

2. Limitations and Assumptions of Multilevel Analysis

Bryk and Raudenbush (1992) identify five assumptions that should be met for HLM to work successfully:

- A. The error term of each level-1 unit should have a mean of zero and the residuals should be normally distributed. For example, if the level-1 units or individual long-term care and fee-for-service recipients and level-2 units are counties, then the mean of the error within each classroom should be zero, the residuals should be normally distributed, and all counties should have variances equal to the other counties in the sample.
- B. Level-1 predictors are independent of the level-1 error term. That is, the covariance between level-1 predictors and the error term should be zero.
- C. Level-2 error terms each have a mean of zero and adhere to a multivariate normal distribution.
- D. Level-2 predictors are independent of all level-2 error terms. Thus, all variables in the second level of the model are not related to any of the error terms on that level of the model, including the error term for the level-1 intercept, and the error term for any of the slopes of level-1 variables.
- E. The level-1 error terms are independent of level-2 error terms. That is, there is not relationship between the error term at level-1 and the error term in the level-2 equation for the level-1 intercept, or the error term in any of the equations used to estimate the slopes of level-1 variables.

The assumptions that are necessary for linear regression analyses also apply to analyses using HLM, and they can be just as complex. One assumption of linear equations is that the errors- because of measurement noise and omitted variables- are distributed normally and are independent of the variables in the equation. In addition, any assumption that the relationships are linear is often overlooked in regression analyses and HLM.

One assumption that relates only to HLM is also important. The major criterion for HLM analyses is to have appropriate data. This means that the data must be hierarchical, with groups nested within higher-level groups, and with enough cases within and between groups to provide sufficient degrees of freedom for the linear equations. As well, the data must be especially accurate and the variables especially reliable and valid because small inaccuracies at one level can lead to bias in relationships found at the next level.

Finally, like other linear models, level-2 models in HLM are sensitive to large standard errors of the estimates, to omitted variables, and to the transformations of existing variables. All of these factors mentioned display the potential dangers of using this new sophisticated methodology on poor concepts, poor data, or both. Burstein, Kim and Delandshere (1989) remind researchers that the new, more powerful methods can produce very complex, yet very wrong, results if data assumptions are not carefully considered⁴⁷.

⁴⁷ Burstein, L., Kim, K-S., & Delandshere, G. (1988). *Multilevel investigations of systematically varying slopes: Issues, alternatives, and consequences*. In R.D. Bock (Ed.), *Multilevel analysis of educational data*. San Diego: Academic Press.

Concerning the interpretation of HLM there are also some points to be noted. Most importantly, analyses based on this method will always be non-experimental and correlational - not causal. Fortunately or unfortunately, correlation does not prove causation. Therefore, one must proceed with caution when interpreting results from HLM, and not imply any causal effects.

It is important to note that the results of HLM are only as good as the data used to estimate the model. If the data are biased or incomplete, the results will be biased or incomplete. Therefore, it is important to ensure that the data used for HLM are of high quality and represent the population of interest.

Another important point is that HLM is a statistical method and not a theoretical framework. It is important to have a strong theoretical understanding of the relationships between the variables in the model before using HLM to test hypotheses.

Finally, it is important to remember that HLM is a complex method and requires a good understanding of statistics and computer software. It is recommended that researchers who are new to HLM seek out training and resources to help them understand the method and its applications.

In conclusion, HLM is a powerful method for analyzing data with a hierarchical structure. It allows researchers to account for the correlation between observations within the same group and to estimate the effects of variables at different levels of the hierarchy. However, it is important to use HLM with caution and to understand its limitations and assumptions.

Multi-level modeling (MLM) is a type of HLM that is used to analyze data with a hierarchical structure. It is similar to HLM in that it allows researchers to account for the correlation between observations within the same group and to estimate the effects of variables at different levels of the hierarchy. However, MLM is specifically designed for analyzing data with a continuous outcome variable.

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1. For more information on HLM, see Raudenbush, S. W., & Brykman, A. S. (2002). *Hierarchical linear models: Applications and data analysis techniques*. Thousand Oaks, CA: Sage Publications.

VIII. Lessons Learned

The conclusions of the Independent Assessment are structured into two parts: (1) Lessons Learned and (2) Recommendations. The Lessons Learned section provides an overview of the lessons learned by the Department and CMOs from the implementation and early years of operation of the program. These lessons are particularly relevant in consideration of expanding Family Care to additional counties in the future. These lessons learned have been catalogued by the Department in various formats and others were conveyed to APS staff during site visits to the CMOs and Resource Centers. The Recommendation Section provides recommendations primarily from the Independent Assessment and EQRO activities over the last year.

A. Findings from Site Visits

Site visits were conducted by APS staff during the spring of 2003. These visits were made to all five CMO pilot counties and were held jointly with CMO and Resource Center directors and selected staff. In addition to these five pilot counties, site visits were also made to two Resource Center only counties. Information gathered during these site visits provides good qualitative data on how the program is working from the counties' perspective.

In general, the counties feel that Family Care is working in their county to meet consumer needs. While all of the counties were able to identify challenges and barriers they are working to overcome, they feel in general that the switch to Family Care has been positive and has allowed them to meet the needs of consumers. The following comments are representative of what was reported by the counties as a group.

One county commented that they felt the transition into the program had gone smoothly, and that while they have some questions and concerns, it is largely a matter of learning the new system. Several counties reported that the Family Care program is perceived very positively in their community. Overall, another county feels that they are meeting the needs of their members and keeping them in the community. For one county, although the switch to Family Care has really been a change of culture, they have found that Family Care has been much more palatable for their consumers than other options that existed before the program. In another county, they feel that Family Care has really allowed them to reach populations that would otherwise be on waiting lists. Additionally, a county reported that they believe the program has been effective in de-mystifying the process of accessing long term care services for consumers. Lastly, another frequently heard comment is that implementing Family Care has led to very good working relationships with State staff.

The EQRO activities' emphasis on assessment of CMOs' process and inputs is better suited for primary and acute services evaluation than for community-based long-term care services, which has been a challenge for counties. This comment was heard from nearly every county. One county felt that in terms of member outcomes, working with the EQRO presented a challenge, because there was an emphasis on process measures and that is inconsistent with Family Care program's stated goal of a person-centered approach. Another county found Metastar very thorough in their review, which is very positive, but that the focus on the process measures means this area could still use some refining. Others expressed that the approach

utilized might not be best for people receiving services in their homes, and that the focus on detail has inhibited their ability to “spread their wings.”

They find that the quality assurance process can sometimes be overly burdensome, and that the review process is structured like an audit, which results in a greater focus on process rather than on outcomes, which again seems inconsistent with the program’s goals of achieving member outcomes. CMOs also found that sometimes the EQRO focuses on compliance rather than examining why you might not be in compliance or what specific circumstances are present. This is mainly seen in quality site reviews and care plan reviews. While another county reported that the new care plan review is more meaningful and more easily used than the original, some staff continued to express concerns that it is reverting back toward being an evaluation tool better suited for assessing primary and acute services rather than long-term care benefits.

Counties are finding it challenging to serve so many consumers with mental health and AODA diagnoses. Another common theme heard in site visits was that counties were encountering some challenges relating to members with AODA and mental health diagnoses⁴⁸. One county noted that they had more individuals with these kinds of issues than they had expected, and it negatively affected quality because they had not hired staff with this type of expertise. They reported that case management for this population can be challenging and also time-consuming, causing workload difficulties.

Another county expressed concern that the individuals with dual diagnoses could pose problems down the road for service delivery and finances in that county and across the state, and that there is not the capacity to serve the scope of mental health and AODA needs does not currently exist. It would require more staff time and oversight than is presently available in the Family Care model. While many providers for mental health services will accept the Medicaid rate, some counties anticipate a problem with accessing these services in the future.

In general, the counties felt they needed to learn ways to serve the mental health population better. Additionally, when expansion of the Family Care program was discussed, the issues of mental health and AODA services were noted as issues that must receive greater consideration than they did with the initial roll out of Family Care in the five pilot counties.

The counties find the various Family Care workgroup meetings useful, but offer some suggestions to increase their value⁴⁹. In terms of the workgroups, feelings were generally very positive among the counties, and the overall feedback was that they provided a useful service and that the workgroups have been important to the CMOs and Resource Centers as they have been developing. However, some workgroups were identified as more helpful than others. For example, the Resource Center workgroup was identified frequently as being beneficial, and providing a solid forum to learn from others. The provider network group was noted as similarly

⁴⁸ As noted in Section III., the Family Care program targets the elderly, physically and developmentally disabled. However, individuals who have other conditions such as chronic mental illness might qualify for the program by meeting specified criteria related to age or existing condition.

⁴⁹ Workgroup meetings are administered by the EQRO and DHFS, typically on a monthly basis, for such topic areas as Fiscal, Case Management, Provider Network, Quality, Executive Directors, among others. These meetings are intended to bring individuals together from pilot counties to share their experiences, help develop ideas, and receive feedback from their peers.

helpful. The case management workgroup, however, was said to be the least useful to the counties, in that it seems to be taking on a new, more policy-making orientation and some counties are only sending supervisors to these meetings.

The main issue that came up repeatedly is the time commitment the workgroup meetings require. Since the majority of the meetings are held in Madison, there is considerable travel time required for many of the CMO and RC staff to attend the meetings. Some counties stated that it was challenging to send staff to meetings and still be able to complete necessary work. Sometimes, they also feel they have difficulty determining which workgroup fills which function, and which staff should be at a particular meeting.

One frequent suggestion was to make more use of teleconferences or videoconferences now that the projects are underway. This would save time if staff didn't have to travel to meetings. Perhaps it would also be possible to reduce the number of meetings held, and make the trainings that are held as relevant as possible for appropriate staff. However, it is important to note that while some counties felt some workgroups could have fewer meetings, others felt some workgroups should meet more often. One recommendation was to consider alternating meetings month to month. Another change that might be helpful is to really target the meeting agendas, and make sure that the staff responsible for chairing the meetings have good meeting facilitation skills to help stay on the agenda. Related to the agenda, another comment was that workgroup agendas are set by the Department, and it would be helpful if the counties could have some input on what they would find most beneficial.

Additional suggestions were that workgroups would be good venues to use for strategic planning for the future, and that it might be helpful to periodically bring in non-Family Care counties.

Counties benefit from the sharing of experiences with other counties, and would appreciate even more DHFS facilitation of this activity, including dissemination of best practices and lessons learned. Many counties felt it would be helpful if the Department emphasized even more the dissemination of best practices and lessons learned from all the pilot programs, and provided more time and opportunities for such sharing activities. Sharing of this sort among the counties would help them avoid investing time in reinventing the wheel for some of the issues they encounter. More opportunities for counties to share experiences at trainings and workgroups would be helpful. Another suggestion was that the Department could develop a panel or workshop covering all aspects of Family Care to share with all to help the learning curve.

One suggestion was to videotape the activities of each county relating to IT and other issues, and distribute these videos among the counties as a way of learning from one another. Several counties are also already sharing resources they have developed with other counties, including brochures and marketing and outreach materials, and more of this sort of information sharing would be welcome.

Counties would appreciate more specific minimum standards from DHFS on information technology (IT) issues, as well as generally more concrete direction on other issues as well.

In general, counties expressed that it would be helpful to receive more concrete direction from DHFS regarding what the Department needs the county programs to provide in terms of data as they develop the program systems. This would give counties specific guidelines to follow, while still allowing for the development of local methods, appropriate for each particular county program. Counties identified a conflict between the Department's desire to allow individuality and flexibility at the local level at the same time they are establishing a number of specific requirements. Counties find it helpful that they have many different State staff to approach with questions, but they also find that sometimes decisions are being made "by committee," and it can take some time to get a definitive answer.

While this issue came up regarding a range of Family Care program aspects, it came up most often in terms of the counties' IT systems, which is an area that several counties noted as particularly challenging. One recommendation is that the Department could set minimum standards for IT and work to ensure that all counties are at the same level. Another suggestion is that given the data reporting expectations for the Resource Center, the Department could provide specific recommendations of the best software and training to use. They also suggest that more direction in utilizing and focusing on outcome measurements would be helpful. Additionally, the provision of more data they can use to identify outcomes and support, given to them with a relatively quick turnaround, would also be useful.

Counties have concerns about Member Outcome Interviews. Three CMOs noted concerns and/or complaints from consumers about inappropriate questions in the interviews. Most, but not all, counties reported that the member outcome interviews are not really of value. Counties expressed a noted lack of understanding pertaining to the meaning, interpretation and utilization of the findings of the Member Outcome Interviews among the local Long-Term Care Councils, the Resource Centers, and the CMOs. The importance of member outcomes needs to be made more meaningful to these groups for the best results. (see Section VI. C. for more elaborate analysis of Member Outcome Interviews).

B. State Identified Lessons Learned

Annual CMO site visits were conducted by DHFS staff in November and December 2002.

These site visits, as well as, Family Care workgroup meetings between CMO, RC and state staff provided a number of opportunities to dialogue about positive and negative aspects of the Family Care program. These dialogues have been distilled into a number of key "lessons learned" by DHFS staff. A summary of these is presented below:

County Issues

Key characteristics of counties that were able to start their CMO successfully have been identified. These are mainly related to having strong leadership within the county that is willing to take a risk in piloting a new program and ending the present system in favor of developing a new model. It was also found to be important for the CMO to have the ability to do detailed strategic planning, and to have the different county agencies affected by the program be able to collaborate well. Strong leaders who would advocate for the needed steps to be taken and were committed to seeing Family Care implemented in their county were also important, as was a priority for serving the needs of the public.

Getting key decision-makers to buy in to the Family Care program was facilitated by educational efforts on the part of stakeholders, and open communication between all parties. This helped to alleviate concerns that accompany change. Additionally, some turf issues have occurred between CMOs and other county agencies involved with the same populations, especially as funding constraints have occurred. Role clarification is required, and this will assist with buy-in among all agencies.

While the CMO governing boards have settled into their oversight role, the long-term care councils are still working at defining and understanding their roles⁵⁰. In order to address the concern that too many local boards are required by Family Care, the pilot sites advise that DHFS should re-evaluate the board structure design currently mandated by Family Care. It is also important to note that funding that already exists in counties for long-term support must not be immediately re-directed to other county programs, due to the fact that funding is necessary for start-up costs. Finally, some unrealistic expectations by stakeholders regarding outcomes and choice in the Family Care Program need to be addressed. It is important not to make too many promises while informing the community about the program. Pilot sites recommend being careful about raising unrealistic expectations about different aspects of the program.

Management and Infrastructure

It is critical to establish a complete management team with clearly defined roles and responsibilities for all areas: interdisciplinary teams; business and fiscal operations; information systems; QI and QA activities; prevention and wellness programs; and SDS. In particular, fiscal management, information technology, and business management tasks were found to be insufficient. Pilot sites suggest that DHFS institute a requirement that new CMOs must have full-time fiscal managers with relevant experience on staff. Additionally, they recommend that the Department require new CMO counties to utilize a business enterprise approach, separate CMO funds from the rest of the county budget, and have independent information systems. They suggested the IT groundwork should be in place ahead of time so the CMO is fully functional at the beginning instead of having to plan and/or develop a new IT system as it moves ahead. They also suggested CMOs have discretion in contracting, procurement and personnel issues, including hiring, which is a particular issue with new emerging staffing needs and a requirement for teamwork. Finally, it was suggested claims management may be best contracted out instead of devoting resources to developing an in-house system. Regardless of which option is used, the system must be responsive to provider concerns.

Eligibility and Enrollment

While the single point of entry has provided improvement for Family Care consumers, the eligibility and enrollment process is not necessarily any simpler than the system in place before the implementation of Family Care. Pilot sites have recommended in particular that Economic Support must be integrated into the planning process at the start.

⁵⁰ As part of the DHFS-CMO contract and the 1999 Wisconsin Act 9, pilot counties are required to appoint a local long-term care councils (LTCCs) to guarantee public input regarding the pilot. LTCCs must include a majority of members who are elderly or disabled or their immediate family members or representatives.

Inter-Disciplinary Teams

Some staff issues emerged related to implementation of the Family Care program. The outcome-based method of care planning, and the resource allocation decision-making process (RAD), presented both new roles and new philosophies for care managers. Interdisciplinary teams require structure and guidance to implement RAD and Family Care. Additionally, rapid expansion required constantly hiring new care managers. For this reason, it will be important to have a standardized training program available to quickly bring in new people.

Nursing input was found to be critical for CMO administrative and interdisciplinary teams. CMO pilots recommend that new sites should have a nurse supervisor in place at the inception, or at minimum that there be nursing participation in the development of the new policies and procedures.

Members with AODA and mental health issues require staff with specific training and support to address the special needs of these individuals. These issues can quickly become overwhelming, so pilot sites suggest training for this should be available early in the process.

Lastly, interdisciplinary teams should not have to focus on business processes. Pilot sites recommend that new CMOs from the start should have someone whose responsibility is to manage claims processing, benefits coordination, and securing authorizations. This will also help with the challenge presented by rapid growth in membership, which has placed a great deal of pressure on staff with little time to regroup as things get busy.

Provider Network

A significant challenge in this area is related to rapid growth in membership, which has made keeping up with provider capacity difficult. Additionally, Family Care presents a different relationship between the CMO and the providers versus that in COP/waivers. Increased competition among providers in response to the emphasis on consumer choice has helped to spur providers to think of new ways to attract consumers and improve quality. If counties had good provider relationships prior to the implementation of Family Care, and emphasized open communication when the transition occurred, they have found it possible to maintain those good relations even with increasing expectations and competition.

Specific suggestions from the pilot sites are:

- New CMOs should be required to have at minimum a full-time provider network developer to deal with provider contracts.
- Collaboration with providers should begin early in the process, and providers should be considered partners and stakeholders in Family Care.
- Claims can present difficulties, so CMOs should work with providers to ensure CMO staff capacity for claims submissions, and responding to provider questions and disputes.
- Keeping in the requirement that new CMOs must use the Medicaid rate.
- Create and support ways to get more complete information on provider costs than is normally available via audits and systematize rate-setting.
- Learn how member outcomes can be achieved by use of informal community supports.

Quality

For CMOs, QA/QI is now viewed as a key element of their programs, and it should be emphasized throughout the Family Care program. However, it can take a significant amount of time to learn about QA/QI. CMO pilots recommend that DHFS can help by providing specific and clear guidance from early on regarding expectations for quality programs. They further suggest that CMOs should have an individual identified at the start whose responsibility is to implement a quality program emphasizing measurable quality indicators. CMOs should be given sufficient time to phase in their quality programs, and fiscal, business, and information technology quality issues should be included in the quality site visit.

It was also emphasized that Family Care's focus on improvement for consumers, as opposed to a regulatory basis, is a key part of Family Care's success and needs to be maintained.

DHFS Role

A critical message is that for counties to take the risk of starting a CMO, there must be a good relationship between DHFS and the counties. The Department faces the challenge of providing enough direction to assist the counties in implementing Family Care, while still maintaining enough flexibility to meet the needs of different counties. It was beneficial that the Department allowed the CMOs to begin slowly and gradually moving toward full implementation. As Family Care expands, DHFS and its staff must maintain this level of commitment and flexibility to ensure the program will work. This will be a challenge, especially as the Department faces possible staffing cuts due to budget issues.

The organization of long term care at the state level is confusing in some regards. Also, DHFS could have provided clearer definitions of roles, responsibilities and expectations for CMO management structure and process development. Now, with experience, both the Department and the CMOs know more about what is needed for information technology, business data analysis, and fiscal management. This last issue must be right from the beginning. Inconsistency in utilization reports early on made it difficult for CMOs to compare themselves with each other. DHFS could also have provided more facilitation for sharing of best practices and other information among the pilot sites. This will be especially helpful to new CMOs as they are starting – sharing existing experience will help them not have to re-invent the wheel.

These are specific needs around training and technical assistance:

- Training for case managers in identifying outcomes should precede RAD training.
- Continuing training in RAD and risk is critical for optimal case management. It is recommended that DHFS continue to do training on an annual basis, as better results are seen when training is done by the Department.
- A training in the general principles of managed care would be helpful.
- Give to new CMOs a checklist of minimal required functional needs for their information technology system.
- Provide clear expectations to CMOs for what they can expect in terms of technical assistance, so that they do not have inaccurate expectations that will not be met.
- Counties require more direction regarding what to do with information provided in the business systems analysis.

- Pilot sites would have found technical assistance very helpful when contracting for information technology services.

COP/Waiver Counties

CMO pilot sites provide these suggestions, based upon their experience, for counties looking ahead to preparing for Family Care or adopting some of its features:

- Begin to get teams together for case managers and other staff.
- Allow case managers to begin making some independent decisions, and taking responsibility for them. This will help them prepare for the decision-making responsibility that comes with Family Care.
- Put in place a full-time provider network developer, adding quality requirements to provider contracts.
- Pay providers in a per-person per-service basis. This places the risk of having adequate members on the provider, instead of the county.
- Foster growth in expertise about mental health and AODA issues.
- Learn the full meaning and implications of consumer choice.
- Provide training about consumer outcomes, the RAD, and risk agreements.
- Create and support ties between fiscal and case management staff.

IX. Conclusions and Recommendations

The Recommendation Section provides recommendations primarily from the Independent Assessment and EQRO activities over the last year.

A. Recommendations

Effective program evaluation is critical to the success and future of the Family Care program. Despite data limitations, it appears that the Family Care program was able to focus on improving access to care and improving quality. Cost effectiveness will require a longer observation and evaluation period to determine the full impact of Family Care on all services covered by Medicaid and the Family Care benefit. Specific recommendations related to access, quality and cost effectiveness are listed below.

1. Access to Care

Despite a lack of reliable and comprehensive data, there is no indication that the Family Care program has access to care problems. Future state or independent reviews should have the benefit of more evaluation data to review and analyze.

Recommendation – For the future, DHFS and the EQRO should address and document aspects of access more thoroughly. Access monitoring activities need to be strengthened. One specific area requiring greater attention is the documenting and monitoring of the provider network for each CMO. At this time, DHFS is in the process of enhancing this area in cooperation with the CMOs and EQRO.

Recommendation – The Provider Network within each CMO plays a pivotal role in what services Family Care members can access. Understanding and assessing the reasons various service providers join and remain within a CMOs network could be useful information to enhance access in the future, as well as improving quality. This could be accomplished through provider complaint analyses and provider satisfaction surveys. Additionally, given the minimal research literature on physician satisfaction or physician perceptions regarding the impact of Medicaid managed care on patient care, among other providers, efforts to gather and synthesize this type of information will be of great assistance to pilot CMOs and future CMOs.

Recommendation – In the future, information should be maintained showing reasons why individuals decide not to enroll in the Family Care program. Further, members and individuals who chose not to enroll in the program could be surveyed to assess and evaluate the access process more in depth and to identify areas for improvement.

Recommendation – The Enrollment Consultants are a valuable asset to eventual Family Care members and individuals who ultimately decide not to enroll in the program. This function should remain intact and be fully utilized. Should expansion within the Family Care program occur, special attention will be necessary by DHFS to ensure the current organization has the capacity to deliver this service.

Recommendation – The reporting process between the Enrollment Consultants and the Resource Centers needs to be streamlined so that all counties are reporting information to the Enrollment Consultants in the same fashion.

Recommendation – Presently, Richland County is the only CMO who has regular meetings with Enrollment Consultant staff. It is recommended that pilot counties and other counties where expansion of the Family Care program were to occur conduct these meetings periodically as well.

Recommendation – DHFS should develop routine reports to monitor access to Family Care on a county level.

2. Quality of Services

A considerable amount of attention has been paid to quality related issues by DHFS, much of which is thoroughly detailed by the EQRO in various reports. Additionally, DHFS has given counties substantial amounts of autonomy in the operations of the CMOs which has spurred a great deal of creativity and flexibility.

Recommendation – The EQRO noted several issues related to data quality and record keeping concerns during the site visits for such things as flu and pneumonia vaccinations and in the care plan reviews. As a result, it was recommended that CMOs choose to use one of eight possible forms. These forms might likely minimize many of the difficulties encountered by the CMOs and noted by the EQRO. However, it is difficult to ascertain how utilizing more than one type of reporting mechanism of varying styles will provide DHFS the ability to easily synthesize a variety of data sources and information across CMOs when the potential for each CMO to utilize a different reporting form exists. As a result, it is recommended that this option be narrowed further to one or two similar forms so that information will be utilized more efficiently.

Recommendation – DHFS has been working with the Resource Centers on guidelines to improve upon disenrollment data tracking. It is suggested that DHFS consider surveys or other methods of ascertaining information from those individuals who chose to disenroll to identify trends and patterns and areas for improvement, particularly given the high levels of “voluntary disenrollment” (behind “death”) for those members choosing to disenroll.

Recommendation – CMOs expressed to APS staff during site visit meetings that the value of workgroup meetings varied greatly. Additionally, the location and frequency of the meetings proved to be inconvenient to CMO staff somewhat regularly. While DHFS has been working to improve the quality of these meetings as well as the location of them, it is recommended that DHFS work with the CMOs to better ascertain, for both entities, what meetings might be changed in terms of frequency and necessity.

Recommendation – DHFS should use the combined averages from the first three rounds of Member Outcome Interview surveys to establish a baseline from which to work and assess within counties and between target groups. Not specifying specific parameters from this information diminishes the usefulness and breadth of collecting this data.

Recommendation – In order to ensure the validity of the member outcome interviews, DHFS should request that the EQRO periodically conduct statistical analyses on inter-rater reliability to enhance the present “reliablizing” utilized for this tool.

Recommendation – At the present time, DHFS has begun the fourth round of Member Outcome Interviews. Through this information, there is a great wealth of data to be utilized. It is suggested that DHFS utilize this information to glean longitudinal looks at changes that have occurred over time. One such methodology would be that of growth curve analyses that would enable DHFS to analyze rates of change between target groups and counties, among others. Further, for future survey rounds, DHFS should consider sampling individuals who have less than one year of Family Care membership and greater than one year in order to discern differences between these two groups.

Recommendation – While the focus areas and performance measures CMOs track annually can change, it is suggested that DHFS work with the CMOs and EQRO in determining one or two selected measures that remain consistent on an annual basis. Having data in this longitudinal fashion enables for greater insight to program impact and assessing changes over time. Further, when gathering information on vaccination rates, analyses should be conducted that determine if Family Care members mirror national patterns that are identified in the research literature.

Recommendation – The EQRO made recommendations in its annual report related to performance improvement project training and timeliness issues for assessment activities, among others. DHFS is working cooperatively with the EQRO and CMOs to improve this process. It is recommended that these efforts continue.

Recommendation – DHFS is early on in its evaluation of grievance and appeal data. While plans exist to scrutinize the various sources of data at their disposal, it is recommended that DHFS conduct on-going, frequent analyses of this information using all available sources of data. Further, it is suggested that DHFS also conduct comparative analyses on similar data for other state administered managed care programs to measure rates of grievances and appeals within the Family Care program compared to those of other programs.

3. Cost-Effectiveness

As previously discussed, exhaustive efforts have been made in developing the statistically valid, risk adjusted Comparison Group utilized throughout the Independent Assessment. However, due to the scope of the assessment, only selected long-term care and primary and acute costs and utilizations were analyzed in detail.

Recommendation – It is suggested that DHFS look to fully leverage resources that will enable this work to be utilized in an ongoing manner to examine changes over time among the Family Care counties and across target groups for the long-term care and primary and acute services within this study, as well as conducting more in-depth analyses than could be done within the scope of this Independent Assessment. Examples of such work might include examination of the full set of services within the Family Care program benefit package, additional primary and acute health related services, as well as on-going monitoring of total long-term care costs and program effects.

Recommendation – Given the substantial variation that exists between the Milwaukee County CMO and the other four CMO counties, it is suggested that future analyses take into account these differences and not only look at the program comprehensively, but also examine subgroups among the CMOs. Analyses such as these will enable DHFS to more effectively ascertain more specific differences that might otherwise be masked by a collective overview of the program.

Recommendation – Future analyses by DHFS should include examining and identifying county and regional differences among providers that might impact cost and utilization for various long-term care and primary and acute outcomes. For example, does prescription drug utilization differ between generic and brand name drugs across counties for drugs that provide the same benefit? If this were to be the case, is this a result of doctors in certain counties or regions of the state being more inclined to prescribe generic or brand name drugs which would ultimately impact drug costs across counties, but not utilization.

Recommendation – DHFS should be supported in its efforts to identify and monitor more effective cost-saving mechanisms and cost restraints for delivering long-term care in community settings through unique management practices, organization of delivery systems and organizational incentives. The Department has developed a working document entitled “Mechanisms of Cost Restraint.” This paper begins to identify specific cost-effective ways the Family Care program, as a whole, and individual CMOs can deliver quality long-term care services at an economical cost.

X. Appendix

Attachment 1: Items Covered in the Family Care Benefit Package⁵¹

The Family Care benefit package includes some Medicaid services, Community Options Program (COP) services, and Home and Community-Based Waiver (HCBW) services. The benefit package includes:

- Adaptive Aids (general and vehicle)
- Adult Day Care
- Alcohol and Other Drug Abuse Day Treatment Services (in all settings)
- Alcohol and Other Drug Abuse Services, except those provided by a physician or on an inpatient basis.
- Case Management (including Assessment and Case Planning)
- Communication Aids/Interpreter Services
- Community Support Program
- Counseling and Therapeutic Resources
- Daily Living Skills Training
- Day Services/Treatment
- Durable Medical Equipment, except for hearing aids and prosthetics (in all settings)
- Home Health
- Home Modifications
- Meals: home delivered and congregate
- Medical Supplies
- Mental Health Day Treatment Services (in all settings)
- Mental Health Services, except those provided by a physician or on an inpatient basis
- Nursing Facility (all stays including Intermediate Care Facility for People with Mental Retardation (ICF/MR) and Institution for Mental Disease (IMD))
- Nursing Services (including respiratory care, intermittent and private duty nursing) and Nursing Services
- Occupational Therapy (in all settings except for inpatient hospital)

⁵¹ SOURCE: DHFS. <http://www.dhfs.state.wi.us/LTCare/Generalinfo/Benpackage.htm>

- Personal Care
- Personal Emergency Response System Services
- Physical Therapy (in all settings except for inpatient hospital)
- Prevocational Services
- Protective Payment/Guardianship Services
- Residential Services: Residential Care Apartment Complex (RCAC), Community Based Residential Facility (CBRF), Adult Family Home
- Respite Care (For care givers and members in non-institutional institutional settings)
- Specialized Medical Supplies
- Speech and Language Pathology Services (in all settings except for inpatient hospital)
- Supported Employment
- Supportive Home Care
- Transportation Select Medicaid covered (i.e. Medicaid covered Transportation Services except Ambulance and transportation by common carrier) and non-Medicaid covered

Attachment 2: Provider Network Summary by CMO – 2000 through 2002

Provider Network Summary by CMO – Calendar Year 2000		
Services	FDL	La Crosse
Adaptive AIDS		3
Adult Day Care	1	7
Adult Family Home	11	
Alcohol & Other Drug Use Day Treatment Services		4
AODA Services	1	
CBRF	19	
Chore Services	4	
Communication AIDS/ Interpreter	1	2
Community Support Program		1
Counseling & Therapeutic Resources		13
Daily Living Skills	7	5
Day Services / Treatment	1	5
Disposable Medical Supplies		17
Durable Medical Supplies	2	16
Health Fitness Program	6	
Home Clean / Home Modifications		various
Home Delivered Meals	5	8
Home Health Care Agencies	5	3
Home Oxygen	3	
Medical Supplies/ Specialized Medical Supplies	18	11
Mental Health - Day Treatment Services		1
Mental Health Services		3
Nursing Homes / facilities	10	21
Occupational Therapy Consult	7	
Outpatient MH/AODA	5	
Personal Care	7	5
Personal Emergency Response	5	3
Physical Therapy	7	9
Prevocational Services	3	7
RCAC Residential Services	3	20
Respite Care	10	4
Specialized Medical Vehicle	5	12
Speech & Language Pathology Services	5	6
Supported Employment	4	3
Supportive Home Care	18	10
Transportation	5	

* This list only includes services that were provided by at least one of the counties in the year 2000

Provider Network Summary by CMO – Calendar Year 2001					
Services	FDL	LaCrosse	Milw.	Portage	Richland
Adaptive AIDS		3		5	15
Adult Day Care	1	8	33	2	4
Adult Day Service				4	
Adult Family Home	18				
Alcohol & Other Drug Use Day Treatment Services		3			2
AODA Services	1			3	
Assessment & Case Planning				1	
Care Management Team		1	1	1	1
Care Management Unit			14		
CBRF	24				14
Chore Services	4				
Common Carrier			10		
Communication AIDS/ Interpreter	1	2		4	3
Community Support Program		1		1	1
Contractor			6		
Corporate Guardian			6		
Counseling & Therapeutic Resources		13		2	
Daily Living Skills	7	5	14	5	1
Day Services / Treatment	4	5			2
Developmentally Disabled Day Center			6		
Durable Medical Supplies	2	16		14	12
Health Fitness Program	6		1		
Home Clean / Home Modifications				3	4
Home Delivered Meals	5	6	4	3	3
Home Health Care Agencies	5	3		5	3
Home Oxygen	3				
Licensed Psychologist			2		
Massage Therapist			1		
Medical Supplies/ Specialized Medical Supplies	19	15		4	11
Mental Health - Day Treatment Services		2			
Mental Health Services		5		7	4
Money Management			3		
Movers			1		
Nursing Homes / facilities	12	13		6	10
Nursing Services				4	
Occupational Therapy Consult	7	10		7	4
Outpatient MH/AODA	4				
Personal Care	7	5		4	5
Personal Emergency Response	2	3	10	1	3
Physical Therapy		10		8	4
Prevocational Services	4	2		3	2
Protective Payment / Guardianship Services		4		1	2
RCAC Residential Services	3	16		49	35
Respite Care	6	4		20	23
Specialized Medical Vehicle	5	3			
Speech & Language Pathology Services	5	7		8	6
Supported Employment	5	3		4	2
Supportive Home Care	18	10	37	10	7
Transportation	5	6		8	7

* This list only includes services that were provided by atleast one of the counties in the year 2001

Provider Network Summary by CMO – Calendar Year 2002		
Services	Milwaukee	Portage
Acupuncturist	1	
Adaptive AIDS		7
Adult Day Care	28	2
Adult Family Home	26	37
Alcohol & Other Drug Use Day Treatment Services		2
AODA Services	2	
Care Management Team	14	1
CBRF	4	18
Communication AIDS/ Interpreter		3
Community Support Program		1
Corporate Guardian	5	
Counseling & Therapeutic Resources		2
Daily Living Skills	12	7
Day Services / Treatment		3
Durable Medical Supplies		7
Health Fitness Program	2	
Home Assistance	6	
Home Clean / Home Modifications	1	2
Home Delivered Meals	2	2
Home Health Care Agencies	18	3
Independent Living	2	
Massage Therapist	2	
Medical Supplies/ Specialized Medical Supplies	9	5
Mental Health - Day Treatment Services		1
Mental Health Services	4	4
Money Management	3	
Movers	2	
Nursing Homes / facilities	12	9
Occupational Therapy Consult		4
Personal Care		4
Personal Emergency Response	9	2
Physical Therapy		7
Prevocational Services		3
Protective Payment / Guardianship Services		1
RCAC Residential Services	4	
Respite Care		18
Specialized Day Care	6	
Specialized Medical Vehicle	3	
Speech & Language Pathology Services		4
Supported Employment		5
Supportive Home Care	36	9
Transportation	12	5

* This list only includes services that were provided by at least one of the counties in the year 2002

Attachment 3: Member Outcome Survey Combined Results by Target Group

: Member Outcome Survey Combined Results by Target Group			
Average of Three Family Care Survey Rounds			
Outcomes and Supports	DD Mean (N=460)	FE Mean (N=644)	PD Mean (N=240)
1ChooseLive	.459	.691	.733
1ChooseLiveSupport	.502	.655	.713
2ChooseWork	.417	.720	.567
2ChooseWorkSupport	.483	.685	.579
3Satisfied	.722	.741	.675
3SatisfiedSupport	.672	.770	.713
4ChooseRoutines	.722	.784	.842
4ChooseRoutinesSupport	.674	.772	.833
5Privacy	.848	.916	.871
5PrivacySupport	.728	.832	.796
6Participate	.563	.593	.471
6ParticipateSupport	.593	.613	.562
7Respect	.680	.781	.733
7RespectSupport	.676	.750	.733
8ChooseServices	.420	.478	.538
8ChooseServicesSupport	.437	.522	.604
9InformalNetwork	.591	.658	.600
9InformalNetworkSupport	.604	.705	.683
10Safe	.767	.728	.758
10SafeSupport	.709	.652	.663
11Fair	.672	.781	.696
11FairSupport	.617	.730	.746
12BestHealth	.674	.519	.446
12BestHealthSupport	.691	.629	.721
13FreeAbuse	.828	.868	.817
13FreeAbuseSupport	.637	.677	.629
14ContinuitySecurity	.600	.562	.417
14ContinuitySecurity Support	.489	.522	.421

Attachment 4: Review of Capitation Rates Methods, Assumptions and Adjustments by Year

		Review of Capitation Rates Methods, Assumptions and Adjustments by Year					
Item No	Methods Assumptions and Adjustments	CY2000	CY2001	CY2002	CY2003	Tentative CY2004	Tentative CY2005
1	Methodology Comprehensive fee-for-service	Historical cost rate bands adjusted to actual mix of enrollees	Historical cost rate bands adjusted to actual mix of enrollees	80% trended 2001 final rates	50% trended 2001 final rates	25% Trended 2001 final rates	Not used
	Comprehensive functional status	Not used	Not used	20% Multiple regression on functional variables	50% Multiple regression on functional variables	75% Multiple regression on functional variables	100% Multiple regression on functional variables
	Intermediate	Historical cost rate band with no adjustments	Historical cost rate band with no adjustments	100% Trended 2001 final rates	100% Trended 2001 final rates	100% Trended 2001 final rates ⁵²	Not yet determined

⁵² Per our interview with OSF, they decided not to rebase 2004 because 2002 CMO actual costs are in line with trended rates.

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Review of Capitation Rates Methods, Assumptions and Adjustments by Year							
Item No	Methods Assumptions and Adjustments	CY2000	CY2001	CY2002	CY2003	Tentative CY2004	Tentative CY2005
2	Base line data for rates Comprehensive fee-for-service Comprehensive functional status Intermediate	1998 MMIS & HSRs data for county specific actual enrollees (retrospective) Not used 1998 MMIS data for non-waiver population \$100 to \$600 ⁵³	1999 MMIS & HSRs data for county specific actual enrollees (retrospective) Not used 1999 MMIS & HSRs data for recipients with intermediate functional screens ⁵⁴	CY2001 rates trended forward CY2000 CMO cost reported in HSRs and functional screen data (four counties) CY2001 rates trended forward	CY2001 rates trended forward CY2001 CMO costs reported in HSRs and functional screen data (five counties) CY2001 rates trended forward	CY2001 rates trended forward CY2002 CMO costs reported in CMO encounter reporting system and functional screen data (five counties) CY2001 rates trended forward ⁵⁵	Not used CY2003 CMO costs reported in CMO encounter reporting system and functional screen data (five counties) Not yet determined

⁵³ "Family Care CMO Demonstration Final Fee-For-Service Calculations and Prospective Capitation Rates for CY 2000", DHFS, November 8, 1999, p.6

⁵⁴ Gerber K, Goetch E, Ogden D, "Wisconsin Department of Health and Family Services 2001 Prospective Rate Development", Milliman, November 20, 2000, p.1

⁵⁵ See footnote 50

Review of Capitation Rates Methods, Assumptions and Adjustments by Year							
Item No	Methods Assumptions and Adjustments	CY2000	CY2001	CY2002	CY2003	Tentative CY2004	Tentative CY2005
3	Base line data for trends and adjustment factors Comprehensive fee-for-service	1995 to 1998 MMIS & HSRS data for state waiver eligibles ⁵⁶	1996 to 1999 MMIS & HSRS data for state waiver eligibles ⁵⁷	1997 to 2000 MMIS & HSRS data for state waiver eligibles excluding 4 CMO counties	1997 to 2001 MMIS & HSRS data for state waiver eligibles excluding 5 CMO counties	1999 to 2002 MMIS & HSRS data for state waiver eligibles excluding 5 CMO counties	Not Used
	Comprehensive functional status	Not used	Not used	Same as fee-for-service	Same as fee-for-service	Same as fee-for-service	Not yet determined ⁵⁸
	Intermediate	Same as fee-for-service	1997 to 1999 data	Same as fee-for-service	Same as fee-for-service	Same as fee-for-service	Not yet determined
4	Services included in capitation	Long term care services only ⁵⁹	No Change	No Change	No Change	No Change	No Change

⁵⁶ FC CMO Demonstration Final for FC 2000, Appendix E

⁵⁷ Goetch E, Ogen D, Smith J, "Department of Health and Family Services Family Care Capitation Rates CY2002", Millman, p 3

⁵⁸ Per our interview with OSF, they are interested in using family care experience once the data stabilizes.

⁵⁹ FC CMO Demonstration Final CY 2000, p 1, and appendix A & B. Services are defined from raw data elements found in MMIS and HSRS. Minor modifications are made to this list appear in the FC contract.

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Review of Capitation Rates Methods, Assumptions and Adjustments by Year							
Item No	Methods Assumptions and Adjustments	CY2000	CY2001	CY2002	CY2003	Tentative CY2004	Tentative CY2005
5	<p>Federal reasonableness requirements</p> <p>Comprehensive fee-for-service and functional status and intermediate</p> <p>(CY 2000 and CY 2001 functional status not used, CY2005 fee-for-service not used)</p>	Rates less than or equal to the UPL for combined LTC waiver programs	Rates less than or equal to the UPL for combined LTC waiver programs	Demonstrate cost effectiveness of rates on a prospective basis for the initial FC waiver ⁶⁰	Rates certified by an actuary as actuarially sound	Demonstrate cost effectiveness of rates on a prospective basis for the FC waiver renewal	Rates certified by an actuary as actuarially sound

⁶⁰ The final rule of the Balanced Budget Act of 1997 had been postponed a number of times. Finally notice of its enactment was given in the following Federal Register citations:
 FR, 6/14/02, Vol.67 No. 115, p. 40989. "EFFECTIVE DATE. These regulations are effective on August 13, 2002.

		Review of Capitation Rates Methods, Assumptions and Adjustments by Year					
Item	Methods Assumptions and Adjustments	CY2000	CY2001	CY2002	CY2003	Tentative CY2004	Tentative CY2005
6	Retrospective adjustments Comprehensive fee-for-service Comprehensive functional status Intermediate	Yes, actual enrollees and provider fee increases Not used No	Yes, actual enrollees and provider fee increases Not used No	Yes, provider fee increases No No	Yes, provider fee increases No No	Yes, cost sharing and provider fee increases Yes, cost sharing Yes, cost sharing	Not used Yes, cost sharing Yes, cost sharing
7	Rate Categories Comprehensive Fond du Lac, La Crosse, Portage and Richland starting in 2001 Milwaukee Intermediate	Composite Elderly (65+) & Disabled ⁶¹ Elderly (60+) Same as comprehensive	Composite Elderly (65+) & Disabled Elderly (60+) No rate categories due to low volume in base ⁶²	Composite Elderly (65+) & Disabled Elderly (60+) Composite ⁶³	Composite Elderly (65+) & Disabled Elderly (60+) Composite	Not yet determined Not yet determined Not yet determined	Not yet determined Not yet determined Not yet determined

⁶¹FC CMO Demonstration Final CY2000, p 3 states, "Current information systems do not permit reliable breakdown of the disabled population into developmentally and physically disabled sub-groups."

⁶² 2001 Prospective Rate Development, p 6

⁶³ Family Care Capitation Rates CY2002, Exhibit II-2

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		Review of Capitation Rates Methods, Assumptions and Adjustments by Year					
Item No	Methods Assumptions and Adjustments	CY2000	CY2001	CY2002	CY2003	Tentative CY2004	Tentative CY2005
8	<p>HSRS Administrative Adjustment</p> <p>Comprehensive fee-for-service</p> <p>Comprehensive functional status</p>	<p>Add to HSRS 7% that is paid separately from claims except for assessments⁶⁴</p> <p>Not used</p>	<p>Add to HSRS 7% that is paid separately from claims except for assessments</p> <p>Not used</p>	<p>Included in CY2001 rates trended forward</p> <p>Not applicable. CMO cost is used⁶⁵</p>	<p>Included in CY2001 rates trended forward</p> <p>Not applicable. CMO cost is used</p>	<p>Included in CY2001 rates trended forward</p> <p>Not applicable. CMO cost is used</p>	<p>Not used</p> <p>Not applicable. CMO cost is used</p>
9	<p>Community Aids Adjustment</p> <p>Comprehensive fee-for-service</p> <p>Comprehensive functional status</p> <p>Intermediate</p>	<p>Average cost of \$6 per functionally eligible enrollee⁶⁶</p> <p>Not used</p> <p>No adjustment</p>	<p>Not applicable, rates developed from MMIS data.</p> <p>Average cost of \$6 per functionally eligible enrollee</p> <p>Not used</p>	<p>Not applicable, rates developed from MMIS data.</p> <p>Included in CY2001 rates trended forward</p> <p>No adjustment. Community aids costs is in CMO cost experience</p>	<p>Not applicable due to trending forward of 2001 rates</p> <p>Included in CY2001 rates trended forward</p> <p>No adjustment. Community aids costs is in CMO cost experience</p>	<p>Not applicable due to trending forward of 2001 rates</p> <p>Included in CY2001 rates trended forward</p> <p>No adjustment. Community aids costs is in CMO cost experience</p>	<p>No adjustment</p> <p>Not used</p> <p>No adjustment. Community aids costs is in CMO cost experience</p> <p>Not Used</p>

⁶⁴ FC CMO Demonstration Final CY2000, p 9
⁶⁵ CMO administration adjustment is described in item number 14
⁶⁶ FC CMO Demonstration Final CY2000, p 7

		Review of Capitation Rates Methods, Assumptions and Adjustments by Year					
Item No	Methods Assumptions and Adjustments	CY2000	CY2001	CY2002	CY2003	Tentative CY2004	Tentative CY2005
10	Lag Factor Adjustment Comprehensive fee-for-service Comprehensive functional status Intermediate	No adjustment for final rates Not used .04 % adjustment	No adjustment for final rates Not used .07% adjustment ⁶⁸	No Adjustment Milwaukee Co 3.2% ⁶⁷ Included in CY2001 rates trended forward	No Adjustment No Adjustment Included in CY2001 rates trended forward	No Adjustment Fon du Lac 1% Other counties 0.3% Included in CY2001 rates trended forward	Not used Not yet determined Not yet determined
11	CSDRB Data Adjustment Comprehensive fee-for-service Comprehensive functional status Intermediate	County specific average percent ⁶⁹ Not used County specific average percent	County specific average percent Not used County specific average percent	Included in CY2001 rates trended forward No adjustment CSDRB is in CMO cost experience. Included in CY2001 rates trended forward	Included in CY2001 rates trended forward No adjustment CSDRB is in CMO cost experience. Included in CY2001 rates trended forward	Included in CY2001 rates trended forward No adjustment CSDRB is in CMO cost experience. Included in CY2001 rates trended forward	Not used No adjustment CSDRB is in CMO cost experience. Not yet determined

⁶⁷ Family Care Capitation Rates CY2002, p 6
⁶⁸ 2001 Prospective Rate Development, Exhibit H
⁶⁹ FC CMO Demonstration Final CY2000, p 10

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Review of Capitation Rates Methods, Assumptions and Adjustments by Year							
Item No	Methods Assumptions and Adjustments	CY2000	CY2001	CY2002	CY2003	Tentative CY2004	Tentative CY2005
12	TCM and CSP Data Adjustments ⁷⁰ Comprehensive fee-for-service Comprehensive functional status	40% county share of added to federal share included in MMIS ⁷¹ Not used	40% county share of added to federal share included in MMIS Not used	Included in CY2001 rates trended forward No Adjustment. Case mgt & community support are in CMO cost experience.	Included in CY2001 rates trended forward No Adjustment. Case mgt & community support are in CMO cost experience.	Included in CY2001 rates trended forward No Adjustment. Case mgt & community support are in CMO cost experience.	Not used No Adjustment. Case mgt & community support are in CMO cost experience. Not yet determined
13	Acuity Factor Adjustment Comprehensive fee-for-service only	Determined from base line data	Determined from base line data ⁷²	Included in CY2001 rates trended forward	Included in CY2001 rates trended forward	Include in CY2001 rates trended forward	Not used

⁷⁰ Targeted Case Management and Community Support

⁷¹ FC CMO Demonstration Final CY2000, p 10

⁷² 2001 Prospective Rate Development, p 12 & Exhibit C

		Review of Capitation Rates Methods, Assumptions and Adjustments by Year					
Item No	Methods Assumptions and Adjustments	CY2000	CY2001	CY2002	CY2003	Tentative CY2004	Tentative CY2005
14	General Administrative Adjustment⁷³ Comprehensive Fee-for-service Comprehensive functional status Intermediate	2% base upon fiscal agent estimate Not used 2% base upon fiscal agent estimate	2% base upon fiscal agent estimate Not used 2% base upon fiscal agent estimate	Included in CY2001 rates trended forward 12% ⁷⁴ Included in CY2001 rates trended forward	Included in CY2001 rates trended forward 7%, Richland 12% ⁷⁵ Included in CY2001 rates trended forward	Include in CY2001 rates trended forward 7%, Richland 12% Include in CY2001 rates trended forward	Not used To be based upon 2003 CMO cost experience Not yet determined
15	Managed Care Adjustment⁷⁶ Comprehensive fee-for-service Comprehensive functional status Intermediate	2% Expected Savings due to managed care ⁷⁷ Not used 2% Expected Savings due to managed care	2% Expected Savings due to managed care Not Used 2% Expected Savings due to managed care	Included in CY2001 rates trended forward No Adjustment Included in CY2001 rates trended forward	Included in CY2001 rates trended forward No Adjustment Included in CY2001 rates trended forward	Include in CY2001 rates trended forward No Adjustment Include in CY2001 rates trended forward	Not used No Adjustment Not yet determined

⁷³ 2% Administrative adjustment and 2% Managed care adjustment are offset and eliminated for revised documentation for the BBA per OSF.

⁷⁴ Family Care Capitation Rate v CY2002, p 13

⁷⁵ Goetch E, Ogden D, Smith J. "Department of Health and Family Services Family Care Capitation Rates CY2003", Milliman, p 12

⁷⁶ See footnote 22

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Review of Capitation Rates Methods, Assumptions and Adjustments by Year							
Item No	Methods Assumptions and Adjustments	CY2000	CY2001	CY2002	CY2003	Tentative CY2004	Tentative CY2005
16	New Eligible Factor Comprehensive Fee-for-service only	Determined from base line data ⁷⁶	Determined from base line data	Included in CY2001 rates trended forward	Included in CY2001 rates trended forward	Include in CY2001 rates trended forward	Not used

⁷⁷ FC CMO Demonstration Final CY2000, p 11

⁷⁸ FC CMO Demonstration Final CY2000, Appendix E

		Review of Capitation Rates Methods, Assumptions and Adjustments by Year					
Item No	Methods Assumptions and Adjustments	CY2000	CY2001	CY2002	CY2003	Tentative CY2004	Tentative CY2005
17	Cost Sharing Adjustment Historical cost Comprehensive	Included HSRS cost sharing in rates	Included HSRS cost sharing in rates	Excluded from CY2001 rates trended forward ⁷⁹	Excluded from CY2001 rates trended forward	Include cost sharing in rates. Estimate cost share prospectively. Exclude actual cost sharing retrospectively.	Not used
	Comprehensive functional status	Not used	Not used	Excluded cost sharing from rates ⁸⁰	Excluded cost sharing from rates	Include cost sharing in rates. Estimate cost share prospectively. Exclude actual cost sharing retrospectively.	Include cost sharing in rates. Estimate cost share prospectively. Exclude actual cost sharing retrospectively.
	Intermediate	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable.	Not Applicable.

⁷⁹ Family Care Capitation Rates CY2002, p 5
⁸⁰ Family Care Capitation Rates CY2002, p 6

Attachment 5: CDPS Validation Analysis

Problem

The Family Care (FC) financial impact assessment must take account of confounding factors, to rule out the spurious influence of individual differences in diagnostic case-mix and severity on health care spending. The APS Healthcare Independent Assessment (IA) team has utilized a case-mix control strategy based on the Chronic Disease and Disability Payment System (CDPS), which has been developed and tested as a diagnosis-related resource grouper for Medicaid populations (Kronic et al. *HCFR* 2000). This methodological approach will ensure that the Comparison Group utilized in the Family Care IA is a random sample from across the state similar in terms of functional abilities, eligibility, and previous service utilization patterns.

The application of this system to the FC target populations (i.e. developmentally disabled, physically disabled, and frail elderly) is problematic. The illness-burden index weights computed by the program were originally estimated from data that included Medicaid AFDC/TANF and SSI-disabled populations. Additionally, the authors state that the home and community-based (HCBW) waiver population and Medicare/Medicaid dual-eligible population were excluded (Kronic et al. *HCFR* 2000). Therefore, predicted resource use from diagnosis-based CDPS groups may not adequately represent actual resource use for these excluded groups, which comprise the FC population.

To obtain an adequate measure of diagnosis and expenditure-related illness-burden for the FC target populations, the CDPS program must be modified to compute index weights specific to these populations. The purpose of this analysis is to estimate and validate a case-mix index for the population of individuals most like those who are eligible to participate in FC.

Data

Data for the CDPS validation analysis were drawn from the Human Service Reporting System (HSRS) through the Medicaid Evaluation and Decision Support (MEDS) data warehouse for the calendar year 1999. HSRS collects human services data submitted by each Wisconsin County. These data include information on HCBW participation.

The waiver population was defined as anyone in HSRS receiving waiver services (CIP II, COP Waiver, CIP IA, CIP IB, CSLA, and BIW), including the Community Options Program (COP-R) recipients for 1999 who additionally had Medicaid eligibility. Therefore, all waiver eligible months where the recipient was simultaneously Medicaid eligible were included in the analysis.

Costs were calculated as the "Net LTS Costs" reported in HSRS, which represent "the net cost under all LTS programs from the LTS episode level...including the gross total costs and the negating income costs." (DHFS 2001). All monthly expenses during waiver eligible months were included if the respondent was also Medicaid eligible in that month. If a waiver participant was only eligible for COP-R in 1999, the COP-R costs were also included for all Medicaid eligible months. Additional fee-for-service (FFS) expenses not captured by the HSRS waiver

reporting system, but paid by Medicaid, were selected from the FFS claims data through the MEDS data warehouse.

The Observed Expenditure and Diagnosis were derived from MEDS Claims Analysis Universe for calendar year 1999. Further, Medical Status Code and Medicare Dual-Eligibility (and age and gender) were obtained from the MEDS Recipient Analysis Universe for calendar year 1999. Finally, data were obtained pertaining to Mental Health condition as an individual's primary diagnosis from the Mental Health Module. Because this latter group is not considered to be a FC Target Group, it was necessary to identify them as a separate group of waiver recipients and exclude them from further analysis.

Method

This analysis tested the null hypothesis (H_0) that the average difference between CDPS-predicted expenditures and actual observed expenditures for calendar year 1999 is the same for the waiver and Medicare-eligible populations as it is for the SSI population. If the null hypothesis was true, then waiver and Medicare indicators would not account for significant additional variance in observed expenditures, over and above variance explained by predicted expenditures based on the SSI-only case-mix index. A linear regression model to test this hypothesis is given by:

$$\text{Obs_Expend} = a + b \times \text{CDPSPred} + c \times \text{Waiver} + d \times \text{MC} + e$$

Where:

Obs_Expend = 1999 Actual Observed Expenditure

CDPSPred = 1999 CDPS Predicted Expenditures

Waiver = Dichotomous Variable for 1999 Waiver Eligibility

MC = Dichotomous Variable for 1999 Dual Eligibility.

The null hypothesis is that the coefficients of Waiver and Medicare indicators are equal to zero. Rejecting this hypothesis implies that CDPS-predicted expenditures based on SSI-only weights are inadequate to account for Medicaid expenditures as they relate to case-mix in the FC target populations. If this is the case, then an alternate case-mix index may be developed and tested in a similar manner.

We take a two-step approach using split-half validation. The first step is to test the null hypothesis using the specified model, and the second step is to test the hypothesis that the alternate case-mix index using FC target-group adjusted weights adequately accounts for diagnosis-related Medicaid expenditures. We split the sample into two halves using random assignment, to allow for exploratory model development with the first half, and model confirmation with the second half.

Step 1.

As a first step we used CDPS to compute the case-mix index using the "concurrent" weights supplied with the program. These weights are regression coefficients from an equation that

regressed total expenditures for one year on diagnoses observed during the same year, based on a national population of SSI-eligible disabled adults, under age 65, on Medicaid. We calculated this concurrent-predicted case-mix index for the first randomly-selected sample of Wisconsin Medicaid recipients who were on SSI, waivers, or Medicare-eligible during 1999. We then regressed the actual observed expenditures in 1999 (including Medicaid fee-for-service amounts paid plus total waiver costs) on the concurrent-predicted case-mix index. The index accounts for 17% of variance in observed expenditures (Table 1, first column of data).

	Model 1 ($R^2=.14$)		Model 2 ($R^2=.21$)	
	Coefficient	Std. Err.	Coefficient	Std. Err.
Intercept	\$8,234	(156)	\$2,548	(256)
Case-Mix	\$4,097	(59)	\$3,553	(57)
On Waiver			\$22,537	(46)
On Medicare			\$3,841	(13)
On Both			\$10,955	(34)

All coefficients are significant at .05 level

To test the hypothesis that this case-mix index works equally well for SSI-eligibles and for the FC target populations, we added "dummy" variables to the equation. These are binary indicators of whether or not individuals are Medicare eligible, Waiver eligible, or waiver eligible with primarily mental health diagnoses (the latter group not being considered one of the FC target groups). The results in Table 1 (second column of data) show that these indicators account for significantly more variance in observed expenditure than is expected based on the SSI-based case-mix index. Therefore, we reject the null hypothesis and conclude that the SSI-derived case-mix index is an inadequate measure of expected resource use for the FC-eligible population.

Step 2.

The previous step not only tested (and rejected) the null hypothesis, but also produced a new set of regression coefficients that can be used to adjust the case-mix index. The new regression of observed expenditures on diagnoses and the program-participation indicators (Waiver, Medicare, or both) constitutes a new set of case-mix weights that is tailored to the Wisconsin FC-eligible population. Table 2 shows the unadjusted SSI based weights computed from our Wisconsin data for 1999 (shown in the second column of data), compared to the new set of weights, adjusted for program-participation indicators.

Case-Mix index Weights Computed for Wisconsin 1999 SSI, Waiver, and Medicare Population			
Adjusted r-squared		31%	33%
GDPS Group	Description	Unadjusted (SSI-based) Case-Mix Index Weight	Adjusted (FC-eligible) Case-Mix Index Weight
INTERCEPT	Intercept	0.56	0.42
WV			0.72
MC			0.04
WV_MC			0.30
A_15_24F	Female Age 15-24	-0.12	-0.14
A_15_24M	Male Age 15-24	-0.15	-0.16
A_25_44F	Female Age 25-44	-0.19	-0.19
A_45_64F	Female Age 45-64	-0.17	-0.16
A_45_64M	Male Age 45-64	-0.04	-0.01
A_OVER64	Age 65 and over	0.02	0.05
CARVH	Cardiovascular, very high	0.88	0.88
CARM	Cardiovascular, medium	0.12	0.12
CARL	Cardiovascular, low	0.07	0.09
CAREL	Cardiovascular, extra low	-0.09	-0.07
PSYH	Psychiatric, high	0.21	0.27
PSYM	Psychiatric, medium	0.26	0.30
PSYL	Psychiatric, low	0.26	0.26
SKCM	Skeletal, medium	0.24	0.21
SKCL	Skeletal, low	0.23	0.20
SKCVL	Skeletal, very low	0.13	0.12
SKCEL	Skeletal, extra low	-0.03	-0.04
CNSH	CNS, high	1.65	1.51
CNSM	CNS, medium	0.78	0.67
CNSL	CNS, low	0.44	0.41
PULVH	Pulmonary, very high	3.79	3.73
PULH	Pulmonary, high	0.50	0.48
PULM	Pulmonary, medium	0.24	0.22
PULL	Pulmonary, low	0.02	0.02
GIH	Gastro, high	0.64	0.66
GIM	Gastro, medium	0.22	0.21
GIL	Gastro, low	0.03	0.02
DIA1H	Diabetes, type 1 high	-0.12	-0.16
DIA1M	Diabetes, type 1 medium	-0.01	-0.04
DIA2M	Diabetes, type 2 medium	-0.17	-0.19
DIA2L	Diabetes, type 2 low	-0.03	-0.04
SKNH	Skin, high	0.32	0.31
SKNL	Skin, low	0.06	0.03
SKNVL	Skin, very low	0.02	-0.01
RENVH	Renal, very high	0.24	0.22
RENM	Renal, medium	0.28	0.21
RENL	Renal, low	0.00	-0.02
SUBL	Substance abuse, low	0.07	0.11

Case-Mix index Weights Computed for Wisconsin 1999 SSI, Waiver, and Medicare Population			
Adjusted r-squared		31%	33%
CDPS Group	Description	Unadjusted (SSI-based) Case-Mix Index Weight	Adjusted (FC-eligible) Case-Mix Index Weight
SUBVL	Substance abuse, very low	-0.06	-0.02
CANH	Cancer, high	0.25	0.23
CANM	Cancer, medium	-0.11	-0.11
CANL	Cancer, low	0.03	0.02
DDM	DD, medium	2.74	2.62
DDL	DD, low	0.98	0.82
GENEL	Genital, extra low	-0.20	-0.18
METH	Metabolic, high	0.23	0.21
METM	Metabolic, medium	0.23	0.21
METVL	Metabolic, very low	0.03	0.00
PRGCMP	Pregnancy, complete	0.49	0.60
PRGINC	Pregnancy, incomplete	0.17	0.31
EYEL	Eye, low	-0.04	-0.04
EYEVL	Eye, very low	-0.10	-0.10
CERL	Cerebrovascular, low	0.29	0.27
AIDSH	AIDS, high	0.57	0.58
INFH	Infectious, high	0.57	0.58
HIVM	HIV, medium	0.57	0.58
INFM	Infectious, medium	0.57	0.58
INFL	Infectious, low	0.22	0.21
HEMEH	Hematological, extra high	2.81	2.75
HEMVH	Hematological, very high	1.18	1.17
HEMM	Hematological, medium	0.40	0.38
HEML	Hematological, low	0.15	0.13
NC_OVR14	No Claims, Age 15+	-0.21	-0.20

It remains to test the hypothesis that this new "adjusted case-mix index" adequately accounts for actual resource-use in the FC-eligible population defined more broadly to include not only the SSI-disabled, but also the Medicare eligible and home- and community-based waiver program participants. Because the first half of our sample was used to construct the new adjusted case-mix index, we turn to the second half of our sample to perform a confirmatory hypothesis test.

Result

The formula for calculating the new "adjusted case-mix index" was split into two blocks. Block 1 is the weighted sum of all the CDPS diagnostic group indicators, which accounts for 35.4% of variance in the second random sample of Medicaid and waiver expenditures observed in Wisconsin in 1999 (Table 3, first column of data).

Regression of Actual Expenditures (FFS and Waiver) on Adjusted Case-Mix Index Divided into Block 1 (All CDPS Groups) and Block 2 (Participation in Waiver or Medicare)				
	Model 1 (R²=.35)		Model 2 (R²=.39)	
	Coefficient	Std. Err.	Coefficient	Std. Err.
Intercept	\$1,497	(149)	\$(738)	(155)
CDPS Groups	\$16,431	(128)	\$15,083	(129)
On Wavier or Medicare			\$20,783	(508)

All coefficients are significant at .05 level

Block 2 is the weighted sum of program-participation indicator variables. This block is added to the equation to test the hypothesis that the unadjusted case-mix index works equally well for all kinds of program participants in the FC-eligible population (Table 3, second column of data). The coefficient for Block 2 is significantly greater than zero, therefore we reject the null hypothesis. The adjusted case-mix index is significantly better than the unadjusted index.

Conclusion

The results support the use of the adjusted case-mix index, rather than the unadjusted index, as a measure of expected financial resource-use, based on diagnostic and program eligibility criteria. Thus, as the IA team moves on to conduct the FC financial impact assessment, we are confident that the adjusted case-mix index constitutes a valid control for expected financial resource-use in the entire FC-eligible population.

Attachment 6: Functional Status Impairment Scale (FSIS) Construction

Purpose

The purpose of this sub-analysis is to construct a valid and reliable unidimensional multiple-indicator scale of functional status using items measured on the FC-Functional Screen (FC-FS) and the Medicare-Minimum Data Set (MDS) functional status assessment for a common set of individuals. With that scale, we develop a formula to compute functional status impairment scale (FSIS) scores. Then we use the formula to impute functional status scores for cases where MDS data are available but FC-FS data are missing. Finally we use the imputed FSIS as an independent "control" variable in the regression analysis of expenditures, and explore the use of FSIS as an intervening variable in path analysis.

Method

- 1) Six ADL measures are used: dressing, eating, bathing, toilet use, transferring, and mobility.
- 2) Four instruments are used, three versions of the FC-FS (FS1, FS2, FS3) and MDS.
- 3) Each measure assigns a score of 0 for independence (no functional status impairment), the FS2 and FS3 use a scale from 1 to 2 to indicate levels of help (2 = help is needed and helper must be present throughout the task), the MDS uses a scale from 1 to 4 (4 = total dependence). FS1 uses a scale from 1 to 3 to indicate levels of help (3 = extensive or complete hands-on assistance needed), except for transferring, which goes up to 4 (4 = two people required), but was re-coded in those cases to 3.
- 4) The additive scale for ADL limitation from the FC-FS instruments ranges from 0 to 12, while the scale from the MDS ranges from 0 to 24. The FS and MDS instruments must therefore be transformed into a common scale.
- 5) Since occasionally not all 6 ADLs are measured at once, the maximum score for any single screen may be less than the maximum for all screens. Therefore, each screen is transformed into a common scale ranging from 0 to the maximum possible for that screen. The formula for calculating the Functional Status Impairment Scale is:

$$FSIS = 100 \times \{ \text{Sum(ADLs)} / [\text{Count(ADLs)} \times \text{MaxItem(Instrument)}] \}$$

Where MaxItem(Instrument)=2 for FS2 and FS3 instruments, 3 for the FS1 instrument, and 4 for the MDS instrument; Count(ADLs) is the number of ADLs that were measured in the screen; and Sum(ADLs) is the sum of the impairment scores for the ADLs that were measured in the screen. FSIS ranges from 0 (total independence) to 100 (total dependence) for each screen that was performed.

- 6) The “mobility” ADL is measured with a single item on the FS instruments, and four separate items on the MDS instrument. To assign equal weight to mobility (1/6) in the FSIS, the four mobility items on the MDS instrument are averaged into a single item:

$$\text{Mobility} = \text{Sum(Items)} / \text{Count(Items)}$$

FSIS scores for MDS screens and FS screens for the same individuals were linked together, and 685 sequences were identified where an MDS assessment was followed by a FS screen within one month, followed by another MDS assessment within one month. These 685 observations were randomly split into two samples of 365 and 320 observations, respectively.

Results

The first sample was used to estimate an imputation formula for the FS score as a linear combination of two consecutive MDS scores not more than two-months apart. The estimated imputation formula is: $\text{FSIS} = 7.5 + .38 * \text{MDS1} + .49 * \text{MDS2}$

In the second sample, the formula was used to impute the FS score, and the imputed score was correlated with the observed FS score. The estimated correlation between observed and imputed FS score was .62. This is less than the estimated auto-correlation of .78 between two successive MDS screens not more than two months apart, but it is more than the correlation of .58 between observed MDS screens and observed FS screens not more than one month apart. This suggests that the imputed FS score and an actual FS screen are roughly equally reliable indicators of MDS-assessed functional status.

Conclusion

We imputed FSIS scores for all individuals with two MDS assessments within a period of two months and used this as our measure of functional status in cases where there was no FC-FS screen performed. Mean values were imputed for cases missing FSIS scores, and this mean-substitution was indicated by a dummy variable (MISSFSIS) in the regression to account for any possible bias introduced by mean-substitution.

Attachment 7: Determining a Rural-Urban Classification Systems for the Family Care Independent Assessment

Why a guideline on rural-urban classification systems?

The unique challenges facing rural health care and health care systems are getting more attention. Analysts looking at rural health disparities must choose from several classification systems. Guidelines are useful for promoting consistency and comparability among analyses that look at rural health.

This is uncharted territory. According to two of the country's leading rural health researchers, Dr. Gary Hart at the University of Washington Rural Health Research Center and Dr. Thomas Ricketts at the Sheps Center at the University of North Carolina at Chapel Hill, no one has systematically addressed the question of how to best incorporate rural-urban classification systems into public health assessment.

Which is the best system for identifying rural areas in Wisconsin?

Wisconsin presents unique challenges in classifying rural areas because of the range in the size of its counties. The most common classification systems (for example, Metropolitan vs. Non-Metropolitan) use county geography. County-based systems can misclassify some areas. The likelihood of misclassification increases with the size of the county. Nationally, 14 percent of residents of Metropolitan counties, as defined by the US Office of Management and Budget, are classified as rural by Bureau of Census definitions (Ricketts et al., 1998). Sub-county definitions using ZIP code or census geography are preferable to county-based systems, because they provide greater discrimination between rural and urban areas.

Wisconsin's rural areas are not homogenous. There are significant demographic differences between remote, small-town rural areas, large towns, and urban fringe areas. A simple binary rural-urban classification can obscure important differences. However, the small populations in more remote rural areas often make it impractical to subdivide rural areas too finely. The ideal system would differentiate among different types of rural areas, but should be collapsible into a smaller number of classifications if needed.

The Rural Urban Commuting Area (RUCA) system: a good choice

No systematic study or standards identify which definitions are most appropriate for analyzing specific types of public health data. APS Healthcare recommends using the Rural Urban Commuting Area (RUCA) system for the Family Care Independent Assessment because it is more flexible and precise than available alternatives.

The RUCA system is a ten-tiered classification system based on census tract geography. Both population size and commuting relationships are used to classify census tracts. First, urbanized (continuously built up areas of 50,000 or more), large town (10,000-49,999), and small town (2,500 to 9,999) cores areas are identified. Next, the primary (largest) and secondary (second largest) commuting flows of remaining tracts are examined using the most recently available

commuting data. High commuting tracts are those where the primary or largest commuting flow is greater than 30% to a core area. Low commuting or influence area tracts are those where the largest flow to core areas is 5-30%.

The RUCA system provides a great deal of flexibility as the codes can be collapsed or combined in several different ways.

Suggested four-tiered consolidation of the RUCA system at the sub-county level

Many data sets will not support analysis using a ten-tiered classification system. The RUCA system can be collapsed in several ways. For general analyses of sub-county data, a four-tiered system can be utilized under the RUCA system.

- **Urban Core Areas** - continuously built up areas 50,000 persons or more. These areas correspond to US Bureau of the Census defined Urbanized Areas.
- **Suburban Areas** - areas with high commuting relationships with Urban Core Areas. Suburban areas include Large Town, Small Town and Isolated Rural Areas with high commuting levels to Urban Core Areas.
- **Large Town Areas** - towns with populations between 10,000 and 49,999 and surrounding rural areas with high commuting levels to these towns.
- **Small Town and Isolated Rural Areas** - towns with populations below 10,000 and their commuter sheds and other isolated rural areas.

Other considerations when making rural-urban comparisons

All population-based health indicators comparing urban and rural areas should be age-adjusted, as the proportion of elderly residents in rural areas is higher than in urban areas. Analysts should also keep in mind that, in general, the residents of rural Wisconsin have lower incomes and have completed fewer years of formal education than those in other areas. Differences in health status between rural and urban Wisconsinites may reflect underlying differences in demographics.

Guidelines

- If data are available at the census tract or ZIP code level, use the RUCA system.
- All rural-urban classification systems currently depend on 1990 commuting data. Updated codes are not likely to be available until fall 2002. Until the updated codes are released, the potential for misclassification should be noted in technical notes.
- For routine analyses we suggest collapsing the ten RUCA codes into four categories,
 - Urban Core Areas
 - Suburban Areas
 - Large Town Areas

- Small Town and Isolated Rural Areas
- If data are only available at the county level, we recommend using the Office of Community and Rural Health's Dominant RUCA codes. The potential for misclassification should be discussed.
- Rural-urban differences may reflect underlying differences in demographics. In general, rural-urban comparisons of health indicators should be age-adjusted, as the proportion of elderly residents in rural areas is higher than in urban areas. Analysts should also keep in mind that the residents of rural Wisconsin have lower incomes and have completed fewer years of formal education than those in other areas.
- Document your choice of a rural-urban classification system and be sensitive to each system's limitations.

This ten-tiered classification system was developed in the late 1990s and is rapidly gaining wide use. It is the only system available at the census tract or ZIP code level.

Four-Tiered Consolidation of RUCA Codes: Many data sets will not support analysis using a ten-tiered classification system. The Washington state Office of Community and Rural Health developed a Four-Tiered Consolidation of RUCA codes in 2001 for general analyses of sub-county data.

- **Urban Core Areas** - continuously built up areas 50,000 persons or more. These areas correspond to US Bureau of the Census defined Urbanized Areas.
- **Suburban Areas** - areas with high commuting relationships with Urban Core Areas. Suburban areas also include Large Town, Small Town and Isolated Rural Areas with high commuting levels to Urban Core Areas.
- **Large Town Areas** - towns with populations between 10,000 and 49,999 and surrounding rural areas with high commuting levels to these towns.
- **Small Town and Isolated Rural Areas** - towns with populations below 10,000 and their commuter sheds and other isolated rural areas.

Table 3: Four-Tiered Consolidation of RUCA Codes

Consolidation Class	RUCA Codes
Urban Core Areas	1
Suburban Areas	2, 3, 4.1, 7.1, 8.1, 10.1
Large Town Areas	4, 5, 6, 7.2, 8.2, 10.2
Small Town and Isolated Rural Areas	7.0, 7.3, 7.4, 8, 8.3, 8.4, 9, 9.1, 9.2, 10, 10.3, 10.4, 10.5

Dominant RUCA County Codes: For cases where sub-county data are not available, the Office of Community and Rural Health has classified counties by dominant RUCA codes. To do this, the population of census tracts within counties by RUCA code aggregated. Counties

are classified as predominantly Urban, Large Town, or Small Town Rural, using the following rules:

Table 4: Rules for Assigning Dominant RUCA Codes to Counties

Dominant RUCA Code	Percent County Population	Residing in Tracts with RUCA Codes
Dominant Urban	> 75%	1, 2, 3, 4.1, 7.1, 8.1, 10.1
Mixed Urban	50 - 75%	1, 2, 3, 4.1, 7.1, 8.1, 10.1
Dominant Large Town Rural	> 75%	4, 5, 6, 7.2, 8.2, 10.2
Dominant Small Town and Isolated Rural	> 75%	7.0, 7.3, 7.4, 8, 8.3, 8.4, 9, 9.1, 9.2, 10, 10.3, 10.4, 10.5
Mixed Rural	50 - 75%	Large Town and Small Town/Rural combined but not meeting Large Town and Small Town Rural Classifications

Counties with less than 75% of the population residing within Urban Core, Suburban RUCAs, Large Town, or Small Town and Isolated Rural RUCAs as defined in the Four-Tiered Consolidation of RUCA Codes system are classified as mixed

REFERENCES

Ricketts TC, Johnson-Webb KD, Taylor P. Rural definitions for health policy makers. Bethesda (MD): Dept. of Health and Human Services (US), Federal Office of Rural Health Policy; 1998 July.

DESCRIPTION OF CODES AND TECHNICAL NOTES**Rural-Urban Commuting Areas**

The attached file with four variables is as follows:

- Column 1 = zip code: alpha version
- Column 2 = zip code: numeric version
- Column 3 = RUCA Code
- Column 4 = Population Category

(RUCAs)

These RUCA codes for zip level analysis are derived from the census tract level RUCA codes and the definitions given below apply.

Census tracts are assigned to categories based on commuting data and Census Bureau definitions (e.g., urbanized area and urban place are Census Bureau terms with specific definitions).

1. Urban core Census tract
[primary flow within Census Bureau defined Urbanized Area (metro \geq 50,000)]
 - 1.1 secondary flow (30-50%) to larger urbanized area
 - 1.0 otherwise
2. Census tract strongly tied to urban core
[primary flow to Census Bureau defined Urbanized Area ($>30\%$)]
 - 2.1 secondary flow (30-50%) to larger urbanized area
 - 2.2 combined flows to urbanized areas of $>30\%$ and greater than primary flow
 - 2.0 otherwise
3. Census tract weakly tied to urban core
[primary flow to Census Bureau defined Urbanized Area but 5-30%]
 - 3.0 --
4. Large town Census tract
[primary flow within large Census Bureau defined Urban Place (10,000-49,999 & $>30\%$)]
 - 4.1 secondary flow (30-50%) to urbanized area
 - 4.0 otherwise
5. Census tract strongly tied to large town
[primary flow to large Census Bureau defined Urban Place ($>30\%$)]
 - 5.1 secondary flow (30-50%) to urbanized area
 - 5.0 otherwise
6. Census tract weakly tied to large town
[primary flow to large Census Bureau defined Urban Place (5-30%)]
 - 6.0 --
7. Small town Census tract
[primary flow within small Census Bureau defined Urban Place (\geq 2,500 & $<$ 10,000 & $>30\%$)]
 - 7.1 secondary flow (30-50%) to urbanized area
 - 7.2 secondary flow (30-50%) to large urban place
 - 7.3 secondary flow (5-30%) to urbanized area
 - 7.4 secondary flow (5-30%) to large urban place
 - 7.0 otherwise
8. Census tract strongly tied to small town
[primary flow to a small Census Bureau defined Urban Place ($>30\%$)]
 - 8.1 secondary flow (30-50%) to urbanized area

- 8.2 secondary flow (30-50%) to large urban place
- 8.3 secondary flow (5-30%) to urbanized area
- 8.4 secondary flow (5-30%) to large urban place
- 8.0 otherwise
- 9. Census tract weakly tied to small town
[primary flow to a small Census Bureau defined Urban Place (5-30%)]
- 9.1 secondary flow (5-30%) to urbanized area
- 9.2 secondary flow (5-30%) to large urban place
- 9.0 otherwise
- 10. Isolated small rural Census tract (remaining rural tracts)
[no primary flows over 5% to any Census Bureau defined Urbanized Area (metro), large Urban Place, or small Urban Place]
- 10.1 secondary flow (30-50%) to urbanized area
- 10.2 secondary flow (30-50%) to large urban place
- 10.3 secondary flow (30-50%) to small urban place
- 10.4 secondary flow (5-30%) to urbanized area
- 10.5 secondary flow (5-30%) to large urban place
- 10.0 otherwise

THE USE OF RUCAS IN HEALTH CARE

The RUCA codes can be used in many different ways in various types of health related research and program development and implementation. There are 30 codes. The large number of codes facilitate the aggregation of the codes to fit specific needs of those using them for health, demographic, geographic, and other types of uses.

In almost all cases, the RUCA codes should be aggregated for use. For instance, it may be appropriate to aggregate them into two groups: rural and urban. In other instances, it may be appropriate to create a specific group for the purposes of targeting a program.

The bottom line from below: Under most circumstances suggested categorizations A, B, and C will be most appropriate for use. There are many ways to aggregate the codes based on purpose. A few examples follow.

The way in which they have been used most is to aggregate the codes into four categories. This is a generally useful aggregation that is useful for most health related work. When this does not fit the bill, the B and C collapsing of the categories is usually satisfactory. This categorization approximates the metro/non metro split at the Census tract (ZIP code) level (categorization A).

Urban focused: 1.0, 1.1, 2.0, 2.1, 2.2, 3.0, 4.1, 5.1, 7.1, 8.1, and 10.1

Large Rural City/Town focused: 4.0, 5.0, and 6.0

Small Rural Town focused: 7.0, 7.2, 7.3, 7.4, 8.0, 8.2, 8.3, 8.4, 9.0, 9.1, and 9.2

Isolated Small Rural Town focused: 10.0, 10.2, 10.3, 10.4, 10.5

The percentages of the estimated 1998 US population for these groupings are: urban, 77.6%; large rural, 9.3%; small rural, 6.9%; and isolated, 6.1%. The advantage of this definition is that it splits urban and rural in approximately the same way as does the OMB Metro definition but at the sub county level and it divides rural into three relevant and useful categories. In many studies and programs, it makes sense to separate the large rural cities/towns (say a place of 30,000 population with many medical providers) from those places that have 1000 population and are isolated from

urban places. It is clear that under most circumstances these two types of places differ greatly and should be considered separately.

Alternatively, the small rural and isolated small rural categories can be combined to create a single "small" rural category (categorization B).

Urban: 1.0, 1.1, 2.0, 2.1, 2.2, 3.0, 4.1, 5.1, 7.1, 8.1, and 10.1
 Large Rural City/Town: 4.0, 5.0, and 6.0
 Small Rural Town: 7.0, 7.2, 7.3, 7.4, 8.0, 8.2, 8.3, 8.4, 9.0, 9.1, 9.2, 10.0, 10.2, 10.3, 10.4, and 10.5

Of course, the four categories can be aggregated. For instance, the three rural categories can be combined to create one "rural" category (this would approximate the standard Metro definition but at the sub county level) (categorization C).

Urban: 1.0, 1.1, 2.0, 2.1, 2.2, 3.0, 4.1, 5.1, 7.1, 8.1, and 10.1
 Rural: 4.0, 5.0, 6.0, 7.0, 7.2, 7.3, 7.4, 8.0, 8.2, 8.3, 8.4, 9.0, 9.1, 9.2, 10.0, 10.2, 10.3, 10.4, and 10.5

Another alternative is to define urban as all places that have 30% or more of their workers going to a Census Bureau defined Urbanized Area (this is the same as "C" but with code 3.0 being moved to the rural group) (categorization D).

Urban: 1.0, 1.1, 2.0, 2.1, 2.2, 4.1, 5.1, 7.1, 8.1, and 10.1
 Rural: 3.0, 4.0, 5.0, 6.0, 7.0, 7.2, 7.3, 7.4, 8.0, 8.2, 8.3, 8.4, 9.0, 9.1, 9.2, 10.0, 10.2, 10.3, 10.4, and 10.5

A more complicated approach can be to assign Census tracts (ZIP codes) as in "A" except use the secondary work commuting flows to assign them to the largest place where 30% or more of their population commutes (categorization E).

Urban: 1.0, 1.1, 2.0, 2.1, 2.2, 3.0, 4.1, 5.1, 7.1, 8.1, and 10.1
 Large Rural City/Town: 4.0, 5.0, 6.0, 7.2, 8.2, and 10.2
 Small Rural Town: 7.0, 7.3, 7.4, 8.0, 8.3, 8.4, 9.0, 9.1, 9.2, and 10.3
 Isolated Small Rural Town: 10.0, 10.4, and 10.5

State of Wisconsin RUCA Codes for Zipcodes

ZIP	ZIPN	POPULATION CATEGORY	RUCA CODE
53001	53001	4	10.1
53002	53002	4	6
53003	53003	2	3
53004	53004	4	2
53005	53005	4	1
53006	53006	4	10.5
53007	53007	4	1
53008	53008	1	1
53009	53009	1	5
53010	53010	4	10.5

State of Wisconsin RUCA Codes for Zipcodes

ZIP	ZIPN	POPULATION CATEGORY	RUCA CODE
53011	53011	4	2.2
53012	53012	4	1
53013	53013	4	2
53014	53014	4	3
53015	53015	4	2
53016	53016	3	5
53017	53017	4	2
53018	53018	4	2
53019	53019	4	5
53020	53020	4	2
53021	53021	4	2
53022	53022	4	1
53023	53023	4	2
53024	53024	4	1
53026	53026	2	2
53027	53027	4	7.3
53029	53029	4	2
53031	53031	2	1
53032	53032	4	10.5
53033	53033	4	2
53034	53034	3	10.5
53035	53035	4	10.4
53036	53036	4	6
53037	53037	4	2
53038	53038	4	10.5
53039	53039	4	5
53040	53040	4	5
53042	53042	4	7.4
53044	53044	4	1
53045	53045	4	1
53046	53046	4	1
53047	53047	2	10.5
53048	53048	4	10.5
53049	53049	4	5
53050	53050	4	7
53051	53051	4	1
53052	53052	1	1
53056	53056	2	1
53057	53057	4	5
53058	53058	4	2
53059	53059	4	3
53060	53060	3	5.1
53061	53061	4	7.3
53062	53062	1	7.3
53063	53063	4	5

State of Wisconsin RUCAs Codes for Zipcodes

ZIP	ZIPN	POPULATION CATEGORY	RUCA CODE
53064	53064	3	2
53065	53065	4	5
53066	53066	4	2
53069	53069	4	2
53070	53070	4	2
53072	53072	4	1
53073	53073	4	7.1
53074	53074	4	2
53075	53075	4	10.1
53076	53076	4	2
53078	53078	4	3
53079	53079	4	5
53080	53080	4	2
53081	53081	4	1
53082	53082	1	1
53083	53083	4	1
53085	53085	4	1
53086	53086	4	2
53088	53088	3	7.3
53089	53089	4	1
53090	53090	4	4.1
53091	53091	4	10.5
53092	53092	4	1
53093	53093	4	2
53094	53094	4	4
53095	53095	4	4.1
53097	53097	4	1
53098	53098	4	4
53099	53099	2	10.4
53101	53101	2	2.2
53102	53102	1	2.2
53103	53103	4	1
53104	53104	4	2.2
53105	53105	4	3
53108	53108	4	1
53109	53109	2	2.2
53110	53110	4	1
53114	53114	4	10
53115	53115	4	7
53118	53118	4	2
53119	53119	4	2
53120	53120	4	2
53121	53121	4	7
53122	53122	4	1
53125	53125	4	10

State of Wisconsin RUCA Codes for Zipcodes

ZIP	ZIPN	POPULATION CATEGORY	RUCA CODE
53126	53126	4	2
53127	53127	3	2
53128	53128	4	9
53129	53129	4	1
53130	53130	4	1
53132	53132	4	1
53137	53137	4	6
53138	53138	2	3
53139	53139	4	2
53140	53140	4	1
53141	53141	1	1
53142	53142	4	1
53143	53143	4	1
53144	53144	4	1
53146	53146	4	1
53147	53147	4	7
53148	53148	3	10
53149	53149	4	2
53150	53150	4	1
53151	53151	4	1
53152	53152	2	2.2
53153	53153	4	2
53154	53154	4	1
53156	53156	4	4
53157	53157	4	9
53158	53158	3	1
53159	53159	2	2.2
53167	53167	3	2
53168	53168	4	2.2
53170	53170	4	2.2
53171	53171	3	1
53172	53172	4	1
53176	53176	2	10
53177	53177	4	1
53178	53178	4	2
53179	53179	4	2.2
53181	53181	4	2.2
53182	53182	4	2
53183	53183	4	2
53184	53184	4	10
53185	53185	4	2
53186	53186	4	1
53187	53187	1	1
53188	53188	4	1
53190	53190	4	4

State of Wisconsin RUCA Codes for Zipcodes

ZIP	ZIPN	POPULATION CATEGORY	RUCA CODE
53191	53191	4	10
53192	53192	3	2.2
53194	53194	1	2.2
53195	53195	2	7
53201	53201	1	1
53202	53202	4	1
53203	53203	2	1
53204	53204	4	1
53205	53205	4	1
53206	53206	4	1
53207	53207	4	1
53208	53208	4	1
53209	53209	4	1
53210	53210	4	1
53211	53211	4	1
53212	53212	4	1
53213	53213	4	1
53214	53214	4	1
53215	53215	4	1
53216	53216	4	1
53217	53217	4	1
53218	53218	4	1
53219	53219	4	1
53220	53220	4	1
53221	53221	4	1
53222	53222	4	1
53223	53223	4	1
53224	53224	4	1
53225	53225	4	1
53226	53226	4	1
53227	53227	4	1
53228	53228	4	1
53233	53233	4	1
53234	53234	1	1
53235	53235	4	1
53237	53237	1	1
53259	53259	1	1
53263	53263	1	1
53267	53267	1	1
53268	53268	1	1
53270	53270	1	1
53277	53277	1	1
53278	53278	1	1
53280	53280	1	1
53281	53281	1	1