there was alignment between the two support range frameworks between 26-54% of the time across the six original support ranges. In total, the two frameworks aligned 41% of the time. For support ranges 1, L, and H, the alignment was higher (> 50%) than all cumulative misalignment, however, this was not the case for support range 2, 3, and 4.

Figure 46

Alignment between the reviewer-based support range (SR) assignments with preliminary support range framework.

	Preliminary Support Range Framework					
Reviewer-based SR Assignment	1	2	3	4	L	H
1	**73 (51%)**	18 (9%)	1 (1%)	0	7 (5%)	0
2	15 (10%)	**65 (33%)**	16 (12%)	2 (2%)	11 (8%)	1 (1%)
3	0	19 (10%)	**35 (27%)**	10 (10%)	2 (2%)	4 (4%)
4	0	0	10 (8%)	**26 (26%)**	0	3 (3%)
L	54 (38%)	68 (35%)	7 (5%)	0	**71 (54%)**	9 (9%)
H	0	18 (9%)	56 (43%)	61 (61%)	17 (13%)	**54 (54%)**
E	2 (1%)	7 (4%)	4 (3%)	1 (1%)	23 (18%)	29 (29%)

Note: Areas of alignment are marked in teal; whereas selected misalignments are highlighted in shades of green.

Next, individual areas of misalignment, particularly those highlighted in shades of green in Figure 46, were further investigated to determine the source of the misalignment between the support range frameworks. First, the misalignment between preliminary Support Range 1 and 2 and reviewer-based Support Range L were predominately based on psychosocial needs (91% & 84%). Second, the misalignment between preliminary SR 3 and 4 and reviewer-based SR H were investigated, and we found that psychosocial needs (48% & 34%), health needs (30% & 49%), or both psychosocial and health needs (21% & 20%) were responsible for this misalignment between the frameworks. These areas of misalignment could be attributed to two issues: 1) reviewers were not given a moderate option for their ratings of psychosocial and health needs in the support range exercise, which caused some reviewers to increase their psychosocial and/or health ratings to high when they would have otherwise, if given a choice, rated more moderately and 2) reviewers were responding to the presence of multiple psychosocial or health needs with daily frequencies and interpreting the resulting psychosocial or health needs as higher than the preliminary framework had deemed them. While the first issue pointed to a limitation of the support range assignment exercise itself, the second issue suggested that adjustments in the psychosocial and health criteria that determine assignment to Support Ranges L and H were needed.

Additionally, the misalignment between preliminary Support Range L and H and reviewer-based Support Range E was clearly a result of no established criteria for Support Range E, meaning that no individuals were assigned to E, even though individuals within the population were considered to have extraordinary needs. All individuals in these two groups were rated as extraordinary in terms of their psychosocial needs, health needs, or more rarely both psychosocial and health needs. The support range assignment exercise thus demonstrated that experienced reviewers felt they could assign individuals to an extraordinary support range based on their review of the MnCHOICES data presented in the profiles. These findings suggested that including an extraordinary support range was appropriate.

Determine support range framework criteria

Our final step in this phase of the development was to determine the support range framework criteria.

CHANGES TO PRELIMINARY FRAMEWORK AND RATIONALE

As detailed above, the support range assignment exercise revealed several areas of misalignment between how our preliminary support range framework assigned support ranges to individuals and the way reviewers assigned support ranges after reviewing profiles composed of selected MnCHOICES data. More specifically, the findings from the support range assignment exercise suggested 1) revisions to the criteria that determined assignment into support range 1-4 versus L or H for both

psychosocial and health needs were needed and 2) the addition of an extraordinary support range was needed.

Revisions to the preliminary framework were systematically tested through the following strategy. First, several different adjustments (decreases from the preliminary framework) to the criteria for the three psychosocial sum scores (behavior, emotions, and manic/psychotic behaviors) were tested by calculating a new support range assignment and comparing it to the reviewer-based assignment. We used the following criteria for evaluating the appropriateness of the new criteria: improvements in the overall alignment between the final SR framework and the reviewer-based SR assignment, decreases in the percentages of misalignment with particular focus on the previously highlighted areas, and constraining the size of the high support range group. If the criteria met these goals, it was also tested on the larger dataset. This iterative process resulted in the following changes to the psychosocial sum scores: behavior, emotion, and manic/psychotic behaviors were each decreased by 1 for Support Ranges 1-4 and L and H. Next, changes to the health criteria were investigated; again, using the same criteria to evaluate the appropriateness of the new criteria. After testing several possible sum scores, the following final criteria were adopted: health sum score was decreased by 4 for Support Ranges 1-4 and L and H. Finally, a series of new criteria were tested in order to create an extraordinary support range (see Figure 7 in the findings section for the final criteria). Together, the final framework resulted in a 11% increase in the total alignment between the new adopted support range assignment criteria and the reviewer-assigned support ranges (total = 52%; Figure 47). See the Findings section of this report for the final Support Range Framework criteria.

Figure 47

Alignment between the reviewer-based support range assignments and the final support range framework.

	Final Support Range Framework						
Reviewer-based SR Assignment	**1**	**2**	**3**	**4**	**L**	**H**	**E**
1	**61 (56%)**	17 (12%)	1 (1%)	0	20 (11%)	0	0
2	11 (10%)	**60 (43%)**	15 (17%)	2 (3%)	19 (10%)	2 (1%)	1 (2%)
3	0	18 (13%)	**32 (36%)**	8 (12%)	3 (2%)	9 (6%)	0
4	0	0	8 (9%)	**22 (34%)**	0	9 (6%)	0
L	34 (31%)	31 (22%)	2 (2%)	0	**115 (61%)**	14 (9%)	13 (24%)
H	0	11 (8%)	30 (33%)	33 (51%)	18 (9%)	**98 (64%)**	16 (30%)
E	2 (2%)	2 (1%)	2 (2%)	0	15	21	24

	(8%)	(14%)	(44%)

Note: Areas of alignment are marked in teal; whereas selected misalignments are highlighted in shades of green.

See the Findings section for the final Support Range Framework and for the distribution of the Support Ranges across the population.

Strengths and limitations

There are some limitations to the approach that we have taken to develop the individual budget framework detailed here, as there are with any budget methodology. The first limitation is that the framework is highly reliant on data taken from the MnCHOICES assessment. Because of this dependence on the assessment, errors in the assessment or imprecise administration cannot be considered in the analysis or implementation of the framework.

Another limitation to this approach is that although we intended to implement a unified budget methodology across all groups we are unable to include children in this unified methodology at this point. Children can be included in a unified methodology with redevelopment of items to align better in MnCHOICES 2.o.

Finally, stakeholder involvement to date has involved requests for developing an approach that involves goals and/or natural supports. In our research and work in other jurisdictions we are not aware of an approach that adequately considers these items in a data-based approach. Further, we are not aware of any objective measures of natural supports or personal goals that could be included in a data-based approach to developing individual budgets, nor are these measures available in Minnesota, though these items are discussed as part of the MnCHOICES assessment, they are not detailed in a consistent and measurable way.

There are many strengths to the approach that we detail here. First the approach is grounded in available data and is highly data-driven. We have used multiple sources of data to develop this proposed framework including data from MnCHOICES, data derived from interactions with an expert panel, and will also use service expenditure data to finalize the model. Taking this approach allows for a multifaceted view of the population.

We were able to meaningfully incorporate feedback and the work of an expert panel who greatly informed the development of the Support Range Framework and individual budget methodology to date. This coordination has provided us with valuable insight and lends credibility to our approach.

This approach can be made stable over time since there are three separate prongs that can each be adjusted to, some extent, independent of one another. Altogether, this approach is a data-driven approach that offer many benefits to DHS and to service recipients who will use this framework as part of the budget methodology.

Additional benefits of this approach are outlined in the Findings section.

Considerations

As this report is preliminary, we offer some brief considerations with the intention of providing more thorough recommendations about the implementation and next steps in the final report.

Stakeholder Communication

DHS may want to begin giving consideration to how essential elements of the individual budget methodology is communicated with stakeholders. We offer some language and tools (e.g., support range descriptions) that may allow for greater understandability about the Support Range Framework. DHS, however, may benefit from thoughtfully considering the best ways to convey information about the framework. For example, after presenting the framework to a few stakeholder groups, the meaning and composition of Support Range L and Support Range E is often unclear. We recommend thinking of ways to make the meaning of these support ranges more obvious, which may include renaming these support ranges.

Additionally, we provide discussion of in-depth analyses that were performed to develop this framework. The results of these analysis which will be of greatest interest to individuals receiving services are those that pertain to how the assessment is scored, what scores are associated with each support range, and which budgets are associated with specific support ranges. Though part of our rationale for choosing this approach was it's comprehsibility, even this level of information can be quite difficult for stakeholders to understand and internalize. DHS should consider efforts to simplify the information as much as possible, while also offering means for individuals who desire more information about the development of the methodology, including obtaining information on the specific analyses used, means to acquire that information.

Recalibration

This report details some of the strengths and limitations of the current process. When this study is complete, we will recommend recalibration, particularly due to MnCHOICES 2.0 being implemented. At that time, DHS will be able to improve any aspects of this process. This may include analysis of a more representative sample at all points of development, more in-depth training of expert panelists, increased participation across expert panels, and consideration of other statistical approaches. Additionally DHS might take stock of the feedback received after the development of this methodology is complete and plan to incorporate any specific feedback into that model.

After MnCHOICES 2.0 is implemented, DHS will have opportunity to consider including children in the framework. Some of the changes that are proposed for the

next iteration may offer enhanced ability to include children within the unified framework as would be optimal. Further, without the inclusion of children in the unified framework, there are few means to distinguish differences in support need among children, though there are likely substantial differences, associated with varying funding amounts that may be considered. Children also frequently use CDCS, and so are limited by not having access to a budget methodology that accounts for their support needs and assigns an appropriate amount of funding. Even though children were not included in Support Range Framework, they are included in the overall budget methodology. This should assist DHS to better understand their needs and the impacts of the budget methodology so that appropriate steps can be taken when MnCHOICES 2.0 data is available.

As detailed in other reports, the budget methodology is highly dependent on assessment data. For these reasons, it is imperative that the assessment undergo validity and reliability testing, and that the assessment protocol is explicitly detailed so that the assessment can be consistently administered. These considerations should be made in coordination with the implementation of MnCHOICES 2.0.

References

Akaike, H. (1974). A new look at the statistical model identification. IEEE Transactions on Automatic Control, 19, 716–723.

Breivik, E., & Olsson, U. H. (2001). Adding variables to improve fit: The effect of model size on fit assessment in LISREL. In R. Cudeck, S. du Toit, & D. Sörbom (Eds.), Structural equation modeling: Present and future (pp. 169–194). Lincolnwood, IL: Scientific Software International.

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. Structural Equation Modeling: A Multidisciplinary Journal, 9(2), 233–255.

Collins, L. M., & Lanza, S. T. (2013). *Latent class and latent transition analysis: With applications in the social, behavioral, and health sciences* (Vol. 718). John Wiley & Sons.

Granado, E.A., (2015). Comparing three effect sizes for latent class analysis (Doctoral dissertation). Retrieved from Google Scholar.

Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural Equation Modeling: A Multidisciplinary Journal, 6(1), 1–55.

Kidney, C., Petner-Arrey, J., and Agosta, J. (2018). *Analysis of MnCHOICES*. St Paul, MN: Minnesota Department of Human Services Disability Services Division.

Kidney, C., Petner-Arrey, J., and Agosta, J. (2018). *Budget Methodology Proposal*. St Paul, MN: Minnesota Department of Human Services Disability Services Division.

Kline, R. B. (2011). Principles and practice of structural equation modeling. New York, NY: The Guilford Press

Muthén, B. (2004). Latent variable analysis: Growth mixture modeling and related techniques for longitudinal data. In D. Kaplan (Ed.), Handbook of Quantitative Methodology for the Social Sciences (pp. 345–368). Newbury Park, CA: Sage.

McDonald, R. P. (2013). Test theory: A unified treatment. Mahwah, New Jersey: Lawrence Erlbaum Associates, Inc.

Rossell, Y. (2012). Lavaan: An R package for structural equation modeling. Journal of Statistical Software, 48(2), 1–36.

Schwartz, G. (1978). Estimating the dimension of a model. The Annals of Statistics, 6, 461–464.

Sclove, L. (1987). Application of model-selection criteria to some problems in multivariate analysis. Psychometrika, 52, 333–343.

Appendix A: Support Range Descriptions

Support Range 1

MnCHOICES	In general, I need no support, minimal reminding, and/or supervision for most activities of daily living like eating, bathing, dressing, and toileting. I sometimes need assistance or supervision for instrumental activities of daily living like housework, shopping, or managing finances. I have no or few health support needs. I may need some support for challenging behaviors like verbal aggression, susceptibility to victimization, or impulsivity. I may need some support for managing emotional needs.
Meaningful Day & Employment	To engage in meaningful employment, I may need initial support to explore employment or education options and find a job, including filling out applications and securing transportation. On the job, I may need intermittent help to troubleshoot any problems I experience, to manage my relationship with co-workers, or tools to manage my anxiety.
 Community Living	To live in and access the community, I may need help to explore living options and housing or to apply for housing benefits. I may need intermittent help to pay bills, to manage my money, to find transportation or maintain my car, and to keep up with housekeeping and maintenance. I may need technology support to live independently.
 Safety & Security	To stay safe and secure, I may need a risk assessment and plans to mitigate vulnerabilities. I may need help setting up emergency contacts and identifying additional supports to keep me safe. I usually know what to do to stay safe and can advocate for myself and manage emergencies, and I may benefit from technology.
 Health Living	To manage and access healthcare and stay well, I may need help setting up and attending medical appointments, finding and communicating with healthcare practitioners, or recognizing mental health care needs. I might manage my healthcare needs on my own but might need a healthcare plan to keep up with my medical needs.
 Social & Spirituality	To build relationships and engage in leisure activities, I may need initial support to coordinate and attend activities that I am interested in. I may need minimal or intermittent support connecting with others or maintaining existing relationships, possibly for mental health or challenging behaviors.
 Citizenship & Advocacy	To drive how my life is lived, I may need support in the form of supported decision-making or different levels of representation (e.g., representative payee or authorizations). I might need temporary support to prioritize or implement my goals and may need guidance to make major decisions.

Support Range 2

MnCHOICES	In general, I need minimal supervision or reminding for most activities of daily living like eating, bathing, dressing, and toileting. I often need assistance or constant supervision for instrumental activities of daily living like housework, shopping, or managing finances. I have no or few health support needs. I may need some support for challenging behaviors like verbal aggression, socially unacceptable behavior, susceptibility to victimization, or impulsivity. I may need some support for managing emotional needs.
Meaningful Day & Employment	To engage in meaningful employment, I may need help to determine my interests and to develop employment skills. I could use help getting and keeping employment, education, or volunteer opportunities. I may also need on-the-job support, including physical support. I might need education and/or supervision and cueing to use public transportation.
 Community Living	To live in and access the community, I may need help to identify housing needs and/or to pay for my home. I may need direct family or staff support to complete homemaking activities such as planning and cooking meals, shopping, and paying bills, and may require 24-hour support. I might need technology, home modifications, and/or specialized transportation.
 Safety & Security	To stay safe and secure, I may need education about emergencies, being home alone, identifying unsafe scenarios (e.g., strangers entering my home), or understanding the consequences of my actions. I may need access to 24-hour supports, or direct support to remain safe in my home or community. I may also need help to manage my emotions or behavior.
 Health Living	To manage and access healthcare and stay well, I may need help to schedule and attend medical appointments, to take medication, including medication for mental health needs. I may need help shopping for and preparing healthy food and reminders to exercise. I may benefit from therapies, but I don't experience frequent hospitalization.
 Social & Spirituality	To build relationships and engage in leisure activities, I may need help to attend events, including transportation. I may need help getting connected with a social group, including support for mental health or challenging behaviors. Education about healthy relationships, boundaries, and dealing with aggression might also help me to maintain my relationships.
 Citizenship & Advocacy	To drive how my life is lived, I may need access to education about advocacy and advocacy opportunities, as well as support to set goals that I can achieve. I may identify people I trust to assist me in processing situations and making decisions about my life. I might need assistance setting up routines, and I may become more independent overtime.

Support Range 3

MnCHOICES	In general, I need some physical assistance for most activities of daily living like eating, bathing, dressing, and toileting. I always or nearly always need assistance for instrumental activities of daily living like housework, shopping, or managing finances. I may have a few health support needs that do not require extraordinary support. I may need some support for challenging behaviors like physical aggression, verbal aggression, socially unacceptable behavior, susceptibility to victimization, or impulsivity. I may need some support for managing emotional needs.
Meaningful Day & Employment	To engage in meaningful employment, I may need thoughtful planning, formal supports to find and keep a job, long-term transportation support, and help to complete activities that I am interested in. I may benefit from the assistance of a job coach or day programming. On-the-job, I may need prompting, direct support, constant monitoring, or physical assistance.
 Community Living	To live in and access the community, I may need daily or 24-hour support for physical or emotional needs. I frequently need help to maintain my home. I may need home modifications, adaptive equipment, and/or assistive technology. I likely need support to access transportation. I may need frequent physical support, including people to lift and transfer me.
 Safety & Security	To stay safe and secure, I may need the support of a representative or other people I identify to help me make decisions, including financial. I may need 24-hour supervision or access to 24-hour supports. I may need help to abstain from eloping or hurting myself. I need to have emergency plans ready to be sure that I can remain safe in emergencies.
 Health Living	To manage and access healthcare and stay well, I may need a special diet, tube feeding, and/or interventions to prevent choking. I may need a home doctor, skilled nursing visits, and/or long-term supports. I may rely on others to set up appointments and to determine when I need medical care. I likely need assistance preparing healthy meals.
 Social & Spirituality	To build relationships and engage in leisure activities, I may need family or staff support to access the things that I want to do. I may need people to facilitate activities and to help me engage in my interests. I might need support available in social situations. I might have heightened emotional needs or need support for challenging behaviors around new people.
 Citizenship & Advocacy	To drive how my life is lived, I may need the help of a guardian or a supportive person that I can depend on to help me make decisions. An advocate might help to ensure that my choices aren't limited because of my needs. Just because I need help doesn't mean that I am not able to make decisions in my life.

Support Range 4

MnCHOICES	In general, I need full physical assistance for most activities of daily living like eating, bathing, dressing, and toileting. I always need assistance for instrumental activities of daily living like housework, shopping, or managing finances. I may have a few health support needs that do not require extraordinary support. I may need some support for challenging behaviors like injury to self, physical aggression, verbal aggression, or susceptibility to victimization. I may need some support for managing emotional needs and may need some support for managing manic or psychotic behaviors.
Meaningful Day & Employment	To engage in meaningful employment, I may need long-term support to find a job and physical support or hand-over-hand assistance to complete work tasks. I may need help to understand work tasks or to manage mental health/behavioral needs. I may require support from more than 1 person and may need assistive technology or communication devices.
 Community Living	To live in and access the community, I may need complete around the clock hands-on help. My living setting may need to be modified to meet my mobility needs. I may need assistive technology or a communication device. I likely need considerable support with transportation and to access the community. I may need a 24-hour plan of care.
 Safety & Security	To stay safe and secure, I may need a guardian, or other representatives, who help me make decisions. I likely need 24-hour access to care in case of emergencies. I may need a risk assessment and plan to mitigate risks. People who support me might need specialized training to keep me safe and secure.
 Health Living	To manage and access healthcare and stay well, I may need extensive emergency planning, advocacy with medical practitioners, preventative care with social worker or RN, and transition planning after hospital stays. I may need significant support for managing health conditions, taking medication, participating in therapy, and promoting my overall wellness.
 Social & Spirituality	To build relationships and engage in leisure activities, I may need help to find and maintain social groups, assistance communicating, hands-on assistance to participate in activities of interest, planning to attend activities due to my health/mobility needs, and/or help with personal care when I am engaged in activities that I enjoy.
 Citizenship & Advocacy	To drive how my life is lived, I may need guardianship or other levels of representation to help make decisions and support to maximize my ability to make decisions. I may need encouragement and communication support to make decisions, as well as people to help advocate for the things that I want.

Support Range L

MnCHOICES	In general, I need no or little support, reminding, and/or supervision for most activities of daily living like eating, bathing, dressing, and toileting. I sometimes or often need assistance or supervision for instrumental activities of daily living like housework, shopping, or managing finances. I have high health support needs and/or high psychosocial needs that require some daily support. I may have support needs for challenging behaviors such as injury to self, physical aggression, verbal aggression, or socially unacceptable behavior. I need support for emotional needs such as difficulties regulating emotion, withdrawal, agitation, and anxiety, and may need some support for managing manic or psychotic behaviors.
Meaningful Day & Employment	To engage in meaningful employment, I might need help to find and keep a job. I may work independently or need support to work in the community, including prompts and/or physical assistance. I may need education to use transportation, and tools to help me manage challenging behaviors or emotional needs at my job. I may need specialized support such as nursing, behavioral, or communication help.
 Community Living	To live in and access the community, I may need help to figure out the right living setting for me, including my own home, with family, or in a group home. I may need education about transportation and means to pay for it. I may need support such as assistive technology, PERS, and/or direct assistance to fill out forms, secure housing or other benefits, pay bills, maintain my home, and create emergency back up plans.
 Safety & Security	To stay safe and secure, I may need supportive people around me, or other forms of representation to help make decisions and manage benefits. I may need education about how to respond in emergency situations. I may need emergency supports and protocols available at all times, a risk assessment to mitigate my vulnerabilities, assistive technology, and/or periodic check-ins.
 Health Living	To manage and access healthcare and stay well, I may need support to schedule and attend medical appointments, follow medical routines, and recognize and understand medical/mental health needs. I may benefit from period check-ins and/or assistive technology. I may attend therapies, receive treatments, or need help to comply with medication schedules.
 Social & Spirituality	To build relationships and engage in leisure activities, I may need help to be active in my community, including education about healthy relationships. I may also need support to express frustration in a positive way or manage other mental health or challenging behaviors so that I can maintain my relationships. I may need long-term supports to access my community, including transportation and means to pay for transportation.
 Citizenship & Advocacy	To drive how my life is lived, I may need supports to express my dreams and to manage my meetings. I can usually advocate for myself and make my own decisions, but I may need formal plans to make sure that I can be independent and make as many choices as possible, including exert help to maintain my

	employment or living situation. I may need tools to help me manage my relationships with others.

Support Range H

MnCHOICES	In general, I need partial to full physical assistance for most activities of daily living like eating, bathing, dressing, and toileting. I always or nearly always need assistance for instrumental activities of daily living like housework, shopping, or managing finances. I have high health support needs and/or high psychosocial needs that require some daily support. I may have support needs for challenging behaviors such as injury to self, physical aggression, verbal aggression, socially unacceptable behavior, or property destruction. I need support for emotional needs such as difficulties regulating emotion, withdrawal, agitation, and anxiety, and I may need some support for managing manic or psychotic behaviors.
Meaningful Day & Employment	To engage in meaningful employment, I likely need a substantial amount of staff support. I may prefer a structured day programming or volunteer opportunities. I often need extensive support for day-to-day activities from skilled individuals and back up plans when support is unavailable. I likely need support to attend school or to engage in other daily activities.
 Community Living	To live in and access the community, I need formal support to help secure appropriate housing, maintain and pay for housing, and pay bills. Home modification and assistive technology can help increase my independence. I likely need consistent 24-hour in home support and other services to live in and access my community including transportation.
 Safety & Security	To stay safe and secure, I may need a risk assessment and planning to mitigate vulnerabilities. I might need supervision in my home and my community and 24-hour access to specialized supports, including nursing and behavioral. I likely need guardianship or other representation to help make decisions or provide oversight. I may need support to deal with legal proceedings, criminal charges, civil commitments, and emergencies.
 Health Living	To manage and access healthcare and stay well, I may need constant help to schedule and attend medical appointments, and to coordinate health support. I may need monitoring for health conditions such as seizures. I may need help communicating with my providers, as well as support to secure reliable health and mental health supports. I experience health or mental health issues that require me to have an emergency plan.
 Social & Spirituality	To build relationships and engage in leisure activities, I may need full support to find and participate in activities with others. I may need support to ensure that my physical, emotional, and medical needs are met, including when I am doing things with my friends and family. I may need long-term support to ensure that I can maintain relationships and manage behavioral or health needs.
 Citizenship & Advocacy	To drive how my life is lived, I may need support to engage in opportunities to make decisions and advocate for myself. I may need formal planning to help me realize my goals and ongoing support to advocate for my needs. I may need help to ensure that even when I experience health or mental health issues, I am still able to make as choices for myself.

Support Range E

MnCHOICES	Criteria for assigning this Support Range to individuals is not yet determined. Therefore, no data from MnCHOICES are available to describe the individuals in this Support Range. This Support Range will be assigned to individuals with complex medical and/or psychosocial support needs.
Meaningful Day & Employment	To engage in meaningful employment, I may need fully customized employment or significant accommodations to work from home. I need at least 1:1 support the entire time that I am working. To access work or day programs, I need constant support and supervision, often from individuals with highly specialized skills. I may be at risk of hospitalization or institutionalization and need flexible options to fulfill a meaningful day.
 Community Living	To live in and access the community, I may need significant home modifications including ceiling track lifts, a ventilator, 24-hour eyes on support, or specialized staff. I may require 2:1 support to help me manage my medical/mental health needs and/or to keep and others around me safe. I may be frequently hospitalized due to health or mental health needs. My housing options may be limited due to my needs, and/or I may have restrictions on my freedom related to legal involvement.
 Safety & Security	To stay safe and secure, I may need specialized family or staff support (e.g., people trained to operate medical equipment and recognize health emergencies, people trained in crisis-prevention who are able to physically intervene if I am in danger or hurting myself or others). I may require 2:1 support to keep me from hurting myself or others. I likely need a guardian or other forms of representation to help me make decisions. I need emergency plans to deal with recurrent emergencies.
 Health Living	To manage and access healthcare and stay well, I may need specialized daily physical assistance for nutrition needs, positioning, mobility, ventilation, and/or other extraordinary support needs. I need help to schedule and attend appointments and may need specialized transportation to get there. I may need in-home medical and behavioral consultation. I may require a specialized living setting to meet my unique needs and help to advocate and communicate my heath needs to others.
 Social & Spirituality	To build relationships and engage in leisure activities, I may need significant long-term support to help with communication and physical support to maintain my personal care or to secure my safety and the safety of others around me when I engage in community activities that I enjoy. I may have limits on my freedoms due to past criminal activity, and/or I may need planning and help to access my community in a way that suits my extensive support needs.
 Citizenship & Advocacy	To drive how my life is lived, I need significant support to determine my interests and goals, make decisions, and/or to advocate for myself, including assistive technology. I may benefit from a strong advocate who knows me and my interests well. Though I have considerable support needs, a strong and well-

coordinated team can help me have the stability required to make important decisions in my life.

Appendix B: Support Range Assignment Exercise Workbook

The following written instructions were given to the reviewers who participated in the support range assignment exercise.

Support Range Assignment Exercise Instructions	
Thank you for taking the time to complete this Support Range Assignment Exercise!	
How to use this workbook:	
1	Go to the "MnCHOICES Profiles" tab by clicking the tab on the bottom of this workbook.
2	Note the ID number in the top black row. Each person has a unique ID number assigned for this exercise. This document does not contain private health information.
3	Read about the individual's ADL and IADL support needs by scrolling down. The colored columns to the left indicate MnCHOICES items and the individual's responses to those items are in the column under the ID. Click on assessment items in the colored column to see the range of responses.
4	When you get to the end of the IADLs section, there will be directions to answer #1 on the "Responses" tab. Go to the "Responses" tab by clicking the word "Responses" on the bottom of this workbook.
5	Find the Profile ID of the individual you are currently reading about in the rows in the "Responses" tab. The first ID you read will be the first row, the second ID will be the second row, and so on.
6	Answer #1 which asks about the "General Support Needs" of the individual with the ID you are currently reading. Remember that General Support Needs means ADLs and IADLs.
7	Go back to the MnCHOICES Profile. Continue steps 3 to 6 for the Psychosocial support needs and Health support needs section, answering #2 and #3 on the "Responses" tab.
8	Once you completely read the entire profile/column for that ID, fill in #4 on the "Responses" tab that asks what Support Range should be assigned to the person.
9	If you had any concerns about the Support Range assignment or would like us to know about anything else, write notes in the boxes after #4 for the ID the notes apply to.
10	Save the worksheet somewhere that will be easy to find later on your computer.
11	Continue on to the next profile, which is in the next column on the "MnCHOICES Profiles" tab. You can scroll to the next column using the arrow in the bottom right corner of the workbook.
12	Repeat steps 3 through 11 until you have read all the profiles in your workbook and responded to all of the questions on the "Responses" tab.
13	Save the workbook.
14	Send the completed workbook to Jami Petner-Arrey (jpetnerarrey@hsri.org) by August 14, 2018 at midnight.
See Jami's email containing training information and Live Help Day (August 7th) information, or contact Jami Petner-Arrey (jpetnerarrey@hsri.org) if you have questions.	

The MnCHOICES Profiles included response to selected ADL, IADL, Psychosocial, and Health items as pictured in the following screenshots.

ADLs

ID:	5
Activities of Daily Living - "ADLs"	
Eating — Cueing/supervision:	Intermittently during the task
Eating — Physical assistance:	Setup/Prep
Eating — Needs:	Needs and gets minimal reminding or supervision
Eating — Support instructions:	Monitor for choking, Provide cues, Able to manage their own need
Eating — Needed adaptive equipment:	
Bathing — Cueing/supervision:	Constantly throughout the task
Bathing — Physical assistance:	Extensive/Total Dependence
Bathing — Needs:	Needs and gets help washing and drying their body
Bathing — Support instructions:	Assist with drying and dressing, Other
Bathing — Needed adaptive equipment:	

IADLs

ID:	5
Instrumental Activities of Daily Living - "IADLs"	
Meal Preparation — Needs:	Often
Meal Preparation — Support instructions:	Work out a menu with person
Transportation — Needs:	Always
Transportation — Support instructions:	Make arrangements for Para transit, Take wheelchair/walker
Housework — Needs - Heavy Housework:	Always
Housework — Needs- Light:	Often
Housework — Needs - Laundry:	Always or nearly always needs assistance
Housework — Support instructions:	Cue to perform tasks

Psychosocial

ID:	5
Psychosocial Support Needs	
Injurious to self — Impacts functioning:	
Injurious to self — Behavior(s) that apply:	
Injurious to self — Intervention:	
Injurious to self — Frequency of intervention:	
Aggressive towards others, physical — Impacts functioning:	
Aggressive towards others, physical — Behavior(s) that apply:	
Aggressive towards others, physical — Intervention:	
Aggressive towards others, physical — Frequency of intervention:	
Aggressive towards others, verbal — Impacts functioning:	Yes
Aggressive towards others, verbal — Behavior(s) that apply:	Yells/Screams at others
Aggressive towards others, verbal — Intervention:	Needs redirection - responds to redirection
Aggressive towards others, verbal — Frequency of intervention:	One time per week

Health

ID:	5
Health Support Needs	
Cardiac - Blood pressure — Need:	Yes
Cardiac - Blood pressure — Performed by:	Other
Cardiac - Blood pressure — Frequency:	Monthly or less
Cardiac - Cardioverter-defibrillator — Need:	
Cardiac - Cardioverter-defibrillator — Performed by:	
Cardiac - Cardioverter-defibrillator — Frequency:	
Cardiac - Pacemaker — Need:	
Cardiac - Pacemaker — Performed by:	
Cardiac - Pacemaker — Frequency:	
Cardiac - Vital Signs — Need:	Yes
Cardiac - Vital Signs — Performed by:	Nurse
Cardiac - Vital Signs — Frequency:	Monthly or less
Cardiac - Weight — Need:	Yes
Cardiac - Weight — Performed by:	Other
Cardiac - Weight — Frequency:	Daily

Responses

ID	Requires responses for all profiles				If you are unsure about the Support Range you selected, tell us why.	Notes:
	1. General Support Need (ADLs & IADLs)	2. Psychosocial Support Need	3. Health Support Need	4. Select Support Range		
1						
2						
3						
4						
5						