Analyzing Your Market Rate Survey Data

Analyzing market rate survey data is an important step toward your goal in setting Child Care and Development Fund (CCDF) subsidy rates. The primary objective of the analyses is to develop reasonable and accurate estimates of the prices child care providers charge for children whose parents do not receive state or federal subsidies.

This is the third in a series of four briefs on market rate surveys and the rate setting process. The focus of this brief is on analyzing the market rate survey data that Lead Agencies collect. This brief provides an overview of steps that Lead Agencies can take to analyze the results of their market rate survey study and to develop price estimates. The brief proposes considerations to rank price estimates into percentile values that can then be used to assist in setting rates. In addition, the brief contains a high-level overview of the steps researchers and data analysts generally take to analyze survey data. The brief does not describe complex statistical methods. Instead, it is intended to be used as a guide to help child care program administrators work with data analysts to maintain oversight of the survey process and ensure that results are consistent with the Lead Agency's objectives.

In the first brief, "*Planning Your Market Rate Survey*," published March 7, 2018, we address regulatory requirements for conducting market rate surveys, differences between prices and the actual cost of care, steps for engaging stakeholders and establishing objectives, and survey methods. The second brief, "*Designing and Conducting Your Market Rate Survey,*" published April 23, 2018, discusses data sources that can be used to conduct or augment the survey, developing survey instruments, selecting the survey participants, timing, and how to engage the child care provider community to ensure adequate participation.

What is the Primary Objective of the Analysis?

Analyzing market rate survey data is not the same as setting the provider payment rates. They are distinctly separate processes. As noted previously, the primary objective of analyzing the data is to develop reasonable and accurate estimates of the prices child care providers charge for children who do not receive state or federal subsidies. The rate setting process cannot begin until all the market rate survey results have been analyzed and determined to be valid and useable. Data about prices and costs should both be considered when setting rates. We will address the rate setting process in the fourth brief in this series.

Evaluating Survey Response Rate

The first step in analyzing the survey results begins with evaluating your survey response rate. Even before the survey deadline, you may want to assess whether surveys are being returned as expected. As completed surveys are returned, you may compare them with the number sent to ensure that you are receiving an adequate response from all types of settings for all age groups, and across all local market areas.

If responses appear to be low for specific segments of the market, this will allow you to urge providers to complete the survey. If the survey is conducted by mail and response rates appear to be low, Lead Agencies should ensure that the providers' addresses are accurate. If the survey was sent to a sample, rather than the full universe of providers, a common practice is to draw an "oversample" of providers in case response rates are low or questionnaires returned are incomplete or unusable. Lead Agencies could randomly select and send the survey to providers included in the oversample.

Recommended Response Rate: High response rates are critical to achieving accurate results. The number of respondents should be sufficient to ensure that the survey estimates are representative of the prices parents will

encounter in the priced market. Response rates should be at least 65 percent of the providers surveyed. Lower response rates likely will decrease the accuracy and could lead to erroneous results both within and between surveys.

Response rates across all regions or local submarkets should be sufficient to produce a reliable and representative sample. A submarket is an area within a market that shares distinct and different economic and demographic similarities, such as high poverty districts, priority school districts, or areas where there may be an economic boom or recession. Localities with low population densities and limited supplies of licensed care for specific age groups are especially prone to inaccuracies. The prices reported by a single provider with high enrollment levels can skew the results, causing a significant increase or decrease in the price estimates. Sampling 100 percent of providers is recommended for submarkets with small numbers of facilities or an insufficient supply of child care slots for specific age groups. We address options Lead Agencies have for dealing with these issues later in this brief.

Data Collection Period: As noted in our previous brief, "*Designing and Conducting Your Market Rate Survey*," data used to establish the price estimates should be collected over a period not to exceed three consecutive months because provider tuition fees do not remain constant. They change over time, often at the start of a calendar year or a new school year. Therefore, price data collected over longer periods may be inaccurate.

Regional Prices

The CCDF Final Rule at CFR 98.45(d) requires Lead Agencies to ensure that the market rate survey reflects price variations by geographic location, category of provider, and age of child. Market price data can be used to identify geographic price differences in local markets and submarkets and may suggest whether existing rate regions may need to be redefined. However, some localities and submarkets may not have enough respondents to develop accurate price estimates. This may not be clear until after the raw survey data has been input into the survey analysis software.

Low response rates usually occur in rural areas with low population densities where the supply or demand for child care services are limited. Lead Agencies have several options to address response rate issues. The first step is to determine the cause, which may be due to:

- lack of interest from providers;
- insufficient facilities in the submarket; or
- lack of supply of care for certain age groups (e.g., infants/toddlers).

As noted above, Lead Agencies can resample areas with gaps if the cause is a low response rate from providers. Ideally, this should be done within the same data collection period of the survey to ensure consistency and accuracy. Local economic conditions, demographics, population density, and other factors affect the supply of child care. If the low response rate is due to an insufficient number of facilities in specific local markets, Lead Agencies can consider creating a stratified sample of providers from different markets with similar characteristics to increase the response rate and validity of the estimates.

Preparing the Raw Data

Once analysts are comfortable with the preliminary response rate it is time to enter the survey results into a database to complete the analysis. Through this process, the analyst may find that the response rates for specific age groups or geographic areas is lower than the preliminary estimate. The analyst will need to decide if the response rates are sufficient to produce reasonably accurate estimates. If they are not, there are several options to consider. While not ideal, these options can help to improve gaps in the survey results.

- Resample the areas if the price data can be collected within the same, or reasonable period as the original survey.
- Merge data from areas with similar economic and demographic characteristics or locations adjacent to the areas with low response rates.
- Augment the survey data with price and capacity from Child Care Resource and Referral (CCR&R) or other administrative data that is reasonably current.
- Use other statistical methods, such as comparing the average prices for these areas to the statewide average prices.

The analyst may use different software tools to examine the data and perform the necessary analysis. However, the entire process could be completed effectively using a basic analytic tool, such as Microsoft Excel. Several key steps should be taken to evaluate and clean unusable data before calculating the survey price estimates. Survey responses need to be evaluated for accuracy and completeness. Information entered for each of the respondents is generally sorted by location, facility type, and child age group. Analysts should use statistical methods to quantify the data, remove erroneous values referred to as outliers, and organize the results into a consistent format that can be used to calculate the price estimates.

Clean Unusable Data: Data cleaning is the process of removing or correcting unusable or inaccurate data. For example, responses on the questionnaires may be blank, incomplete, inconsistent, or non-responsive to the information requested. An incomplete survey questionnaire may not identify the facility or location, for example. The cleaning process involves removing bad data, validating values against the survey responses, and contacting child care providers for additional information or clarifications. Examples of data that need to be removed or corrected include the following:

- Responses with a value of zero or where the price was left blank.
- Prices not associated with a billing period or rate unit. For example, the respondent entered a price of $60 without indicating if the rate was a daily rate or part-day or full-day rates.
- Decimal points were missing from the response. For example, if the provider listed a full-time preschool rate of 14000 per week, it may be reasonable to assume that the correct value is $140.00 per week.

Organizations with Multiple Sites: Privately owned national provider chains and programs managed by municipalities, or associations of providers operated by nonprofit organizations may operate facilities in multiple locations. Lead Agencies should ensure that the reported prices are associated with the individual sites. This could be done by reviewing the questionnaires to confirm that each response included the facility's license number and address.

Outliers: Outliers are prices that fall significantly outside of the range of other prices reported by respondents. It is difficult to determine if a price value is a true outlier and should be dropped from the analysis, or if it is within the range of prices that should be included. Researchers should use statistical methods to identify true outliers. For example, they may compare them to the average of the reported price values and calculate the deviation from the average rate to determine the impact the outlier has on the price estimates. Outliers that are not removed from the analysis can distort the results of the prices estimates.

Validity of the Results

The accuracy of the market rate survey results largely depends on the clarity of the survey questions, how well the survey was administered, the response rates, and whether providers answered questions consistently. While there is no absolute way to determine the validity of the results without performing a statistical analysis, Lead

Agencies may look at the reported prices to see if "on face value" the results appear to be reliable. One approach is to compare the survey results to the current prices listed with CCR&R agencies. Lead Agencies can use license numbers to conduct a match with the CCR&R database to see how the prices compare. It is important to emphasize that face value tests are not a measure of statistical validity.

The CCDF Final Rule at 45 CFR 98.45(c)(1) requires market rate surveys to be statistically valid and reliable. Based on CCDF research[1] to identify the parameters for valid and reliable market rate survey, the Administration for Children and Families (ACF) provides guidance in the preamble section of the CCDF Final Rule. [2] It outlines the following benchmarks that may be used to assess the validity and reliability of the survey:

1. Includes child care providers within the priced market that charge parents a price established through an arm's length transaction where the parent and the provider do not have a prior relationship that is likely to affect the price charged.
2. Uses data sources or combinations of sources that fully capture the universe of providers in the priced child care market.
3. Includes providers from all geographic areas of the state, territory, or tribal service area and collects and analyzes data in a manner that links prices to local geographic areas.
4. Uses rigorous data collection procedures regardless of the method (mail, telephone, web-based, or administrative data) and includes a response from a high percentage of providers; generally, 65 percent or higher (below 50 percent is suspect).
5. Uses strong sample designs and conducts analyses of potential response bias to ensure that the full universe of providers in the child care market is adequately represented in the data and findings.
6. Analyzes data in a manner that captures market differences and examines the price per child care slot, recognizing that all child care facilities should not be weighted equally because some serve more children than others.
7. Collects and analyzes price data separately for each age group and category of care to reflect market differences.

Price Mode Conversions

Child care providers use different methods or price modes for charging tuition rates to families. Common price modes include hourly, part-day, full-day, weekly, and monthly rates. In our prior brief, "*Designing and Conducting a Market Rate Survey*," we suggest ways of limiting the need for price mode conversions through the design of the survey questions or by asking providers how they define part- and full-time care or other price modes they use.

Price mode conversions can impact the validity (or reliability) of the survey results. The survey will be more accurate when the need for conversions is eliminated or minimized. Table 1 lists common conversions methods. There are no standardized formulas for converting one pricing mode to another. Lead Agencies must make assumptions about which conversion factors to use if the information was not obtained through the market rate survey, which can lead to validity issues.

[1] Grobe D., Weber, R., Davis, E., Kreader, L. and Pratt, C., (2008). Study of Market Prices: Validating Child Care Market Rate Surveys, Oregon Child Care Research Partnerships.

[2] CCDF Final Rule, page 67509,: https://www.gpo.gov/fdsys/pkg/FR-2016-09-30/pdf/2016-22986.pdf

Table 1: Common Price Mode Conversion Factors

Pricing Mode	Conversion Factor
Hourly ⟷ Daily	Eight or nine hours per day
Hourly ⟷ Weekly	35, 40 or 45 hours per week
Daily ⟷ Weekly	Five days per week
Hourly ⟷ Monthly	160 to 180 hours per month
Daily ⟷ Monthly	22 days per month
Weekly ⟷ Monthly	4.33 weeks per month
Part-Time Daily	Up to four or five hours per day
Full-Time Daily	More than four or five hours per day
Part-Time Weekly	Less than 25 to 32 hours per week
Full-Time Weekly	More than 25 to 35 hours per week

If a provider charges hourly tuition rates and the subsidy program uses weekly rates, the hourly price needs to be converted to a weekly price. The analyst may multiply the hourly rate by 35, 40, or 45 hours to convert it to a weekly rate when analyzing the market rate data. But the assumption may be inaccurate and lead to an invalid result. Table 2 demonstrates the potential impact converting one pricing mode to a different pricing mode can have on market price estimates.

Table 2: Impact of Price Mode Conversions

License Number	Region	Setting	Hourly School-Age Price	Weekly Conversion Factor	Weekly Price at 35 Hours	Weekly Conversion Factor	Weekly Price at 40 hours	Price Difference
1121	North	Center	$ 8	35 hours	$280	40 hours	$320	+ $40
2127	North	Center	$11	35 hours	385	40 hours	$440	+ $55
6742	North	Center	$7	35 hours	$245	40 hours	$280	+ $35
9875	North	Center	$9.50	35 hours	$332.25	40 hours	$380	+ $47.75
3765	North	Center	$10	35 Hours	$350	40 Hours	$400	+ $50

The example includes a small subset of five child care providers. It uses two different factors—35 hours and 40 hours, to convert the hourly prices reported by the providers to weekly prices. The results differ by more than $35 per week depending on which conversion factor is used. Therefore, it is important to be aware that market rate surveys that require multiple price mode conversions can decrease the accuracy of price estimates.

Weighting Prices by Capacity

A market rate survey should accurately capture all the prices that providers charge to parents in the child care market. A more sophisticated method of measuring the price of care is to weight the price charged by each provider's capacity; i.e. the number of slots. The consensus among most early care and education researchers is that market prices should be weighted by capacity to account for differences in the size of child care programs. This is referred to as the *weighted average*. Weighting prices by capacity determines the relative importance of each value in the child care market. For example, assume two child care programs serve preschool children in a local community. Provider A has a capacity of 30 preschool slots. Provider B has a capacity of 100 preschool slots. Each program charges different prices for tuition. Treating the programs equally by averaging the prices does not

reflect the fees parents will encounter because Provider B offers more slots at the same price—70 more children than Provider A. Therefore, programs with more capacity have a greater impact on the child care market. [3]

There are different methods for measuring capacity. For instance, licensed capacity which is often tied to the square footage of the child care classroom; staffed capacity, which is based on the numbers of teaching staff, staff to child ratio, and group size requirements in each classroom; and typical enrollment, which is based on what the program typically enrolls in a given classroom. Licensed capacity can overstate the number of available slots because most child care programs do not operate at full capacity. Lead Agencies may consider asking providers to indicate their typical or optimal enrollment levels to develop price estimates that are more consistent with the tuition fees families will encounter in the priced market.

Weighted Average Price Calculations

Weighing the reported prices by capacity determines the relative importance or weight each value has in the child care market. The weighted average differs from the average price in that it is calculated by multiplying the reported prices by the capacity—i.e., the number of slots reported for each age group and price value. Table 3 demonstrates the difference between straight average and weighted average price value calculations.

Table 3: Average vs. Weighted Average Prices Values for Preschool Children

Provider	Region	Setting	Weekly Price	Number of Slots	Weighted Price
1	East	Center	$320	25	$8,000
2	East	Center	$560	60	$33,000
3	East	Center	$480	50	$24,000
4	East	Center	$400	75	$30,000
5	East	Center	$360	15	$5,400
6	East	Center	$520	70	$36,400
7	East	Center	$420	40	$16,800
8	East	Center	$360	30	$10,800
9	East	Center	$320	40	$12,800
10	East	Center	$280	35	$9,800
Total of 10 Providers		**Totals**	**$4,020**	**440 Slots**	**$187,000**
		Average Price = $402		**Weighted Average Price = $426**	

In this example, the average price for preschool care is calculated by adding the sum of the reported prices ($4,020) and dividing the total by the total number of the providers (10). The result is an average price of $402. The weighted average price calculation has an additional step. The prices are multiplied by the number of preschool slots each provider has. The sum of the weighted average prices ($187,000) is then divided by the total number of slots (440). The result is a weighted average price of $426, which takes the capacities of the facilities into account. Weighted average prices more accurately represent the extent to which families will encounter these prices in the child care market.

[3] Weber, R., Grobe, D, Davis, E., Kreader, j., Pratt, C., (May 2007), *Practices and Policies: Market Rate Surveys in States, Territories, and Tribes*.

Determining Market Rate Percentiles

The CCDF Final Rule at CFR 98.45(a) requires Lead Agencies to certify that their payment rates are sufficient to ensure equal access to child care services comparable to those provided to families not eligible to receive child care assistance under any federal, state, or tribal programs. Traditionally, a market rate survey provides an easy comparison for what parents in the "priced market" pay for care. ACF considers payment rates set at the 75th percentile or higher as providing families receiving CCDF subsidies with access equal to that of families not receiving child care assistance.

The 75th percentile refers to the number separating the 75 percent of the lowest rates from the 25 percent that are highest. To calculate market rate percentiles, the price estimates need to be listed in rank order from the highest price to the lowest price. For example, assume that 20 providers responded to the market rate survey and each provider has only one preschool child care slot. The 75th percentile would be the price at or below which 15 of the providers (75 percent x 20 providers = 15) reported charging for services.

Using the 75th percentile is not the only method to demonstrate equal access. Examples of data sources and types of information that can be used to demonstrate access can be found in this OPRE research report "*Market Rate Surveys and Alternative Methods of Data Collection and Analysis to Inform Subsidy Payment Rates*."

Comparing Average and Weighted Average Price Calculations

The tables on the following pages demonstrate how to calculate the 75th percentile price values. The examples assume that within a county there are 20 child care center providers. Table 4A lists the prices charged by each of the 20 providers ranked from the highest price to the lowest price. The calculation counts each provider equally. It does not take the number of slots each provider has (its relative weight in the child care market) into consideration. Table 4B performs the same calculation, except instead of ranking the price values, it multiplies the prices by the number of child care slots (capacity) of each provider to weight the price values.

Table 4A: Column A lists the license number or provider ID of the facility. Column B numbers the providers, ranking them from highest to lowest priced provider. Column C lists the cumulative percent of providers, counting each provider once starting at the bottom of the column. Each provider's prices are listed in Column D. The row highlighted in yellow is the price at or below which 75 percent reported prices fall. In the example, 75 percent of providers reported charging $500 or less for tuition, which is the 75th percentile.

Table 4B: Using the same 20 providers, **Table 4B** performs the same calculations as Table 4A, except that instead of counting each provider equally, it counts the number of slots at each price level from the highest to lowest price. These 20 providers offer 1,320 slots within the child care market. We calculate the 75th percentile based on the number of slots at the different prices charged, highest to lowest. Column C lists the cumulative total number of slots for all 20 providers. Column D lists the cumulative percent of slots. Column E lists prices from the highest price to the lowest. The row highlighted in yellow is the price at or below which 75 percent of child care providers reported charging for services. This is the 75th percentile of the child care market.

Table 4A: 75th Percentile Calculation Based on Price and the Number of Providers

Col. A	Col. B	Col. C	Col. D
Provider ID	Total Providers (20)	Percent of Providers	Weekly Price
1124	20	100%	$550
1065	19	95%	$540
3254	18	90%	$535
6519	17	85%	$525
4005	16	80%	$515
1625	**15**	**75%**	**$500**
1857	14	70%	$490
9045	13	65%	$485
1225	12	60%	$475
2698	11	55%	$465
1914	10	50%	$460
1325	9	45%	$455
1101	8	40%	$450
1710	7	35%	$435
1556	6	30%	$425
1294	5	25%	$420
5369	4	20%	$410
7447	3	15%	$405
1481	2	10%	$395
8256	1	5%	$350
Total = 20			

Table 4B: 75th Percentile Calculation Based on and Weighted the Number of Slots for Each Provider

Col. A	Col. B	Col. C	Col. D	Col E
Provider ID	Slots per Provider	Total Slots (1,069)	Percent of Total Slots	Weekly Price
1124	30	1,350	100%	$550
1065	70	1,320	98%	$540
3254	60	1,250	93%	$535
6519	50	1,190	88%	$525
4005	40	1,140	84%	$515
1625	30	1,100	81%	$500
1857	60	1,070	79%	$490
9045	**70**	**1,010**	**75%**	**$485**
1225	80	940	70%	$475
2698	85	860	64%	$465
1914	100	778	57%	$460
1325	50	675	50%	$455
1101	70	625	46%	$450
1710	80	555	41%	$435
1556	80	175	35%	$425
1294	90	395	29%	$420
5369	80	305	23%	$410
7447	75	225	17 %	$405
1481	80	150	11 %	$395
8256	70	70	5 %	$350
Total = 20	**1.320 Slots**			

In Table 4A, the row highlighted in yellow shows that 75 percent of providers reported charging to parents $500 or less. This means that $500 falls at the 75th percentile of the child care market price. In example Table 4B, the row highlighted shows that 75 percent of the provider slots are priced at $485 or less for tuition. This is the 75th percentile price based on weight or size of the program—the capacity or weigh in the child care market.

What is Next?

In the fourth and final brief of this series on market rate surveys, we will include a discussion on setting base subsidy payment rates, developing the market rate survey report, evaluating affordability, and how the payment rates provide families receiving CCDF with equal access to a broad range of child care providers.

Other Resources

Lead Agencies may be interested in the following resources to help plan for their market rate surveys.

CCDF-ACF-PI-2016-08 Attachment: *CCDBG Act and Final Rule Requirements for Market Rate Surveys & Alternative Methodologies*.

https://www.acf.hhs.gov/sites/default/files/documents/occ/ccdf_acf_pi_2016_08_attachment_ccdbg_act_and_final_rule_requirements_for.pdf

CCDF Final Rule. https://www.acf.hhs.gov/occ/resource/ccdf-final-regulations

Grobe, D., Weber, R., Pratt, C., Emlen, A., (September 2003), *Market Rate Study Guidebook—A Guide to Implementing a Child Care Market Rate Study Using Child Care Resource & Referral Data.* http://health.oregonstate.edu/sites/health.oregonstate.edu/files/sbhs/pdf/2003-ChildCare-Market-Rate-Study-Guidebook.pdf

Illinois Department of Human Services, *Market Rate Survey of Licensed Child Care Programs in Illinois Fiscal Year 2014.* https://www.dhs.state.il.us/OneNetLibrary/27897/documents/HCD%20Reports/Child%20Care/MarketRateSurvey2014v111.pdf

Ohio State University Statistical Consulting Service, Ohio Department of Job and Family Services, (January 2017), *2016 Ohio Child Care Market Rate Survey Analysis.* http://jfs.ohio.gov/cdc/docs/2016MarketRateSurvey.stm

OPRE Report 2017-115 *Market Rate Surveys and Alternative Methods of Data Collection and Analysis to Inform Subsidy Payment Rates.*

https://childcareta.acf.hhs.gov/sites/default/files/new-occ/resource/files/cceepra_methods_for_informing_subsidy_rates_508_compliant_v2b.pdf

Program Instruction: Guidance on alternative methodologies and cost analyses for purposes of establishing subsidy payment rates. https://www.acf.hhs.gov/occ/resource/ccdf-acf-pi-2018-01

Program Instruction: Timeline and Requirements for Market Rate Survey and Alternative Methodology. https://www.acf.hhs.gov/occ/resource/ccdf-acf-pi-2016-08

Weber, R., Grobe, D. Davis, E., Kreader, J., Pratt, C. (May 2007), *Study of Market Prices: Validating Child Care Market Rate Surveys*. http://www.researchconnections.org/childcare/resources/14724