

— Detailed Methodology

# Split by More Than the Grand River

How uneven access to affordable child  
care divides Kent County





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## Study Area Geographic Extent

Working together with local partners, IFF conducted a study of early childhood education (ECE) in Kent County, Michigan. The analysis is done at three geographic levels – Kent County, the 30 cities/townships in Kent County and the 20 neighborhoods in the City of Grand Rapids.

## Data Collection and Preparation

### Birth to 5-Year-Old Demand

In order to gauge the child care demand for children aged birth to 5 years, IFF operates on the premise that every child can benefit from Early Childhood Education (ECE) programs. Accordingly, our approach aims to ensure every child in the community can access a child care slot.

We leverage data from the Esri single-year population estimates for ages 0 to 6. This data provides estimates on infants and toddlers (from birth to 2 years old), preschoolers (from 3 to 5 years old), and Pre-K (4-year-olds). It forms our baseline for determining the demand or the number of children in the community requiring child care slots.

Because the eligibility requirements for federal and state ECE subsidy programs overlap, some children were eligible for more than one program and therefore were counted in the demand for each program. The overall demand, however, was an unduplicated count.

To ascertain the demand for state-subsidized child care across different age categories, we consider the child population in each age bracket. We then multiply this by the proportion of children under 6 who come from households with incomes below 200% of the Federal Poverty Level (FPL) — this is in line with Michigan's current subsidy guidelines. During the pre-COVID period, we determined demand based on 125% of the FPL, and during the COVID period, we used 150% of the FPL.

For the Head Start and Early Head Start programs, eligibility is determined by a household income below 100% of the FPL. We estimate demand by multiplying the count of children in the age range 3 to 5 (for Head Start) and 0 to 2 (for Early Head Start) by their respective percentages eligible for subsidy.

State-specific proportions inform our eligibility calculations for Pre-Kindergarten (Pre-K) and Kindergarten (KG), based on respective admission cut-off dates. In Michigan, this proportion stands at 66-33. This means that the Pre-K population comprises 66% of 4-year-olds and 33% of 5-year-olds. Conversely, the KG population is determined as 66% of 5-year-olds.

The Great Start Readiness Program (GSRP) is only available for Pre-K children with a family income below 250% of the FPL. We calculated the demand for GSRP by multiplying the Pre-K population with the percent of children under 6 years with a family income of less than 250% FPL.

## Birth to 5-Year-Old Capacity

We obtained data on provider capacity for 2020 and 2022 from the Michigan Department of Education’s (MDE) Office of Great Start (OGS), Child Development and Care (CDC) Program, the MDE OGS Great Start Readiness Program (GSRP), the MDE OGS Head Start Collaboration (Head Start/Early Head Start), the Michigan Department of Licensing and Regulatory Affairs (LARA), and the Early Childhood Investment Corporation’s (ECIC) Great Start to Quality (GSQ) under a Data Sharing Agreement.

In our research, we focused only on licensed providers and the number of children they are approved to care for. We defined quality providers as those providers that have a Great Start to Quality (GSQ) rating of three stars and above. It is important to understand that the IFF data on the access to and need for child care is not an exact number for any one specific provider’s availability of slots, but an approximation of the community’s level of access and equity overall.

Child care is offered for children up to 13 years old. For those 6 years and older, care is typically provided before or after school and during summer. We've excluded from our data those programs catering solely to school-aged children. However, if a child care provider looks after both young children (0 to 5 years) and older ones, we count their licensed capacity towards the 0 to 5 capacity.

In IFF's Early Childhood Education (ECE) initiatives, our primary focus is on child care for children aged 0 to 5. This encompasses care for infants and toddlers (ages 0 to 2), preschoolers (ages 3 to 5), and Pre-K programs for 4-year-olds.

## Estimating Infant/Toddler (0 to 2) and Preschool-Aged (3 to 5) Capacity

To determine capacity for the 0-2 and 3-5 age groups, we combined data from Child Development and Care (CDC), Great Start to Quality (GSQ), Great Start Readiness Program (GSRP), Head Start (HS)/Early Head Start (EHS), and the Department of Licensing and Regulatory Affairs (LARA). We also utilized the Michigan Child Care Market Rate study, which examines the cost structure of child care in the state, providing a breakdown by age and program type. After removing school-age children from the analysis, the infant/toddler category was used to make up the 0-2 multiplier and the preschool category was used to make up the 3-5 multiplier. The 0-2 and 3-5 multipliers were applied by program type to the overall licensed capacity.

Provider Type	Infant/ Toddler	Multiplier 0-2 years old	Preschool	Multiplier 3-5 years old	Total
Center	17,528	33%	35,589	67%	53,117
Group Home	2,396	42%	3,245	58%	5,641
Family Home	1,779	44%	2,246	56%	4,025

Table 1: Age-specific multipliers for estimating ECE capacity

## Estimating Subsidized Care Capacity

We obtained a list from the CDC detailing providers and the count of children enrolled under different subsidy programs. Matching this information with files from LARA proved challenging due to the absence of a consistent identifier for providers. Nevertheless, we did our best to align the records accurately by creating a unique identifier from a combination of data attributes like provider name and address.

## Data Analysis

Our study encompasses several analytical elements: K-means clustering, shifts in ECE providers during the COVID period, Access Indicators, and focus group discussions with parents and providers.

## K-means Clustering Analysis of Household Characteristics

To gain insights into the different communities of Kent County, we employed a K-means clustering analysis on relevant ECE-based variables at the U.S. Census Tract (Tract) level. This analysis aimed to categorize census tracts based on pertinent U.S. American Community Survey (ACS) variables and identify four groups of community resilience. The clustering process collects all the census tracts that have similar values for these variables and puts them into a group. This process is repeated until four groups are formed and the census tracts within each group are similar to one another but significantly different from the tracts in other groups. In essence, this method forms groups of tracts with similar characteristics.

The ability of a community to adapt to shifts in the ECE system is influenced by various socio-economic factors. Our research delved into the relationship between family ECE needs and the top three socio-economic variables highlighted in our past studies. We incorporated the following three variables into the K-means clustering analysis:

- Median household income
- Percent of single parent households
- Percent of children ages 0 to 5 with all parents working

The four groups of lowest, lower, moderate and highest community resilience are characterized in the following table.

ACS Census Tract Variable	Lowest Community Resilience	Lower Community Resilience	Moderate Community Resilience	Highest Community Resilience	Kent County
Median Family Income	\$51,089 Lowest	\$72,555 2nd lowest	\$81,045 2nd highest	\$118,880 Highest	\$81,007
Percent of Single Parent Households	65 Highest	25 2nd highest	21 2nd lowest	10 Lowest	30
Percent Children Under 6 with All Parents Working	67 2nd lowest	77 Highest	37 Lowest	74 2nd highest	68

Table 2: Attributes of the four community resilience groups in Kent County

## COVID Impact and Provider Closure Analysis

To gauge the effects of COVID on ECE providers, IFF analyzed the provider lists from both 2020 and 2021. This helped identify which programs had shut down since the pandemic began, which new ones emerged, and which ones consistently operated throughout. We cross-referenced providers using criteria such as license numbers, facility addresses, and names. Providers were sorted according to their facility type, differentiating between home- and center-based ECE. From there, we calculated the percentage change between the pre-COVID and during-COVID periods by comparing the pre-COVID total to the post-COVID total and then dividing by the initial pre-COVID figure.

## Service Gap and Service Level Calculations

This needs assessment is grounded in a supply and demand gap analysis. The demand for ECE slots was subtracted from the supply of ECE providers at the two different geographic levels: county, and city/township. The difference between supply and demand is called the **service gap**. The larger the service gap, the greater the need for ECE services. In addition to the service gap, we calculated the **service level** by dividing the supply with the demand. This estimate indicates the percentage of children under age six that have access to ECE services and is the degree of service coverage in a particular geography.

For calculating the service gaps and service levels for Pre-K, we considered the school district boundaries within Kent County. We aggregated the supply and demand for the 22 school districts and then performed these calculations.

We calculated service gaps and service levels for the following programs:

1. Overall ECE (ages 0-2,3-5 and 0-5)
2. State subsidized ECE (ages 0-2, 3-5 and 0-5)
3. Pre-K (children eligible for the Great Start Readiness Program in Michigan)
4. Early Head Start (ages 0-2)
5. Head Start (ages 3-5)

Additionally, service gap and service level estimates were derived for all the above programs that have high quality, with a GSQ rating of three and above.

## Access Indicators

ECE Access Indicators measure the performance of ECE services in meeting the need of families within a community. The Access Indicator is calculated for the U.S. Census Tract (Tract) and considers both demand for and supply of ECE services for families living in the Tract. Various ECE program types (e.g., Head Start, Pre-K, State Subsidized Care) or programs available to various age groups (such as 0-2 or 3-5) are examined individually in terms of supply (slots at ECE service providers) and demand (family need). This nuanced approach, rather than a one-size-fits-all approach allows for a deeper understanding of access and need for particular ECE services. Individual Access Indicators are created for these individual ECE services. All of the Access Indicators can then be examined as a group to determine the Access Index. However, in this study, we chose to evaluate each access indicator separately for access 0-5, access 0-2, quality access 0-5, quality access 0-2, access to subsidy for ages 0-5, access to Head Start, access to Pre-K, access to center-based ECE for ages 0-5, and access to home-based ECE for ages 0-5.

The Access Indicators indicate whether families get an appropriate share of supply based on their demand. Of note, the Access Indicators do not indicate whether there is enough total supply of ECE services to sufficiently meet total demand system-wide, but how fairly the existing supply is spatially accessible to families. An Access Indicator of one or greater indicates that families are receiving their appropriate share of supply based on their demand. An Access Indicator below one indicates that families are not getting their fair share of supply based on their demand.

Accordingly, a higher Access Indicator value indicates that families' demand for ECE services, relative to other communities, are better met. Factors which may lead to a Higher Access Indicator in a given location include:

Access Side: Distance to greater numbers of quality slots is shorter

Demand Side: Fewer children have a need for quality slots

Conversely, a lower Access Indicator value suggests that compared to other communities, the demand for ECE services among families is less adequately addressed. Factors which may lead to a Lower Access Indicator in a given location include:

Access Side: Distance to greater numbers of quality slots is longer

Demand Side: More children need quality slots

In this study, we developed multiple Access Indicators to gain a comprehensive understanding of the ECE landscape. Given that ECE providers offer a range of services and families have varied needs, it's essential to recognize these differences. Access Indicators were calculated for:

- Access 0-5
- Access 0-2
- Quality Access 0-5
- Quality Access 0-2
- Access to Subsidy 0-5
- Access to Head Start
- Access to Pre-K
- Access to center-based ECE for ages 0-5
- Access to home-based ECE for ages 0-5



Equitable Access



Inequitable Access

## Steps to arrive at Access Indicators

Below is the methodology used to calculate the Access Indicator. There are three components – access to supply of ECE services (A), demand for ECE services (D), and the ratio of access to supply and demand for ECE services.

### Determining Access (A)

Access (A) to each and every provider for each and every Census Tract is determined utilizing the Gravity Model, which is based on the distance and capacity of a provider to the Census Tract.

$A_j$  is the ECE Access for Census Tract  $j$

$$A_j \equiv \sum_{i=1}^n \frac{s_i}{r_j^2}$$

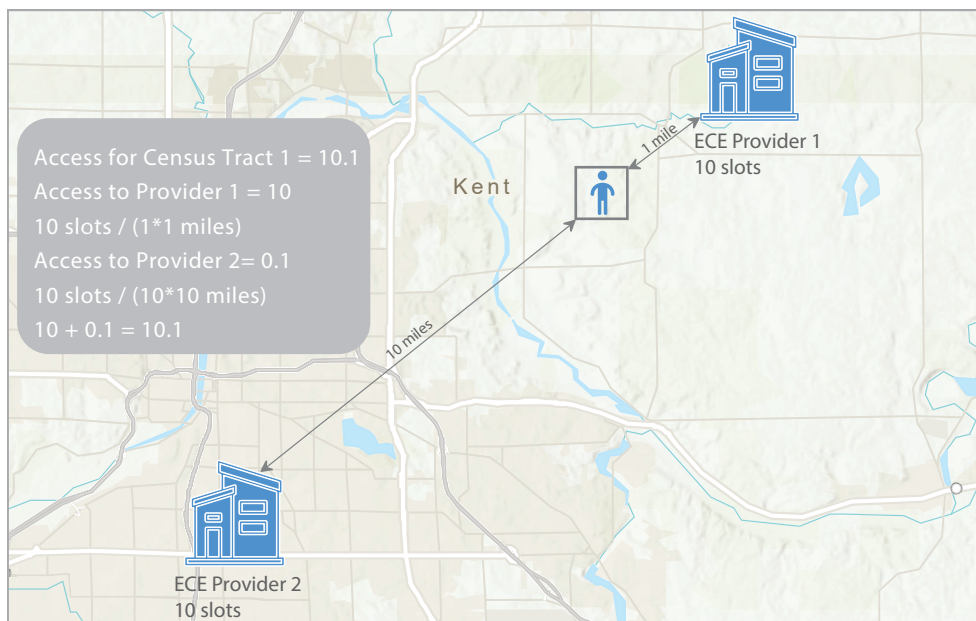
#### Where

$n$  is the total number of providers

$s_i$  is the provider capacity for the  $i^{\text{th}}$  provider

$r_j$  is the distance from the center of Census Tract  $j$  to the  $i^{\text{th}}$  Provider location

This graphic illustrates the concept. As an example, a provider one mile away with a capacity of 10 contributes 10, and a provider 10 miles away with a capacity of 10 contributes 0.1 to a Census Tract's Access.





### Determining Total Access (TA)

Total Access (TA) is the sum of access for all Tracts within the study area.

$$TA \equiv \sum_{j=1}^n A_j$$

#### Where:

$A_j$  is the ECE Access for the  $j^{\text{th}}$  Census Tract

$n$  is the total number of Census Tracts

### Determining Access Share (AS)

Access Share (AS) is the share of the total study area access for ECE services for a given Census Tract.

AS = Access (A) to ECE services in a given Census Tract / Total Access (TA) to ECE services in the whole study area.

AS is the Access Share for a Census Tract  $j$ . It is the ratio of the Access of Census Tract  $j$  to the Total Access in the study area.

$$AS_j = A_j / TA$$

Where

$A_j$  is the ECE Access for the given Census Tract

TA is the total Early Childhood Education Access for the study area

### Determining Demand (D)

Demand (D) is the total number of children in a Census Tract requiring ECE services.

### Determining Total Demand (TD)

Total Demand (TD) is the total number of children in the study area.

### Determining Demand Share (DS)

Demand Share (DS) is the share of the total study area demand for ECE services for a given Census Tract.

$$DS = D / TD$$

Or the number of children requiring ECE services in a given Census Tract / total children requiring ECE services in the whole study area.

### **Calculating the Access Indicator**

Access Indicator is determined for Census Tract  $j$ . It is the ratio of the Access Share to the Demand Share.

$$\text{Access Indicator}_j = AS_j / DS_j$$

Where

$AS_j$  is the Access Share for Census Tract  $j$

$DS_j$  is the Demand Share for Census Tract  $j$

### **Calculating Rank**

The access indicator value of each Tract is ranked. A rank of 1 indicates the lowest access to ECE and the highest rank is the geography with the highest access to ECE services.

### **Percentile Rank Score**

The percentile rank score is calculated for each of the Tracts. It indicates the percentage of Tracts at or below a given Tract's score. Values range from 0 to 100%. The percentile rank indicates how well a community performed in comparison to other communities regarding access to ECE services. For example, a community with a score at the 35th percentile had better access to ECE services than 35% of other communities. It also means that it had lower access to ECE services than 65% of other communities. Access Indicators of the cities/townships of Kent County were derived from the mean of access indicator values of the corresponding census tracts. Ranks and percentile rank scores were then calculated for these cities/townships in Kent County.

### **Qualitative Engagement**

IFF strives to highlight the lived experiences of families, ECE professionals, and other stakeholders in research studies. IFF engaged parents, childcare providers, and leaders in the ECE ecosystem throughout Kent County to serve in an advisory role. The advisory committee members generously contributed their time, expertise, perspectives, and data, providing valuable insights that informed the landscape study.

### **Focus group interviews with parents and providers**

The focus group interviews allow us to dive deeper into the experiences of individual families and providers with the ECE system. IFF conducted three focus group interviews, two with providers of Grand Rapids and Kent County, and one with parents of Kent County. Due to the stressors placed on both these groups by the pandemic and the timing of the focus groups (conducted in Dec 2020/ Jan 2021), attendance was lower than expected and data collected was focused on immediate challenges/ needs from the pandemic (as opposed to longer term needs and challenges). See Appendix 1a and 1b for the focus group questions for providers and parents respectively.

### **General Limitations with Data**

Data for this study was compiled from multiple sources and data was not always publicly available from state or federal websites. Data on provider capacity comes from CDC, GSRP, HS/EHS, LARA and GSQ as part of a Data Sharing Agreement. IFF has had tremendous support from local experts and organizations and is grateful for their help in obtaining relevant and recent data for the study. Special requests were made to multiple agencies and organizations in order to compile valuable data for analysis.

## Delays and Timing in Data Collection

Delays and challenges in receiving recent and relevant data at the geography or level needed led to limitations in the analysis. Some of these challenges have been resolved after IFF's Data Sharing Agreement (DSA) in 2019 with MDE's Office of Child Development and Care. However, data often arrives without documentation or metadata to help researchers accurately analyze information. This can lead to delays in getting follow-up clarification. Also, we had to merge the datasets from five different entities and clean up the final merged dataset. For this reason, it is critical for agencies to collaborate for better data collection, storage, and documentation for future studies.

## Snapshot in Time

The data provided in this study should be seen as a snapshot in time, meaning that it is a representation of a specific place at a particular time. For this reason, estimates and conclusions made from this data should be focused less on exactitude and more on the context the data provides. This allows for our estimates to focus more on the scale of the work that needs to be done and the direction in which it needs to head in order to make a positive impact.

## Missing Data

IFF makes every attempt to obtain necessary and relevant data for our studies. In some cases, indicators were left out of final analysis if relevant and recent data could not be obtained. IFF uses information presented from prior research studies in the area when possible to fill in information and data gaps.

## Census Data

The census data variables used are based on the five-year ACS estimates from 2017 to 2021. This provides IFF the necessary estimates at census tract level and also takes care of the variability in the annual census estimates.

## Multiple Data Sources

IFF compiles data from multiple sources. Every attempt is made to ensure that data is accurate and can be matched. However, consistency of data provided from different departments and agencies do not always align completely.

## Qualitative Data

IFF made multiple attempts to recruit and encourage community participation in focus group interviews and facility surveys. Qualitative work had challenges prior to the COVID-19 pandemic, but during COVID, changes in family and providers ability to give their time and focus, and burnout from other research and evaluation initiatives at the state and local levels led to research fatigue.



## Appendices

### Appendix 1a: Focus group questions for providers

- How has the child care landscape changed in the community you serve due to Covid-19?
  - [Probe] In particular, how have things at your facility changed due to the Covid-19?
- What are some of the issues and barriers that you see today in providing quality ECE care?
  - [Probe] Do you have concerns about complying with social distancing requirements?
  - [Probe] Do you have concerns about financial sustainability in the short and long-term?
- How are these barriers similar to or different from the barriers you faced prior to the covid-19 pandemic?
- How are your enrollment numbers currently? How have school closure impacted your child-care program and population enrolled?
- What have been some helpful resources/support for that you hope will continue? What else do you need?
- Please tell us a little bit about your experience with the state licensing and quality rating system.
- Thank you all for sharing your experience with us. I'd like to ask if there is there anything else you would like to share or that you think we should know as we continue with our work?

### Appendix 1b: Focus group questions for parents

- Tell me a bit about yourself and your family. How have you been lately?
- How are you handling child care right now? Are your children going to a provider lately?
  - Where?
  - For how long (full day or part time?)
- What happened with your child care provider in March 2020? Did your child continue to go to the provider? (Did the provider close and reopen?)
  - How did you decide to send your child to the provider or not? Did you have concerns, and how have your provider addressed those?
- How did you select a provider before the pandemic? Or during the pandemic?
  - What did you look for in a provider?
  - How did you choose that provider over others? Did anything stick out about the director, teachers, facility, or location?
- What is your biggest concern today as it related to child care?
- What was the biggest challenge you faced before COVID-19 as it related to child care?
- What is your biggest concern today as it related to child care?
- How has your community or neighbors been impacted by the pandemic?

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  - Early Childhood Investment Corporation’s (ECIC) Great Start to Quality (GSQ)

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