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Alternative Methods for Minnesota's Market Rate Study of Child Care Prices

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Background

Minnesota's Child Care Assistance Program (CCAP) provides financial subsidies to help eligible families pay for child care while parents are working, searching for employment, or pursuing education leading to employment. The Minnesota Department of Human Services (DHS), following legislative direction, sets the maximum rates that can be paid for care under CCAP. The federal government requires that states ensure that parents who receive child care assistance have access to the range of providers in the child care market similar to other parents. States are instructed to provide evidence of access based on a local market rate survey. This report, prepared by a research team at the University of Minnesota under contract with DHS, explores alternative techniques for collecting and analyzing child care price information in the market rate survey. The report is organized around four basic questions related to geographic groupings, pricing modes and conversions, school-age care and non-standard hour care.

A stakeholder advisory committee was convened, meeting three times to help inform and guide the study. The committee included state legislators, county representatives, child care resource & referral agencies, child care advocates, representatives from child care centers, licensed family child care providers, unions representing family child care providers, and others with knowledge of the child care market. Committee members played a key role in helping to develop a set of principles by which to assess the alternative approaches. Based on these principles, the alternative methods were evaluated on the criteria of access, fairness, stability, simplicity and transparency.

What geographic boundaries should be used to set maximum child care rates?

It makes practical sense that parents seek child care that is convenient to their home or work locales. It makes economic sense that the price for labor-intensive, geographically-specific services, such as child care, will vary from place to place. It makes public policy sense that boundaries be set within which prices can be analyzed in order to provide a basis for determining a maximum child care payment rate. However, if those boundaries are too narrow, some areas may not contain enough observations on prices to provide statistical validity; if the boundaries are too large, the resulting maximum rates may not adequately reflect the particular circumstances of local communities.

In recent years, maximum rates have been determined for each of the state's 87 counties, except in those counties where few providers respond to the rate survey, and in which a regional or statewide basis is used to calculate the maximum rate for child care centers. This method results in a large number of different maximum rates. One objective of this study was to develop a process for determining geographical boundaries for setting CCAP maximum rates that satisfied the federal benchmark of providing access and addressed concerns about the use of county-based maximum rates. The research team investigated a wide variety of alternative techniques that could be used to create larger geographic groupings. These alternatives were divided along two dimensions. First, the methods were distinguished by geographic unit, that is, they were based either on county or ZIP code-level data. Second, the

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methods differed based on the type of data used--the groups were based either on child care prices or on economic characteristics related to child care prices. Four alternative geographic groupings are compared in this report:

- County groups based on child care prices with separate groupings by type of provider (center or licensed family child care provider)
- County groups based on average female earnings
- ZIP code area groups based on child care prices with separate groupings by type of provider (centers and licensed family child care providers)
- ZIP code groups based on child care prices with provider types combined.

Each of the four grouping methods resulted in similar outcomes and did not result in major changes in parental access compared to a baseline scenario that was based on 2007 data and current DHS methods. Details on other grouping methods considered, and the selection process, are included in the report's Technical Appendix.

The study recommendations include creating larger geographic groups for the purpose of setting maximum rates rather than setting distinct maximum rates for each county. Whether DHS chooses to create groups based on child care prices or another characteristic, the study notes that it is important to use multiple sources of information about the child care market to ensure that the groups are capturing market differences. Each grouping method involves a certain amount of judgment, whether it is determining the number of groups or deciding how to handle areas on a boundary. These decisions are best made in the context of knowledge about the area, including information on child care prices and economic and demographic characteristics and trends, rather than relying solely on a statistical algorithm. A work group comprised of state child care administrative staff and others knowledgeable about child care throughout the state can provide critical information on these issues. The statistical method used for grouping provides the starting point, which must then be tested and compared to the market, and refined where necessary.

How should DHS synthesize various child care prices?

Child care providers have varied pricing practices. Some facilities charge hourly, while others use daily, weekly, or monthly time units. Providers may offer one price to all families, or they may offer a set of pricing options to parents, such as allowing them to pay either for a week or on an hourly basis. The relationship between prices in different units of time is not standardized, however, and varies considerably across regions and types of providers. In a number of circumstances, DHS converts prices reported by child care providers in one unit of time to other time units (or "pricing modes"). For example, a daily price is multiplied by five to obtain a weekly price. As is the case for many goods and services, many child care providers charge prices that reflect quantity pricing, that is, it is usually cheaper (per hour) to pay for weekly care than the hourly price multiplied by the number of hours in a week. The price conversions used by DHS typically do not reflect quantity pricing.

To collect accurate price information about the private child care market, the survey should collect price data in the pricing modes used by providers. Given that pricing practices in the market are not standardized, any conversion of prices is likely to

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create prices that do not exist in the market, and thus distort survey findings. Study authors recommend revising the survey questions in order to better capture child care price information as reported to parents. In addition, the use of larger geographical groupings should eliminate the need for conversions due to concerns about statistical validity arising in areas with few providers.

Price conversions are also used by DHS in circumstances in which most licensed family child care providers in an area offer only hourly prices. These situations may occur even if larger geographic groupings are adopted. CCAP payments to child care providers are subject to a daily and weekly maximum based on the hours in care, regardless of whether the provider charges by the hour, day or week. These daily and weekly caps are intended to control program costs. If price conversions are not done, it is equivalent to imposing quantity pricing on providers who charge by the hour and (it is assumed) do not use quantity pricing. It is important to ensure that parents have access to providers in these areas, including those who do not use quantity pricing. This study found that the use of conversions under these circumstances had little impact on overall parental access. Nonetheless, in markets where most providers charge on an hourly basis, further research into how these providers calculate the total fees for a week would be useful.

What methods should be used to determine maximum payment rates for out-of-school time?

School-age children represent a distinct submarket for child care services, and in fact there may be multiple submarkets reflecting differences in school-year, summer and kindergarten care. School-age children may need child care when school is not in session, including before and after school, on school holidays or other days off, and in the summer. Care during the school year is typically priced differently than in the summer because it is generally for fewer hours per day than during the summer. Regulations regarding school-age child care allow larger group sizes and more children per staff member than regulations for younger children, which affect the cost of care. Finally, the market for child care for school-age children includes a variety of different kinds of providers and institutions, including licensed family child care homes, child care centers, public schools, and community recreation centers and programs.

This report examined a number of issues regarding school-age care and the rate survey and, in general, the findings support current DHS practices. The main concern raised about school-age care in the CCAP is the use of hourly, daily and weekly pricing modes for maximum CCAP rates, which do not match the pricing practices in the private market for school-age care. School-age care providers often set prices for blocks of time that may include up to three hours before or after school, with the same fee regardless of the actual hours of care. Collecting and analyzing information on all pricing modes and schedules offered by school-age providers does not seem feasible, in part because of the difficulty in converting or creating comparable prices across providers.

The current practice of setting hourly, daily and weekly CCAP maximum rates does not reflect how some providers charge for school-age care in the private market, and as a result, may limit parents' access to this type of care. When facilities charge for a

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block of time (e.g., after-school) and parents are authorized to purchase care only by the hour, parents may have difficulty accessing that care. This issue may be resolved by changing authorization policies rather than by collecting and analyzing additional pricing mode data, or changing maximum rate setting policy. The re-establishment of a part-day maximum rate or authorizing care in blocks of time that reflect child care schedules could be used to address this access issue for school-age care.

Should CCAP maximum rates be set for non-standard hour care? If so, on what basis should that maximum be set?

Very few licensed providers in Minnesota offer extensive non-standard hour (before 6 a.m. or after 6 p.m. or weekends) child care, though some are open for at least one hour during those non-standard times. DHS sets maximum rates for non-standard hour care only for licensed family child care homes in counties with a sufficient number of providers reporting non-standard hourly prices. In addition, DHS sets a maximum rate for non-standard hour care only if it is higher than the applicable maximum rate for standard hour care.

The rate survey provides a limited amount of information about non-standard hour prices. It is important to continue to collect data on hours of care from providers as it is the main source of information on availability of non-standard hour care. Given the small number of providers reporting prices for non-standard hour care, the report authors recommend that DHS not use this information to calculate and set maximum non-standard hourly rates at the county or regional level. Given the limitations of market price data on non-standard hour care, the report authors recommend further research into alternative approaches to increase availability of non-standard hour care, rather than use of non-standard hour CCAP maximum rates based on rate survey data.

Conclusion

Conducting a survey of child care prices is a complicated endeavor, primarily because the child care market is complex. It is important to note that the primary purpose of the child care price survey is to ensure that parents have access to care in the local market. Given the importance of survey findings for CCAP policy, accuracy of results is important, requiring use of scientifically sound methods for conducting the survey, analyzing the data, and reporting the findings. Use of survey findings to inform setting of CCAP maximum rates helps to ensure equitable treatment of families in different parts of the state, or needing different types of care, as measured in terms of access.

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Introduction

Minnesota's Child Care Assistance Program (CCAP) provides financial subsidies to help eligible families pay for child care while parents are employed, searching for employment, or pursuing education leading to employment. The Minnesota Department of Human Services (DHS), following legislative direction, sets maximum rates that can be paid for care in the CCAP. The state pays a provider's usual charge for eligible children (minus any parental co-payment) up to the maximum established. When a provider's charge is greater than the established maximum rate, the parents are responsible for the difference, in addition to any required family co-payment.

The federal government requires that states ensure that parents who receive child care assistance have access to a range of providers in the child care market similar to other parents. States are instructed to provide evidence of access based on a *local market rate survey*.[1] A market rate survey collects information on the amount that child care providers charge parents for various types of care in a geographic area. Despite the federal requirement to conduct a local market rate survey, states have been given little guidance about how to conduct such a survey, or how to use the information in their rate-setting process.[2]

The federal Administration for Children and Families encourages states to use market rate survey findings to inform the setting of child care subsidy maximum rates. The federal rule states that maximum rates "established at least at the 75th percentile would be regarded as providing equal access."[3] If all provider prices are ranked in order from low to high, the 75th percentile is defined as the price at which three quarters of all the prices are equal to or lower than that level. The federal government views the 75th percentile as a benchmark rather than a requirement. Until recently, the 75th percentiles from the most current rate survey typically were used to establish the maximum rates in most counties in Minnesota. The current process for setting maximum rates in Minnesota is based on recent legislative decisions not directly connected to the rate survey results. Regardless of how information from the rate survey is used in the maximum rate-setting process, the survey is required and can provide useful information to parents, policymakers, and child care providers about the child care market.

While there are many issues related to conducting a market rate survey and producing accurate findings, the rate survey and data analysis conducted by Minnesota already includes many of the best practices identified by national experts. Nonetheless, a number of issues and concerns have been raised in recent years about the market rate survey and data analysis. State legislators, county officials, and DHS

[1] Department of Health and Human Services, Administration for Children and Families (July 24, 1998), 45 CFR, Parts 98 and 99. Child Care and Development Fund, Final Rule, Section 98.43. Federal Register. Vol. 69. http://www.access.gpo.gov/su_docs/fedreg/a980724c.html.

[2] Stoney, L. 1994. Promoting access to quality child care: Critical steps in conducting market rate surveys and establishing rate policies. Washington, D.C.: Children's Defense Fund. Karolak, E., Collins, R., & Stoney, L. 2001. Conducting market rate surveys and establishing rate policies. Washington, D.C.: National Child Care Information Center Weber, R. B., Grobe, D., Davis, E. E., Kreader, J. L., and Pratt, C., 2007. Child care market rate survey practices of states, territories, and tribes. Corvallis, OR: Family Policy Program, Oregon State University. http://www.researchconnections.org/location/ccrca12266.

[3] Department of Health and Human Services, Administration for Children and Families (July 24, 1998), 45 CFR, Parts 98 and 99. Child Care and Development Fund, Final Rule, Section 98.43. Federal Register. Vol. 69. http://www.access.gpo.gov/su_docs/fedreg/a980724c.html.

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administrators have had questions or concerns about various aspects of the rate survey and rate setting process. Also, the Minnesota Office of the Legislative Auditor identified some concerns in its 2005 report.[4] In 2007 DHS issued a request for proposals (RFP) to conduct a research study on alternative methods for the CCAP market rate survey and specified a number of issues to be addressed. This report presents findings from that research project funded by DHS and conducted by the University of Minnesota.

Challenges of conducting child care market rate surveys

Conducting a survey of child care prices is a complicated endeavor, primarily because the child care market is complex. Thus, it is important to note the goal and purpose of the child care market rate survey: the information is used to inform child care subsidy rate setting so that parents receiving a subsidy have access to the child care market. The most important criterion, therefore, for judging the quality of a market rate survey is whether the results accurately reflect the child care market. The provider charges found when parents are searching for child care in a particular area should be reflected in the market rate survey.

The child care market is a complex mix of different types of providers and services. While the government directly funds some child care services (primarily through programs such as Head Start and pre-K programs in school districts), most child care is provided in the private market. Providers set their charges based on what the private market will bear, that is, what parents are willing and able to pay. Unlike some government programs, child care assistance is a relatively small part of funding in the child care market. An analysis of 2004 data found that only about 6 percent of licensed family child care slots and 10 percent of center slots in Minnesota were funded (in whole or in part) by child care assistance payments.[5]

It is important to recognize that a market rate survey is a study of the priced child care market.[6] The market rate survey should include only prices that are set in arm's length transactions, that is, in which the buyer and seller are not related, nor have a pre-existing relationship. A recent Minnesota study found that nearly half of households using regular child care had relatives and friends as the primary arrangement and estimated that about one quarter of family, friend and neighbor (FFN) caregivers earn income from providing child care.[7] Even if they are paid for providing care, FFN caregivers usually do not offer care to the general public, and the amount they are paid may be influenced by the relationship between the provider and the parents. Thus, the market rate survey does not include these providers or their charges because they do not reflect transactions in the open market. In the CCAP, approved FFN caregivers are called legal non-licensed

[4] Office of the Legislative Auditor, state of Minnesota. 2005. Child Care Reimbursement Rates. Report No. 05-01 (January). St Paul, Minn. http://www.auditor.leg.state.mn.us.

[5] Cost of Child Care: Legislative Report on Cost Containment Options in the Child Care Assistance Program, Minnesota Department of Human Services, January 2005, p. 7. http://edocs.dhs.state.mn.us/lfserver/Legacy/DHS-4350-ENG.

[6] Grobe, D., Weber, R. B., Davis, E. E., Kreader, J. L., and Pratt, C. 2008., Study of Market Prices: Guidance for Validating Child Care Market Rate Surveys. Corvallis, OR: Family Policy Program, Oregon State University.

[7] Chase, R., Arnold, J., Schauben, L. and Shardlow, B.. 2006. Family, friend, and neighbor caregivers: Results of the 2004 Minnesota statewide household child care survey. http://www.wilder.org/download.0.html?report=1893.

providers. Setting maximum CCAP rates for legal non-licensed (LNL) providers requires a different process because they are not (and cannot) be included in a market rate survey. In most states, including Minnesota, the maximum rates for LNL care are based on a percentage of the maximums established for licensed family child care providers.

Objectives of the report

The focus of the report includes four key areas of study identified by DHS:

- Geographic groupings
- Pricing modes and price conversions
- School-age children
- Non-standard hour care.

The objectives of this report are threefold. For each of the key areas identified by DHS, this report:

- Identifies critical issues regarding the rate survey and CCAP maximum rates
- Analyzes background information and rate survey data to inform these issues
- Makes recommendations.

This report is accompanied by a Technical Appendix which provides more detail on the methods and data used for the study.

Study methods and data sources

The first phase of the project included an in-depth review of studies, reports and web sites to identify alternative methods that might be used to address the issues identified by DHS. Each state is required to submit a Child Care and Development Fund (CCDF) Plan to the federal government, and all of these were reviewed (50 states and the District of Columbia). In addition to a review of relevant literature and web searches, several experts in other states were consulted. To provide background information on provider practices in Minnesota, the authors conducted interviews with the five district Child Care Resource & Referral agencies in Minnesota who are responsible for conducting the rate survey.

The second phase of the project focused on analyzing alternative methods using the data collected in the 2007 rate survey. The data set was provided by DHS, the same data set used by another contractor to conduct the analysis for the 2007 rate survey. To address the issues identified by DHS, the data were analyzed with regard to geographic groupings, school age care, non-standard hours, conversion rates, pricing modes and response rates. The 2007 data were analyzed statewide, by economic development region, by county, and by ZIP code area. Most of the analysis was conducted using the SAS statistical program, although Excel was also used. For the creation of geographical groupings, both SAS and ArcGIS software were used to compare different statistical methods. Details on the statistical methods and results from various comparison tests are included in the Technical Appendix.

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Project stakeholder advisory committee and evaluation criteria

To ensure that input was obtained from a variety of stakeholders, a stakeholder advisory group was convened. Invitations for committee membership were sent to state legislators, county representatives, child care resource & referral agencies, child care advocates, representatives from child care centers, licensed family child care providers, unions representing family child care providers, and others with knowledge of the child care market. (A list of committee member affiliations is provided in the Technical Appendix.)

This advisory group met three times during the course of the research project. At the first meeting, held in November 2007, participants provided feedback on the current rate survey and analysis process. They also discussed criteria for use in guiding the selection of alternative methods to consider in the analysis phase of the research project. The second meeting was held in March 2008, where committee members provided feedback on the background briefing paper and input on different geographic grouping methods. At the final meeting held in June 2008, stakeholders provided feedback on the first draft of the final report and on study recommendations.

The committee played a key role in helping the research team develop a set of principles by which to evaluate the alternative methods and inform policy decision making. The first principle emphasized by committee members stated that CCAP maximum rates should reflect the market in terms of the geographic clustering of prices, the pricing modes used in the market and the age groupings commonly used by providers. The committee also identified timeliness, accuracy, and credibility as important principles and noted the importance of balancing stability in rate setting with the ability to reflect real trends in the child care market. Based on these principles, five criteria were created for evaluation of alternative methods, as defined below.

- Access: Parents have access to the range of child care providers in their local community
- Fairness: Based on local provider business practices and market conditions
- Stable: Changes should reflect real market trends rather than random fluctuations
- Simple: Relatively straightforward to implement and administer
- Transparent: Easy to understand and explain to others.

The advisory committee was asked to review the five evaluation criteria at their third meeting. They ranked the five criteria by dividing 100 points into weights for each one. Access and fairness were by far the most important criteria, with an average of 36 and 31 points respectively out of 100, (table 1). The other three criteria averaged about 10 or 11 points out of 100. Nearly every committee member gave more weight to access and fairness than the other criteria, suggesting a high degree of consistency. Throughout the study the authors relied on these criteria in evaluating alternative methods and in developing recommendations.

Table 1: Ranking of evaluation criteria by the stakeholder advisory committee

Criteria	Explanation	Average of committee weights (out of 100 points)
Access	How well does the method ensure that parents will have access to the range of child care providers in their community?	36.5
Fairness	Will the method be perceived to be fair to providers and parents in different communities?	31.2
Stable	Will the method result in survey findings and groups that are relatively stable over time?	10.4
Simple	Is the method relatively simple to implement and administer?	10.4
Transparent	Is the method easy to understand and to explain to others?	11.5

Definitions of terms used in this report

To reduce confusion over terminology, the authors use *prices* to refer to the fees charged by child care providers. A provider's usual price is the amount paid per child by families who do not receive child care assistance. The *maximum rate* is set by DHS and represents a ceiling on the amount that can be paid for care of children through the CCAP. The government pays either the provider's usual price or the maximum rate, whichever is less. A *pricing mode* is the way in which the provider quotes the price for child care. Common pricing modes in Minnesota are hourly, daily and weekly. *Conversion* involves using a formula to change a price in one pricing mode to another mode. For example, an hourly price could be multiplied by 40 or by 50 to be converted to a price for a week. *Facilities* and *child care providers* are used interchangeably in this report to include child care centers, licensed family child care homes, school-age programs and preschool or nursery school programs in which care and early education services are provided. *Family child care providers* refer to those licensed in Minnesota; LNL providers are not included in the market rate survey. The *rate survey* is conducted by DHS to collect information on prices charged by child care providers in Minnesota. Survey information is collected by the district child care resource and referral agencies (CCR&R).

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Market rate surveys and setting CCAP maximum rates

A market rate survey of prices in the child care market reveals the complexity of this market, with different types of providers, pricing modes, and submarkets by age of child, location and type of provider (e.g., centers or licensed family providers). Setting maximum payment rates for child care assistance is a process separate from the market rate survey, but findings of the survey inform the maximum rate setting process. States have discretion in how they determine and set maximum payment rates for child care assistance, and as a result, states have widely varying policies and practices. States usually set different maximum rates based on location (geography), age of child, type of provider, and pricing mode. Under current practice, Minnesota uses more maximum rate categories than most other states. Table 2 provides an estimate of the number of categories used for rate setting by each state based on number of age groups, types of care, geographic units and pricing modes. The count of maximum rate categories is calculated as the number of age groups multiplied by the number of types of care times the number of geographic units and the number of pricing modes (including separate part-time and full-time maximums, if applicable). For example, Minnesota has four age groups (infant, toddler, preschool, and school-age), two types of care (centers and licensed family child care homes), 87 geographic units (counties), and three pricing modes (hourly, daily and weekly), for a total of 4*2*87*3 = 2,088 categories.

Minnesota has more maximum rate categories than many states, in large part because counties are used as the geographic unit. Arkansas, Virginia, Pennsylvania, Florida and California also have a large number of categories, in part because they have a fairly large number of geographic units (though they do not all use counties). Florida also has seven age groups, while Arkansas and Pennsylvania have four separate categories of types of care. California includes more pricing modes, including hourly, full-time daily, full-time weekly, full-time monthly and part-time weekly and monthly.

Other states with a large number of geographic units (often counties) have fewer maximum rate categories than Minnesota by using fewer pricing modes. North Carolina and South Dakota use only one pricing mode (monthly in North Carolina and hourly in South Dakota). The states with the fewest rate categories typically have only a few geographic units, either setting only a statewide maximum rate or separate rates for a small number of regions. They also often use only one or two pricing modes, though this is not always the case. For example, both Rhode Island and Hawaii use four pricing modes, yet set only statewide maximum rates. States setting statewide maximum rates may have difficulty demonstrating that parents have equal access in some parts of the state as required by the federal government.

The count of maximum rate categories for each state shown in table 2 should be viewed as approximate because differences in the ways that states report these categories make it difficult to ensure that numbers are strictly comparable. The number of categories is likely to be an undercount, as it does not include separate categories for accredited providers (or other types of tiered reimbursement), non-standard hour care, special needs, or family, friend and neighbor care. While many states have policies establishing separate maximums for some or all of these categories, the maximum rates for these categories are often in terms of a percentage of or add-on to the standard maximum rate. Also, state rate surveys often do not collect information specific to these categories.

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The wide variation in the number of maximum rate categories across states shown in table 2 illustrates the range of options and choices made by different states. Nearly all states use multiple age groups and establish separate maximum rates for licensed family child care homes and centers. Most states also use multiple pricing modes. The policy decisions made by states regarding the number of maximum rate categories must balance the ability to reflect the complexity of the child care market with simplification achieved by having fewer categories. One of the objectives of this project was to determine ways in which Minnesota could reduce the number of maximum rate categories without reducing access of parents to providers in their local child care market.

Table 2: Number of maximum rate categories estimated for each state

State	Age groups	Types of care	Geographic regions	Pricing modes and schedules	Total number of categories	Effective date
Alabama	3	3	9	1	81	1-Oct-07
Alaska	4	3	6	5	360	1-Apr-06
Arizona	4	3	6	2	144	1-Jul-07
Arkansas	4	4	75	3	3,600	1-Nov-06
California	3	2	58	6	2,088	1-Oct-06
Colorado	5	2	64	Varies		1-Oct-05
Connecticut	3	2	5	4	120	1-Jan-02
Delaware	4	2	3	1	24	FFY 2006
D.C.	4	2	1	2	16	1-Oct-05
Florida	7	3	31	4	2,604	1-Jul-05
Georgia	4	2	3	2	48	April, 2005
Hawaii	1	5	1	4	20	24-May-02
Idaho	5	3	7	1	105	1-Jan-01
Illinois	2	2	3	2	24	1-Jul-01
Indiana	5	2	92	3	2,760	FFY 2008-2009
Iowa	3	3	1	1	9	1-Jan-07
Kansas (Family)	2	2	3	1	12	1-Feb-05
Kansas (Centers)	5				30	1-Feb-05
Kentucky	3	3	6	2	108	1-Oct-03
Louisiana	2	4	1	1	8	1-Jan-07
Maine	5	2	17	2	340	4-Oct-08
Maryland	2	2	7	3	84	15-Oct-07

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Table 2: Number of maximum rate categories estimated for each state (continued)

State	Age groups	Types of care	Geographic regions	Pricing modes and schedules	Total number of categories	Effective date
Massachusetts (Centers)	4	3	6	1	72	1-Jul-01
Massachusetts (Family)	2				36	1-Jul-01
Michigan	2	3	6	1	36	29-Dec-02
Minnesota	4	2	87	3	2,088	1-Jul-06
Mississippi	4	2	1	2	16	1-Jul-03
Missouri	3	3	3	3	81	1-Mar-07
Montana	2	3	13	2	156	1-Jul-04
Nebraska	4	2	3	2	48	1-Jul-05
Nevada	4	3	4	1	48	1-Nov-04
New Hampshire	2	2	1	2	8	1-Jul-07
New Jersey	4	2	1	10	80	1-Oct-07
New Mexico	4	4	2	4	128	15-Aug-07
New York	4	4	5	4	260	31-Jul-06
North Carolina	5	2	100	1	1,000	1-Oct-06
North Dakota	3	3	1	7	63	1-Oct-03
Ohio	5	5	6	3	450	June, 2007
Oklahoma	5	2	2	2	40	July, 2007
Oregon	4	3	3	3	108	1-Oct-05
Pennsylvania	6	4	67	2	3,216	1-Aug-06
Rhode Island	3	2	1	4	24	4-Jan-04
South Carolina	3	3	2	2	36	1-Oct-03
South Dakota	3	2	66	1	396	1-Oct-07
Tennessee	5	3	2	1	30	1-Jul-05
Texas	4	3	28	2	672	1-Mar-07
Utah	5	3	1	1	15	1-Jul-07
Vermont	4	2	1	4	32	8-Jul-07
Virginia	4	2	117	1	936	1-Sep-04
Washington	4	2	7	2	112	1-Jul-07
West Virginia	2	4	1	2	16	1-Jul-03
Wisconsin	4	2	4	2	64	June, 2007
Wyoming	5	2	1	3	30	1-Apr-05

Source: Authors' calculations based on recent state CCDF plans. Note that there may be variations in definitions across states that affect the number of cells counted. Pricing modes and schedules include units of time (hourly, daily, etc.) and count part-time and full-time as separate cells. School-age rates are usually counted as an age group, though in some states, school-based school-age programs are counted as a separate type of care,

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Geographic groupings

Recently DHS set maximum rates at the county level (in most situations). With 87 counties setting a distinct maximum rate for each county (for each type of care and age group) results in a large number of maximum rates to be determined. Another concern is that in some counties there are very few providers, so price changes reported by providers in the survey can result in large year-to-year fluctuations in the 75th percentile. As a result, when there are few providers in a category, DHS uses a regional or statewide basis for calculating the maximum rate. Another concern relates to county boundaries that may not align with child care markets, and multiple markets may exist within one county. A study objective was to develop a process for determining geographical groupings for setting CCAP maximum rates that satisfies the federal benchmark of providing access, and addresses the following three key concerns:

- The large number of maximum rates when counties are used as the geographical unit
- Large fluctuations in 75th percentiles due to small numbers of providers in some counties
- Possible non-alignment of county and child care market boundaries.

One alternative to setting county-level maximum rates is to group counties together. The objective is not to find areas in which all providers charge the same price for the same type of service. In most child care markets, there will be a range or distribution of prices. The purpose is to find areas in which the price distribution is similar, or at least that the average prices (or 75th percentiles) are similar.

If all 87 counties are lined up based on the county average child care price, one gets a sense of the distribution of prices around the state. Using weekly prices as an example, in 2007 the average price for toddlers at licensed family child care providers ranged from $85 in Red Lake County to $151 in Hennepin County. Yet, the distribution is not smooth (nor uniform), it is skewed and clustered. It could be simplified by dividing the counties into groups by looking at the distribution of county averages (or 75th percentiles), and grouping similar ones together. While this process would be fairly straightforward, it may not seem fair because two analysts are likely to group the counties somewhat differently. To the extent that the county averages fall into natural groupings, that is, similar groups with breaks in between, the groups could be chosen more easily. However, it is not certain that every analyst would create exactly the same groupings, as some judgment may be needed to decide into which grouping a particular geographic unit falls.

More formal approaches for grouping observations include statistical methods based on the similarity (or dissimilarity) of the objects, such as cluster analysis. While a number of statistical approaches were explored, the software package ArcGIS and the Jenks optimal natural breaks method of classification was selected to create geographic groupings. Details on this and other methods considered are in the Technical Appendix. The Jenks classification method groups observations based on maximizing the similarity among the observations in a group, while at the same time maximizing the differences between groups. This method identifies the optimal groupings by minimizing the sum of absolute deviations about class medians.[8]

[8] Slocum, Terry A., 1999. Thematic Cartography and Visualization. Upper Saddle River, New Jersey: Prentice Hall.

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In effect, this method looks for groups or clusters that occur in the data and provides a systematic way to find the natural breaks between groups.

In any cluster analysis, understanding the objective and the data are important in determining the method to be used. For this project, the groupings are intended to capture child care prices by geographic area so they may be used to inform CCAP maximum rates. Groupings that better reflect the child care market are more likely to ensure that parents have access to child care options in their area. The groupings may be based on child care price data directly, or alternatively, on economic and demographic factors related to child care prices.

While DHS has used counties as the primary geographic unit for setting maximum rates, it is possible to use ZIP code areas rather than counties for grouping. While there are many more ZIP codes than counties, either can be grouped in ways that result in a similar number of groups. Analyzing data at the ZIP code level allows for variation within a county, which may be important for counties with large land areas, on the edge of metropolitan areas, or with multiple child care markets within their boundaries. The disadvantage of ZIP codes is their large number, and many have few providers. Two examples are provided in this report of ZIP code-based groupings to compare with county-based groupings. A discussion of the advantages and disadvantages follows.

The types of alternative methods used for creating geographical groupings can be divided along two dimensions. First, the methods are distinguished by type of geographic unit, that is, they are based either on county or ZIP code-level data. Second, the methods differ based on the type of data used; the groupings are based either on the price information in the rate survey or on economic characteristics related to child care prices. Four alternative geographic groupings are included in this report:

- County groups based on child care prices with separate groupings by type of provider (center or licensed family child care provider)
- County groups based on average female earnings
- ZIP code area groups based on child care prices with separate groupings by type of provider (center or licensed family child care provider)
- ZIP code groups based on child care prices with provider types combined.

A number of additional grouping methods were considered using both counties and ZIP code areas. For example, ZIP code groups were tested based on average female earnings, which were found to be unsatisfactory. Details on other methods tested and selection criteria are described in the Technical Appendix.

For each of the four alternatives included in this report, the authors describe the criteria for grouping, and provide a map showing examples of the groups or clusters. They then calculate the mean and 75th percentile for each group using 2007 rate survey data and compare these to a baseline 75th percentile using DHS' current methodology applied to 2007 data.[9] They also calculate the proportion of provider prices in each county that do not exceed the 75th percentiles calculated for each grouping method as a measure of parental access. In the last section, the advantages

[9] This analysis provides a measure of whether the new grouping would result in major changes in the 75th percentiles compared to using current methods and 2007 data, but does not compare the new groupings to current maximum rates.

and disadvantages of the alternative groupings were compared using the five criteria developed with the advisory committee (access, fairness, stability, simplicity and transparency). The recommendations are summarized at the end of the section.

Groups based on child care prices (county clusters)

This approach groups counties based on the similarity of child care prices. The objective is not to determine the area that represents a local child care market, but rather to identify areas with similar child care price distributions. The county-level 75th percentiles of prices were used as the measure for determining the clusters. (If prices in a county are ranked from low to high, the 75th percentile is the price below which three quarters of the prices fall). The 75th percentile of prices for toddlers were calculated for each county for three types of pricing modes (hourly, daily and weekly), and two types of care (child care centers and licensed family providers).

Analysis methods

Grouping counties based on child care prices is complicated by the use of multiple pricing modes and different prices for different types of care and age groups. However, these different prices are highly correlated so that the process can be simplified by focusing on one age group (toddlers).[10] The 75th percentile of toddler prices was calculated for each county for each type of care (centers and licensed family providers) and each pricing mode (hourly, daily and weekly). The 75th percentiles were calculated using the provider price data from the 2007 survey.[11] For centers only, the calculation of the 75th percentile was weighted by capacity.[12] The clustering of counties was then based on these calculated 75th percentiles.

Using the 75th percentile for each type of care and each pricing mode, counties were grouped into four clusters based on the Jenks optimal natural breaks method in ArcGIS software, and assigned a cluster number. The decision to use four groups or clusters was based on analysis of a number of criteria used in cluster analysis (details in the Technical Appendix). Each county was assigned six clusters: one for each of three pricing modes and two types of care (except if there were no providers reporting toddler prices in that pricing mode for that county). There was a high degree of consistency (in cluster assignments) across pricing modes, but where they differed, the average cluster number weighted by the number of providers in each pricing mode was calculated and rounded to obtain the final cluster number (separately for centers and licensed family child care providers). Thus, each county has two price cluster assignments: one for centers and another for licensed family providers.

Results

Figure 1 *(see following two pages)* shows the distribution of counties in the four groups based on price clusters for centers, while figure 2 shows the counties in each group based on price clusters for licensed family providers. For 26 counties, the cluster number did not match for center and licensed family providers. This reflects

[10] The focus was on toddler prices as they are the closest to an average price for a provider (based on an earlier analysis). Alternative methods include using all age groups or an average of prices (weighted by capacity). Based on preliminary analysis, either of these alternatives is likely to result in similar groupings.

[11] No conversions of provider price data were done, and at this stage of the analysis, there was no minimum number of providers required for the calculation of the 75th percentile.

[12] Capacity was defined as the desired capacity for the age group. If desired capacity was not available, licensed capacity was used instead.

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differences in the distribution of prices for centers and family providers, which lead to different groupings based on natural breaks. Prices are highly correlated for the two types of care, so counties that tend to have higher center prices also tend to have higher licensed family child care prices. Nonetheless, given the differences in the ranges of prices between centers and licensed family providers, separate geographic groupings were created for centers and licensed family providers. Counties with no centers reporting prices in 2007 are not assigned to a group in the analysis. These counties would need to be assigned to price clusters so that the entire state is covered by the geographic groupings. This process ensures that if a new provider opens, a maximum rate will have been established, even if there were no providers in that county at the time of the survey. Methods for assigning these counties to groups are discussed in detail in the Technical Appendix.

Figure 1: County clusters based on child care prices - center providers

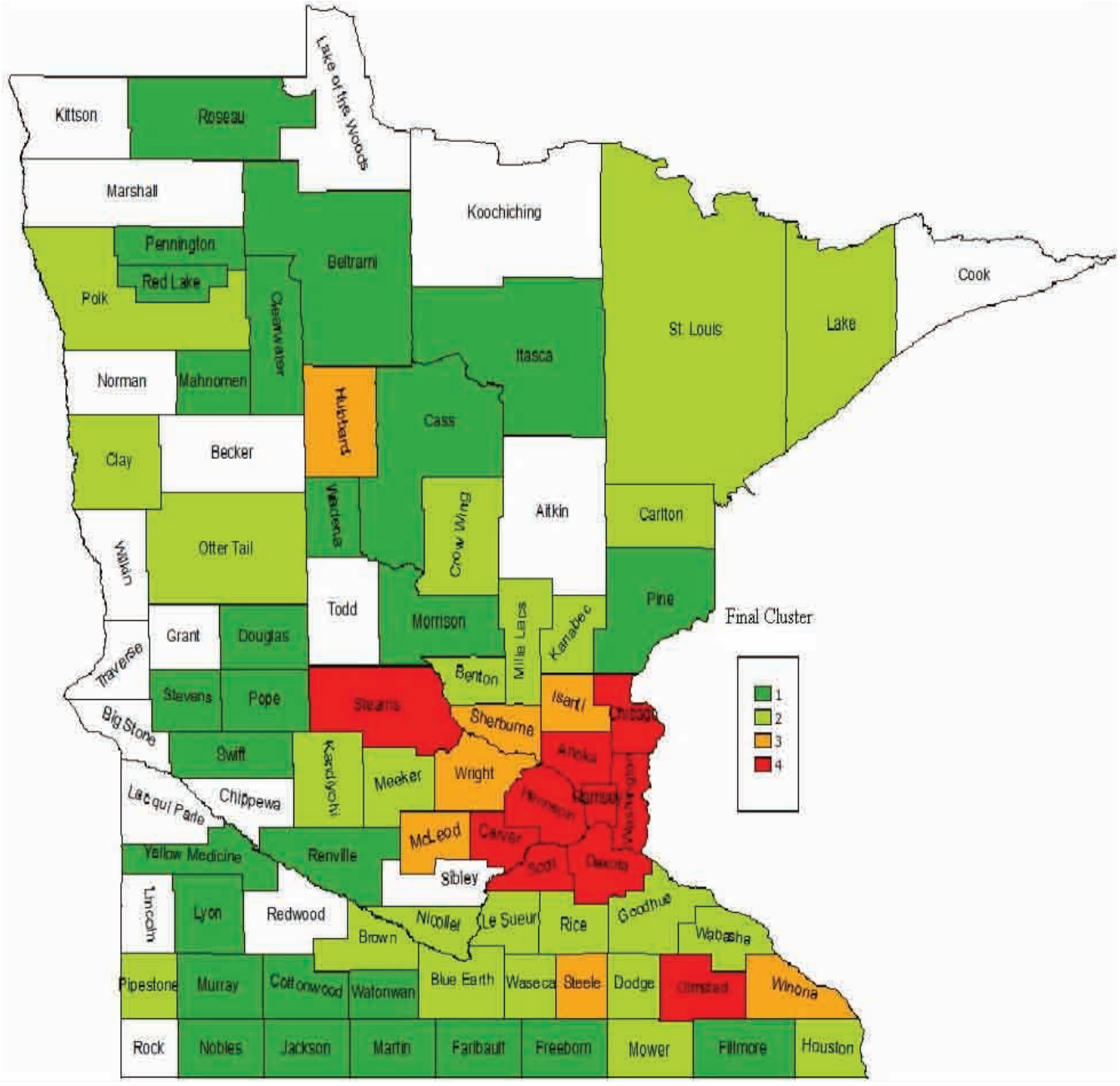

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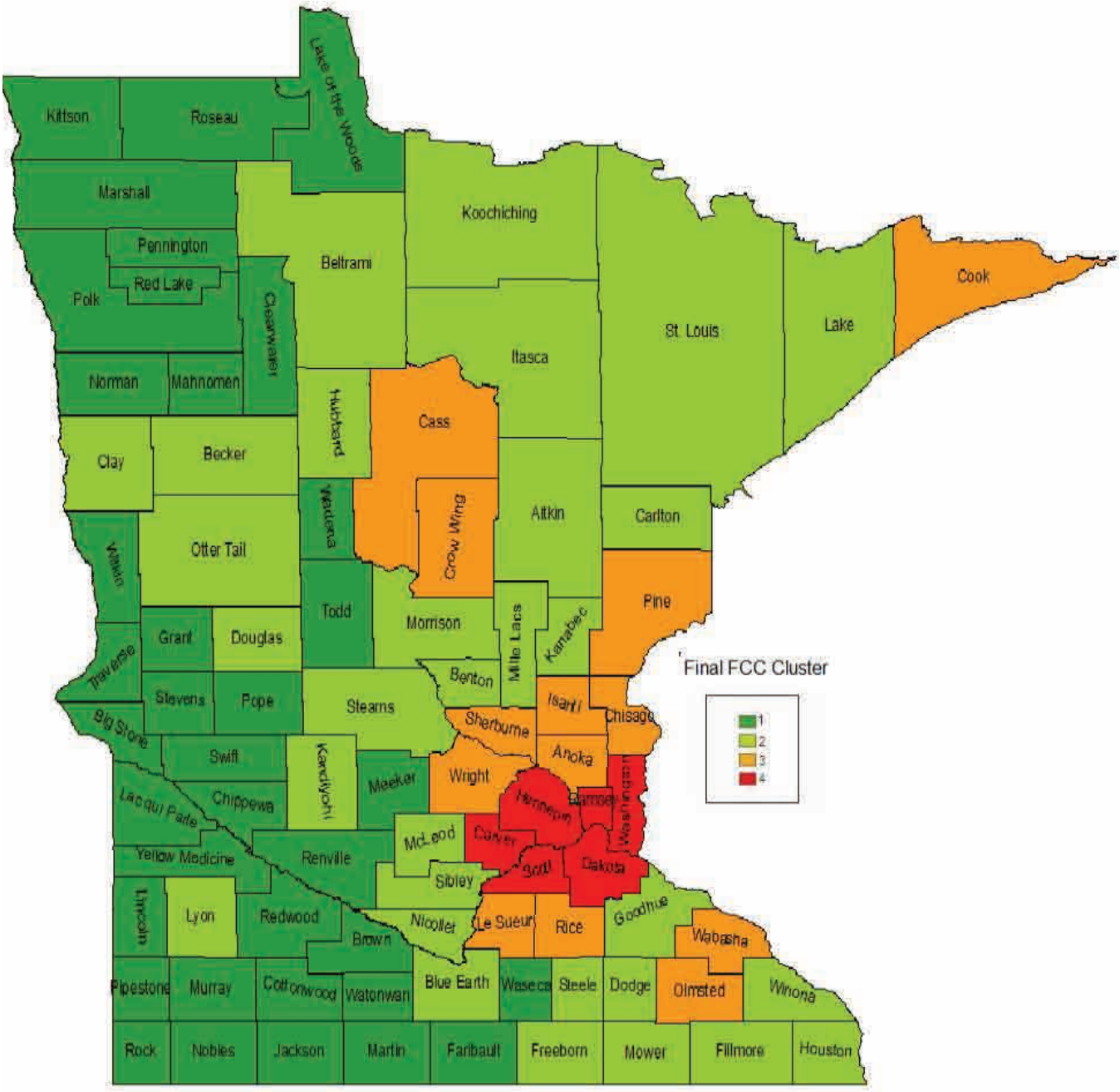
Figure 2: County clusters based on child care prices - family providers



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Based on assigning providers to these four groups (by type of provider), table 3 shows the number of providers, mean, and 75th percentile price for each cluster. If the geographic groupings capture price differences across the areas well, one would expect to see a pattern in which the mean and 75th percentiles increase for each successive group. This pattern is clearly seen for all pricing modes (table 3). The higher clusters are associated with higher average prices and 75th percentiles. As shown in table 3, the 75th percentile of hourly prices for licensed family providers increases from $2.25 in cluster one, to $2.50 in cluster two, $3.77 in cluster three and $6.00 in cluster four. Similar patterns are seen across all pricing modes and for both types of providers.

Table 3: Number of providers (N), mean and 75th percentile price for each price cluster
(Toddler prices)

County price clusters	Hourly			Daily			Weekly		
	N	Mean	75th	N	Mean	75th	N	Mean	75th
Centers									
Cluster 1	29	$2.61	$2.85	19	$25.21	$27.00	18	$120.98	$128.00
Cluster 2	45	$3.46	$3.75	56	$30.59	$33.20	63	$138.92	$150.00
Cluster 3	10	$5.91	$7.00	23	$41.27	$42.40	33	$171.86	$176.00
Cluster 4	180	$9.46	$11.00	294	$66.88	$78.00	431	$235.17	$257.00
Licensed family child care providers									
Cluster 1	1100	$2.08	$2.25	288	$20.32	$21.20	234	$101.12	$107.50
Cluster 2	1820	$2.35	$2.50	1167	$22.81	$25.00	1328	$110.72	$120.00
Cluster 3	698	$3.24	$3.77	1185	$27.26	$30.00	1563	$127.23	$135.00
Cluster 4	920	$5.29	$6.00	1508	$33.54	$36.00	2318	$148.69	$160.00

Note: Based on 2007 rate survey data.

The county price groupings have sufficient numbers of providers, with the smallest number (10) found in cluster three for centers reporting hourly prices. Even with the relatively small number of centers in that cell, the mean and 75th percentile for the cluster fall between the clusters on either side, suggesting that the county price clusters are capturing areas with distinct price distributions.

To compare the price clusters to current DHS practice, the 75th percentile for weekly prices calculated for each price cluster was compared to the baseline 75th percentile calculated for each county. The baseline 75th percentiles for weekly prices were calculated as part of the 2007 rate survey and were provided by DHS. For each county there are eight comparisons, that is, the cluster 75th percentile was compared to the baseline 75th percentile for each of four age groups and two types of care in the county. In the majority of comparisons, the cluster 75th percentile is within 10 percent of the weekly price baseline 75th percentile (table 4). For centers, 58 percent of comparisons are within 10 percent of the baseline, and for licensed family child care, nearly 88 percent. Very few cluster 75th percentiles are more than 25 percent lower or higher than the baseline comparison. Thus, overall, grouping the counties into these clusters based on prices yields results very similar to the current method.

Table 4: Comparison of 75th percentiles (p75) for each cluster with 2007 baseline 75th percentiles for all age groups (Weekly prices)

County price clusters	Centers		Licensed family child care	
	Number of cells	Percent of all cells	Number of cells	Percent of all cells
Cluster p75 within 10% of baseline	158	58.1	305	87.6
Cluster p75 between 10 and 25% higher than baseline	41	15.1	28	8.0
Cluster p75 higher than baseline by 25% or more	9	3.3	1	0.3
Cluster p75 between 10 and 25% lower than baseline	55	20.2	13	3.7
Cluster p75 lower than baseline by 25% or more	9	3.3	1	0.3

Note: The number of comparisons equals the number of counties (87) multiplied by the number of age groups (4) for a total of 348 comparisons, except for counties that have no centers reporting prices. Based on 2007 rate survey data.

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Despite the overall similarity between the cluster results and the baseline, there are a few counties and age groups for which the cluster 75th percentiles differ by more than 25 percent from the weekly price baseline 75th percentile (table 5). The greatest differences occur for centers. Most of the differences occur for infant 75th percentiles compared to baseline. In four counties (Beltrami, Clearwater, Hubbard and Mahnomen), the price cluster 75th percentile for infant weekly prices is considerably below the baseline 75th percentile. These four counties had a baseline 75th percentile for infants of $424, which is based on a regional calculation that includes one center in Hubbard County with unusually high weekly prices compared to other centers in surrounding counties. In Chisago and Stearns Counties, the center price cluster 75th percentiles are higher than the baseline by more than 25 percent for infants and toddlers.

For licensed family providers, the 75th percentile decreased by 25 percent or more in Murray County for toddlers, and in Cook County for school-age care. Overall, however, this approach using county price clusters would result in 75th percentiles similar to the current method in most counties and age groups. The fact that the county price cluster method produces similar results to the baseline suggests that if a change in methods is undertaken, the new groupings would not in and of themselves have a major impact relative to current methods (based on 2007 data).

Table 5: Counties with more than 25% difference between price cluster and baseline 75th percentiles

Weekly prices	County	Cluster 75th percentile	Baseline 75th percentile	Dollar difference	Percent difference
Centers					
Infant	Beltrami	$143.00	$424.00	-$281.00	-66.3
	Chisago	$301.00	$212.00	$89.00	42.0
	Clearwater	$143.00	$424.00	-$281.00	-66.3
	Douglas	$143.00	$200.00	-$57.00	-28.5
	Hubbard	$204.00	$424.00	-$220.00	-51.9
	Mahnomen	$143.00	$424.00	-$281.00	-66.3
	Pope	$143.00	$200.00	-$57.00	-28.5
	Stearns	$301.00	$190.00	$111.00	58.4
	Stevens	$143.00	$200.00	-$57.00	-28.5
Toddler	Chisago	$257.00	$184.00	$73.00	39.7
	Stearns	$257.00	$179.00	$78.00	43.6
Preschooler	Chisago	$222.00	$174.00	$48.00	27.6
	Stearns	$222.00	$166.25	$55.75	33.5
	Winona	$160.00	$120.00	$40.00	33.3
School age	Lyon	$110.00	$148.00	-$38.00	-25.7
	Pine	$110.00	$150.00	-$40.00	-26.7
	Polk	$128.00	$99.00	$29.00	29.3
	Stearns	$215.00	$166.25	$48.75	29.3
Licensed family child care providers					
Toddler	Murray	$112.50	$87.50	$25.00	28.6
School age	Cook	$135.00	$180.00	-$45.00	-25.0

Note: Based on 2007 rate survey data.

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Groups based on average female earnings (county clusters)

This approach groups counties based on the similarity of average female earnings in the county. Average female earnings are highly correlated with average child care prices at the county level (the estimated correlation coefficient was 0.76 or higher for each pricing mode and type of care). Alternatives using similar variables such as average earnings of both male and female workers, or median family income, resulted in similar groupings of counties (details are provided in the Technical Appendix).

Analysis methods

The county average earnings of female workers was obtained from the U.S. Census 2000. The mean earnings of all female workers with earnings for each county was downloaded using the DataNet GeoAnalysis tool on the Minnesota State Demographic Center web site: www.demography.state.mn.us. Using ArcGIS software, counties were grouped into four clusters based on county average female earnings using the Jenks natural breaks method. The decision to use four groups or clusters was based on analysis of a number of criteria used in cluster analysis (described in the Technical Appendix). More clusters would result in a very small number of counties in some groups. The appropriate cluster number was assigned to each provider in the data base based on their county location, and the mean and 75th percentile of prices were calculated for each group (separately for each age group, pricing mode and type of care).

Results

Table 6 shows the four geographical groupings of counties based on average female earnings. The distribution of counties in the four groupings is mapped in figure 3. The highest average female earnings are found in the Minneapolis-St Paul metropolitan area, along with Rochester. Areas surrounding these two metropolitan areas have the next highest level of average female earnings. The map of county average female earnings shows a nearly steady gradient moving away from the Minneapolis-St. Paul area, with average earnings declining the further one travels. One exception is Cook County in the northeast corner of the state, which also has relatively high average female earnings.

Table 6: Four groups based on county average female earnings

Earnings cluster	Number of counties	Range of county average female earnings
1	39	$13,936 to $17,382
2	28	$17,514 to $19,579
3	12	$19,899 to $23,509
4	8	$25,422 to $29,195

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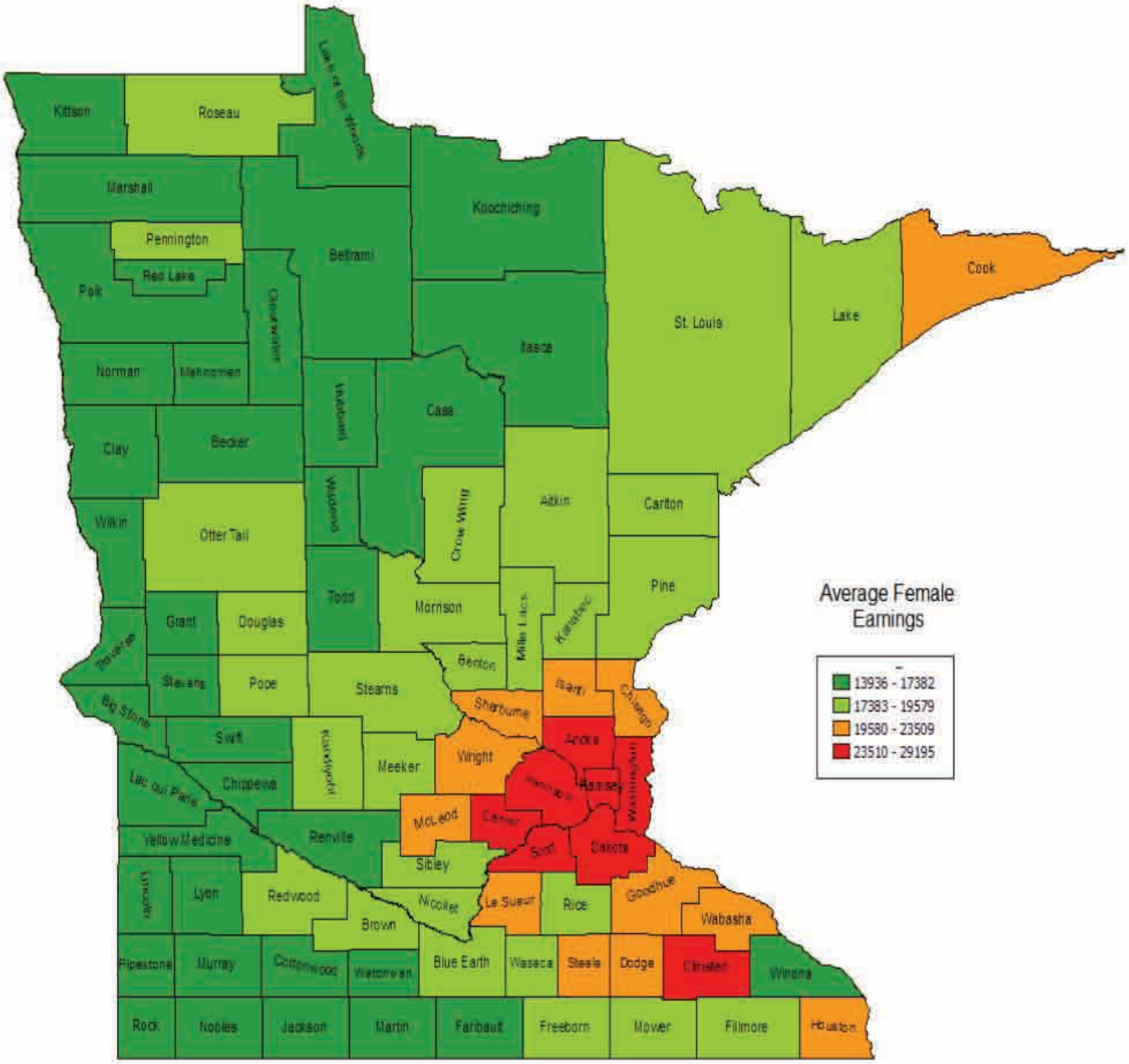
Figure 3: County clusters based on average female earnings



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Based on assigning providers to these four clusters of counties, table 7 shows the number of providers, mean, and 75th percentile price for each cluster. Given the positive correlation between county average female earnings and average child care prices, one would expect the mean and 75th percentiles to increase steadily with the clusters, as they do. As shown in table 7, the 75th percentiles of hourly prices for licensed family child care providers increase from $2.25 in cluster one, to $2.50 in cluster two, $3.00 in cluster three and $6.00 in cluster four. Similar patterns are seen across all pricing modes and for both types of providers, suggesting that these groupings match market prices fairly well.

Table 7: Number of providers (N), mean price and 75th percentile price for each earnings cluster
(Toddler prices)

County earnings clusters	Hourly			Daily			Weekly		
Centers									
	N	Mean	75th	N	Mean	75th	N	Mean	75th
Cluster 1	27	$2.70	$3.00	22	$27.75	$29.00	19	$138.99	$140.00
Cluster 2	51	$4.04	$3.75	60	$33.23	$35.00	74	$143.88	$155.00
Cluster 3	15	$6.70	$9.00	30	$43.52	$48.00	42	$167.15	$176.00
Cluster 4	171	$9.53	$11.00	280	$67.47	$79.00	410	$237.89	$257.00
Licensed family child care providers									
Cluster 1	1131	$2.15	$2.25	512	$21.40	$22.50	491	$103.95	$110.00
Cluster 2	1724	$2.32	$2.50	1007	$23.01	$25.00	1061	$112.74	$125.00
Cluster 3	553	$2.72	$3.00	583	$26.57	$30.00	824	$122.28	$130.00
Cluster 4	1130	$5.09	$6.00	2046	$32.12	$35.00	3067	$144.37	$160.00

Note: Based on 2007 rate survey data.

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To compare the earnings clusters to current DHS practice, the 75th percentile of weekly prices calculated for each earnings cluster was compared to the baseline 75th percentile calculated for each county. Overall, the earnings groupings result in relatively small changes from the baseline 75th percentile in most counties (table 8). Across all age groups, 75 percent of cells for licensed family providers and 52 percent of cells for centers had a 75th percentile within 10 percent of the baseline 75th percentile for weekly prices. As shown in Table 9, a few counties do have sizeable differences, particularly for infant prices. The five greatest differences are all in Region 2, where the baseline 75th percentile is quite high for infants, at $424 per week, compared to the earnings cluster 75th percentile of $145 per week. Only about 2 percent of age-group price 75th percentiles for licensed family providers and 6 percent for centers show differences greater than 25 percent from the baseline (including both higher and lower than baseline).

Table 8: Comparison of 75th percentile (p75) for each earnings cluster with 2007 baseline 75th percentiles for all age groups (Weekly prices)

County earnings clusters	Centers		Licensed family child care	
	Number of cells	Percent of cells	Number of cells	Percent of cells
Cluster p75 within 10% of baseline	182	52.3	260	74.7
Cluster p75 between 10 and 25% higher than baseline	77	22.1	60	17.2
Cluster p75 higher than baseline by 25% or more	11	3.2	5	1.4
Cluster p75 between 10 and 25% lower than baseline	67	19.3	21	6.0
Cluster p75 lower than baseline by 25% or more	11	3.2	2	0.6

Note: The number of comparisons equals the number of counties (87) multiplied by the number of age groups (4) for a total of 348 comparisons, except for counties that have no centers reporting prices.Based on 2007 rate survey data

All of the counties with a differential greater than 40 percent compared to the baseline are counties where the baseline 75th percentile for infants is $424, which, as noted earlier, is based on a regional calculation that includes one center in Hubbard County with unusually high weekly prices. For infants, the following counties would see a decrease in the 75th percentile of over $200 using the earnings clusters: Beltrami, Clearwater, Hubbard, Lake of the Woods and Mahnomen. A few other counties have large differentials greater than 25, but less than 40 percent. Six counties (Becker, Grant, Le Sueur, Stevens, Traverse and Wilkin) would have a decrease of about $55 in the 75th percentile for infants (for centers). Most of the comparisons to the baseline are within 10 percent for family child care prices. Differences of 25 percent or more occur in Murray and Roseau Counties for infant and toddler prices, Cook County for toddler and school-age prices, and Pennington County for toddler prices. Overall, however, using groups based on average female earnings would not result in major changes in the 75th percentile in most counties for most age groups, with a few exceptions. *(Refer to Table 9 on the following page.)*

Table 9: Counties with more than 25% difference between earnings cluster and baseline 75th percentiles

Weekly prices	County	Cluster 75th percentile	Baseline 75th percentile	Dollar difference	Percent difference
Centers					
Infant	Becker	$145.00	$200.00	-$55.00	-27.5
	Beltrami	$145.00	$424.00	-$279.00	-65.8
	Clearwater	$145.00	$424.00	-$279.00	-65.8
	Grant	$145.00	$200.00	-$55.00	-27.5
	Hubbard	$145.00	$424.00	-$279.00	-65.8
	Lake of the Woods	$145.00	$424.00	-$279.00	-65.8
	Le Sueur	$204.00	$150.00	$54.00	36.0
	Mahnomen	$145.00	$424.00	-$279.00	-65.8
	Pennington	$171.00	$125.00	$46.00	36.8
	Redwood	$171.00	$135.50	$35.50	26.2
	Roseau	$171.00	$125.00	$46.00	36.8
	Stevens	$145.00	$200.00	-$55.00	-27.5
	Traverse	$145.00	$200.00	-$55.00	-27.5
	Wilkin	$145.00	$200.00	-$55.00	-27.5
Toddler	Le Sueur	$176.00	$137.50	$38.50	28.0
	Pennington	$155.00	$120.00	$35.00	29.2
Preschooler	Freeborn	$145.00	$106.00	$39.00	36.8
	Le Sueur	$163.00	$125.00	$38.00	30.4
	Pennington	$145.00	$115.00	$30.00	26.1
School age	Lyon	$110.00	$148.00	-$38.00	-25.7
	Morrison	$130.00	$100.00	$30.00	30.0
	Roseau	$130.00	$99.00	$31.00	31.3
Licensed family child care providers					
Infant	Murray	$120.00	$87.50	$32.50	37.1
	Roseau	$125.00	$100.00	$25.00	25.0
Toddler	Cook	$130.00	$180.00	-$50.00	-27.8
	Murray	$110.00	$87.50	$22.50	25.7
	Pennington	$125.00	$100.00	$25.00	25.0
	Roseau	$125.00	$100.00	$25.00	25.0
School age	Cook	$120.00	$160.00	-$40.00	-25.0

Note: Based on 2007 rate survey data.

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Groups based on child care prices (ZIP code clusters) with separate clusters by type of provider

This approach uses ZIP code areas as the geographic unit for clustering. In this approach, ZIP code areas are grouped together into clusters by analyzing the distribution of child care prices by type of care, pricing mode and age group. With this method, the maximum rate paid to a child care provider would be determined by the ZIP code of the provider's location (instead of the provider's county). Although there are many more ZIP code areas than counties in Minnesota, the number of resulting clusters may be the same as with a county-based grouping method.

Analysis methods

The 75th percentile of child care prices was calculated for each ZIP code for each type of care, each pricing mode and each age group. Using ArcGIS software, the ZIP code 75th percentiles were grouped into four clusters based on the Jenks natural breaks method. The authors began with six clusters based on the criteria for the optimum number of clusters, however, six clusters resulted in only a small number of providers in some clusters. The grouping was re-optimized using four clusters to ensure sufficient numbers of providers in all groups.

Clustering was first done separately for each pricing mode, age group and type of care. In other words, each ZIP code area was first assigned a cluster for each pricing mode, for each age group and type of care. Next, the clusters for each pricing mode were combined across age groups to create one cluster per pricing mode (per type of care) by averaging the cluster assignments. For most ZIP codes, the clusters matched across two or more age groups. At this stage, each ZIP code area had three cluster assignments, one for each pricing mode. For most ZIP codes, there was close correspondence across the pricing mode clusters. The pricing mode clusters were combined for each ZIP code area by averaging the cluster numbers and rounding to the nearest integer. In this approach, each ZIP code area was assigned two final clusters, one for centers and a (potentially) different one for licensed family providers. In the fourth grouping method (described below), the clusters for the two types of care are combined into one set of clusters.

The appropriate cluster number was assigned to each provider in the 2007 rate survey data base based on their ZIP code, and the mean and 75th percentile of prices were calculated for each group (separately for each age group, pricing mode, and type of care). The 75th percentiles for the price groups were compared to the baseline 75th percentile (provided by DHS based on 2007 data and current methods). To calculate a county-level 75th percentile based on ZIP code price groups, a weighted average of the ZIP code 75th percentiles within the county were calculated, weighted by the number of providers in each ZIP code.

Results

Figure 4 shows the distribution of ZIP codes in the four groups based on the final price cluster for centers, while figure 5 illustrates the groups for licensed family providers. The cluster in the Minneapolis-St. Paul metropolitan area (4) reflects the higher child care prices in that region. There is a mid-priced ring (cluster 3) around the Twin Cities. The more rural parts of the state have the two lowest price

clusters, with a few exceptions around Rochester, St. Cloud and Cook County. Note that the assignment of ZIP codes to clusters shown in these maps should be considered a first step, based on cluster analysis only. It is important that the ZIP code assignments are examined in detail to ensure that there is geographical consistency. This "smoothing," described in detail in the Technical Appendix, is an important part of the process of creating and testing the clusters. As part of the process, ZIP code areas with no reported prices would also be assigned to clusters so that the entire state is covered by the geographic groupings. This process ensures that if a new provider opens, a maximum rate will have been established, even if there were no providers in that ZIP code area at the time of the survey.

Figure 4: ZIP code price clusters - center providers

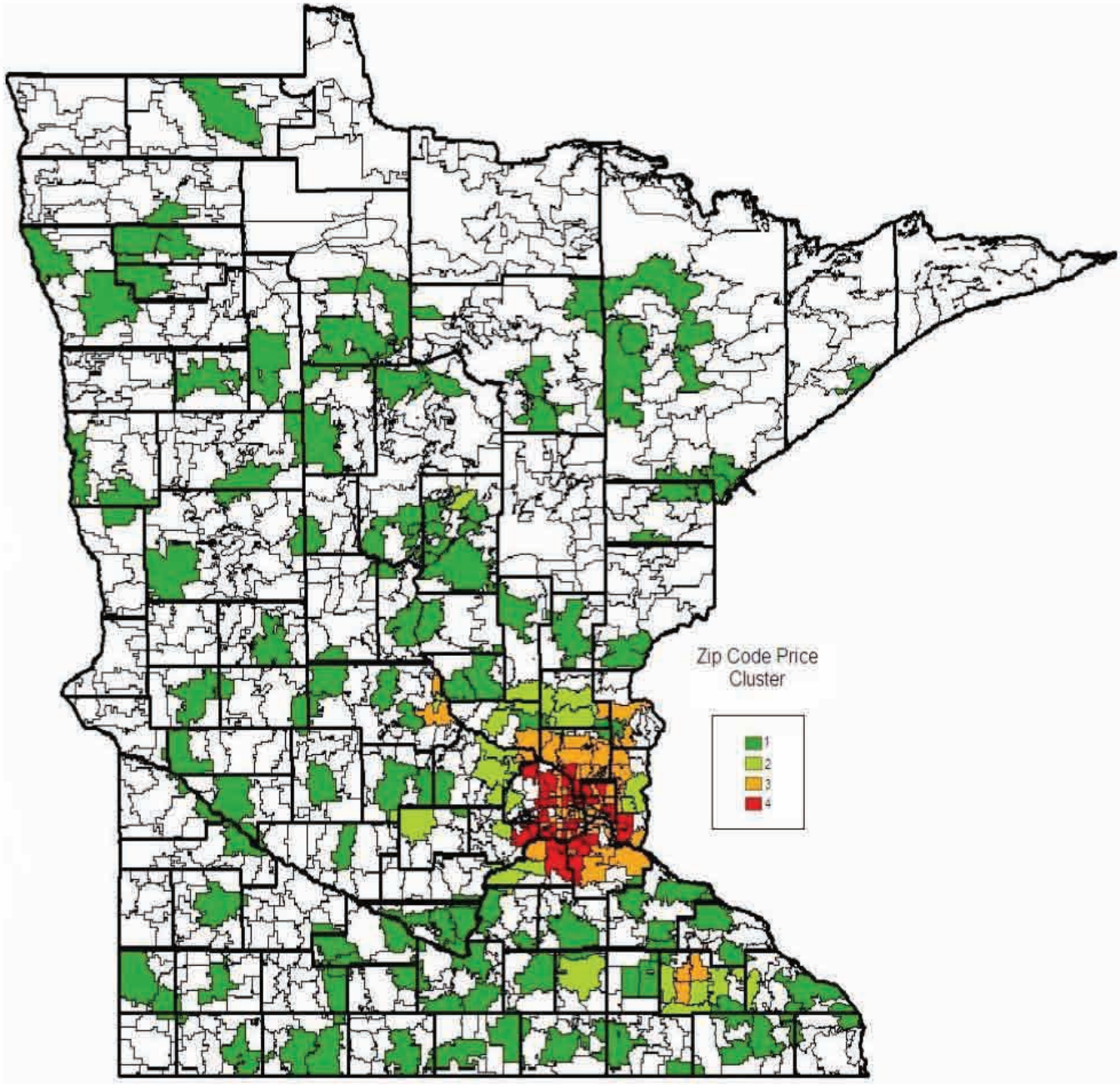
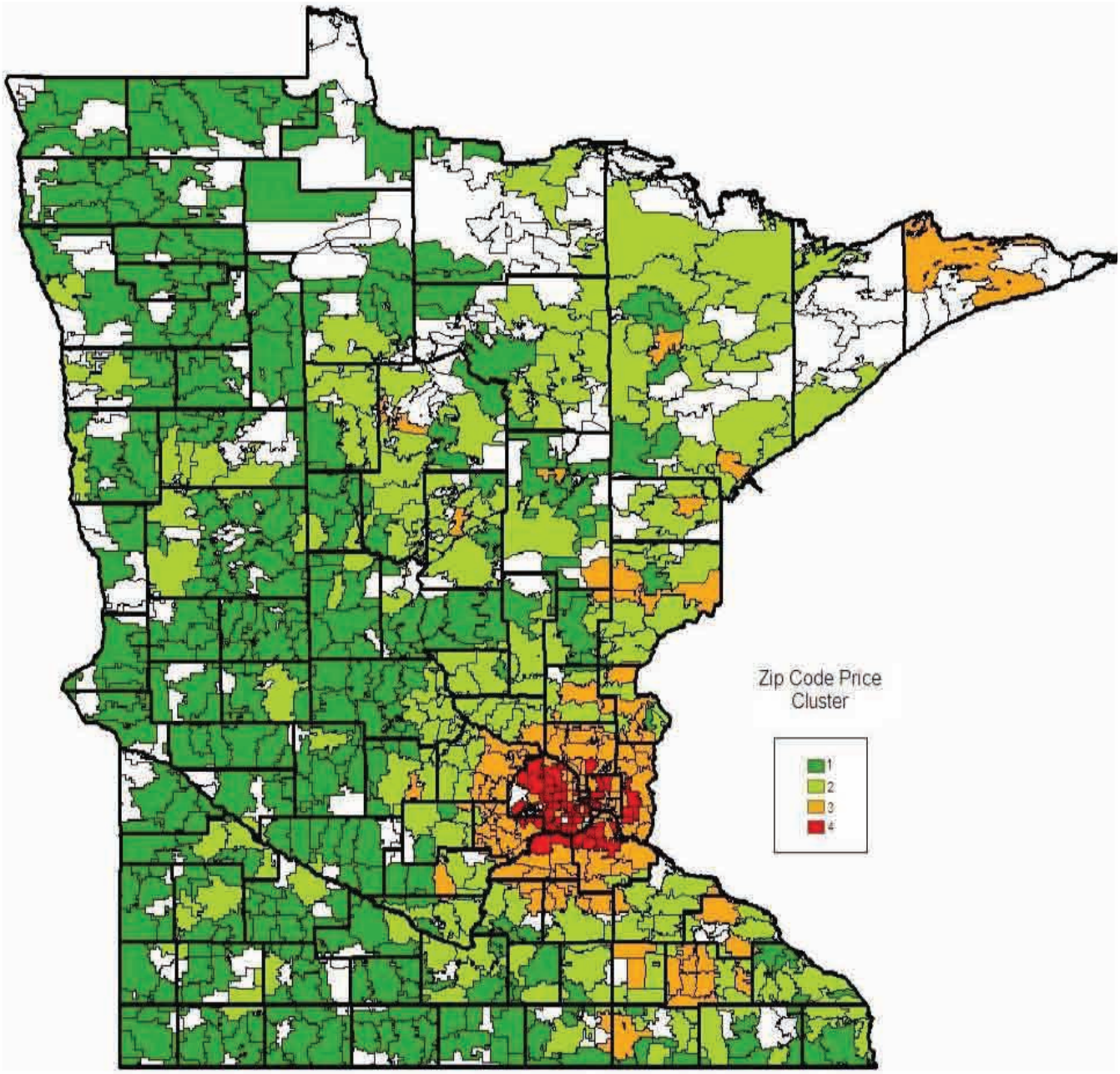


Figure 5: ZIP code price clusters - family child care providers



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Based on assigning providers into these four groups, table 10 shows the number of providers, mean, and 75th percentile price for each cluster. The smallest number of providers in a cell is 16, suggesting that small numbers should not be a problem with this grouping method. The 75th percentile of weekly prices for centers increases from $145 for cluster one to $269 for cluster four. For hourly prices for licensed family child care providers, the 75th percentiles increase from $2.25 in cluster one, $2.55 in cluster two, $5.00 in cluster three and $6.00 in cluster four. Similar ascending patterns are seen across all pricing modes and for both types of providers.

Table 10: Number of providers (N), mean price and 75th percentile price for each ZIP code price cluster (Toddler prices)

ZIP code clusters (separate)	Hourly			Daily			Weekly		
Centers									
	N	Mean	75th	N	Mean	75th	N	Mean	75th
Cluster 1	77	$3.20	$3.50	79	$29.38	$32.50	88	$137.15	$145.00
Cluster 2	16	$6.23	$8.00	37	$40.91	$46.00	49	$169.49	$180.00
Cluster 3	73	$8.83	$10.00	118	$62.27	$68.00	199	$221.52	$241.00
Cluster 4	98	$10.07	$11.00	158	$71.58	$81.00	209	$251.05	$269.00
Licensed family child care providers									
Cluster 1	1576	$2.08	$2.25	613	$20.60	$22.00	494	$100.54	$107.00
Cluster 2	1541	$2.48	$2.55	1124	$23.78	$25.00	1396	$113.70	$125.00
Cluster 3	1040	$4.25	$5.00	1730	$29.88	$34.00	2497	$136.17	$150.00
Cluster 4	381	$5.74	$6.00	681	$35.67	$40.00	1056	$156.99	$170.00

Note: Based on 2007 rate survey data.

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Comparing the results from this grouping method with current practices revealed few major differences from the baseline 75th percentiles. As shown in table 11, in most cases the 75th percentile for the price clusters is within 10 percent of the baseline 75th percentile for weekly prices.[13] For centers, about 68 percent of cells are within the 10 percent threshold for weekly prices, compared to 87 percent of licensed family child care. Very few of the age- group county cells had differences greater than 25 percent from the baseline 75th percentile for weekly prices, and most of these were center prices. For a small number of counties, there is a sizeable change. In four counties (Beltrami, Clearwater, Hubbard and Mahnomen), the cluster 75th percentile is more than 60 percent lower than the baseline *(See table 12 on following page)*. As seen previously, these counties have a very high baseline 75th percentile weekly price for infants based on current methods. In other counties, the cluster method would result in somewhat higher 75th percentiles than the baseline. Overall, however, the results using this grouping method are similar to the baseline methods with 2007 data.

Table 11: Comparison of 75th percentiles (p75) for each cluster with 2007 baseline 75th percentiles for all age groups (Weekly prices)

ZIP code clusters (separate)	Centers		Licensed family child care	
	Number of cells	Percent of cells	Number of cells	Percent of cells
Cluster p75 within 10% of baseline	189	67.5	302	86.8
Cluster p75 between 10 and 25% higher than baseline	51	18.2	24	6.9
Cluster p75 higher than baseline by 25% or more	10	3.6	2	0.6
Cluster p75 between 10 and 25% lower than baseline	26	9.3	20	5.7
Cluster p75 lower than baseline by 25% or more	4	1.4	0	0

Note: The number of comparisons equals the number of counties (87) multiplied by the number of age groups (4) for a total of 348 comparisons, except for counties that have no centers reporting prices.Based on 2007 rate survey data

[13] A county-level 75th percentile was calculated by using the ZIP code-based clusters and weighting the cluster 75th percentiles by the number of providers in the county within each ZIP code-based cluster.

Table 12: Counties with more than 25% difference between ZIP code price cluster and baseline 75th percentiles

Weekly prices	County	Cluster 75th percentile	Baseline 75th percentile	Dollar difference	Percent difference
Centers					
Infant	Beltrami	$160.75	$424.00	-$263.25	-62.1
	Chisago	$265.97	$212.00	$53.97	25.5
	Clearwater	$160.75	$424.00	-$263.25	-62.1
	Hubbard	$160.75	$424.00	-$263.25	-62.1
	Mahnomen	$160.75	$424.00	-$263.25	-62.1
	Pennington	$160.75	$125.00	$35.75	28.6
	Red Lake	$160.75	$125.00	$35.75	28.6
	Roseau	$160.75	$125.00	$35.75	28.6
	Sherburne	$241.97	$192.00	$49.97	26.0
Toddler	Beltrami	$145.00	$115.00	$30.00	26.1
Preschooler	Chippewa	$135.00	$107.50	$27.50	25.6
	Freeborn	$135.00	$106.00	$29.00	27.4
	Swift	$135.00	$107.50	$27.50	25.6
	Yellow Medicine	$135.00	$107.50	$27.50	25.6
Licensed family child care providers					
Infant	Murray	$117.75	$87.50	$30.25	34.6
Toddler	Murray	$112.40	$87.50	$24.90	28.5

Note: Based on 2007 rate survey data.

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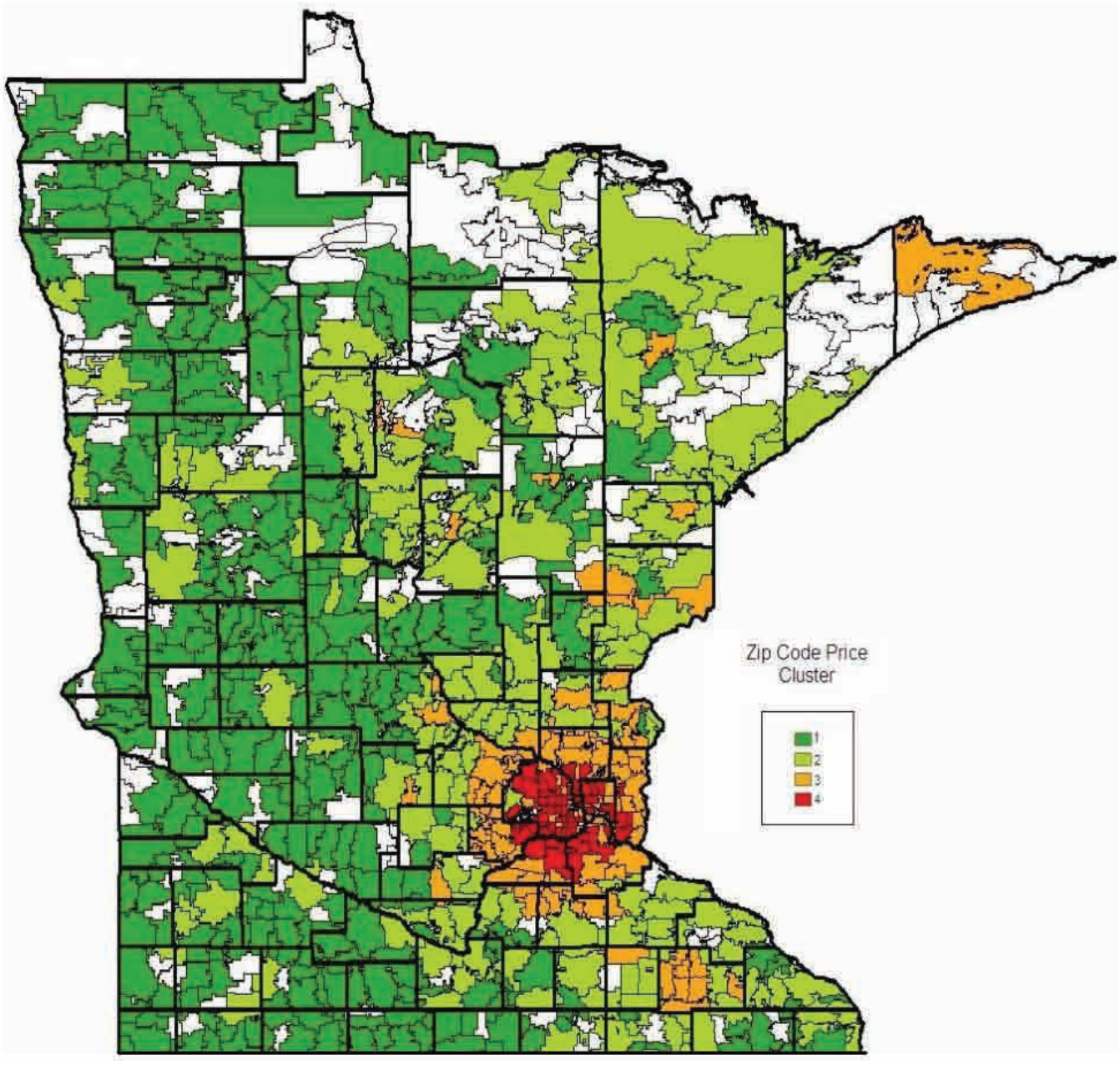
Groups based on child care prices (ZIP code clusters) with provider types combined

This approach is similar to the previous one except that an additional step is included to combine the clusters by type of provider. This approach simplifies the final categorization because each ZIP code has only one cluster assignment, reducing the number of ZIP code areas without a cluster assignment. The analysis methods are the same except that a final step is added in which the center and family provider cluster numbers are averaged and rounded, yielding a combined cluster number. If there is no cluster number for centers, the cluster number for licensed family provider prices is assigned to the area. The main difference between the two ZIP code clustering methods is that many ZIP codes in the Twin Cities area (Region 11) are split into two groups when the type-of-provider clusters are not combined. The combined method has the advantage that each county is assigned to a cluster, even if there are no centers currently reporting prices in that county (the cluster will be based on the licensed family provider cluster number).

Figure 6: ZIP code price clusters



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Based on assigning providers into these four groups, table 13 shows the number of providers, mean, and 75th percentile price for each cluster. The smallest number of providers in a cell is 24 for centers with weekly prices, suggesting that small numbers should not be a problem with this grouping method. The 75th percentile of weekly prices for centers increases from $135 for cluster one to $264 for cluster four. For hourly prices for licensed family child care providers, the 75th percentiles increase from $2.25 in cluster one, $2.60 in cluster two, $5.00 in cluster three and $6.00 in cluster four. Similar ascending patterns are seen across all pricing modes for both types of providers. The 75th percentiles for these groups are very close to the ones calculated using separate ZIP code-based clusters by type of provider.

Table 13: Number of providers (N), mean price and 75th percentile price for each ZIP code price cluster (Toddler prices)

ZIP code clusters (combined)	Hourly			Daily			Weekly		
Centers									
	N	Mean	75th	N	Mean	75th	N	Mean	75th
Cluster 1	30	$2.66	$2.90	27	$26.68	$30.00	24	$124.06	$135.00
Cluster 2	56	$3.96	$4.24	71	$32.97	$36.00	87	$146.84	$155.00
Cluster 3	58	$8.66	$10.00	99	$58.30	$66.00	162	$211.01	$230.00
Cluster 4	120	$9.81	$11.00	195	$70.54	$80.00	272	$247.53	$264.00
Licensed family child care providers									
Cluster 1	1576	$2.08	$2.25	613	$20.60	$22.00	494	$100.54	$107.00
Cluster 2	1625	$2.48	$2.60	1131	$23.93	$25.00	1363	$114.31	$125.00
Cluster 3	729	$4.20	$5.00	1336	$29.47	$33.00	1884	$135.03	$150.00
Cluster 4	608	$5.46	$6.00	1068	$33.96	$38.00	1702	$149.43	$161.00

Note: Based on 2007 rate survey data.

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As was the case with the ZIP code clusters separated by type of care, there were few major differences between the cluster and baseline 75th percentiles. As shown in table 14, in most cases the 75th percentile for the price clusters is within 10 percent of the baseline 75th percentile for weekly prices.[14] For centers, about 63 percent of age-group county percentiles are within 10 percent for weekly prices, compared to 86 percent for licensed family child care. Very few of the age-group county cells had differences greater than 25 percent from the baseline 75th percentile for weekly prices, and most of these were center prices. For a small number of counties there is a sizeable change compared to the baseline. In more cases than occurred using the separate ZIP code clusters, the cluster 75th percentile is substantially below the baseline. In addition to Beltrami, Clearwater, Hubbard and Mahnomen Counties, the cluster 75th percentile for weekly infant prices at centers is more than 25 percent lower for Douglas, Pope and Stevens Counties *(see table 15)*. In a small number of counties, the clusters result in higher 75th percentiles than baseline for other age groups. Looking at licensed family child care prices, all the cluster 75th percentiles are within 10 percent of the baseline for weekly prices except in Murray County (for infants and toddlers). Overall, the results using this grouping method were similar to the baseline methods with 2007 data, and to the method based on separate ZIP code clusters for centers and licensed family child care providers.

Table 14: Comparison of 75th percentiles (p75) for each cluster with 2007 baseline 75th percentiles for all age groups (Weekly prices)

ZIP code clusters (combined)	Centers		Licensed Family Child Care	
	Number of cells	Percent of cells	Number of cells	Percent of cells
Cluster p75 within 10% of baseline	177	63.2	298	85.6
Cluster p75 between 10 and 25% higher than baseline	50	17.9	25	7.2
Cluster p75 higher than baseline by 25% or more	6	2.1	2	0.6
Cluster p75 between 10 and 25% lower than baseline	40	14.3	23	6.6
Cluster p75 lower than baseline by 25% or more	7	2.5	0	0

Note: The number of comparisons equals the number of counties (87) multiplied by the number of age groups (4) for a total of 348 comparisons, except for counties that have no centers reporting prices. Based on 2007 rate survey data

[14] A county-level 75th percentile was calculated by using the ZIP code-based clusters and weighting the cluster 75th percentiles by the number of providers in the county within each ZIP code-based cluster.

Table 15: Counties with more than 25% difference between ZIP code price cluster and baseline 75th percentiles

Weekly prices	County	Cluster 75th percentile	Baseline 75th percentile	Dollar difference	Percent difference
Centers					
Infant	Beltrami	$158.50	$424.00	-$265.50	-62.6
	Clearwater	$145.00	$424.00	-$279.00	-65.8
	Douglas	$145.00	$200.00	-$55.00	-27.5
	Hubbard	$158.50	$424.00	-$265.50	-62.6
	Isanti	$244.14	$182.00	$62.14	34.1
	Mahnomen	$145.00	$424.00	-$279.00	-65.8
	Pope	$145.00	$200.00	-$55.00	-27.5
	Stevens	$145.00	$200.00	-$55.00	-27.5
Toddler	Beltrami	$145.00	$115.00	$30.00	26.1
Preschool	Freeborn	$145.00	$106.00	$39.00	36.8
	Yellow Medicine	$145.00	$107.50	$37.50	34.9
School age	Cass	$125.00	$100.00	$25.00	25.0
	Wadena	$126.67	$100.00	$26.67	26.7
Licensed family child care providers					
Infant	Murray	$117.75	$87.50	$30.25	34.6
Toddler	Murray	$112.40	$87.50	$24.90	28.5

Note: Based on 2007 rate survey data.

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Comparison of alternative geographic groupings

There are numerous ways to group areas for the purposes of CCAP maximum rate setting, though not all of them will result in groupings that make sense for this purpose. In choosing a method, it is important to note that the federal purpose for market rate surveys is to demonstrate that parents have access to the range of child care options in the local market. Forming groups based on child care prices would be the most direct way of incorporating information about the market. Child care prices are related to the economic and demographic characteristics of an area, so these characteristics could also be used to form groups. Nonetheless, prices encapsulate relevant information about the market and so may be the most direct basis for creating groups. However, using child care prices to form groups is complicated by the presence of different pricing modes (hourly, daily, weekly), and the variations in prices by age group and type of care (centers or licensed family child care providers). Using child care prices as the basis for grouping requires summarizing all the information in a meaningful way.

This report describes four alternative methods for creating geographical groupings that demonstrate different options in terms of clustering on prices or on economic characteristics, and clustering of counties or ZIP codes. Other methods that were tested are described in the Technical Appendix. In general, methods based on other county-level economic variables that were highly correlated with child care prices resulted in groupings similar to the county female earnings clusters. However, variables like county median rent were not recommended, in part, because recent events in the housing market may disrupt the relationship between housing characteristics and child care prices in different areas. Groupings based on metropolitan designations or administrative regions such as child care resource and referral districts were not recommended because these methods did not capture child care price differentials in some areas.

Among the alternatives presented in this section, all four resulted in clusters that had sufficient numbers of providers and matched market prices fairly well. All four also resulted in 75th percentiles similar to the baseline for most age groups in most counties. Table 16 summarizes information from previous tables comparing the 75th percentiles calculated for each grouping with the baseline 75th percentiles for weekly prices. All four methods closely matched the baseline for licensed family child care provider prices, but there were more differences for centers. However, there are relatively few differences across methods, suggesting that any one of the four methods would result in similar overall results. The groups based on county female earnings had slightly more comparisons that deviated from the baseline by more than 10 percent, compared to the other grouping methods. The fact that the different grouping methods yield similar results suggests that adopting any one of these grouping methods would not result in major differences compared to current methods (based on 2007 data).

Table 16: Summary of comparison of cluster and 2007 baseline 75th percentiles for all age groups

Based on weekly prices	Percent of cells within 10% of baseline		Number of cells with difference greater than 25%	
Type of grouping	Centers	Licensed family child care	Centers	Licensed family child care
County price clusters	58.1%	87.6%	18	2
County earnings clusters	52.3%	74.7%	22	7
ZIP code separate type-of-care clusters	68.2%	86.8%	14	2
ZIP code combined type-of-care clusters	63.2%	85.6%	13	2

Note: There are a maximum possible 348 comparisons for cells defined by age-group, county and type of provider.
Based on 2007 rate survey data.

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Analyzing child care price data at the ZIP code level identifies counties in which there is more than one group of prices. At the same time, ZIP code areas with higher or lower prices may or may not represent a distinct child care market, as parents may cross ZIP code boundaries to find child care. ZIP codes within a city probably do not represent distinct child care markets, so use of ZIP codes requires some adjustment (smoothing) of the final assignment of clusters to ensure geographic consistency. Smoothing requires the analyst to make judgments about which ZIP codes belong together because they share membership in a single community—a community within which parents are able to purchase care—and to adjust the results of the cluster analysis. Using county-level data is, in effect, doing some smoothing. Whether counties are useful as a way to group ZIP code areas is to some extent an empirical question, that is, do counties represent a reasonable approximation of child care markets, or do some counties actually have multiple child care markets? A look back at figure 5 will note that for many counties, the ZIP codes within their boundaries are in the same price cluster. Where they differ, the question is whether the ZIP code areas represent different child care markets, such as a university town or the edge of a major city, which may have different prices than surrounding communities in the same county. Determination of how often counties have multiple child care markets would suggest whether grouping by ZIP codes would be preferred to grouping by counties.

The examples of geographic groupings included in this report also demonstrate the tradeoffs between clustering on prices versus clustering on economic or demographic characteristics. Using average female earnings (at the county level) resulted in reasonable clusters as judged by the comparison with baseline 75th percentiles. However, a few counties would be assigned to clusters with lower 75th price percentiles than they would have if assigned based on child care prices in that county. It may be that in some areas, average female earnings and child care prices are not as closely aligned and other factors make prices higher or lower than one would expect based on what women in that community earn. In addition, given that price data is used to judge whether or not clusters are reasonable, using prices to create clusters is a more direct approach. However, there are several advantages to grouping on economic or demographic characteristics rather than child care prices. First, using price is complicated because of the amount of information that must be summarized, including different pricing modes (which vary in use around the state), prices for different age groups, and for different types of providers. There are numerous ways to combine this information, which may result in somewhat different groupings. In addition, using characteristics other than price may lessen the concern that using price to create geographic groupings may influence prices in the market.

Another issue to consider when determining the preferred method for geographical groupings is the frequency of redoing the grouping. Whether or not clusters are re-grouped for every rate survey will depend, in part, on the method chosen. An approach that relies on data available only in the 2000 Census will not require re-grouping for 10 years. However, this method may not capture changes in communities and markets that occur over the 10 years. Clustering of child care prices directly would allow re-grouping every year of the rate survey, though it is not likely that counties would change groupings each year. ZIP code-level price data are likely to show more variability year-to-year, though this will not necessarily lead to major changes in overall ZIP code price groupings.

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Comparison of impact on access for different grouping methods

One important criterion for comparing the methods used to create geographic groupings is the resulting level of parents' access to care in the local child care market. If prices in an area with higher child care prices are combined with those in a lower priced area, the resulting 75th percentile for the group may be too low for access to providers in the higher priced area. As a measure of parental access, the percentage of reported prices in a county at or below the 75th percentile was calculated for its cluster. Setting maximum rates based on groups of counties or ZIP code areas will not always result in similar levels of access in all counties included in that geographic group.

To calculate access rates for each county, provider prices reported in the 2007 market rate survey were compared to the 75th percentiles calculated for each grouping method based on age group, pricing mode and geographic cluster. The total number and percentage of reported prices in each county less than or equal to the associated 75th percentile were calculated. This analysis provides an indication of the level of access for parents in each county based on the 75th percentiles.[15] Table 17 provides a summary of the access measure statewide, for Region 11 and for greater Minnesota. Overall, the percentage of provider prices at or below the cluster 75th percentile is very similar across the four grouping methods. The percentage statewide is above 75 percent for both centers and licensed family child care providers for all four methods. Because provider prices in the market often clump at round numbers, it is common that the 75th percentile may fall at one of these round numbers, and thus more than three quarters of prices are at or below the 75th percentile.

Table 17: Percent of provider prices at or below the cluster 75th percentile for each grouping method

	County price clusters	County average female earnings clusters	ZIP code clusters (separate by type of care)	ZIP code clusters (combined)
Centers				
Statewide	82.6	83.1	80.6	80.8
Region 11	83.0	84.0	80.4	80.5
Greater Minnesota	81.8	80.9	81.1	81.4
Licensed family child care providers				
Statewide	81.0	80.0	80.5	80.4
Region 11	78.8	77.6	77.3	77.8
Greater Minnesota	82.5	81.6	82.6	82.1

Note: Based on 2007 rate survey data and includes all age groups and pricing modes (hourly, daily and weekly).

[15] Access is defined as the percentage of prices at or below the 75th percentile for the cluster. Other components of access such as location, available openings, and affordability are important issues but are not considered in this measure of access.

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Despite the overall high level of access across the four methods, there were some differences at the county level, and in a few counties, the access level was low under one or more grouping methods. Looking first at center prices, between four and eight counties had access rates of less than 60 percent across the four methods (table 18).[16] These were not always the same counties, however. For licensed family child care provider prices, nearly all counties had access levels at or above 60 percent. At most, six counties had access rates below this level, which occurred with the county female earnings clusters. No counties had access rates below 60 percent for licensed family provider prices using the two ZIP code cluster methods. However, access numbers were calculated based on initial assignment into ZIP code clusters. Once the cluster assignments are smoothed, these access calculations would need to be redone for all counties.

Table 18: Access rates by county for each grouping method

Percent of provider prices in a county at or below 75th percentile	County price clusters		County earnings clusters		Separate ZIP code clusters		Combined ZIP code clusters	
	N of counties	%	N of counties	%	N of counties	%	N of counties	%
Centers								
Less than 60%	8	11.4	7	10.0	4	5.7	8	11.4
60-74%	12	17.1	8	11.4	11	15.7	11	15.7
75-89%	21	30.0	14	20.0	17	24.3	11	15.7
90% or more	29	41.4	41	58.6	38	54.3	40	57.1
Licensed family child care providers								
Less than 60%	4	4.6	6	6.9	0	0	0	0
60-74%	15	17.2	11	12.6	15	17.2	17	19.5
75-89%	33	37.9	33	37.9	49	56.3	47	54.0
90% or more	35	40.2	37	42.5	23	26.4	23	26.4

Note: Access at the county level is defined as the percentage of provider prices in the county that are equal to or less than the cluster 75th percentile (includes all age groups and hourly, daily and weekly prices). Based on 2007 rate survey data.

[16] In contrast, based on the 2007 survey data, current CCAP maximum rates result in county-level access rates for centers ranging from 31 to 65 percent in Region 11, and 0 to 100 percent in greater Minnesota. For licensed family child care providers, the 2007 access rates for counties based on current CCAP maximums range from 38 to 61 percent in Region 11, and 15 to 93 percent in greater Minnesota.

Summary of changes based on different geographic groupings

Using a new geographic grouping method rather than counties as the geographic unit has the potential to impact the cost of the CCAP to the state. In principle, using geographic group-level rather than county-level maximum rates could either raise or lower costs. While a full cost analysis of different methods is beyond the scope of this study,[17] a scenario was created to estimate the overall impact from changing geographic grouping methods compared to using the current county-based approach. To do this, the 75th percentiles were calculated for each age group for weekly prices for centers, licensed family child care providers, and legal non-licensed providers (as 80 percent of the licensed family providers' 75th percentile). These percentiles were compared to the 75th percentiles calculated by DHS using 2007 data and current methods. To sum up the differences in the 75th percentiles, weights provided by DHS were used that represent the proportion of CCAP children in each age group, type of care and by county. The differences in the 75th percentiles were multiplied by these weights and summed to obtain a weighted average percentage change in the 75th percentiles for each of the grouping methods.

The geographic grouping methods shown in this report would, for the most part, result in little change based on the weighted average percentage change in the 75th percentiles (see table 19). Each of the four grouping methods resulted in groups for which the 75th percentile of weekly prices was close to the baseline 75th percentile from the 2007 survey. Based on the summary measure, however, the change in 75th percentiles was only about 0.3 percent higher for the county cluster methods. For the ZIP code methods, the 75th percentiles were about 1 percent lower than the current baseline method, suggesting that costs to the state would decrease slightly with these methods.[18] As previously discussed, some counties may see a larger increase or decrease in 75th percentiles when using a new methodology.

Table 19: Summary of weighted percent change in 75th percentiles by grouping method

Type of grouping method	Weighted percent change in 75th percentiles
County price clusters	0.3
County female earnings clusters	0.3
ZIP code clusters (separate by type of care)	-0.9
ZIP code clusters (combined types of care)	-1.3
Note: See text for description of method. Based on 2007 rate survey data.	

[17] A cost analysis comparing any proposed changes to the current maximum rates will be conducted by DHS.
[18] Note that these comparisons use 2007 data and current methods as the baseline rather than current maximums allowed in the CCAP.

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Discussion and recommendations

In table 20, information is summarized about each of the four alternative grouping methods in relation to the criteria used for evaluation. In terms of simplicity and transparency, only methods that were reasonably simple and relatively easy to explain to non-statisticians were included in this report, thus all four score highly on these criteria. (Methods involving different statistical approaches are discussed in the Technical Appendix.) All four groupings presented here use fairly straightforward methods, though using price data involves more decisions about how to combine multiple pricing modes and prices for the two types of providers. The smoothing necessary for ZIP code price groupings reduces transparency. In terms of access and fairness, the ZIP code price groupings are best able to capture market price variation and different child care markets within a county. However, both county price and county earnings groupings result in fairly close matches with the child care market. Using stability as the criterion, ZIP code-based price groupings have the potential to be less stable given the small number of providers in many ZIP codes. Groupings based on data other than price would not necessarily need to be revised each year, yet may be less transparent to external stakeholders who are unfamiliar with the link between economic characteristics and child care prices.

Table 20 summarizes the evaluation criteria for each method based on the research team's views, and was informed by discussion at the stakeholder advisory committee meeting. The committee felt strongly that access and fairness were the most important criteria, and would put less weight on simplicity and transparency. Yet, there is no one correct way to create geographic groupings for the purpose of setting CCAP maximum rates. Whatever method is used involves a certain amount of judgment informed by policymakers and other stakeholders, and consideration of different factors. Taking into account multiple sources of information is likely to produce the best results. For example, clustering on price may result in a particular county being on the border between two groups. Looking at information on average female earnings or child care price trends in recent years may help to determine the appropriate cluster for that county. Conversely, using average female earnings to cluster counties may place a few counties in clusters that have much lower child care prices. It may be that in those areas, child care prices are affected more by other factors, reducing their correlation with earnings of women in the area. Relying solely on a statistical algorithm to determine the groupings without understanding the child care market offers the potential for creating groupings that do not match what is happening in the market, and thus may impact parents' access to care.

In determining the alternatives to be used for geographical groupings, recall that the objective was to find a process that results in a method for setting CCAP maximum rates that satisfies the federal benchmark of providing access, reduces the number of maximum rates needed, deals with the small numbers of providers in some counties, and addresses the possible non-alignment of county and child care market boundaries. Alternative ways to group counties or ZIP code areas were examined to reduce the number of CCAP maximum rates set. The vast number of possible alternatives were narrowed by focusing on methods that were relatively easy to implement and understand, and that resulted in groupings that met the criteria of access, fairness and stability. There is no one best method for creating geographic groupings, though some are clearly preferred to others. The four alternative methods described in this report provide a sense of some of the trade-offs among the criteria.

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The study recommendations focus on data needed for creating geographic groupings, methods and issues to be considered. The recommendations include:

1) Collect data on ZIP code and county location of providers in the rate survey to allow for analysis of geographic variation in prices (no change from current practice). Regardless of the method chosen, understanding of the child care market will be enhanced by examining prices at both the county and ZIP code level.

2) Create geographic groupings for the purpose of setting CCAP maximum rates rather than setting distinct maximum rates for each county. Geographic groups, whether groups of counties or ZIP code areas, will reduce the number of maximum rates set, and will lessen or eliminate the problems that arise with small numbers of providers in some counties. Analysis of rate survey price data suggests that there are a limited number of price clusters, or areas with similar child care prices in the state. Although there may be a large number of local child care markets, each market belongs to one of a small number of price clusters.

3) The method for creating groupings should be relatively straightforward to implement and transparent or easy to explain. A statistical software package such as ArcGIS that creates groupings based on Jenks optimal natural breaks is one example of such a method. Testing to ensure that the resulting groups make sense in terms of the local child care market is a crucial step in the process.

4) If the grouping is based on an economic variable rather than price, use county as the geographic unit for grouping. The ZIP code-level groupings on economic variables like average female earnings resulted in clusters that performed less well in terms of reflecting child care prices in the market.

5) If the geographic groups are based on child care prices, consider the trade-offs between using counties and ZIP codes as the geographic basis for grouping. ZIP code areas capture more of the price variation and allow for multiple child care markets within counties. The level of detail offered by ZIP code-level prices is likely to result in groupings that reflect the market better. However, the small number of providers and variability across ZIP codes results in the need for some adjustment of the final assignment of clusters to ensure geographic consistency (smoothing). As a result, the process of determining the final ZIP code groups may not be as simple and transparent as with counties. It is strongly recommended that this process utilize input from knowledgeable local stakeholders about the child care markets in different counties.

6) If DHS chooses an economic variable for clustering counties, investigate thoroughly whether the clusters capture the price variation in child care markets. Testing the clusters each year will be important. Any economic characteristic used should be highly correlated with average child care prices by geographic unit, though high correlation is not sufficient to guarantee that the grouping will result in clusters that match child care price variation in the market. While multiple economic characteristics could be used, the most obvious choices are highly correlated themselves (such as median family income, average earnings, median rent and housing values) and would add little additional knowledge to the clustering, while making the method more complicated and less transparent. Average female earnings at the county level performed well as the basis for grouping counties, based on 2007 rate survey data.

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7) Whether DHS chooses to cluster counties on price or another characteristic, it is important to use multiple sources of information and knowledge of the child care market to ensure that the clusters are indeed capturing market differences. Each method involves judgments, whether in determining the number of clusters, choosing how to combine pricing mode clusters, or deciding how to handle counties on the border between two clusters. These decisions are best made in the context of knowledge about the area, including information on child care prices, economic and demographic characteristics, and trends rather than relying solely on a statistical algorithm. A work group of state child care administrative staff and others knowledgeable about child care throughout the state can provide critical information to the analyst. The clustering software provides the starting point for determining groupings, which must then be tested and compared to the market and refined where necessary.

Table 20: Comparison of each grouping method based on evaluation criteria

Assessment of Evaluation Criteria					
Grouping basis	**Access**	**Fairness**	**Stable**	**Simple**	**Transparent**
County child care prices	Closely tied to prices in the community except where there is within-county variation	Reflects provider practices and prices at the county level	May have some year to year variation	Relatively simple to implement and administer, information from different pricing modes and age groups must be combined	More transparent than other methods because county boundaries are clear and little smoothing is needed
County average female earnings	Access was lower in a few counties although overall access was similar to other methods	Less fair because it is not based on provider practices or the market	Changes only when new decennial Census data are available	Easy to implement at county level; based on only one variable	May be less transparent to those who do not see a link between female earnings and child care prices
ZIP code child care price clusters separated by type of provider	Access higher because it accounts for within county variation	Fair because it is based on child care provider practices in the market	May have some year to year variation; small numbers of providers in some ZIP codes may cause fluctuations	Less easy to implement and administer than county-based methods	Less transparent because ZIP code boundaries are less well known and smoothing may be needed for community cohesion
ZIP code child care price clusters with types of providers combined	Accounts for within county variation but combining provider types lowered access slightly	By combining types of providers, may reduce fairness	May have some year to year variation; small numbers of providers in some ZIP codes may cause fluctuations	Less easy to implement and administer than county-based methods	Less transparent because ZIP code boundaries are less well known and smoothing may be needed for community cohesion

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Pricing modes and price conversions

Child care providers have varied business practices regarding how they charge. Some facilities charge hourly while others use a daily, weekly or monthly time unit. Providers may offer one pricing mode (for example, a full-time weekly price), while others may offer a set of options to parents (for example, allowing them to pay on either a weekly or an hourly basis). These different pricing practices raise two types of issues for the rate survey: which pricing modes to use to collect data; and whether prices in different modes can be compared (or converted to other modes).

Most states, including Minnesota, convert (some of the) prices reported in one pricing mode to another at one or more of the stages of survey data collection and analysis. Conversions are often done when there are only a small number of prices reported of a particular type (for example, hourly prices for toddlers at centers in a certain county). In other states, conversions may also be done to simplify the maximum rate setting process because some states use only one or two pricing modes for maximum rates. Under current practice, DHS also converts some provider prices in counties in which one pricing mode is predominant.

To develop recommendations regarding pricing modes and conversions, the pricing practices of child care providers in Minnesota were examined in detail. The research questions included:

1) What are the most common pricing modes used by centers and licensed family child care providers in Minnesota, and do these vary regionally?

2) Do most child care providers in Minnesota offer parents only one pricing mode or more than one option?

3) How does the calculated average price change if one uses the conversion formula implied in the rate survey (10 hours per day and 50 hours per week) compared to no conversions?

4) Do providers offer quantity pricing, that is, price discounting for larger purchases of time (or conversely, charge a premium for shorter periods)?

5) What is the most common or average conversion ratio between different pricing modes when providers use more than one? Does this ratio vary regionally?

6) Are providers who offer more than one pricing mode similar (in terms of average prices) to those who have only one?

The findings from this research are used to support recommendations regarding the rate survey, analysis and maximum rate setting. Understanding pricing practices of child care providers in Minnesota is necessary to collect accurate price information, and to develop CCAP maximum rate policies that allow parents access.

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Pricing modes

In Minnesota, child care providers use many different pricing modes; this is evident from interviews with CCR&R staff, the rate survey data, and direct provider information. These differences reflect both business practices and preferences, and differences in markets across the state. Some licensed family child care providers charge only an hourly rate and charge only for the time a child is in care; other providers charge a weekly rate for a child in care for at least 30 hours per week. Providers may prefer a weekly price because if the child is not there for the entire day or week, the provider is unable to sell the residual or remaining service to someone else for a few hours. However, charging a daily or weekly rate may not be a viable option in some communities because parents are only willing to pay for hours of care received.

The use of different pricing modes would be less challenging for the market rate survey if there were a standard conversion between pricing modes; if, for example, an hourly price multiplied by eight or 10 resulted in the price the provider would charge for daily care. However, because providers typically offer quantity pricing (or a volume discount) for care paid on a weekly or daily basis, and because these conversion rates differ across providers, there is no standard or accepted formula in the market. Issues specifically related to conversions are discussed in the following section.

Most child care providers report hourly, daily or weekly prices. However, the rate survey includes only these three options, which may influence the pricing modes used and reported by providers. When asked, most district CCR&R staff and others felt that monthly prices are uncommon in Minnesota, yet monthly prices are frequently used by child care providers in other states. Other options such as part-day, part-week and per-session prices are also used in the private market, and are not included in the rate survey (except to the extent that providers may record these alternative methods in the comments section of the survey).

The pricing practices of child care providers vary around the state. Table 21 shows the percentage of providers offering only one pricing mode in each economic development region (a map of these regions is in the Technical Appendix). In some areas such as Regions 4, 6W and 8, more than three-quarters of providers offer only one pricing mode. In other areas, particularly Regions 6E, 7E, 7W and 11, one-third or fewer of child care centers have only one pricing mode. In Region 11 more than 40 percent of licensed family child care providers charge only one mode, which is weekly; whereas in the rest of the state the percentage with only one mode ranges from 57 to 94 percent, and the dominant mode is usually hourly or daily.

For both centers and licensed family child care homes, the most common pricing mode varies regionally. Hourly and daily prices are more common in rural areas, while weekly prices are more common in some urban areas. Use of a weekly pricing mode is likely to produce more stable income because the amount paid is constant each week, rather than varying by the number of hours used. Community constraints, combined with provider preferences, are likely to affect the pricing mode chosen. It may be that rural child care markets will not support weekly pricing because parents will only pay for the hours of care used.

Table 21: Pricing modes for centers and licensed family child care providers in Minnesota

Economic Dev. Region	Centers		Licensed Family Child Care	
	Percent with one pricing mode	Most common pricing mode	Percent with one pricing mode	Most common pricing mode
1	55.6	daily and weekly	69.8	hourly
2	60.0	daily	68.3	daily
3	62.5	hourly	72.6	hourly
4	75.0	daily	70.9	hourly
5	41.2	weekly	59.1	hourly
6E	30.0	weekly	73.4	hourly
6W	100.0	hourly	91.9	hourly
7E	29.4	daily	48.0	weekly
7W	33.3	weekly	56.9	weekly
8	78.6	hourly	94.0	hourly
9	67.9	weekly	77.6	hourly
10	67.3	weekly	74.2	weekly
11	30.0	weekly	41.1	weekly

Note: Based on 2007 rate survey using prices for toddlers.

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In order for the rate survey to capture accurate price information, the survey should collect price data in all the ways that providers charge. By asking providers to report prices in any and all pricing modes that they use, the prices are more likely to reflect the prices parents would find in the market. Collecting data on all pricing modes also allows for tracking of changes in business practices regarding both most common pricing mode and the relationships among the different modes. If the rate survey was changed to include fewer pricing modes (for example, only weekly or only hourly), providers would either have to create a price in order to respond to the survey, or their prices would be excluded. In either case, collecting less information would likely result in less accurate information about prices in the private market. Thus, it is recommended that the survey continue to ask providers for hourly, daily and weekly prices. DHS may want to consider including an option for providers to report monthly prices in order to track whether this pricing mode is commonly used (or if it becomes more common). Collecting data on part-day or session prices may also be useful, as discussed below in the section on school-age care.

Conversion of prices using 10/50 formulas

Given that providers use different pricing modes, an important consideration is whether prices can be converted from one pricing mode to another in a way that reflects actual market prices. One approach to different pricing modes is to convert between modes using a standard formula or conversion rate. The rate survey asks providers to report the (daily or weekly) price charged for a child in care for 10 hours in one day, or for 50 hours in one week.[19] Based on the survey questions, current DHS practice uses the 10-hour day and 50-hour week when doing conversions. Thus an hourly price would be converted to a weekly price by multiplying by 50, or by 10 to obtain a daily price. This approach assumes that providers who have only an hourly price would charge 50 times that price for 50 hours of care in a week, and that providers with only a daily rate would charge five times the daily rate for a week.

Converting prices raises concerns because conversion of prices from one mode to another may distort prices in ways that do not reflect the market. In other words, providers may use quantity pricing to discount prices for larger amounts of time (such as weekly prices relative to hourly), and these conversions do not take such premiums or discounts into account. To assess whether using conversions results in different prices, reported (non-converted) prices in each pricing mode were compared to prices converted using the standard in the rate survey (10 hours per day, 50 hours per week). For this analysis, prices in Region 11 and greater Minnesota were analyzed separately. There were differences at the regional and county level, but the number of providers charging in more than one pricing mode became quite small when analyzing at the regional or county level once outside of Region 11.

[19] The survey question is intended to ensure that the provider's weekly charge covers up to 50 hours of care.

The first set of comparisons in table 22 compares conversions from a smaller unit of time to a larger one: hourly and daily prices converted to weekly. Hourly prices reported by providers were multiplied by 50 (hours), and daily prices were multiplied by five. These converted prices were compared to the reported weekly prices. For both centers and licensed family providers, the average weekly (non-converted) price was lower than the average of the converted prices. The lower non-converted average suggests that providers offer quantity pricing: a weekly price is less than a daily price multiplied by five, or an hourly price multiplied by 50. The differences were small, however, for licensed family providers in greater Minnesota, suggesting that the weekly price was approximately the same as the hourly price multiplied by 50, or the daily price by five. Converting hourly to daily prices usually resulted in a higher average price, except for licensed family providers in greater Minnesota. These findings indicate that among facilities that charge in more than one pricing mode, volume pricing is common. Licensed family child care providers in greater Minnesota are the exception as they do not appear to use volume pricing.

Table 22: Comparison of average converted prices using 10/50 formulas to non-converted prices

	Centers				Licensed Family Providers			
	Region11*		Greater Minnesota		Region11*		Greater Minnesota	
	N	Mean	N	Mean	N	Mean	N	Mean
Conversion to a larger time unit								
Weekly (not converted)	396	$232.83	152	$153.77	2825	$144.96	2618	$116.39
Hourly *50	169	$464.38	96	$196.02	1052	$260.18	3486	$117.86
Daily*5	276	$326.31	117	$169.92	1816	$163.41	2332	$120.06
Daily (not converted)	276w	$65.26	117	$33.98	1816	$32.68	2332	$24.01
Hourly*10	169	$92.88	96	$39.20	1052	$52.04	3486	$23.57
Conversion to a smaller time unit								
Hourly (not converted)	169	$9.29	96	$3.92	1052	$5.20	3486	$2.36
Daily/10	276	$6.53	117	$3.40	1816	$3.27	2332	$2.40
Weekly/50	396	$4.66	152	$3.08	2825	$2.90	2618	$2.33
Daily (not converted)	276	$65.26	117	$33.98	1816	$32.68	2332	$24.01
Weekly/5	396	$46.57	152	$30.75	2825	$28.99	2618	$23.28

*Note: These conversions are for illustration purposes only. Current policy does not include conversion of prices in Region 11. Based on toddler prices in the 2007 rate survey.

The lower half of table 22 shows conversions from larger to smaller units of time by comparing conversions of weekly and daily prices to hourly. The conversions again resulted in a different average price than the average of non-converted prices. For example, the average of weekly prices divided by 50 hours for centers in greater Minnesota was $3.08, compared to an average hourly (non-converted) price of $3.92. This difference may reflect quantity discounting for larger time units or providers' preference for weekly over hourly pricing modes. The non-converted daily average price tended to be higher than the weekly price divided by five, again with the exception of licensed family providers in greater Minnesota. In general, the converted prices differed from reported prices, though the size of the differences varied. Conversions from larger to smaller units of time confirmed the findings of the prior analysis, that volume pricing appears common for all but licensed family providers in greater Minnesota.

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Conversion of prices using market conversion ratios

While the rate survey defines a daily price as the price for a 10-hour day and a weekly price as the charge for a 50-hour week, providers have different implicit and explicit conversion ratios. If a provider offers both a weekly and daily price, for example, the explicit conversion ratio is the ratio of the two. If the provider only offers a weekly price, the implicit conversion rate is the ratio of the weekly price to a hypothetical daily price that the provider would have charged, though in fact the provider does not offer this daily price to parents, and may not know what it would be.

As is the case for many goods and services, many child care providers charge prices that reflect quantity pricing, that is, it is usually cheaper (per hour) to pay for weekly care than the hourly price multiplied by the number of hours in a week. When DHS uses conversions, one practice is to multiply a provider's hourly price by 50 to obtain a weekly price, but many providers do not charge a weekly price that is 50 multiplied by their hourly price. Similarly, providers (who have weekly and daily prices) sometimes do not charge a weekly price that is five times the daily price. Data was analyzed from the 2007 rate survey to better understand the typical volume discounts offered by providers in Minnesota. Note that this analysis is based only on providers offering more than one pricing mode. Many providers do not offer more than one mode, so are excluded from this analysis. The evidence is clear that when multiple prices are offered, there is quantity pricing.

The number of providers with more than one pricing mode was fairly small in some counties; therefore the ratios among pricing modes were analyzed for Region 11 (the Minneapolis-St. Paul metropolitan area) and the rest of the state. As shown in table 23, the ratios varied both regionally and by type of provider. The conversion of weekly to daily prices was fairly consistent, with a ratio of about four between weekly and daily prices. Thus, the weekly price was typically about four times the daily price rather than five (as in five days per week), for providers with both a daily and a weekly price. The weekly-to-daily price ratio was slightly higher for licensed family child care providers (closer to five) than for centers. However, it is important to note that this ratio ranged widely, with ratios for individual providers ranging from two to 16.

The ratio of weekly to hourly prices was more variable across type of provider and geographic region than the weekly to daily ratio. For child care centers in Region 11, the mean ratio was 25 compared to about 35 in other parts of Minnesota. For example, this suggests that a family choosing to pay for care on an hourly basis in Region 11 would pay more than the weekly price if the hours of care exceeded 25 in a week.[20] Note that this ratio was considerably lower than 50 (hours in a week), or even 40. A similar regional difference was seen for licensed family child care providers, with weekly to hourly ratios of 29 for Region 11, and 45 elsewhere. Among providers with more than one pricing mode, the ratios varied widely, thus there did not seem to be a standard conversion rate even within regions. However, the average weekly to hourly ratio was always less than 50, again suggesting that providers with more than one pricing mode offered quantity pricing for weekly compared to hourly prices.

[20] It is unlikely that a family would choose to pay hourly in this situation if the provider offered both hourly and weekly pricing modes.

The ratio of daily to hourly prices also varied across type of provider and region. In Region 11, the mean ratio was 7.3 for centers compared to 6.6 for licensed family providers. The ratio was higher elsewhere in Minnesota, with a mean of eight for centers and more than nine for licensed family providers. In greater Minnesota, the mean ratio was nine or 10 in all regions, compared to seven in Region 11. However, the ratios varied widely across providers, suggesting that there was no common conversion formula, and no standard relationship between pricing modes used in the private market.

Table 23: Comparison of pricing modes offered by child care providers

	Ratio of weekly price to daily price (mean)	Ratio of weekly price to hourly price (mean)	Ratio of daily price to hourly price (mean)
Centers			
Region 11	3.7	25	7.3
Greater Minnesota	4.4	34	7.9
Licensed family child care providers			
Region 11	4.5	29	6.6
Greater Minnesota	4.8	45	9.4

Note: Based on toddler prices in the 2007 rate survey data.

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Based on data from providers with more than one pricing mode, it is clear that the average conversion ratios used by these providers are not the same as the 10-hour day and 50-hour week. This discrepancy is consistent with the results shown earlier, that prices converted using the 10-hour day and 50-hour week differed from the non-converted prices. Rather than converting using the 10/50 formulas, an alternative approach is to use the average ratios estimated from the market data to convert prices from one mode to another. This approach allows for conversions based on practices of providers who charge in more than one pricing mode.

Table 24 compares non-converted prices to those converted using the average ratios calculated by type of care and region (as shown previously in table 23). The averages of the converted prices were considerably closer to the average non-converted price than when the conversions were done using the 10-hour day and 50-hour week. However, there were a number of cases, particularly for centers in greater Minnesota, where the averages were not close. The findings suggest that using market ratios to convert prices distorted the average price less than the 10/50 conversion formulas. However, the accuracy of the converted prices depends on two assumptions. First, the results will differ depending on how the market ratios are calculated because of variation across types of care and regions of the state. Second, this approach assumes that the pricing by providers who offer more than one pricing mode is similar to that of providers who offer only one pricing mode. As shown in the next section, providers who offer only one pricing mode, particularly only hourly pricing, may differ systematically from those who offer more than one pricing mode.

Table 24: Comparison of average prices converted using market ratios to average non-converted prices

	Region11		Greater Minnesota	
Centers				
Toddler prices	**N**	**Mean**	**N**	**Mean**
Weekly (not converted)	396	$232.83	152	$153.77
Hourly converted from daily	169	$236.09	96	$128.04
Weekly converted from daily	276	$239.51	117	$147.83
Daily (not converted)	276	$65.26	117	$33.98
Daily converted from hourly	396	$63.44	152	$35.35
Daily converted from weekly	169	$67.34	96	$30.62
Hourly (not converted)	169	$9.29	96	$3.92
Hourly converted from daily	276	$9.00	117	$4.35
Hourly converted from weekly	396	$9.16	152	$4.71
Licensed family child care providers				
Weekly (not converted)	2825	$144.96	2618	$116.39
Weekly converted from hourly	1052	$152.83	3486	$106.31
Weekly converted from daily	1816	$148.05	2332	$115.50
Daily (not converted)	1816	$32.68	2332	$24.01
Daily converted from hourly	2825	$32.00	2618	$24.20
Daily converted from weekly	1052	$34.08	3486	$22.06
Hourly (not converted)	1052	$5.20	3486	$2.36
Hourly converted from daily	1816	$4.99	2332	$2.27
Hourly converted from weekly	2825	$4.94	2618	$2.58

Note: Based on toddler prices in the 2007 rate survey.

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Comparison of average prices for providers with one versus multiple pricing modes

The market ratio-conversion approach uses the ratio of prices from one set of providers and applies it to a different set of providers. Thus, it assumes that providers who report more than one pricing mode are similar to those with only one pricing mode. Yet providers who differ in their pricing options may differ in other business practices, including their average prices. Comparisons of average prices for those with one pricing mode and those with multiple modes show some important differences. As shown in table 25, child care centers that offer only hourly prices had considerably lower prices, on average, compared to those with more than one pricing mode. Centers with only daily prices had somewhat lower average prices than those with multiple modes. In contrast, centers with weekly only prices had an average price very similar to the average price for centers that offer other pricing modes in addition to weekly.

For licensed family child care providers, average prices were fairly close for providers with one mode versus multiple modes (table 25). The one exception was in greater Minnesota, where licensed family child care providers who charge only hourly had a lower average price ($2.26 per hour) compared to those who had other pricing modes (daily or weekly), in addition to hourly ($2.61). Similar patterns were seen by analyzing the data by economic development region or county (where there are enough providers).

Table 25: Comparison of average prices for providers with only one pricing mode versus multiple pricing modes

	Region 11		Greater Minnesota	
Centers				
Toddler prices	**N**	**Mean**	**N**	**Mean**
Hourly prices				
Hourly only	7	$7.86	51	$2.82
Multiple modes	162	$9.35	45	$5.16
Daily prices				
Daily only	0	--	26	$27.78
Multiple modes	276	$65.26	91	$35.75
Weekly prices				
Weekly only	115	$230.63	54	$154.80
Multiple modes	281	$233.74	98	$153.20
Licensed family child care providers				
Hourly prices				
Hourly only	212	$5.12	2525	$2.26
Multiple modes	840	$5.22	961	$2.61
Daily prices				
Daily only	75	$30.31	652	$23.10
Multiple modes	1741	$32.78	1680	$24.37
Weekly prices				
Weekly only	1002	$115.73	983	$143.11
Multiple modes	1823	$116.79	1635	$145.97

Note: Based on toddler prices in the 2007 rate survey.

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If the prices of providers charging one mode were similar to those of providers with more than one pricing mode, it would provide more confidence in the price findings based on converting prices using the average market ratio. However, if conversions are necessary, using a market ratio may reflect the private market better than using a formula (such as 10 and 50 hours). The average weekly prices shown in table 25 were similar for providers with one and multiple pricing modes, however, providers with only hourly prices have lower average prices.

Price conversions and geographic groupings

Price conversions are an issue in two different circumstances: when small numbers are likely to make 75th percentile estimates unstable over time, and when only a small percentage of providers charge in daily or weekly pricing modes. In the first case, the issue is the instability of market rate survey findings over time, which may not reflect actual market trends. In the latter case, the issue is one of access and fairness related to the state's CCAP payment policies. CCAP payments to child care providers are subject to daily and weekly maximums based on hours in care, regardless of the pricing mode used by the provider. Thus, the payment to a provider who charges by the hour may be limited by the daily or weekly maximum. These daily and weekly caps are intended to control program costs, and to help avoid potential situations in which providers alter pricing modes to find a more advantageous payment rate. If only a small percentage of providers in a geographic area charge a weekly rate and they use quantity pricing, the weekly cap would be based on volume pricing, despite the fact that only a minority use that pricing practice. For those parents using up to 50 hours of care with a provider who charges only an hourly price, the weekly cap might be less than what that provider would charge. Given that these daily and weekly caps are imposed, DHS established the prevailing practice rule in setting daily and weekly maximum rates to ensure that providers who charge only hourly prices are represented in the calculations of daily and weekly maximums, if they are the majority of providers in an area. The hourly prices of these hourly-only providers are multiplied by 10 or 50 to create converted daily or weekly prices. This prevailing practice rule applies only to licensed family child care providers who are not in Region 11.[21]

While the use of larger geographic groups is likely to eliminate the problem of small numbers of providers and the potential for unstable 75th percentiles, the conditions which trigger conversions due to the prevailing practice rule may still occur. Even with large numbers of providers using each pricing mode, providers that use daily or weekly prices may represent a small percentage of providers in a cluster. To determine if providers with daily or weekly prices represent a minority within the larger geographic groupings, the prevailing practice rule was applied to the four geographic grouping methods. The analyses were then recalculated comparing the new 75th percentiles to the baseline, and access rates were calculated for each county to determine the impact of conversions in the different geographic grouping methods.

[21] As reported in the rate survey, licensed family child care providers in Region 11 do not typically charge only by the hour. A large percentage of licensed family providers in Region 11 charge a daily or weekly rate. Therefore, a large percentage of Region 11 providers contribute price information that is used to set the daily and weekly caps, and it is not necessary to apply the prevailing practice rule to the licensed family providers in Region 11.

Analysis Methods

The first step was to determine whether the prevailing practice rule would apply in any of the clusters for each geographic grouping method. The percentage of providers was determined in each pricing mode (hourly, daily and weekly) for each age group in each cluster for licensed family child care providers. The prevailing practice rule was applied in any cluster in which the percentage of licensed family providers charging daily or weekly was below 30 percent (based on current methods). In any cluster in which the percentage of providers charging weekly fell below 30 percent, if a provider did not report a *weekly* price, a weekly price was created for them by multiplying their daily price by five if there was a daily price or, otherwise, by multiplying their hourly price by 50. In any cluster in which the percentage of providers charging daily fell below 30 percent, if a provider did not have a *daily* price, a daily price was created for them by multiplying their hourly price by 10.[22] The 75th percentiles of daily and weekly prices for the cluster were then re-calculated, including converted and reported prices.

Having established which providers' prices would be subject to conversions under the prevailing practice rule, three types of analysis were conducted. First, the cluster 75th percentile with conversions was compared to those done without conversions for only the clusters and age groups in which conversions were done. Second, the new 75th percentiles were compared to the baseline 75th percentiles and the percentage of counties with cluster 75th percentiles within 10, or more than 25 percent different from the baseline, were computed. This analysis included all counties, whether or not they were impacted by conversions. Finally, the access rate was calculated for each county, including all counties and pricing modes to compare the access rate with those shown earlier (without conversions). The results are summarized below, with additional details provided in the Technical Appendix.

[22] If the provider had only a weekly price, the weekly price was divided by five to create a daily price. Including the weekly prices divided by five did not impact the results because few providers had only a weekly price.

Results

The only cluster in which the prevailing practice rule applied was the first cluster in each of the grouping methods, which included the areas with the lowest child care prices or lowest average female earnings.[23] In these areas, most providers charged by the hour, and less than 30 percent reported a daily or weekly price for some or all age groups (see table 26). In cluster one of the county earnings clusters, the percentage of providers fell under 30 percent only for school-age weekly prices (though the percentage was close to 30 for all age groups). Thus, the prevailing practice rule would apply and conversions were done only in the age groups and pricing modes shown in table 26 where the percentage was less than 30. Note, however, that there were at least several hundred licensed family child care providers reporting daily and weekly prices in cluster one for each grouping method. The concern is not the number of providers, but the percentage in different pricing modes (details may be found in the Technical Appendix).

Table 26: Percentage of family child care providers with daily and weekly pricing modes by type of geographic grouping

Percentage of providers with each pricing mode	County price cluster #1	County earnings cluster #1	ZIP code price cluster #1
Infant prices			
Daily price	22	31	29
Weekly price	18	30	23
Toddler prices			
Daily price	22	31	29
Weekly price	18	30	24
Preschool prices			
Daily price	22	31	29
Weekly price	18	30	24
School age prices			
Daily price	22	31	28
Weekly price	17	29	22

Note: The separate and combined ZIP code cluster methods resulted in the same observations in the first cluster so that there is no difference between the two ZIP code methods for the conversion results (for cluster #1). Based on 2007 rate survey data.

[23] The two ZIP code methods, using separate clusters by type of provider or combining them, resulted in the same observations in cluster one. Therefore, the results for conversions were the same for both ZIP code grouping methods.

Having established which clusters and age groups would be subject to the prevailing practice rule, the appropriate prices were converted and the 75th percentiles re-calculated. To determine the size of the effect of conversions on the 75th percentiles, table 27 shows the 75th percentiles with and without the conversions for each grouping method (the results were the same for both ZIP code grouping methods). Overall, the 75th percentiles including converted prices were very similar to those based only on reported daily and weekly prices. The 75th percentiles, including converted prices were usually, but not always, higher than without conversions. On average, providers who offer only an hourly pricing mode tended to have somewhat lower prices than those with daily and/or weekly pricing. For example, including hourly prices converted into daily prices (by multiplying hourly prices by 10) slightly lowered the calculated 75th percentile for daily prices for infants in the ZIP code price grouping methods (from $22.79 to $22.50).

Table 27: Comparison of 75th percentiles with and without conversions under the prevailing practice rule, by geographic grouping method

	Age group 75th percentile			
	Daily prices		Weekly prices	
	No conversions	With conversions	No conversions	With conversions
County price cluster #1				
Infant	$22.50	$22.50	$112.50	$112.50
Toddler	$21.20	$22.50	$107.50	$110.00
Preschool	$21.00	$22.00	$106.25	$108.00
School age	$21.00	$22.00	$105.00	$107.50
County earnings cluster #1				
School age	n.a.	n.a.	$105.00	$112.50
ZIP code cluster #1				
Infant	$22.79	$22.50	$112.50	$112.50
Toddler	$22.00	$22.00	$107.00	$110.00
Preschool	$21.50	$21.60	$101.25	$107.50
School age	$21.00	$21.50	$100.00	$107.50

Note: The separate and combined ZIP code cluster methods resulted in the same observations in the first cluster so that there is no difference between the two methods for the conversion results. Based on 2007 rate survey data.

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The 75th percentiles with conversions were compared to the baseline 75th percentiles as a measure of the difference from current methods (which include county-level calculation of 75th percentiles and price conversions). While only counties in cluster one were affected by conversions, the comparisons for all counties and age groups are summarized in table 28 for licensed family child care provider prices for the four grouping methods. In all cases, the changes were small, however, the trend was for conversions to increase the cluster 75th percentiles relative to the baseline and non-converted cluster 75th percentiles. For county earnings clusters, more age-group county 75th percentiles were between 10 and 25 percent higher than baseline than without conversions. The conversions did not affect counties with the biggest discrepancies because these counties were not in cluster one for any of the grouping methods.

Table 28: Comparison of 75th percentiles (p75) for each cluster with baseline 75th percentiles for all age groups with and without prevailing practice conversions

Licensed family child care providers				
Based on weekly prices	**County price clusters**		**County earnings clusters**	
Percent of age-group county comparisons	**No conversions**	**With conversions**	**No conversions**	**With conversions**
Cluster p75 within 10% of baseline	87.1	87.6	77.9	73.9
Cluster p75 between 10 and 25% higher than baseline	7.5	7.5	13.8	18.1
Cluster p75 higher than baseline by 25% or more	0	0	0.3	0.3
Cluster p75 between 10 and 25% lower than baseline	4.9	4.3	7.2	6.9
Cluster p75 lower than baseline by 25% or more	0.6	0.6	0.9	0.9
	Separate ZIP code clusters		**Combined ZIP code clusters**	
Cluster p75 within 10% of baseline	86.8	86.2	85.6	84.5
Cluster p75 between 10 and 25% higher than baseline	6.9	10.6	7.2	11.2
Cluster p75 higher than baseline by 25% or more	0.6	1.2	0.6	1.2
Cluster p75 between 10 and 25% lower than baseline	5.7	2.0	6.6	3.2
Cluster p75 lower than baseline by 25% or more	0	0	0	0

Note: The number of comparisons equals the number of counties (87) multiplied by the number of age groups (4) for a total of 348 comparisons. These results include all clusters and so differ for the two ZIP code methods. Based on 2007 rate survey data.

One of the goals of the prevailing practice rule is to ensure that parents' access is not adversely impacted by use of daily and weekly maximums in areas in which hourly pricing is the most common practice. Therefore, the CCAP converts hourly prices of hourly-only providers to daily prices (hourly times 10), or weekly prices (hourly times 50), in those areas. To determine the impact of conversions on access, the percentage of provider prices in each county at or below the 75th percentile using the new 75th percentiles was calculated, including conversions in cluster one where applicable. The summary access rates shown in table 29 include all counties, whether or not the prevailing practice rule applied.

Table 29 summarizes the findings for county access rates with and without conversions based on licensed family child care provider prices. Overall, the prevailing practice rule for conversions did not have a large impact on access because of the relatively small changes in 75th percentiles after conversions were done. The percentage of prices at or below the 75th percentile could be lower, in fact, if the 75th percentile, including converted prices, is lower (as was the case for infant prices).

Table 29: County access rates with and without prevailing practice rule conversions for each grouping method

Percent of licensed family child care provider prices at or below 75th percentile				
	No conversions		With conversions	
	Number of counties	Percent	Number of counties	Percent
County price clusters				
Less than 60%	4	4.6	4	4.6
60-74%	15	17.2	13	14.9
75-89%	33	37.9	34	39.1
90% or more	35	40.2	36	41.4
County earnings clusters				
Less than 60%	6	6.9	6	6.9
60-74%	11	12.6	10	11.5
75-89%	33	37.9	32	36.8
90% or more	37	42.5	39	44.8
Separate ZIP code clusters				
Less than 60%	0	0.0	0	0.0
60-74%	15	17.2	14	16.1
75-89%	49	56.3	49	56.3
90% or more	23	26.4	24	27.6
Combined ZIP code clusters				
Less than 60%	0	0.0	0	0.0
60-74%	17	19.5	16	18.4
75-89%	47	54.0	47	54.0
90% or more	23	26.4	24	27.6

Note: Access at the county level is defined as the percentage of provider prices at or below the cluster 75th percentile. Includes all age groups and hourly, daily and weekly prices. Based on 2007 rate survey data.

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The number of counties with low access rates (below 60 percent) did not change with conversions. However, a small number of counties increased their access rates above 75 percent with conversions. For example, with county price clusters, two counties (Norman and Yellow Medicine) moved from having access rates between 60 and 74 percent to above 75 percent. For ZIP code clusters, the access rate improved the most in Freeborn County, increasing three percentage points, from 93 to 96 percent. Of the counties that saw improved access with conversions, only five had access rates below 75 percent without conversions (all had access rates above 63 percent). Conversions improved access in a few counties, though in most cases the access rate was already at or above 75 percent.

Discussion and recommendations

Converting prices raises concerns because conversion from one pricing mode to another may distort prices in ways that do not reflect the market. Based on analyzing data from providers who offered more than one pricing mode in 2007, there is strong evidence that there is not a standard way of converting between pricing modes in the market. Without standard conversion practices, any conversions are likely to create prices not found in the market.

As is the case for many goods and services, many child care providers charge prices that reflect quantity pricing, that is, it is usually cheaper (per hour) to pay for weekly care than the hourly price multiplied by the number of hours of child care in a week. The rate survey asks for a weekly price that covers 50 hours, but most providers who have both a weekly and hourly price do not charge a weekly price that is 50 multiplied by their hourly price. Similarly, providers sometimes do not charge a weekly price that is five times the daily price. Based on analysis of providers offering more than one pricing mode, there is evidence of quantity pricing when paying weekly versus hourly or daily. While the conversion ratios vary across providers, using the estimated average market ratio resulted in similar average weekly prices for providers with one or more modes of pricing. However, this approach applied the pricing practices of one group of providers (those with more than one pricing mode) to those with different pricing practices (those with only one pricing mode).

When conversions are done, current DHS practice is to use the conversion formula implied in the rate survey questions. The rate survey asks providers to report the (daily or weekly) price charged for a child in care for 10 hours in one day or for 50 hours in one week (see table 30 for question wording). Most providers who charge daily or weekly have a fee for a day or week that does not change with the actual hours in care. For example, the daily fee is charged for a child who is in care for six hours or more. The fee does not change if the child is in care for more than six hours. However, it is possible that the provider would charge more for hours beyond a certain number (such as 10 or 12). The rate survey attempts to capture consistent price information from all providers by specifying the number of hours covered by the daily (or weekly) price. However, providers may respond to the survey question by creating a price that they do not offer in order to report a price for a 10-hour day (or 50-hour week). Interviews with district CCR&R staff indicated that many providers are confused by the 10-hour and 50-hour conditions specified in the survey questions.

Table 30: Rate survey questions

If you care for children at least 10 hours per day or 50 hours per week and you charge by the day or week … How much do you charge per day for a child in your care for 10 hours in one day? How much do you charge per week for a child in your care for 50 hours in one week?
Note: Based on 2007 rate survey.

There is evidence that the use of these survey questions has impacted the private child care market. Many providers in greater Minnesota report a weekly price that is 50 times their hourly price and a daily price that is 10 times their hourly price. A recent newsletter from a district CCR&R defined a weekly price as "the price for 50 hours of care" when the provider has a weekly price. In contrast, in Region 11, providers typically have daily and weekly prices that are much less than 10 and 50 times the hourly price, respectively. Their pricing practices reflect quantity pricing, and may be intended to discourage parents from using care on an hourly basis. These variations in pricing practices across regions likely reflect different market characteristics. Nonetheless, the challenge for the rate survey is to capture prices that reflect the actual market. At the same time, DHS wants to ensure that the prices reported by providers (and used to inform maximum rate setting) cover the number of hours of care that may be authorized. If a parent is authorized for 50 hours of care in a week, the weekly price of care should cover 50 hours; otherwise the parent may be faced with paying an extra amount not covered by the CCAP. The current rate survey questions are one way to ensure that providers report prices that cover 50 hours of care (or 10 hours per day).[24] However, there is evidence in greater Minnesota that suggests that the survey has influenced the pricing practices of providers.

The objective of the market rate survey is to capture the prices in the market as accurately as possible. To do so, the survey questions should ask providers to report prices as they quote them to parents.[25] For example, the survey would ask providers

[24] In the current survey, if providers report a weekly (daily) price that does not cover 50 (10) hours of care, that price is not included in the analysis of the data.

[25] It is not recommended that providers be asked to convert their own prices, that is, a provider who does not have a weekly price should not be asked to provide one. An on-the-spot price conversion during the survey is not likely to produce valid findings that reflect actual market prices.

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if they have a weekly price for care, and if so, the amount. A follow-up question can be used to ask whether this price would cover 50 hours of care in a week. If not, the provider could be asked what they would charge for 50 hours. Analysis of the prices reported in response to the question specifically about 50 hours of care may provide further insight into provider pricing practices. Providers whose prices do not cover 50 hours could be excluded from the analysis, as is currently done. Analysis of the differences between providers' responses to these questions could help determine whether or not these prices should be excluded. As with any survey questions, pilot testing and comparing results with the current approach is recommended prior to a change in the survey.

Assuming that the survey collects, analyzes and reports price data in the modes used by providers, the results will reflect the market if no conversions are done. This approach may encounter large fluctuations over time in 75th percentiles in some counties due to small numbers of providers, however, larger geographic groupings should eliminate this problem. The prevailing practice rule, however, may still apply in larger geographic groupings if fewer than 30 percent of licensed family child care providers use daily or weekly pricing. The 75th percentiles changed only slightly after conversions under the prevailing practice rule, which resulted in small changes in access rates.

In evaluating the options regarding conversions using the five criteria (access, fairness, stability, simplicity and transparency), the authors considered separately the use of conversions to address the problem of small numbers and for the prevailing practice rule (see table 31). These are two separate uses of conversions and reflect the important distinction between the market rate survey and CCAP payment policies. In analyzing the survey data, having a sufficient number of providers reporting prices in a given pricing mode in an area is important to avoid fluctuations due to small numbers, rather than actual market trends. Not doing conversions when there are small numbers is likely to result in unstable findings. Converting using 10-50 formulas does not seem appropriate in this situation, because it creates prices that are not found in the market. Multiplying hourly prices by 50 and dividing a weekly price by 50 lead to different prices than providers charge. Conversion using market ratios would reflect market practices better, and thus be less likely to distort survey findings than using a formula. However, these market ratios themselves may fluctuate over time, and their use reduces the simplicity and transparency of the method. Given that there is no standardized pricing practice in the market, any conversion of prices is likely to create prices which do not exist in the market, thus distorting the survey findings. Using larger geographic groupings should eliminate the need for price conversions due to small numbers of providers in some areas.

Table 31: Comparison of alternative methods for conversions based on the evaluation criteria

Alternatives	Access	Fair	Stable	Simple	Transparent
Scenario 1: Price conversions in situations where there are a small number of providers					
Do no conversions	Based on providers' reported prices so access should be high	Fair because based on market practices	Results likely to be very unstable because of small numbers of reported prices	Simplest approach; no need to determine how to do conversions	Transparent because based on providers' reported prices
Convert using 10-50 formulas	Access can either increase or decrease after conversions	Less fair when market practices are not based on a standard formula for conversions	More stable because of increased numbers of prices used in the analysis	Relatively simple to use the given formula; but need rules for when to do conversions (minimum number of providers)	Less transparent because of the conversion formula
Convert using market ratios	Access can either increase or decrease after conversions	Fair because based on market practices	More stable because of increased numbers but market ratios may change over time	Less simple because of the need to calculate market ratios	Market ratios are less transparent than either one given formula or no conversions
Scenario 2: Price conversions under Minnesota's prevailing practice rule					
(Daily and weekly payment caps are imposed on providers with only hourly prices (in some circumstances)					
Do no conversions	With no conversions, access may be limited to some providers who charge only hourly because of the daily and weekly payment caps	If other providers use quantity pricing, doing no conversions may be less fair if one assumes that the provider who only charges hourly would charge a parent for all the hours used	Results would be stable over time	Simplest approach; no need to determine how to do conversions	Transparent because based on providers' reported prices
Convert using 10-50 formulas	Access can either increase or decrease after conversions; actual change was very small increase in access overall	Using prices of all providers may be perceived as increasing fairness as it does not impose pricing practices of a small fraction of providers on others	Which clusters and age groups need conversions may change year to year (less stable)	Using one formula is simpler than market ratios, however it is more complicated than doing no conversions	Which clusters and age groups need conversions may change year to year (less transparent)
Convert using market ratios	Access can either increase or decrease after conversions	May be perceived as less fair as it is imposing the behavior of some providers onto others	May be less stable due to changes in provider practices over time	Less simple because market ratios must be calculated each year	Market ratios are less transparent than either a known formula or no conversions

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The issue of conversions also arises in Minnesota because of current authorization and payment policies. Given that daily and weekly caps are imposed on all providers, DHS converts hourly prices to daily and weekly prices in situations where fewer then 30 percent of providers offer a daily or weekly price. Doing no conversions in these situations may be perceived as less fair (than doing conversions) if one assumes that a provider who charges only hourly would charge parents for all hours used, that is, that they would not adopt quantity pricing for an authorized week of care and that the provider is subject to a daily or weekly cap based on prices that include quantity pricing. In many child care markets, providers do offer quantity pricing, though this practice appears less common in greater Minnesota. Converting using the 10-50 formulas will not necessarily increase access, however, as providers with hourly-only prices tend to have lower prices on average than providers with other pricing modes. Using 2007 data and the four proposed geographic grouping methods, it was found that changes in 75th percentiles and access rates were generally quite small when conversions were done under the prevailing practice rule.

As noted earlier, it is important to distinguish between market rate survey practices and setting of maximum rates and related CCAP payment policies. To collect accurate price information about the private child care market, the survey must collect price data in the pricing modes used by providers. Given that there is no standardized pricing practice in the market, any conversion of prices is likely to create prices that did not exist in the market, thus distorting the survey findings. The use of conversions for reasons related to payment policies may be perceived as being fair to providers, but may have unintended consequences in terms of influencing market practices and does not necessarily increase access. Use of these conversions increases the complexity of the method while having a minimal impact on the results based on analysis of 2007 data.

The study recommendations focus on the importance of collecting accurate price data and suggest ways to limit the need for price conversions.
The recommendations include:

1) Collect price data the way providers charge. DHS may want to consider adding monthly, part-day or session pricing as options for providers to report. Monthly pricing does not appear to be a common mode, but by including it in the survey, DHS can monitor changes in provider practices that may include monthly pricing. Currently, those providers that charge monthly may not have their prices included in the survey, or they may have to create prices they do not charge in order to have their prices included.
2) Consider re-wording the rate survey questions to obtain more accurate information about the daily and weekly prices that providers charge in the private pay market. For any survey, the phrasing of questions is crucial to obtaining accurate and useful information. Questions that specify 10 hours of care per day and 50 hours per week appear to confuse providers, and may have influenced their pricing practices.
3) Use geographical groupings that result in sufficient numbers of providers so that conversions are not necessary to address the problems that arise with small numbers of providers. Child care prices fall into a relatively small number of prices clusters, and using fewer geographic units both simplifies the maximum rate setting process and eliminates the potential problems of having a small number of providers in an area.

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4) Review the use of conversions under the prevailing practice rule and consider other policy approaches to meet DHS' objectives. Further research is needed into how providers calculate the total fees for a week in markets where most providers charge on an hourly basis. Information on the length of time children are in care (range and average hours) and, in a separate survey question, asking the charge for 50 hours of care, would be useful. If providers charge the hourly price times 50 hours, then 50 may be an appropriate conversion ratio. However, providers in many areas use quantity pricing for daily or weekly prices. Considerable evidence suggests that there is no standard conversion practice among providers, thus any conversions are likely to create prices not found in the market. Use of conversions under the prevailing practice rule for proposed geographic groupings resulted in only small changes in 75th percentiles and access rates, yet complicated the analysis.

Care for school-age children during out-of-school time

School-age children represent a distinct submarket for child care services, and there may be multiple submarkets reflecting differences in school-year, summer and kindergarten care. School-age children may need child care when school is not in session, including before and after school, on school holidays or other days off, and in the summer. Care during the school year is typically priced differently than in the summer because it is generally for fewer hours per day than during the summer. Regulations regarding school-age child care allow larger group sizes and lower staff-child ratios than for younger children, which affects the cost of providing care. The child care market for school-age children includes a range of different providers and institutions, including licensed family child care homes, child care centers, public schools, and community recreation centers and programs.

Four primary issues were identified related to the rate survey and maximum CCAP rates for school-age children. These include:

- Whether to include license-exempt providers of care to school-age children who currently are not included in the rate survey
- Whether to identify separate submarkets for school-age children in the summer and school-year
- Whether to separate kindergarten-age children from older school-age children when collecting price information or setting maximum rates, (or more generally, how many age groups to distinguish)
- Whether the pricing of care for school-age children occurs in pricing modes that differ from those used to set maximum rates (hourly, daily and weekly). Each of these issues is examined below, followed by a discussion of recommendations.

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Licensed and license-exempt providers of care for school-age children

Care for school-age children is provided by a variety of different types of providers and institutions, including licensed family child care homes, child care centers, public schools, and community recreation centers and programs. These options have developed in the private market in response to parents' needs for different schedules, activities, and locations of care for school-age children. Licensing regulations for school-age are different than for younger children, allowing more children per staff member and larger group sizes. Many providers of school-age care are license-exempt, including programs run through schools, park and recreation programs, clubs and scouting programs (see Minnesota Statute 245A.03, subd. 2 for details). It is not clear whether public schools, community recreation centers and programs, and other legally-exempt providers of school-age services belong to the same market as centers and licensed family child care homes if they offer different services or are subject to different regulations.

Based on the 2004 household survey, about 41 percent of children aged 6 to 9 years, and 25 percent of children aged 10 to 12, attend before or after school programs in Minnesota during the school year.[26] The survey did not try to distinguish between licensed and license-exempt programs (a distinction parents may not know), thus, there is little direct evidence on the percentage of school-age children who are receiving care in license-exempt facilities and programs. One study found that because most programs serving school-age children are exempt from licensing, these facilities are not typically included in child care market rate surveys.[27] In Minnesota, only licensed programs are included in the rate survey.

While there is little current information on the number of school-age children in Minnesota using license-exempt providers, including these providers in the rate survey would provide additional information about prices in the private market for school-age children. But the cost of surveying these additional providers could be quite high. One impediment to such a survey is the lack of a comprehensive list of license-exempt providers of school-age care, such as school-based and community education programs. Another concern is that license-exempt providers are likely to be a distinct submarket with their own set of prices and pricing modes, so data collection and analysis would need to be done to determine how they relate to licensed school-age facilities. In addition, while some license-exempt programs offer care and services similar to licensed providers, programs that focus on sports, arts, or other enrichment activities may be a different market altogether that would not be considered child care for the purposes of the rate survey.

[26] Chase, R., Arnold, J., Schauben, L. and Shardlow, B. (2005). Child care use in Minnesota: 2004 statewide household child care survey. St. Paul, Minn: p.41

[27] Grobe, D., Weber, R. B., Davis, E. E., Kreader, J. L., and Pratt, C. 2008. Study of Market Prices: Guidance for Validating Child Care Market Rate Surveys. Corvallis, OR: Family Policy Program, Oregon State University.

Summer and school-year pricing

An important distinction for school-age care is between school-year and summer care, which roughly correlates to part-time and full-time care. Centers and licensed family child care providers typically have different prices for school-age care during the school year and in the summer, or on other days when school is not in session and children are in care for longer time periods. In 2002 DHS conducted a survey of school-age care providers to collect information about typical hours of care for school-age children. It was found that the maximum hours of care provided was slightly higher for kindergarten than for older school-age children, and varied before and after school. On average, programs were open three hours before school and four hours after school for kindergarteners, and slightly less for older children (2.4 hours before school and three hours after school). Hours of operation for school-release days were similar to those in the summer (averaging about 10 hours). Note that the hours of operation and the hours of care a child receives may differ as parents are likely to use only the hours of care needed.

In the rate survey, providers are asked to report their full-time prices for school-age children. They may report an hourly, daily and/or a weekly price. There is no distinction in the survey between summer and school-year care. If providers have different full-time prices for school-year and summer, they are instructed to report the highest price they would charge. Thus, if the provider's weekly price is higher in the summer than during the school-year, the summer price is reported on the survey. Note that the provider does not charge this higher price for a child in the CCAP during the school year; this is just information gathered in the survey.

A number of states collect separate price information for school-age children for care during the school-year and summer. Some states also set separate maximum payment rates depending on whether school is in session. Thirteen states create at least two distinct maximum rates for school-age care, typically for summer and school-year. Georgia sets three maximum rates rather than two, including a part-time daily after school rate that is used for normal school days, an occasional daily rate which is used for days off from school, and a full-week daily rate which is used for care during the summer.

Minnesota's rate survey does not collect separate information on prices in the summer and school year. Because survey respondents are instructed to provide their highest price for school-age care, the data are likely to include the higher prices for summer. Collecting more information from providers (e.g., both summer and school-year prices) is unlikely to result in a change in access or cost to the state, yet would increase the cost and complexity of the survey.

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Age groups and school-age care

The rate survey collects price data from licensed child care centers and licensed family homes on four age groups: infant, toddler, preschool and school-age, as defined by licensing standards. In 2007 the average price for a school-age child typically was lower than for other age groups (table 32). However, hourly prices at licensed family providers for school-age and preschool-age children were the same, on average, in greater Minnesota ($2.33). Overall, however, average prices are lower for school-age children than for other age groups.

Some licensed providers have the same price for a school-age child as for a preschool-age child, particularly on an hourly basis. If providers charged the same for the two age groups, there would be no need to have separate maximum rate categories for preschool-age and school-age children. Among licensed child care centers in 2007, nearly 80 percent had the same full-time hourly price for school-age and preschool-age children. But only 51 percent had the same daily price, and 43 percent had the same weekly price. The pattern is similar for licensed family homes. Nearly 90 percent of licensed family providers had the same hourly price for preschool-age and school-age children, 65 percent charged the same daily price, and 52 percent had the same weekly price for the two age groups. The differences are sufficient to suggest that separate age categories are desirable to reflect market practices.

Table 32: Average prices of child care by age group in Minnesota, 2007

	Region 11		Greater Minnesota	
	Centers	Licensed family child care	Centers	Licensed family child care
Average hourly price				
Infant	$11.03	$5.43	$4.77	$2.43
Toddler	$9.53	$5.20	$4.46	$2.36
Preschool-age	$8.73	$4.95	$4.22	$2.33
School-age	$8.55	$4.85	$3.77	$2.33
Average daily price				
Infant	$84.50	$35.07	$40.55	$25.27
Toddler	$67.86	$32.68	$35.52	$24.01
Preschool-age	$58.60	$30.66	$33.39	$23.33
School-age	$54.27	$27.69	$29.23	$22.58
Average weekly price				
Infant	$284.13	$155.40	$176.86	$122.87
Toddler	$238.98	$144.96	$159.58	$116.39
Preschool-age	$208.28	$136.37	$146.28	$112.37
School-age	$188.23	$122.04	$129.28	$107.21

Note: Based on 2007 rate survey data.

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In the rate survey, providers are asked to report their full-time prices for school-age children. The survey does not provide data on prices for kindergarten-age separate from older school-age children. Instead, providers are instructed to report their highest rate for school-age children. If the provider has a higher price for kindergarten-age than for other school-age children, the survey instructs the provider to report the higher price. While the survey data cannot be used to determine if prices are higher for kindergarten children, interviews with providers and provider organizations suggest that at least some providers have higher prices for kindergarten-age, particularly during the school year. These higher prices tend to reflect the longer hours of care typically used by kindergarten-age, particularly those in part-day kindergarten programs in public schools.

According to their Child Care and Development Fund (CCDF) plans, most states differentiate child care prices by age, including a separate category for school-age children, when setting maximum rates.[28] Five states use only two age groups, dividing children into those age 3 (or 2 1/2) and younger, and those older, and do not have a separate school-age rate. A few states differentiate school children by age, typically kindergarten and older students. For those states with a separate category for kindergarten, the daily and weekly maximum rates set for kindergarten-age are typically higher than for older school children, though hourly maximum rates are often the same.

Pricing modes for school-age care

The pricing practices of providers for school-age children are complicated and varied. Many school-age care providers charge for a block of time before school, after school, after kindergarten, etc. Parents in the private market pay for a block of time regardless of the exact length of time a child is in care. If the before-school session runs from 6:30 a.m. until 9:00 a.m., for many programs the charge is the same whether a child arrives at 6:30 a.m. or at 8:30 a.m. In addition, the price per block of time sometimes depends on the number of days attended in a week. For example, the (per-day) fee charged for three days of before-school sessions differs from the (per-day) fee charged for four days of before-school sessions, or two days of before-and-after school sessions. Many providers offer parents these different pricing options to allow for less than full-time attendance while covering their fixed costs. Collecting and analyzing price information is difficult when there are numerous variations offered by providers (and no consistent way to make comparisons).

The issue of pricing modes is important for many school-age care providers because of the relationship between how they set their prices and how the CCAP reimburses based on authorized hours of care. School-age care providers often set prices for blocks of time. A parent in the CCAP may be authorized for only one hour of care before school (depending on work schedule) and yet be required by the school-age care program to pay the entire before-school fee. If the hourly maximum rate is lower than the fee for the before-school block of time, the parent would be responsible for paying the difference. Under the current system, some parents may not be able to access school-age care programs that charge based on blocks of time.

[28] Note that states may collect information on prices for more age groups than they use in setting maximum rates. It is recommended that data collection include the age groups commonly used by providers to allow for analysis of age group prices, even if a state does not use all the age groups in setting maximum rates.

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To ensure access to this type of care, one approach would be to collect more information than currently obtained in the rate survey, including part-day or session (block of time) prices. However, collecting information on all pricing variations offered by providers is not feasible. Information could be collected based on the most common way of pricing for before- and after-school sessions, or for the highest price per session. Even with these limitations, adding survey questions would increase response burden and the complexity of the survey. In addition, the varied price schedules for school-age in the private market are difficult to compare across providers. With detailed information on the prices charged for each combination of days of week and maximum hours covered, analysts could calculate a per-hour equivalent for care. Alternatively, providers could be asked to report an hourly price based on converting their prices for before- or after-school blocks of time. However, in both cases the hourly equivalent is not a price found in the market; many providers do not offer care on an hourly basis for school-age children (during the school year).

Discussion and recommendations

The four main issues related to the rate survey and maximum CCAP rates for school-age children include 1) whether to include license-exempt providers of care to school-age children in the rate survey; 2) whether to identify separate submarkets for school-age children in the summer and school-year; 3) whether to separate out kindergarten-age children from older school-age children when collecting price information or setting maximum rates, and 4) how to collect data on and set maximum rates for school-age children when school-age providers used pricing modes that differ from those used to set maximum rates (hourly, daily and weekly).

For the first three issues, no change to the current approach is recommended. Including license-exempt providers like school district programs in the rate survey would provide additional information about prices in the private market. However, the cost of surveying these additional providers could be quite high. The state may wish to conduct occasional surveys of these programs to collect price information and determine whether there are other issues to consider regarding pricing of school-age care.

Minnesota's approach for the rate survey does not collect separate information on prices in the summer, or for kindergarten-age children. Instead, survey respondents are instructed to provide their highest price for school-age care if they have different prices. This approach is likely to result in findings that would include the higher prices for summer or for kindergarten-age children. Collecting more information from providers would increase the cost and complexity of the survey. However, conducting a separate survey of school-age providers at three or five year intervals would allow the state to monitor changes in the private market for school-age care in Minnesota. This (occasional) survey could include questions on summer versus school-year prices, kindergarten versus older children, hours of operation and part-time pricing.

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The main concern raised about school-age care in the CCAP is the use of pricing modes for maximum CCAP rates that do not match practices in the private market for school-age care. As described previously, providers often set prices for blocks of time that may cover up to three hours before school or up to four hours after kindergarten. The amount paid each week may vary, depending on the number of days attended and school-release days. Collecting price information for school-age care is complicated by the use of blocks of time as the basis for pricing, and the numerous schedules offered by providers. As a result, collecting hourly, daily and weekly prices in the rate survey does not fit how many providers charge for school-age care (particularly during the school-year). Collecting information on all pricing modes and schedules offered by school-age providers also does not seem feasible, in part because of the difficulty in converting or creating comparable prices across providers.

Two CCAP policy activities interact around school-age rates. The first is setting a maximum CCAP rate based on sessions or blocks of time because that would more closely reflect the market for school-age care. The current practice of setting hourly, daily and weekly maximum rates does not reflect how some providers charge for school-age care in the private market, and as a result, may limit parents' access to this type of care. The second is CCAP authorization policy. When facilities charge only by a block of time and parents are authorized to purchase care only by the hour, they may have difficulty accessing that care. This issue may be resolved by changing authorization policies rather than by collecting and analyzing additional pricing mode data, or changing maximum rate setting policy. Either re-establishing a part-day maximum rate or authorizing care in blocks of time that reflect child care schedules may directly address this access issue, though a recommendation on authorization policy would go beyond the research conducted as part of this study.

Reinstating a part-day maximum CCAP rate could have implications for the rate survey. As noted above, DHS could collect and analyze additional information in the rate survey to provide a basis for setting a part-day maximum rate. In addition to price, information on the (maximum) number of hours covered by a block of time fee or part-day price could be useful (to analyze equivalent prices across providers). Alternatively, DHS may use information from sources other than the rate survey to determine part-day maximum rates. DHS could determine a percentage adjustment of daily maximum rates for care that covered less than a full day. For example, one child care center interviewed charges about 65 percent of the daily price for care that lasts up to five hours a day (the percentage they use varies by the child's age group). The percentage chosen for the part-day maximum rate should take into account that most providers must charge a higher per-unit price for part-time care because of fixed costs.

The issues around school-age care pricing and blocks of time go beyond the rate survey and involve policies on authorization of hours of care and payment in the CCAP. Thus, changing the rate survey or method for setting maximum rates may not resolve these concerns without consideration of policies related to authorization and payments.

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The study recommendations support continued use of current survey methods for school-age care but suggest the need for additional pricing modes for part-day care. The recommendations include:

1) Do not include license-exempt providers of care to school-age children in the rate survey (no change from current practice). While including these providers would increase the amount of information on which to base maximum rates, the cost and complexity of such a survey would be high. License-exempt providers are likely to be a distinct submarket with their own set of prices and pricing modes, so data collection and analysis would need to be done to determine how they relate to licensed school-age facilities.
2) Do not collect separate price information on summer and school-year child care (no change from current practice). While child care prices differ in summer and school-year, the current survey captures adequate information for setting maximum CCAP rates. If DHS decides to set separate maximum rates for summer and school-year care, price information should be collected separately in the survey. Collecting information on school-year care prices separately might help DHS determine the most common pricing mode for part-day care (see recommendation 4).
3) Use one age group for school-age children rather than collecting separate price information for kindergarten-age and older school children (no change from current practice). The difference in price between these age groups tends to reflect differences in hours of care. It is important, however, that providers receive clear instructions on how to respond to survey questions to ensure that they understand how to answer the question on the "highest rate" for school-age children; providers should report the price for kindergartners if it is higher than for older school children.
4) Reinstate a part-day maximum rate to reflect the way providers charge parents for care that is less than a full day (such as before or after school care). However, the current survey provides limited information on which to set a part-day maximum rate. Even if price data were collected on all possible combinations of days and blocks of time offered by providers, analyzing such data would be difficult. DHS may need to consider other sources of information and other policy goals in determining how to set a part-day maximum rate.

Impact on access

It is difficult to assess the impact of a statute change to allow part-day CCAP payments on families' access to different providers and on costs to the state. The analysis of impact on access would be based on estimated changes to the maximum rates. In this case, a new category of maximum rates would be established. Access is likely to increase for families with school-age children who previously did not use providers who charged in alternative pricing modes because of the restrictions on how the CCAP pays. It is likely that this will result in some increase in CCAP payments as providers previously paid by the hour would be paid for a part-day instead, if that is how they charge parents in the private market.

The main concern raised in relation to school-age care in the CCAP focused on the discrepancy between how many providers charge for school-age care in blocks of time, and the maximum rates and authorization policies of the CCAP based on hourly, daily and weekly pricing modes. Thus, changing the rate survey, or even the method for setting maximum rates, may not resolve these concerns without consideration of CCAP policies related to authorization and payments.

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Non-standard Hour Care

When parents work during hours that are outside the standard 8 a.m. to 5 p.m. time period, children may need care during those same non-standard hours. The National Association of Child Care Resource & Referral Agencies (NACCRRA) defines non-standard hours as care occurring before 6 a.m. or after 6 p.m. on weekdays or anytime on the weekends. While most children in child care are attending care during standard hours, many also need care during non-standard hours. The 2004 statewide household child care survey found that 48 percent of children in Minnesota (of those regularly in child care) needed care in the evenings during the week, and 44 percent needed care on the weekends.[29] While many of these children are cared for by relatives during non-standard hours, the numbers suggest that there is a high level of need for non-standard hour care. Some families do not have relatives who are willing or able to provide this care.

With the majority of non-standard hour care in Minnesota provided by legal license-exempt providers, usually relatives and close friends, the same pattern is likely to hold true for parents in the CCAP who use non-standard hour care. They, too, are likely to use legal non-licensed providers for non-standard hour care. Yet parents who do not have access to relatives and close friends need access to licensed providers that offer non-standard-hour care.

Two major issues face the state. First, state policy aims to provide parents who work non-standard hours access to child care. Second, the small number of licensed providers that report providing non-standard-hour care, when combined with the even smaller number who report distinct prices for non-standard hour care, provide little market price information for setting CCAP maximum rates for non-standard-hour care. Furthermore, because much of the care during non-standard hours is provided by legal non-licensed providers (who typically do not have market prices), it is not clear whether information from the rate survey is useful for determining CCAP maximum rates for non-standard hour care.

Two main questions were identified for consideration if DHS sets CCAP maximum rates for non-standard hour care based on market information (from the rate survey). The questions include:

- What price information to collect in the rate survey (in particular, whether to collect information on other pricing modes in addition to hourly or for different types of non-standard hour care)
- Whether to include non-standard hour prices only if they exceed the standard hour prices.

In addition, two issues were considered related to setting CCAP maximum rates for non-standard hour care:

- Whether to determine the 75th percentile (and the non-standard hour maximum rates) at a regional or statewide level rather than at the county level
- Whether to consider approaches to setting non-standard hour maximums based on information or policy outside the rate survey.

Each of these issues is examined next, followed by recommendations.

[29] Chase, R., Arnold, J., Schauben, L. and Shardlow, B. (2005). Child care use in Minnesota: 2004 statewide household child care survey. St. Paul, Minn.

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Non-standard hour care in the rate survey

During Minnesota's rate survey, providers are asked for three pieces of information related to non-standard hours of care. First, providers are asked if they provide care in the early mornings (before 6 a.m.), evenings and nights (after 6 p.m.) or weekends. Second, providers are asked their highest hourly charge when providing care during early mornings, evenings, nights or weekends for each age group. Only hourly prices are collected for care during non-standard hours. Third, providers are asked their opening and closing times for each day of the week (including weekends). Based on reported opening and closing times, the number of providers open during any non-standard hours was calculated.

Very few licensed providers in Minnesota offer care specifically during non-standard hours. Based on an analysis of opening and closing times in the 2007 rate survey data, most providers do not offer any non-standard hour care. Some center facilities may be open slightly longer (before 6 a.m. or after 6 p.m.), but few offer extensive non-standard hours or overnight care. Table 33 shows the number and percentage of centers and licensed family providers who are open for at least one hour during non-standard hours, based on an analysis of their opening and closing times in 2007 survey data. Only providers open at least one non-standard hour are included, so those who close at 6:30 p.m. or open just before 6 a.m. are excluded.

Table 33: Availability of licensed providers during non-standard hours in Minnesota

	Providers open at least one nonstandard hour				Providers open 24 hours			
	Centers		Licensed family providers		Centers		Licensed family providers	
Economic dev. region	Number	%	Number	%	Number	%	Number	%
1	0	0	41	14.5	0	0	1	0.3
2	2	20.0	18	9.3	0	0	7	3.5
3	4	9.8	66	12.5	0	0	21	3.9
4	1	5.3	40	6.1	0	0	10	1.5
5	0	0	54	14.6	0	0	7	1.8
6E	1	6.7	41	12.5	0	0	7	2.1
6W	0	0	14	9.3	0	0	2	1.3
7E	1	5.3	53	17.2	0	0	11	3.5
7W	1	2.4	89	7.5	0	0	8	0.7
8	2	13.3	40	10.7	0	0	7	1.8
9	1	2.5	49	8.2	0	0	14	2.3
10	0	0	136	10.8	0	0	30	2.4
11	18	3.5	199	5.0	5	1.0	36	0.9

Note: Non-standard hours include after 6 pm and before 6 am on weekdays and anytime on weekends. A map of the Minnesota economic development regions can be found in the technical appendix. Based on 2007 rate survey data.

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The percentage of providers open at least one non-standard hour varies across regions and type of provider (centers or licensed family child care providers). For centers, the percentage open at least one non-standard hour ranges from zero to 20 percent across the regions. The number of licensed family providers offering at least one non-standard hour in most regions is larger, but the percentage is similar to that of centers, ranging from 5 to 17 percent across regions. Based on an analysis of opening and closing times in 2007 survey data, very few licensed providers offer overnight care (24 hours) anywhere in the state.

Most licensed providers do not offer care during non-standard hours, and those that do often charge the same hourly price as for standard hours. Table 34 shows the average hourly price charged during non-standard hours for preschool-age children by region in Minnesota. (Other age groups had similar results.) The number of licensed providers reporting an hourly price for non-standard hours in the 2007 rate survey was quite small, especially for centers, in part because few licensed providers offer non-standard hour care. In addition, the 2007 rate survey asked only for hourly prices for non-standard hour care, and some providers might use alternative pricing modes for this care. For most providers who reported non-standard hour prices, the hourly prices were the same for standard and non-standard hours.

Few licensed providers charge more for non-standard hour care than their usual hourly charge, though those who do charge more may offer more extensive non-standard hours (beyond a slightly earlier opening or later closing time). There is only one center in Minnesota that reported a higher hourly price for non-standard hour care. For this center, the hourly price for school-age was $3.50 higher during non-standard hours. Among licensed family providers, the range of premiums for non-standard hour care ranged from 7 cents per hour to $10. Most premiums fell between 25 cents and $1.50 per hour. The few providers who report much higher premiums, up to $10 per hour, may use this as a way to discourage use of non-standard hours, or late pickups by parents. However, there is no information, based on the survey, as to why some providers charge more, sometimes considerably more, while others charge the same or even less for non-standard hour care.

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Table 34: Comparison of hourly prices for non-standard (NSH) and standard hours for preschool age children by region

Economic Dev. Region	Centers			Licensed family child care providers		
	Number reporting a NSH hourly price	Mean NSH price	Mean difference in hourly prices	Number reporting a NSH hourly price	Mean NSH price	Mean difference in hourly prices
1	0			17	$1.99	$0.03
2	1	$2.85	-$0.17	6	$1.98	$0.04
3	5	$3.08	$0.00	88	$2.56	$0.03
4	0			14	$2.06	$0.00
5	1	$5.00	$0.00	75	$2.45	$0.08
6E	4	$5.88	$0.00	61	$2.37	$0.06
6W	1	$2.15	$0.00	33	$2.07	$0.05
7E	3	$9.00	-$0.25	53	$2.68	$0.11
7W	5	$7.80	$0.00	103	$2.76	$0.23
8	4	$2.59	$0.00	68	$2.08	$0.02
9	0			16	$2.23	$0.15
10	0			19	$2.69	$0.19
11	16	$8.65	$0.00	139	$5.80	$0.72

Note: Based on preschool-age prices in the 2007 rate survey. A map of Minnesota economic development regions is located in the technical appendix.

As described above, few licensed providers offer care during non-standard hours, and even fewer report an hourly price for non-standard hours in the rate survey. The low numbers may indicate that some providers charge in pricing modes other than hourly. However, collecting information on additional pricing modes is unlikely to increase the number reporting prices sufficiently to allow calculation of county-level non-standard hour rates (in most counties). In addition, prices may differ depending on the timing of the non-standard hour care. Providers may charge differently for weekend daytime care than evening care during the week, and differently still from overnight care. Collecting information on these price variations would increase the survey cost, yet is unlikely to provide sufficient numbers in most counties to allow calculation of a maximum rate.

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Based on 2007 rate survey data, few licensed providers report hourly prices for non-standard hour care, and even fewer report charging a higher price for that care. If the average price is the same for non-standard and standard hour care, one might conclude that there is no need for separate (higher) maximum rates for non-standard hour care. However, the reported prices do not reflect the price that might induce other licensed providers to offer non-standard hour care. Providers currently willing to provide non-standard hour care at the same price they charge for standard hour care may differ from those who are not willing to, and it is likely that other providers would want to charge a higher price to provide non-standard hour care (as they are not offering non-standard hour care at their current prices). Thus, the rate survey provides only a limited amount of information about non-standard hour prices, including only licensed providers (not legal non-licensed providers), and only those willing to offer non-standard hour care and report hourly prices.

Setting maximum rates for non-standard hour care

Under current practice in Minnesota, DHS sets maximum rates for non-standard hour care only for licensed family child care homes in counties with a sufficient number of providers reporting a non-standard hourly price. In addition, DHS sets a maximum rate for non-standard hour care only if it will be higher than the applicable maximum rate for standard hour care.[30] Less than one-third of Minnesota counties had a 2007 non-standard hour maximum rate (and in some counties, for only one or two age groups). A non-standard hour maximum is not set for child care centers because of the small numbers reporting non-standard hour prices in the rate survey. The applicable maximum rate for standard hour care is used in cases for which there is no established non-standard hour maximum.

[30] The 75th percentile of the non-standard hourly price may be lower than the 75th percentile of all the hourly prices reported in the county (for standard hours) because of differences in prices across providers (providers may in some cases charge less for non-standard hour care, or providers who offer non-standard hour care may have lower prices, on average, than those who do not).

One option for addressing the small number of providers reporting non-standard hour prices is to use a larger grouping of counties to establish a regional or statewide non-standard hour rate. Table 35 provides an example of estimated 75th percentiles calculated for hourly non-standard hour prices for Region 11 and greater Minnesota.[31] While this approach would increase the number of providers used as a basis for calculation of the 75th percentile, the result might not reflect variation in premiums charged for non-standard hours within the regions, and thus may limit parent access to this type of care in certain areas. For example, for licensed family child care providers, the 75th percentile of non-standard hour prices in Region 11 is $6 for toddlers, while the 2007 maximum non-standard hourly rate in Dakota County is $10. Comparisons between the regional non-standard hour rate and the 2007 non-standard hour maximum show that the regional percentile is larger in most counties, but in a few counties it is considerably below the maximum. Changing to a regional approach may therefore affect parental access differently across counties. However, even with regional or statewide calculations, these calculations are based on a relatively small number of licensed providers reporting hourly prices for non-standard hour care.

Table 35: Estimated 75th percentile for non-standard hour care for Region 11 and greater Minnesota

Hourly Price	Region 11	Greater Minnesota
Centers		
Infants	$12.00	$9.00
Toddlers	$10.00	$9.00
Preschool	$10.00	$9.00
School Age	$10.00	$8.50
Licensed family child care providers		
Infants	$7.00	$2.75
Toddlers	$6.00	$2.60
Preschool	$6.00	$2.50
School Age	$6.00	$2.50
Note: Based on 2007 rate survey data		

[31] The regional comparison could be done using one or more of the alternative groupings described in the section on geographic groupings.

As an alternative to calculating a non-standard hour rate based on the rate survey, a number of states use a dollar or percentage increase over the standard hour maximums for non-standard hour care. Fifteen states and the District of Columbia set a higher maximum rate for non-standard hour care in their child care assistance programs. The most common methods are a flat increase, or percentage increase, of the relevant maximum rate.[32] Nine states and the District of Columbia offer a percentage increase for non-standard hours ranging from 5 to 100 percent over the maximum rate for care during standard hours. Montana doubles the maximum rate for care during non-standard hours. Illinois, Kentucky, and West Virginia increase the maximum rate paid for non-standard hours by $2 to $4 per day per child. These states set higher maximum rates for non-standard hour care in an effort to provide incentives for providers to offer non-standard hour care, however, these states have not reported whether providers are more likely to offer non-standard hour care in response to higher maximum rates.

Some states place conditions on higher rates for non-standard hours. California requires that a minimum of 25 percent of the hours spent in care be during non-standard hours. If 25 to 50 percent of time is spent in non-standard hours, the state will pay up to 12.5 percent higher than the standard maximum rate. Spending more than 50 percent of care time in non-standard hours qualifies for an increase in the maximum rate by 25 percent. Maryland's differential also ranges between 5 to 15 percent, depending on the number of hours spent in care during non-standard hours. West Virginia requires that at least four hours per day must be during non-standard hours for the differential to be applied. Montana requires 12 hours of care in a 24-hour period for a rate differential to be applied.

The use of a dollar or percentage increase over the standard hour maximums for non-standard hour care avoids the problem of low numbers reporting prices for non-standard hour care. A percentage increase would account for regional price variation in the state (to the extent that standard maximums vary across regions), unlike a fixed dollar increase. The amount of this premium could be based on the non-standard hour price differences found in the market, although the small number of providers reporting these prices is still a concern. Alternatively, the percentage increase could be higher than the non-standard hour price difference found in the market, which might provide an incentive to providers to offer non-standard hour care.

The extensive use of legal non-licensed providers for non-standard hour care partly reflects availability (few licensed providers offer non-standard hour care), and partly reflects preferences (parents may prefer relatives and close friends for this type of care). Few licensed providers are willing to provide care during evening, overnight and weekend hours, yet many parents require care at these times due to their work schedules, and may not have access to relatives and friends who are able or willing to care for children. Therefore, providing access to non-standard hour care is an important policy objective. However, using the market rate survey to set higher non-standard CCAP maximum rates may not be an effective tool for increasing access.

[32] Szekely, Amanda E., Using CCDF to Finance Improved Access to Child Care During Nontraditional Hours. Welfare Information Network. 2004. http://www.researchconnections.org/discover/redirect.jsp?redirectTo=http://www.financeproject.org%2FPublications%2FusingccdftofinanceSB.pdf

The rate survey provides insufficient information about prices for non-standard hour care, both because of the small number of licensed providers reporting prices, and because legal non-licensed providers generally do not have market prices. Prices of licensed providers who are willing to offer non-standard hour care may not reflect a premium for that care, and may not induce other providers to provide this care.

Discussion and recommendations

Based on analysis of issues related to collecting accurate and meaningful market price data for non-standard hour care, the following recommendations are made:

1) Collect information on non-standard hour care availability and hourly prices in the rate survey (no change from current survey practice). Use this information to track availability of non-standard hour care offered by licensed providers, and to inform policy on setting maximum rates for non-standard hour care.

2) Do not use reported hourly prices for non-standard hour care to calculate and set maximum non-standard hourly rates at the county or regional level. Consider determining maximum rates for non-standard hour care based on information or policy goals other than the rate survey. One option is to set non-standard hour maximum rates based on a percentage increase over the standard maximums to account for price variation across counties. Use survey information to monitor premiums charged by providers for non-standard hour care to ensure that policy does not limit access to this kind of care.

3) Consider alternative approaches to increase availability of non-standard hour care by licensed providers through policies and programs other than setting of separate CCAP maximum rates for non-standard hour care. (An analysis of these alternative policies is beyond the scope of this project.)

Impact on access

The impact on access of a change in how maximum rates are set for non-standard hour care is difficult to assess. Additional information would be needed, including how providers respond to changes in non-standard hour maximum rates (e.g., do they provide more or less care as a result?), and how parents respond (e.g., do they use more or less non-standard hour care?) Two-thirds of Minnesota counties do not have separate non-standard hour maximums. A policy that sets a higher non-standard hour maximum based on a percentage increase over the standard maximum would result in higher maximums in these counties, therefore could increase parents' access. However, there is little research to inform policy regarding the level at which providers would respond by offering (more) non-standard hour care. Based on comments from the stakeholder committee, the lack of availability of non-standard hour care may be related to regulatory issues more than CCAP rate setting. Given the stated policy goal of ensuring access to non-standard hour care, it makes sense to set a higher maximum rate for non-standard hour care to allow access to providers who charge more for this type of care. However, other policy approaches may be more effective than CCAP maximum rate setting for increasing the availability of non-standard hour care.

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Conclusion

DHS, following legislative direction, sets maximum rates that can be paid for care in Minnesota's CCAP. DHS contracts for a survey of child care prices to be conducted in the state. Conducting the price survey and setting CCAP maximum rates are distinct but interrelated activities. The price survey can provide a wealth of information about the child care market, expanding knowledge about regional differences in prices, provider pricing practices, and availability of different kinds of child care. Until recent years, maximum CCAP rates were based on findings of the most recent survey. However, the current process for setting CCAP maximum rates is based on recent legislative decisions not directly connected to survey results.

Setting CCAP maximum rates based on findings from the price survey has several advantages from a policy perspective. First, the federal Administration for Children and Families, which oversees the Child Care and Development Fund, encourages states to use survey findings to inform setting of child care subsidy maximum rates. Second, federal rules require that states demonstrate, based on the survey, that families receiving child care assistance have access to care in their communities equal to that of parents not receiving subsidies. Using survey results to inform setting of CCAP maximum rates can provide the basis for equitable treatment of families in different parts of the state, or needing different types of care, as measured in terms of access.

Given the importance of survey findings for CCAP policy, the accuracy of results is important and requires use of scientifically sound methods for conducting the survey, analyzing the data, and reporting findings. Many aspects of the current method used by DHS follow best practices as recommended by national experts.[33] This report, prepared by a research team at the University of Minnesota under contract to DHS, explored alternative techniques for collecting and analyzing child care price information in the survey. The report focused on four key issues identified by DHS: geographic groupings; pricing modes and price conversions; school-age care and non-standard hour care. Alternative regional grouping strategies considered included both ZIP code- and county-based groupings, as well as groupings based on child care prices, economic characteristics such as average female earnings, and administrative regions such as metropolitan designations or CCR&R districts.

The current practice of setting distinct maximum rates for each county has the advantage of allowing for price variations around the state, yet encounters problems when there are few providers in a county, or when counties include more than one child care market. Larger geographic groups may help to resolve these issues and will reduce the number of maximum rate categories needed. However, larger geographic groups may not reflect differences in local child care markets, and depending on how they are created, could result in less access to care in some communities. The study recommends a process for creating geographic groupings rather than proposing a specific set of groups. If DHS proposes a change in methods to create larger geographic groupings, the recommended process would be used with data from the most recent survey to identify the specific groups. Testing the groups with

[33] Grobe, D., Weber, R. B., Davis, E. E., Kneader, J. L., and Pratt, C. 2008. Study of Market Prices: Guidance for Validating Child Care Market Rate Surveys. Corvallis, OR: Family Policy Program, Oregon State University.

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current survey data is critical to ensuring that the groups reflect differences in child care markets. Collecting and analyzing survey data on provider prices at the county and ZIP code-levels will continue to be necessary as a means of testing the larger geographic groups.

Child care providers have varied pricing practices, which creates challenges for the survey of prices and for CCAP maximum rate setting. In order to collect accurate price information about the private child care market, the survey collects price data in the pricing modes commonly used by providers (hourly, daily and weekly). CCAP maximum rates are set using these common pricing modes. However, it is important to monitor the pricing practices of providers in the survey as they may shift over time.

Care for school-age children is one submarket for child care services in which pricing practices vary substantially. The main concern raised about school-age care in the CCAP is the use of pricing modes for maximum CCAP rates that do not match practices in the private market for school-age care. Prices may be based on blocks of time (e.g., a set price for part of a day, regardless of the hours actually used), and on the number of days of care per week. Collecting information on all pricing modes and schedules offered by school-age providers does not seem feasible, yet the current practice of setting hourly, daily and weekly CCAP maximum rates does not reflect how some providers charge for school-age care in the private market. Addressing these concerns may require review of authorization and payment policies rather than collection of additional price data. For example, the re-establishment of a part-day maximum rate, or authorization of care in blocks of time that reflect child care schedules, may resolve this issue.

Not only do providers use different pricing modes, research provides strong evidence that there is not a standard way in the child care market of converting prices from one pricing mode to another, for example, from an hourly price to a weekly price. As a result, using a formula to convert provider prices is likely to create prices that do not exist in the market, thus distorting the survey findings. There are two key questions to consider: first, under what circumstances is a price needed in another pricing mode (that is, when should price conversions be done), and second, how should the converted price be created (e.g., what formula to use). The use of larger geographical groupings should eliminate the need for conversions due to concerns about statistical validity arising in areas with few providers. However, DHS has identified a small number of situations in which converted prices are considered necessary for reasons related to CCAP payment cap policies. In those situations, use of a formula to convert prices that is based on local market practices is likely to best represent "what the market prices would have been." However, gathering additional information on pricing practices of providers who use only an hourly price mode may help to inform DHS on how best to create these converted prices.

When parents work during hours that are outside the standard 8 a.m. to 5 p.m. time period, children may need care during those same non-standard hours. While many children are cared for by relatives during non-standard hours, some families do not have relatives who are willing or able to provide this care. Few licensed providers report prices for non-standard hour care, so there is little market price information on which to base CCAP maximum rates for non-standard hour care. Because there is limited information in the formal priced market for non-standard hour care, an alternative approach is to base policy decisions on policy objectives and information outside the survey. The practice used in a number of states is to set a maximum rate for non-standard hour care that is a certain percentage above the applicable standard hour maximum rate. Further research is needed, however, to determine the most effective approach to increasing non-standard hour care, whether by a percentage increase in CCAP maximum rates for non-standard hours, reducing regulatory barriers, or providing other types of incentives to providers.

Conducting a survey of child care prices is a complicated endeavor, primarily because the child care market is complex. Thus, it is important to keep in mind the goal and purpose of the child care market rate survey: the information is used to inform CCAP maximum rate setting so that parents receiving a subsidy have access to the child care market. The most important criterion, therefore, for judging the quality of a market rate survey is whether the results accurately reflect the child care market. The use of survey findings to inform the setting of CCAP maximum rates helps to ensure that parents have access to care in the local market.

A separate companion document, DHS-5540A-ENG, contains the Technical Appendices for this report. This document includes detail on criteria used to create different groupings, additional results on price conversions and geographic groupings, project methods and data sources. Online readers of this report can access the Appendices by clicking this link to DHS-5540a. Others can view this document by going to the DHS Web site, www.dhs.state.mn.us, click on the Publications tab, and using the search function to find "Techncial Appendices: Alternative Methods for Minnesota's Market Rate Study of Child Care Prices."

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