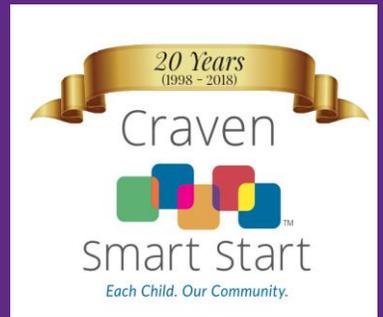


# Child Care Economic Impact Report *Craven County*



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## Executive Summary

Child care is an important industry in Craven County, North Carolina, with wide-ranging effects on those who work in that sector and utilize its services. However, it also has a broader impact on economic activity throughout Craven County. This study uses Economic Impact Analysis (EIA) and IMPLAN (an economic modeling software package that is widely used for estimating the economic effects of a given industry), as well as a survey of parents and guardians who use child care services in Craven County, to estimate the breadth of impact of the child care industry on the county. This report reveals that there are numerous economic benefits that the child care industry brings to the area's local economy.

### **Chief among the major EIA findings are the following:**

- ▶ The child care industry generates an estimated \$17.4 million in total output<sup>1</sup> for Craven County.
- ▶ This is in spite of the fact that the number of people employed in the industry in Craven County declined by more than 25% from 2005-2017.

Because of the impact that the child care industry has on Craven County, understanding the economic consequences of its continued decline is vitally important. This study examined a variety of decline scenarios to the child care industry. The first set of scenarios focused on the impact associated with the industry's employment decline, without factoring in the impact that such declines might have on families that rely on child care services. Those scenarios projected the economic impact of decreased employment levels by 5, 10, and 25 percent.

- ▶ The general economic scenarios estimate losses in employment in Craven County that range from 23 to 116 jobs, as depicted in Table E-1. Labor income losses<sup>2</sup> range from \$550,080 to almost \$2.8 million. Losses in total value added<sup>3</sup> range from \$788,901 at a 5% decline to more than \$3.9 million at a 25% decline. Total output losses are estimated at \$1.26 million to more than \$6.37 million.

While there are significant economic effects generated from the general economic scenarios, they underestimate other potential impacts. Most notably, the estimates from these scenarios do not include the induced income decline that could be caused by parents who would have to exit the workforce to take care of their children if child care services were not available. To account for this additional economic impact, a team of investigators at the Center for Survey Research (CSR) conducted a survey of parents and guardians in Craven County to learn about how the lack of child care services could impact their ability to work.

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<sup>1</sup> The industry's annual revenues and net inventory change.

<sup>2</sup> All forms of income, including wages, payroll taxes, benefits and proprietor income.

<sup>3</sup> The difference between an industry's output and the cost of intermediate inputs. Demonstrates the contribution to the GDP made by an industry.

**Of those who answered the survey on child care:**

- ▶ 34% of those employed reported that they would have to quit their job if child care services were not available.
- ▶ 15% of those who answered the child care survey reported that they would have to move to another area if child care services were not available.
- ▶ About 22% reported that they would have to work fewer hours if child care was not available, and 10% indicated that their partner or spouse would have to work fewer hours if child care was not available.

Three additional scenarios were developed based on the findings from the survey: a labor income change scenario, a household income change scenario, and household income change scenario with a 34% adjustment. (This adjustment accounts only for the income that stays in the local economy). The results of these scenarios are shown in Table E-1.

- ▶ The Labor Income Change Scenario accounts for payroll taxes, but does not take into consideration different spending patterns by individuals of varying income groups. In this scenario, the Craven County economy could lose 2,133 jobs, \$245 million in total output, more than \$136 million in total value added, and about \$71 million in labor income because of the lack of child care services.
- ▶ The household income change scenarios include different spending patterns. The lower range scenario, with a 34% adjustment, results in losses of 1,080 jobs, about \$36 million in labor income, and about \$123 million in output. The full household income change scenario estimates losses of 3,176 in jobs, about \$106 million in labor income, more than \$200 million in total value added, and total output losses in excess of \$361 million.

The results in this report demonstrate that declining employment in the child care industry in Craven County will have an impact far beyond the employees of the facilities and the families that rely on them. There are wide-ranging economic effects throughout the county and across many industries.

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**Table E-1. Summary of Scenarios for Potential Economic Impacts of Child Care in Craven County**

<b>Scenario</b>	<b>Employment (jobs)</b>	<b>Labor Income</b>	<b>Total Value Added</b>	<b>Total Output</b>
<b>General economic scenarios: Child care employment decline</b>				
5% Decrease	-23	-\$550,080	-\$788,901	-\$1,265,315
25% Decrease	-116	-\$2,793,047	-\$3,969,786	-\$6,372,827
<b>Expanded economic scenarios: Income changes due to the lack of child care services</b>				
Household income change with 34% adjustment	-1,080	-\$36,169,790	-\$68,205,919	-\$123,051,469
Labor income change	-2,133	-\$71,525,413	-\$136,826,299	-\$245,872,375
Household income change	-3,176	-\$106,381,736	-\$200,737,997	-\$361,916,084

*Note:* Calculated via IMPLAN 3.1 (2016). All dollar figures are adjusted to 2018 dollars. The income change scenarios are based on the survey 2018 input.

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## Introduction

Families with preschool children are increasingly dependent on child care services. Today, 25% of families with preschool children, in which both parents work outside the home, use an organized child care facility as their primary arrangement (Deller, Hoyt, Hueth, & Sundaram-Stukel, 2009). Yet, quality child care can have prohibitive costs. Child care services nationwide represent more than 10% of the 2016 median income for a married couple with an infant in a child care center (Child Care Aware of America, 2017). In Craven County, North Carolina, the annual child care rates range from \$5,096 (for a school-age child) to \$6,240 (for infants and toddlers). This amounts to an average of approximately 13% of the median household income in the county (U.S. Census Bureau, 2018).

The most direct economic benefit of the industry is that it provides employment for child care workers (Belli, Bustreo, & Preker, 2005; MacGillvary & Lucia, 2011; Garcia, Heckman, Leaf, & Prados, 2018). Research also shows that early child care has both direct and indirect economic effects on parents, children, and others in the community. Without the child care industry, many parents would be unable to engage in employment outside of the home to earn an income. Both child care workers and the employed parents spend their income in the surrounding communities (buying groceries, paying for haircuts, eating at restaurants, shopping for clothes, etc.), helping to stimulate the local economy. This spending creates another round of economic impact as the grocer, hairstylist, restaurant employees, and shop owners earn and then spend their income as well.

To estimate both the direct and indirect effects of child care on the economy, researchers commonly employ input-output (I/O) models, which allow for the calculation of multipliers to estimate the regional effects of a specific economic activity, such as child care services. Multipliers are based on the idea that an initial economic activity creates additional effects in other areas of the economy through linkages among various industries.

In the pages that follow, this report explains the sources of data and methods employed in the analysis. The report then presents the scenarios that the CSR team of investigators developed as part of the analysis, along with an explanation of the results. First, we show economic estimates generated by child care industry employment decline. Next, the report examines household and labor income changes in the county that could result from the lack of child care (that is, people quitting their jobs or moving out of the area because they cannot find child care). Finally, we summarize the results and provide conclusions.

## Methods

The CSR team of investigators implemented a variety of research methods, which we describe below.

*Economic Impact Analysis:* IMPLAN<sup>4</sup> is the most widely used tool for measuring the economic importance of the child care industry (Liu & Warner, 2009). The IMPLAN algorithm is based on an Input/Output (I/O) model in which final demand drives economic growth. Such models allow for the estimation of multiplier effects for an individual industry (that is, the effect that an industry may have on all other sectors). IMPLAN captures the economic impacts of both the inputs that the industry consumes and the outputs that the industry generates.

More specifically, IMPLAN models estimate direct, indirect, and induced effects. Direct effects stem from the economic activity itself. For example, child care facilities provide employment and income to the employees of the facilities. Indirect effects are changes in income, sales, or jobs from the sectors that provide goods and services to child care establishments. Induced effects occur when consumer spending changes based on disturbances in labor that are the result of indirect and direct effects.

The IMPLAN I/O models use national, state, and county data to provide information on industries, sectors, and consumers. Child care, however, is particularly important to regional markets and economies. As one study concluded, “Average direct employment for child care is larger than that for either job training or water and sewage systems, a further reflection of its importance in the regional economy” (Liu & Warner, 2009, p. 102). Indeed, the child care industry is one of the leading economic multipliers across all sectors at the state level (Liu & Warner, 2009). In addition to modeling the impact of child care industry employees on the county’s economy, IMPLAN produces estimates for scenarios based on changes in household spending and labor income decline resulting from parents or guardians not having access to child care services. (Appendix A contains additional details on the methodology and methodology limitations).

*Survey Data Collection:* While I/O models are necessary for estimates of economic impact, they do not include the effects that are imposed on parents when child care services are not available. To incorporate the economic impact on parents who are able to earn incomes because their children are in child care, the CSR team of investigators conducted a survey of parents and guardians of children in child care facilities. The survey responses allowed the research team to examine the broader economic impact of the child care industry throughout Craven County.

To generate a more complete understanding of the economic ripple effects that could result from decreased use of child care services, the research team conducted a survey of child care clients in

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<sup>4</sup>The IMPLAN data is based on: BEA benchmark input-output tables, BEA Regional Economic Accounts (REA), BEA Annual Industry Accounts, BEA National Income and Product Accounts (NIPA) tables, BLS Quarterly Census of Employment and Wages (QCEW), BLS Consumer Expenditure Survey (CES), Annual Survey of Manufactures (ASM), County Business Patterns (CBP), and Annual Retail Trade Survey.

Craven County from February 8 to March 25, 2018. Those who were contacted to complete the survey were provided either a paper copy or an online version of the questionnaire in English or Spanish. Based on estimates that Craven County Smart Start, Inc. provided to the CSR, there are 2,341 children in child care in the county. This represents roughly 1,171 households. The CSR received completed surveys from 167 respondents (with 95% of the respondents completing their survey using the English version and 5% completing their survey using the Spanish version). The survey data allow for the analysis to address more finely tuned scenarios, such as the number of households in which one or both parents would not be able to work if child care happened to be unavailable. (For additional information about the survey, see Appendix B and C.)

*Scenario Development:* A useful method for increasing understanding when the future is uncertain is scenario development. Under scenario development, researchers can generate multiple potential outcomes that could occur based on the current, baseline situation. For the purpose of this report, the proposed scenarios focus on the child care industry in Craven County.

The CSR research team utilized 2016 data from Craven County. This is the most recent data available in IMPLAN. The analysis considers ‘what-if’ scenarios that examine how changes in child care availability may impact the larger Craven County economy. The first scenario that we consider is the current state of the child care industry in Craven County. This “baseline scenario” allows for the estimation of the total economic effects – including multiplier effects – on the county.

Next, the research team identified scenarios that examine how changes in the child care industry could potentially impact the overall economy of Craven County. The main scenarios that we consider estimate the effects of a decrease in child care employment. The decrease scenarios examine a 5, 10, and 25 percent decrease in the number of people that the child care industry employs.

The analysis in this report also includes expanded models of economic impact by incorporating a 2018 survey of parents and guardians who use child care services in the county. The survey provided unique data on the impact of employment that results from a lack of child care facilities. Specifically, the survey asked questions of what people would do if child care was not available to them. The expanded models incorporate the survey data, which provide additional effects on parents that the simple models do not include.

## Results

### *PART I: General Economic Scenarios*

This section presents the results of the general economic scenarios (which do not assess the impact of the employment status of parents). We start with the baseline model, followed by the scenarios of 5%, 10%, and 25% decreases in employment to the Craven County child care industry.

#### **Baseline Model**

In the baseline scenario, we do not change any activities for the child care sector in Craven County. This scenario allows for the establishment of a baseline for all subsequent “what-if” analyses. Drawing on the most recent data from 2016, Craven County has 210 different industries, and its Shannon-Weaver Index of Economic Diversity is 0.6493.<sup>5</sup> This index represents the specialization or diversity of industries. A value close to zero indicates a high dependence on one or two industries. A value close to one indicates a diversity of industries in the county. A more diversified economy can better withstand economic shocks because it has a variety of industries to re-employ displaced workers.

In the analysis that follows, we compare child care services in Craven County to industries in which child care workers may find alternative employment, such as elementary and secondary education<sup>6</sup>, building material and garden equipment supplies stores (e.g. Lowes), and general merchandise stores (e.g. Walmart).<sup>7</sup> We also include physician offices, which are another service industry and one of the top industries in the county by labor income.

In 2016, the population of Craven County was approximately 103,445.<sup>8</sup> Total personal income equaled about \$4,355,057,000 and total employment was about 61,211. The child care services

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<sup>5</sup> The top industries in Craven County include military and non-military employment by the federal government, plumbing fixture fitting and trim manufacturing, owner-occupied dwellings, and real estate. The owner-occupied dwellings category is an internally created industry by IMPLAN to account for the value of home ownership, and as such does not have employment and labor income associated with it. Owner occupied dwellings represents the repair and construction associated with owning a home. The employment by federal government is outside of county control. Plumbing fixture fitting and trim manufacturing is an industrial sector, which is quite different from child care and related services.

<sup>6</sup> IMPLAN makes an important distinction between public and private schools for two reasons: they have different input cost functions and while public institutions are part of final demand, private institutions are part of intermediate demand. As such we list them separately in the tables. That is, public schools are treated as institutions, while private schools are part of industries.

<sup>7</sup> We based our decision to select those industries for comparison based upon interviews that we conducted in February of 2018 with child care service providers.

<sup>8</sup> These are the numbers provided by the IMPLAN 2016 model. The IMPLAN numbers are based on various sources of data, and do not represent a complete census of the area. Hence, they represent the best available approximation.

sector was among the top industries in Craven County based on the total number of employed workers (#34 overall). Table 1 provides additional industry information about child care services and comparable industries in Craven County (expressed in 2018 constant dollars).

As shown in the first column of table 1, the “total number employed” includes full-time and part-time workers. The second column presents the full time equivalent (FTE) numbers (which differentiate between part-time and full-time employment and weight for each accordingly). Total output by an industry, as shown in the third column, represents the industry’s annual revenues and net inventory change. In the case of child care services, this amounts to an approximation of annual revenues.<sup>9</sup> The fourth column, total value added, reflects the difference between the industry’s output and cost of intermediate inputs, showing the contribution to the gross domestic product (GDP) of an individual industry.

**Table 1. Comparable Industries, Craven County (2018 Dollars)**

<b>Description</b>	<b>Total Number Employed</b>	<b>Full Time Equivalent Employment</b>	<b>Total Value Added</b>	<b>Total Output</b>
Child care services	399	346	\$11,516,598	\$17,385,868
Elementary and secondary education (private schools)	70	63	\$2,611,275	\$3,534,425
Employment and payroll of state government, education (public schools)	744	589	\$32,684,174	\$32,684,174
Building material and garden equipment supplies stores	433	371	\$22,856,093	\$39,331,101
General merchandise stores	1,212	1039	\$45,884,225	\$77,256,699
Offices of the physicians	1,149	1031	\$111,600,874	\$168,161,026

*Note:* Calculated via IMPLAN 3.1 (2016). All numbers are rounded to the nearest whole number.

Table 2, shown below, presents the components that add up to labor income: employee compensation and proprietor income. The employee compensation numbers represent the fully loaded payroll value, not just wages and benefits, but also payroll taxes. The child care industry is 77th in employee compensation, but 27th in proprietor income, which is likely impacted by at-home child care services. The proprietor income includes those who are self-employed and those working for unincorporated business. This indicates that while the industry overall may not have high compensation, it is one of the most important sources of income for self-employed

<sup>9</sup> For retail sector industries, this represents the retail margin (sales receipts including taxes subtracting the cost of goods sold).

individuals in Craven County. Among comparable industries, child care services is the 2nd largest source of proprietor income, but lags behind almost three comparable industries in terms of employee compensation. This was confirmed by interviews with the child care providers in Craven County (February 2018) who indicated that some of the child care workers may be eligible for social assistance. Other property type income includes corporate profits, rents, dividends, and interest income categories. Even at the national level, the other property type income for the physician offices industry has been negative for the past three years (IMPLAN 2018).

**Table 2. Industry Detail and Summary, Craven County (2018 Dollars)**

<b>Industry</b>	<b>Employee Compensation</b>	<b>Proprietor Income</b>	<b>Labor Income</b>	<b>Other Property Type Income</b>
Child care services	\$7,710,705	\$1,232,488	\$8,943,194	\$1,901,221
Elementary and secondary education	\$2,324,003	\$73,164	\$2,397,167	-\$35,031
Employment and payroll of state government, education (public schools)	\$27,959,074	--	\$27,959,074	\$4,725,100
Building material and garden equipment supplies stores	\$14,343,635	\$623,033	\$14,966,668	\$5,281,770
General merchandise stores	\$31,907,051	\$173,437	\$32,080,488	\$5,889,839
Physician offices	\$108,548,340	\$3,480,342	\$112,028,682	-\$3,102,600

*Note:* Calculated via IMPLAN 3.1 (2016). All numbers are rounded to the nearest dollar.

Table 3 presents Social Accounting Matrix (SAM) multipliers for the baseline scenario.<sup>10</sup> It depicts several different multipliers: output, labor income, employment, and value added. The output multiplier measures the requirements from all other sectors needed to deliver an additional dollar-unit output of child care services to the final demand in Craven County.

As the results in the table indicate, the total effects equate to a 1.431 output multiplier for child care services (SAM multiplier). That is, for every additional dollar generated by child care services, the total effect on Craven County industries equals to \$1.43 (\$1 in direct effect and \$0.43 in indirect and induced effects).<sup>11</sup> The labor income multiplier measures the changes in the

<sup>10</sup> SAM multipliers capture economic outputs of a socio-economic system. All transactions between economic actors in any given system are captured in SAM multipliers.

<sup>11</sup> The direct effect represents the initial change in an industry. Indirect effects represent the increased demand for services from the suppliers (e.g., child care services buying from meal catering services). The induced effects account for wage-related expenditures in the child-care sector. This represents all purchases the employees of the child care services made as well as local suppliers of child care services. A SAM (Social Accounting Matrix) multiplier includes direct, indirect and induced effects or (direct + indirect + induced)/direct.

economy from a dollar-unit change in final demand for child care services. Because the income in child care services industries is generally lower, this multiplier is also smaller than the output multiplier (1.223). For each additional dollar increase in demand for child care services, Craven County’s economy can generate about \$0.22 of additional income.

The employment multiplier, shown in the third column, measures the change that results from the addition of one employee in the child care industry. Overall, for each additional job added to the child care services sector, Craven County can expect to generate a total of 1.16 jobs. Given that the employment number focuses on the industries using the child care services directly, this most likely underestimates the impact. Finally, total value added adjusts the output by the costs of intermediate inputs. This amount is different from profits. For each dollar of value added generated by child care services, there is a total of \$1.35 value added to the overall Craven County economy.

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**Table 3. SAM Multipliers (2016 Data)**

<b>Multiplier Type</b>	<b>Employment (jobs)</b>	<b>Labor Income</b>	<b>Total Value Added</b>	<b>Total Output</b>
Child care services	1.163	1.223	1.350	1.431
Elementary and secondary education	1.197	1.185	1.321	1.435
Employment and payroll of state government, education (public schools)	1.140	1.124	1.202	1.364
Building material and garden equipment supplies stores	1.328	1.330	1.412	1.446
General merchandise stores	1.215	1.305	1.389	1.427
Physician offices	1.163	1.223	1.350	1.431

*Note:* Calculated via IMPLAN 3.1 (2016). For additional information about SAM multipliers, see <https://implanhelp.zendesk.com/hc/en-us/articles/115009542407-Explore-Multipliers>.

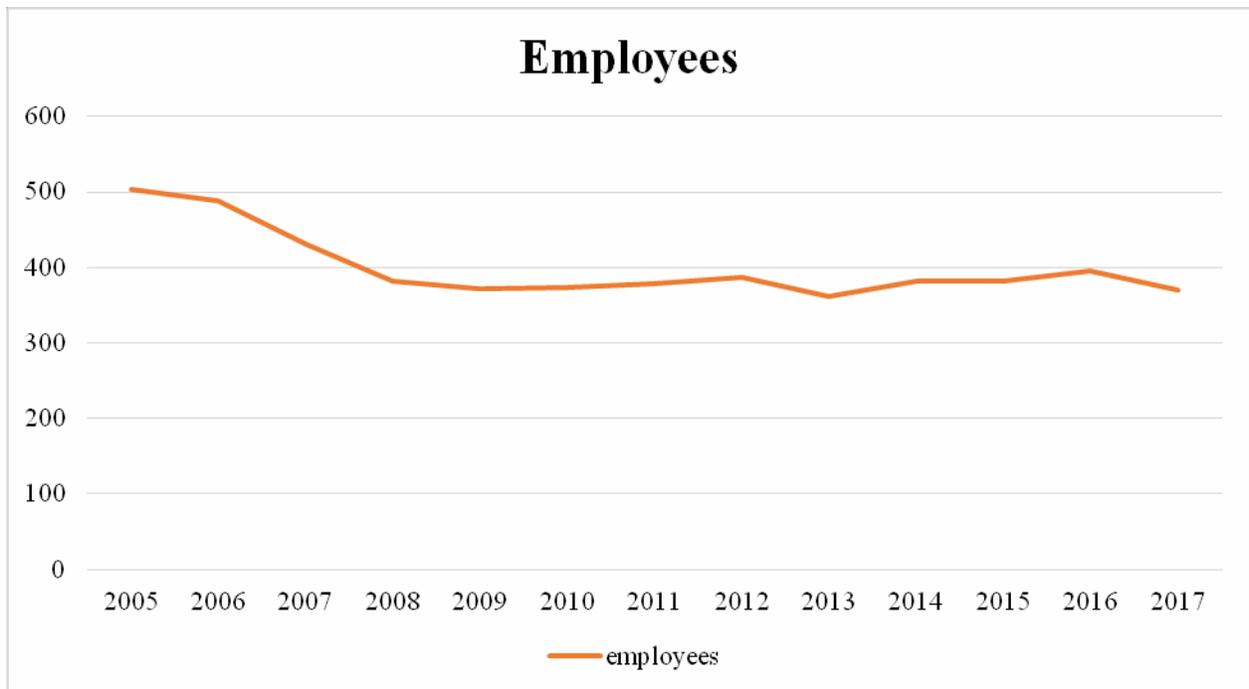
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The industry has similar, but slightly lower output multipliers when compared to other industries in table 3. In terms of labor income SAM multipliers, it is ahead of the physicians’ offices, and elementary and secondary education. In terms of employment SAM multipliers, it is ahead of the public schools. Finally, on total value added using SAM multipliers, it is also ahead of both public and private schools.

## *Employment Decline in Child Care Services*

These scenarios explore a hypothetical situation in which child care services in Craven County experience a decrease in employment by 5%, 10%, and 25%. The following chart shows the North Carolina Department of Health and Human Services Division of Child Development and Early Education data for Craven County from 2005 through 2017. The chart shows the annual average number of employees, which fell from an average of 503 in 2005 to an average of 370 in 2017. This decrease of 133 employees is larger than the 25% decrease scenario discussed below, thereby suggesting that such a scenario is realistic and worth consideration.

**Figure 1. The Number of Employees in the Child Care Industry in Craven County, 2005-2017**



*Source:* North Carolina Department of Health and Human Services Division of Child Development and Early Education.

At the time of this writing (August 2018), there are about 350 employees in child care services in Craven County: 318 are working in child care facilities and the rest are independent child care providers. As figure 1 indicates above, this number has declined over time. For example, Craven County employment in child care services stood at 374 employees as recently as December of 2017. This decline is comparatively close to the 5% decrease scenario discussed below.

*5% scenario:* With a 5% decrease in employment in the child care sector, our model's estimates indicate that the total county economy would lose \$550,080 in labor income, about \$788,901 in total value added, and \$1,265,315 in total output (see table 4). Likewise, with just a 5% decrease

in child care services, the county’s economy will lose about 23 jobs. This is the equivalent of a closure of a small child care facility (interviews February 2018).

In addition, table 5 compares a 5% employment decline in the child care industry with 5% declines in comparative industries. The child care industry decline represents almost 80% of the employment impact of a building material and garden equipment supplies store. Offices of the physicians and general merchandise stores have considerably larger employment impacts than child care services, but they also have much larger employment. A 5% decrease in these industries would lead to almost 4 times the loss of jobs compared to the building material and garden equipment supplies stores.

**Table 4. The Effect of 5% Decrease in Child Care Services in Craven County**

<b>Impact Type</b>	<b>Employment (jobs)</b>	<b>Labor Income</b>	<b>Total Value Added</b>	<b>Total Output</b>
Direct Effect	-20.0	-\$453,884	-\$584,489	-\$884,549
Indirect Effect	-1.4	-\$38,657	-\$84,659	-\$165,672
Induced Effect	-1.9	-\$62,539	-\$119,754	-\$215,094
Total Effect	-23.3	-\$555,080	-\$788,901	-\$1,265,315

*Note:* Calculated via IMPLAN 3.1 (2016). All dollar figures are adjusted to 2018 dollars. These numbers do not include the potential impacts from parents needing to adjust to the loss of child care services.

**Table 5. Comparison of 5% Industry Decrease on Craven County Economy (2018 dollars)**

<b>Industry</b>	<b>Employment (jobs)</b>	<b>Labor Income</b>	<b>Total Value Added</b>	<b>Total Output</b>
Child care services	-23.3	-\$555,080	-\$788,901	-\$1,265,315
Elementary and secondary education (public and private)	-47.0	-\$1,745,135	-\$2,176,794	-\$2,535,626
Building material and garden equipment supplies stores	-29.2	-\$1,023,508	-\$1,659,245	-\$2,910,949
General merchandise stores	-80.2	-\$2,308,155	-\$3,513,687	-\$6,019,643
Physician offices	-92.2	-\$6,848,669	-\$7,841,369	-\$12,357,140

*Note:* Calculated via IMPLAN 3.1 (2016). All dollar figures are adjusted to 2018 dollars.

*10% scenario:* Table 6 summarizes the results of 10% decrease on the Craven County economy, while table 7 represents the comparison of child care services to the comparable industries with a similar 10% decrease in employment.

**Table 6. The Effect of 10% Decrease in Child Care Services in Craven County**

<b>Impact Type</b>	<b>Employment (jobs)</b>	<b>Labor Income</b>	<b>Total Value Added</b>	<b>Total Output</b>
Direct Effect	-40.0	-\$907,767	-\$1,168,977	-\$1,769,099
Indirect Effect	-2.8	-\$77,314	-\$169,317	-\$331,343
Induced Effect	-3.7	-\$125,079	-\$239,508	-\$430,189
<b>Total Effect</b>	<b>-46.5</b>	<b>-\$1,110,160</b>	<b>-\$1,577,802</b>	<b>-\$2,530,630</b>

*Note:* Calculated via IMPLAN 3.1 (2016). All dollar figures are adjusted to 2018 dollars.

**Table 7. Comparison of 10% Industry Decrease on Craven County Economy (2018 Dollars)**

<b>Industry</b>	<b>Employment (jobs)</b>	<b>Labor Income</b>	<b>Total Value Added</b>	<b>Total Output</b>
Child care services	-46.5	-\$1,110,160	-\$1,577,802	-\$2,530,630
Elementary and secondary education (both public and private schools)	-92.7	-\$3,449,313	-\$4,303,869	-\$4,998,103
Building material and garden equipment supplies stores	-57	-\$2,000,493	-\$3,243,069	-\$5,689,583
General merchandise stores	-147	-\$4,231,617	-\$6,441,760	-\$11,036,013
Physician offices	-186	-\$13,817,491	-\$415,820,306	-\$24,931,073

*Note:* Calculated via IMPLAN 3.1 (2016). All dollar figures are adjusted to 2018 dollars.

*25% scenario:* Under this 25% scenario, the largest decrease scenario that we examine, there would be the equivalent of 100 lost jobs in the child care services sector. The Craven County economy would lose an additional 16 jobs throughout the economy (100 lost jobs through direct impact, 7 lost jobs through indirect impact, and 9 lost jobs through induced impact). The economy would lose \$2,793,047 in labor income, about \$3,969,786 in value added, and \$6,372,827 in total output (see table 8 on the next page).

Table 9 represents the top 10 industries impacted by employment in this scenario. As the results show, the 25% scenario affects employment mainly in real estate, full-service restaurants, and limited-service restaurants. Overall, it impacts nearly every component of the service sector in Craven County.

**Table 8. Comparison of 25% Industry Decrease on Craven County Economy (2018 Dollars)**

<b>Industry</b>	<b>Employment (jobs)</b>	<b>Labor Income</b>	<b>Total Value Added</b>	<b>Total Output</b>
Child care services	-116	-\$2,793,047	-\$3,969,786	-\$6,372,827
Elementary and secondary education (public and private)	-233.6	\$8,686,498	\$10,837,989	\$12,592,453
Building material and garden equipment supplies stores	-143	-\$5,024,492	-\$8,145,382	-\$14,290,114
General merchandise stores	-368	-\$10,596,528	-\$16,131,019	-\$27,635,635
Physician offices	-464	-\$34,483,653	-\$39,481,982	-\$62,219,288

*Note:* Calculated via IMPLAN 3.1 (2016). All dollar figures are adjusted to 2018 dollars.

**Table 9. Top 10 Industries Impacted by Output with 25% Decrease in Child Care Services (2018 dollars)**

<b>Description</b>	<b>Total Output</b>
Child day care services	-\$4,463,360
Real estate	-\$423,675
Owner-occupied dwellings	-\$201,651
Other federal government enterprises	-\$65,621
Limited-service restaurants	-\$59,631
Physician offices	-\$58,291
Wholesale trade	-\$55,992
Other financial investment activities	-\$50,569
Employment services	-\$47,605
Full-service restaurants	-\$44,755

*Note:* Calculated via IMPLAN 3.1 (2016). All dollar figures are adjusted to 2018 dollars.

## ***PART II: Expanded Economic Scenarios***

This section describes the expanded models that utilize the survey data of parents and guardians with children using child care services in Craven County. These expanded economic scenarios account for additional considerations not analyzed in the general economic models. To conduct this expanded analysis, the CSR team of investigators collected information unavailable from traditional data sources through an original survey. (See the Appendix, Part B, for the full questionnaire.)

Before discussing the methodology behind the expanded model estimates, we provide below a general overview of the key findings from the survey.

- 53% reported that Craven County needs more child care services.
- 29% reported that they experienced difficulty in finding the child care they wanted.
- 34% reported that they would have to quit their job if a child care services were not available.
- 21% reported that they would have to reduce working hours if child care was not available.
- 15% reported that they would move to another area if child care was not available.
- 43% of respondents reported that their work schedules create extra stress with regard to caring for their children.
- About 30% reported their employers as not being flexible in their work schedule when it comes to meeting their child care needs.

### ***Survey-Adjusted Economic Estimates***

As highlighted above, the survey data provide estimates of the percentage of people who would have to quit their jobs if they did not have child care. The survey data also allow for deeper inspection on the impact of losing child care services across income groups. Using the survey data of those who would have to quit their jobs without child care by income group and combining it with data from IMPLAN on the number of households per certain income groups, the expanded economic models allow us to estimate the overall number of income lost per income group.

However, before going further with our discussion of the analysis and results of the expanded economic models, an important caveat is in order. The household income change scenario, discussed later in more detail, accounts for personal income taxes, but does not account for payroll taxes. To address that issue, we ran a labor income change scenario that accounts for payroll taxes (although, unlike the household income change scenario, it does not account for the variability of impacts across different income groups).

To arrive at the final estimates for the expanded economic scenarios, we calculate the proportion of income that stays within the county. We use industry shares of final demand to calculate the proportion of income that stays in Craven County. Not all income stays locally. For smaller areas, there is a high loss of income outside of the region. We calculate the ratio of the income that stays inside the region and apply that percentage to account only for the income that stays locally (about 34% for Craven County). This may also help to account for only a proportion of household income lost due to the lack of childcare (with the current data we are not able to determine what proportion of household income may be lost). The final calculation is based on the following formulas: a) labor income change; b) household income change; and c) household income change with a 34% adjustment:

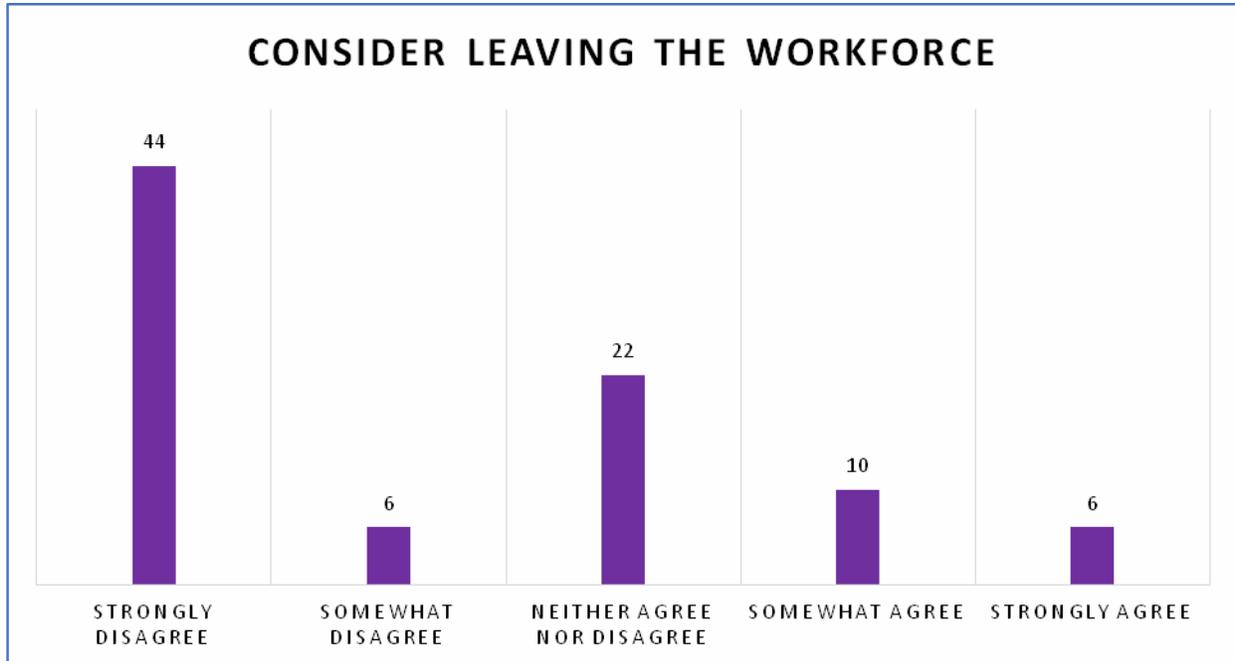
- a) *Labor income change = the total sum of proportion of people losing their jobs (survey) \* household income by category*
- b) *Household Income lost by income group = proportion of people losing jobs (survey) \* household income (by group)*
- c) *Household income lost by income group with adjustment = proportion of people losing jobs (survey) \* household income (by group) \* adjustment ratio<sup>12</sup>*

We created a number of survey items that assess the impact of lack of child care in Craven County on workforce participation. The proportion of people losing their jobs is based on the survey question, “What would the impact be on you and your family if the child care services were no longer available in your area?” While this is a question based on a hypothetical scenario, several respondents answered that they would indeed leave the workforce (see figure 2).

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<sup>12</sup> For example, using the income group of \$30,000-\$39,999, the household income change will be the following: Household income change for \$30,000-\$39,999 group= 20.6% \* \$350,212,390 \* 34%. That is, about 20.6% of those with incomes between \$30,000 and \$39,999 may be affected by the lack of child care and may have to quit their jobs or move, leading to loss of -\$72,102,551 in household incomes. However, not all of the income stays inside the region; hence we take 34% of this income to arrive at the final household income outcome of about \$24,514,867 for this group.

**Figure 2. Responses to Survey Question: “I am considering leaving the workforce to care for my child full-time”**



Source: CSR Survey (2018).

For the impact of child care question (“What would the impact be on you and your family if the child care services were no longer available in your area?”), about 35%<sup>13</sup> of the respondents indicated that they or their partners would have to quit their jobs. When we add together those who say that they would move to another area, some 39% of the respondents would be negatively impacted by the lack of child care services in the Craven County.<sup>14</sup>

The lack of child care services can also lead to fewer working hours: About 22% of respondents indicate that they will have to work fewer hours, and about 10% indicated that their partner would have to work fewer hours. The smaller percentage of those who may have to work fewer hours versus those who may have to quit their jobs has a straightforward and likely explanation: Not all jobs allow flexibility of working fewer hours, while still being able to take care of a child.

<sup>13</sup> We count households only once: whether they or their partner would have to quit their jobs. Our answer choices also allow for a range of actions in response to the lack of child care services.

<sup>14</sup> About 5% of respondents selected moving as their only option which may indicate that they will be able to move geographically, but keep their current or a similar job (e.g. via telecommuting or moving to another community).

Only 4%<sup>15</sup> of the respondents indicated that they will hire a nanny without selecting any other options (such as working fewer hours and/or quitting their job and/or moving). About 6% of respondents selected both relying on baby-sitter/nanny and relatives, while another 24% of respondents would rely on relatives only. Overall, about 52% of respondents would rely on relatives, but more than half of them also selected other options.

### ***Labor Income Change Scenario***

As noted earlier, the labor income change scenario does not take into account differences between income groups, but does incorporate payroll taxes. This is important because the income losses that may occur due to the lack of child care services are most likely labor income, which is subject to payroll taxes. The following table summarizes the labor income change in Craven County compared to the comparative industries used in the baseline model.

**Table 10. Labor Income Change Scenario Comparison**

<b>Description</b>	<b>Employment (jobs)</b>	<b>Labor Income</b>	<b>Total Value Added</b>	<b>Total Output</b>
Labor income change scenario	-2,133	-\$71,525,413	-\$136,826,299	\$245,872,375
Child care services	399	\$8,943,194	\$11,516,598	\$17,385,868
Elementary and secondary education (private schools)	70	\$2,397,167	\$2,611,275	\$3,534,425
Employment and payroll of state govt., public education	744	\$27,959,074	\$32,684,174	\$32,684,174
Building material and garden equipment supplies stores	433	\$14,966,668	\$22,856,093	\$39,331,101
General merchandise stores	1,212	\$32,080,488	\$45,884,225	\$77,256,699

*Note:* Calculated via IMPLAN 3.1 (2016). Labor income change uses survey 2018 numbers. All dollar figures are adjusted to 2018 dollars.

First, we calculate the household income changes by the income group. To arrive at the labor income change scenario, we sum all negative income changes by the group, and use the resulting number in the scenario: -\$578,891,398 or about 12% of household income in Craven County.

<sup>15</sup> Two respondents are in the \$30,000-\$39,999 income bracket; one respondent is in the \$60,000-\$69,999 income bracket; and another one is in the 10,000-\$19,999 income bracket. This leaves too few cases to conduct the analysis. Even if we expand our nanny/baby-sitter selections to those who would rely on relatives as well, we still have a small number of cases, and we add a complication on calculating part-time baby-sitters. The major issue is that we do not know how many of these nannies/baby-sitters are new to the area and do not represent just lateral move within industry for a specific nanny. That is, only nannies moving into Craven County will need to be considered or nannies that did not have previously that income. For the latter case, we may need to account for their use of savings or other partial income. Overall, hiring a nanny can be modeled as an income change rather than an industry change because nannies usually do not have intermediate expenditures. The tax non-compliance is about 80-90% which means that we do not have to account for taxes for this new income.

This approach ensures that the total amount of proposed change is the same across different scenarios. As table 10 also indicates, the labor change scenario produces results larger than any comparative industries in the baseline scenario. This is due to the effects being spread across multiple income groups and industries.

This scenario may induce losses of 2,133 jobs in employment. There are also losses of \$71,525,413 in labor income, \$136,826,299 in total value added, and \$245,872,375 in output lost. That is, Craven County may lose up to 2% in total labor income, 3% in total value added, and 3% of the total employment due to the lack of child care services in the area.

### ***Household Income Change Scenario***

The household income change scenarios are based on the proportions shown in table 11. We use the Public Use Microdata Survey (PUMS) household income levels for distributing survey income groups to IMPLAN income groups. Table 12 depicts the top 10 industries affected by household income changes in response to the lack of child care services. The table reports the full model and the model with the 34% adjustment, which allows us to account for the incomes leaving the area as well as incomes lost within the household.

**Table 11. Income Groups in our Survey and IMPLAN**

<b>Income groups survey</b>	<b>Bridge</b>	<b>IMPLAN income groups</b>	<b>Proportions</b>
Less than \$10,000	The whole group	Less than \$15,000	13.7%
\$10,000-19,999	Proportion of the group to less than \$15,000 category		
		Proportion of the group to the next income group in IMPLAN	\$15,000-29,999
\$20,000-29,999	The whole group		
\$30,000-39,999	The whole group	\$30,000-39,999	20.6%
\$40,000-49,999	The whole group	\$40,000-49,999	2.9%
\$50,000-59,999	The whole group	\$50,000-69,999	14.7%
\$60,000-69,999	The whole group		
\$70,000-79,999	The whole group	\$70,000-99,999	20.6%
\$80,000-89,999	The whole group		
\$90,000-99,999	The whole group		
\$100,000-149,999	The whole group	\$100,000-149,999	11.8%
Over \$150,000	Proportion of the group to the next income group in IMPLAN	\$150,000-199,999	1.4%
	Proportion of the group to the next income group in IMPLAN	\$200,000	1.6%
Prefer not to answer	n/a	n/a	n/a
Don't know	n/a	n/a	n/a

*Sources:* CSR Survey (2018), IMPLAN 3.1 (2016), and PUMS (2012-2016).

**Table 12. Total Employment Lost for Top 10 Industries in Craven County Due to the Lack of Child Care Services**

Industry	Full model	34% adjustment
Limited-service restaurants	-235	-80
Real estate	-208	-71
Retail - General merchandise stores	-152	-52
Full-service restaurants	-148	-508
Physician offices	-133	45
Nursing and community care facilities	-122	-41
Retail - Food and beverage stores	-113	-38
Retail - Nonstore retailers	-87	-30
Personal care services	-85	-29
Religious organizations	-84	-29

*Note:* Calculated via IMPLAN 3.1 (2016). Household income change uses CSR survey data.

These top industries represent about 43% of the overall employment loss using the income proportions in our scenario. The labor income losses (-\$36,169,790) represent about 2% of the overall labor income in the county. For comparison, the real estate labor income in the county equals \$33,446,241 and physician offices labor income is \$112,028,682. The following table represents the top ten industries that lose labor income with our household income scenario.

**Table 13. Top Ten Industries According to Total Labor Income Losses in Craven County Due to the Lack of Child Care Services**

Industry	Full model	34% adjustment
Physician offices	-\$13,089,233	-\$4,450,339
Retail - General merchandise stores	-\$4,078,428	-\$1,386,666
Limited-service restaurants	-\$3,842,222	-\$1,306,356
Nursing and community care facilities	-\$3,818,782	-\$1,298,386
Wholesale trade	-\$3,763,090	-\$1,279,450
Retail - Motor vehicle and parts dealers	-\$3,557,958	-\$1,209,706
Real estate	-\$3,507,708	-\$1,192,621
Religious organizations	-\$3,437,950	-\$1,168,903
Automotive repair and maintenance, except car washes	-\$3,278,584	-\$1,114,719
Offices of dentists	-\$2,991,797	-\$1,017,211

*Note:* Calculated via IMPLAN 3.1 (2016). Household income change uses CSR survey data. All dollar figures are adjusted to 2018 dollars.

Similar to employment effects, the labor income losses are present across various industries in Craven County, and impact negatively some of the top industries in Craven County.

The household income changes that occur in response to the lack of child care in Craven County amount to losses between \$68,250,919 and \$200,737,997 in total value added or about 1% to 4% of the overall total value added in Craven County. The physician offices industry total value added equals \$111,600,874 and the real estate industry total value added is \$171,909,919. The following table represents the top ten industries with losses in total value added in our scenario.

**Table 14. Top Ten Industries According to Total Value Added Losses in Craven County Due to the Lack of Child Care Services**

Industry	Full model	34% adjustment
Owner-occupied dwellings	-\$39,892,293	-\$13,563,380
Real estate	-\$18,029,227	-\$6,129,937
Physician offices	-\$13,039,249	-\$4,433,345
Limited-service restaurants	-\$9,130,508	-\$3,104,373
Monetary authorities and depository credit intermediation	-\$7,285,732	-\$2,477,149
Wholesale trade	-\$7,141,044	-\$2,427,955
Retail - General merchandise stores	-\$5,833,313	-\$1,983,326
Retail - Motor vehicle and parts dealers	-\$5,273,969	-\$1,793,149
Nursing and community care facilities	-\$4,799,339	-\$1,631,775
Offices of dentists	-\$4,726,623	-\$1,607,052
Legal services	-\$4,331,085	-\$1,472,569

*Note:* Calculated via IMPLAN 3.1 (2016). Household income change uses CSR survey data. All dollar figures are adjusted to 2018 dollars.

The owner-occupied dwellings industry is an IMPLAN-created industry that represents the costs of homeownership (e.g. repairs). The lack of child care services in Craven County may lead to the decline in spending related to homeownership. When people move, they may have to sell their houses, especially if their commute times are sufficiently higher than before. When people have to quit their jobs, their overall household income is negatively affected (as depicted by our scenarios) and, as such, they may spend less for home maintenance. Since owner-occupied dwellings are not a real industry, the table contains an extra actual industry affected by our scenarios.

The total output losses range between \$123,051,469 (34% adjustment model) and \$361,916,084 (full model), which surpass the total industry outputs of industries, such as physician offices (\$168,161,026) and the real estate total output (\$287,421,265).

The following table shows top ten industries according to total output losses in our scenarios.

**Table 15. Top Ten Industries According to Total Output Losses in Craven County Due to the Lack of Child Care Services**

<b>Industry</b>	<b>Full model</b>	<b>34% adjustment</b>
Owner-occupied dwellings	-\$61,498,390	-\$20,909,453
Real estate	-\$30,270,714	-\$10,292,043
Physician offices	-\$19,401,061	-\$6,596,361
Limited-service restaurants	-\$17,736,819	-\$6,030,519
Other federal government enterprises	-\$12,432,065	-\$4,226,902
Wholesale trade	-\$11,168,305	-\$3,797,224
Monetary authorities and depository credit intermediation	-\$10,411,957	-\$3,540,065
Retail - General merchandise stores	-\$9,676,659	-\$3,290,064
Retail – Non-store retailers	-\$9,087,709	-\$3,089,821
Nursing and community care facilities	-\$7,910,236	-\$2,689,480
Retail - Motor vehicle and parts dealers	-\$7,231,966	-\$2,458,868

*Note:* Calculated via IMPLAN 3.1 (2016). Household income change uses CSR survey data. All dollar figures are adjusted to 2018 dollars.

The total output losses represent the total production losses in Craven County due to a lack of child care facilities. These losses may be 7 to 20 times larger than the total output by child care industry.

Our scenarios project losses between \$32,137,949 and \$92,511,994 in employee compensation. For example, physician office employee compensation equals \$108,548,340. Table 16 shows the top ten industries losing employee compensation in our scenarios. The employee compensation includes wage and salary employment with all applicable benefits and taxes.

Household income changes in Craven County due to the lack of child care facilities also projects losses of \$4,031,841 in proprietor income or about 3% of the overall proprietor income in the county. Comparatively, physician offices proprietor income equals \$3,480,342 and the real estate industry is \$20,338,076. Table 17 shows the top ten industries losing proprietor income in our scenarios.

**Table 16. Top Ten Industries According to Employee Compensation Losses in Craven County Due to the Lack of Child Care Services**

<b>Industry</b>	<b>Full model</b>	<b>34% adjustment</b>
Physician offices	-\$12,682,596	-\$4,312,083
Retail - General merchandise stores	-\$4,056,379	-\$1,379,169
Nursing and community care facilities	-\$3,847,061	-\$1,308,001
Limited-service restaurants	-\$3,801,998	-\$1,292,679
Wholesale trade	-\$3,706,385	-\$1,260,171
Religious organizations	-\$3,436,280	-\$1,168,335
Retail - Motor vehicle and parts dealers	-\$3,169,077	-\$1,077,486
Offices of dentists	-\$2,881,086	-\$979,569
Full-service restaurants	-\$2,846,633	-\$967,855
Automotive repair and maintenance, except car washes	-\$2,593,544	-\$881,805

*Note:* Calculated via IMPLAN 3.1 (2016). Household income change uses CSR survey data. All dollar figures are adjusted to 2018 dollars.

**Table 17. Top Ten Industries According to Proprietor Income Losses in Craven County Due to the Lack of Child Care Services**

<b>Industry</b>	<b>Full model</b>	<b>34% adjustment</b>
Real estate	-\$2,132,976	-\$725,212
Personal care services	-\$1,306,673	-\$444,269
Other personal services	-\$805,752	-\$273,956
Automotive repair and maintenance, except car washes	-\$685,040	-\$232,914
Home health care services	-\$588,945	-\$200,241
Offices of other health practitioners	-\$491,504	-\$167,111
Truck transportation	-\$477,030	-\$162,190
Physician offices	-\$406,637	-\$138,257
Retail - Motor vehicle and parts dealers	-\$388,881	-\$132,220
Personal and household goods repair and maintenance	-\$357,230	-\$121,458

*Note:* Calculated via IMPLAN 3.1 (2016). Household income change uses CSR survey data. All dollar figures are adjusted to 2018 dollars.

Overall, the losses in employment due to the lack of child care services are about 2.7 to 8 times larger than the total employment in the child care industry in Craven County because parents are spread out across various income groups and belong to various industries. The losses to

employee compensation represent about 4 to 12 times the employee compensation in the child care industry. The child care industry does not typically pay high salaries; however, it appears to be an important source of proprietor income in Craven County.

It is also worth considering additional effects not captured in the above estimates. The loss of a job may lead to a loss of child care support. The loss of child care support may in turn make finding a new job more difficult, perpetually trapping families in a Catch-22: one cannot find a job because he or she does not have child care support, but one does not have child care support because he or she does not have a job.

## **Conclusions**

Our study combines multiple methods and data sources to estimate the economic impact of child care services in Craven County. We conducted interviews with key informants from child care services in Craven County in February 2018, along with a survey of parents and guardians of parents who use child care services. We employed IMPLAN proprietary data and software to calculate the economic impact of employment losses directly to the child care services industry as well as induced impacts of labor and household income changes due to parents' loss of child care services. The following table summarizes all scenarios run for this report. The table also includes the numbers for the child care industry in Craven County and the overall county numbers for employment, labor income, total value added, and output.

Beyond jobs and dollar figures, the viability of families remaining in Craven County is tied to child care services. Ultimately, someone—a parent, a guardian, a relative, a friend, another nanny or another facility—needs to provide care to children who are under five years of age. As parents adjust to the declining supply of child care facilities in Craven County, they may prefer to locate somewhere else. Likewise, new mothers and fathers from a different county may decide against relocating to Craven County due to a lack of child care services. Taken together, it seems reasonable to speculate that any declines in child care services are likely to exacerbate the population and workforce decline in Craven County.

This report also raises a number of questions for further research. If declines continue in the child care industry, one may wonder what happens to the larger geographic area, including Pamlico County and Carteret County. There is a possibility that a decline in child care services in Craven County creates opportunities somewhere else in the region. Alternatively, the decline may affect all geographic areas equally. While we have some anecdotal evidence of the Catch-22 that can occur due to a lack of child care—particularly for parents at lower income levels—it would be useful to quantify such effects further. With the loss of economic activity, Craven County also loses revenue in taxes—an important issue worthy of research in a follow up study.

**Table 18. Summary of Expanded and General Economic Scenarios**

	<b>Employment (Jobs)</b>	<b>Labor Income</b>	<b>Total Value Added</b>	<b>Total Output</b>
<b>Current economy</b>				
Total Craven County Economy	61,211	\$3,206,701,843	\$4,898,445,131	\$8,200,429,179
Child Care Industry	399	\$8,943,194	\$11,516,598	\$17,385,868
<b>General economic scenarios: Child care employment change</b>				
5% decrease in child care employment	-23	-\$555,080	-\$788,901	-\$1,265,315
10% decrease in child care employment	-47	-\$1,110,160	-\$1,577,802	-\$2,530,630
25% decrease in child care employment	-116	-\$2,793,047	-\$3,969,786	-\$6,372,827
<b>Expanded economic scenarios: Income change scenarios due to the lack of child care</b>				
Labor income change	-1,080	-\$36,169,790	-\$68,250,919	-\$123,051,469
Household income change	-2,133	-\$71,525,413	-\$136,826,299	-\$245,872,375
Household income change 34% adjustment	-3,176	-\$106,381,736	-\$200,737,997	-\$361,916,084

*Note:* Calculated via IMPLAN 3.1 (2016). All dollar figures are adjusted to 2018 dollars. The employment numbers in IMPLAN are run for the year 2018. The income change scenarios are based on the CSR survey data.

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## Appendix A

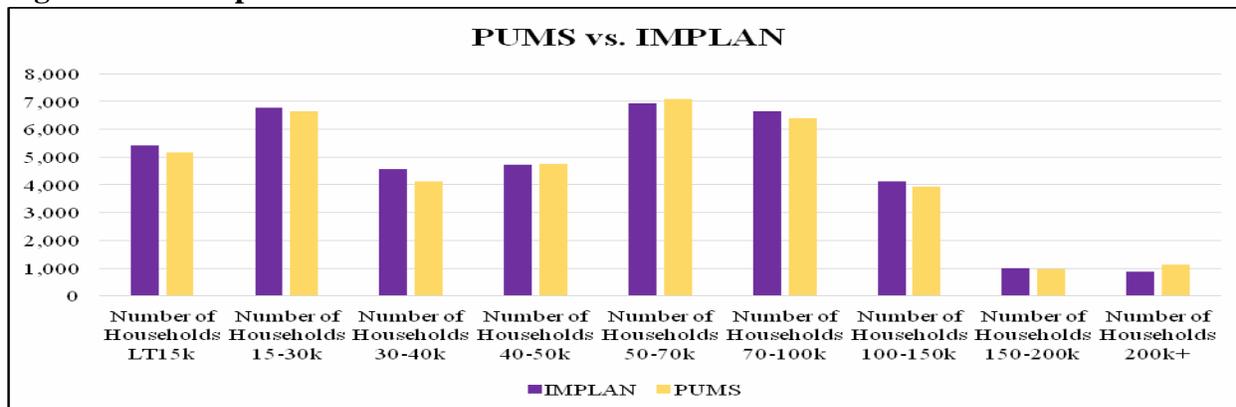
### Public Use Microdata Survey (PUMS)

The income distribution used in IMPLAN is also used in the Consumer Expenditure Survey. The income distribution in our survey is from Pew Research Center. Hence, the income groups slightly differ at the lower and upper end. We use the 5-year American Community Survey (ACS) Public Use Microdata Survey (PUMS) data to create proportions of income groups to apply to the IMPLAN data. These estimates provide more precision than one-year estimates. PUMS does not provide data at the county level, but aggregates to Public Use Microdata Areas (PUMAs) which are special partitions with at least 100,000 people. The PUMA for Craven County coincides with the borders of the County.

Each income group has been calculated as a percentage of the total number. For example, 5.9% of people who will have to quit their job or move are in the under \$10,000 income group. This whole income group is assigned to the IMPLAN income group, under \$15,000. However, only a proportion of the \$10,000 - \$19,999 group in our survey will belong to IMPLAN income group under \$15,000. We assign such cases (for income group \$10,000 - \$19,999 and over \$150,000) based on the PUMS income group distributions. That is, we calculate the relative proportions of less than \$10,000 to \$19,999: about 53% belong to under \$15,000 and about 47% belong to \$15,000 to \$29,999 groups. Overall, we distribute 13.7% of people to the income group under \$15,000. The next income group (\$15,000 to 29,999) will receive the whole proportion of \$20,000 to \$29,999 from our survey, and 47% of the \$10,000 to \$19,999 group to arrive at the total of 12.7%. At the top of income distribution, we distribute the survey category of over \$150,000 as about 47% going to the group \$150,000-199,999 and about 53% going to the group over \$200,000. Table 11 represents all the resulting proportions.

The PUMS are very close to IMPLAN data, allowing us to achieve better precision in breaking down the income categories from our survey to IMPLAN incomes. The following chart shows the comparative distribution of IMPLAN household characteristics compared to the PUMS 2012-2016 income groups for Craven County.

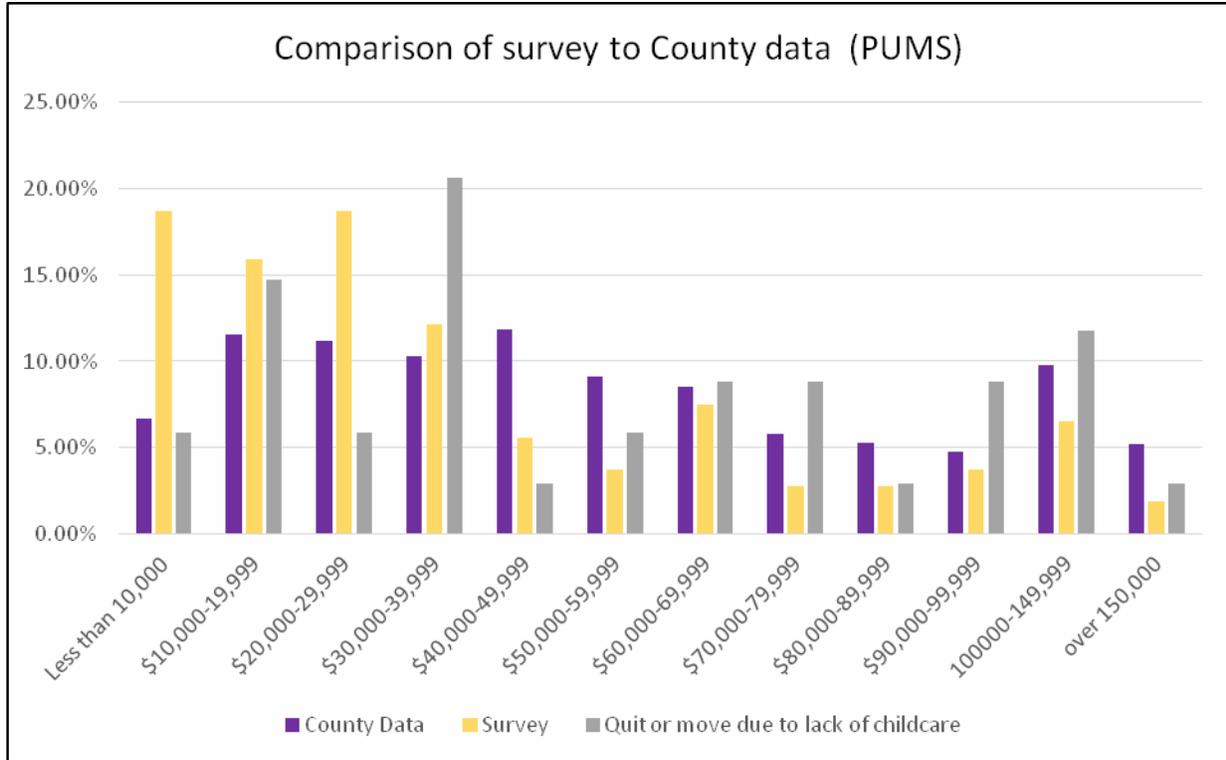
**Figure A-1. Comparison of the Number of Households between IMPLAN and PUMS**



Sources: CSR Survey (2018), IMPLAN 3.1 (2016), and PUMS (2012-2016).

Figure A-2 provides compares the PUMS data to the CSR survey data by income groups for those affected lack of child care.

**Figure A-2. Comparison of PUMS to 2018 Survey**



Sources: CSR Survey (2018), IMPLAN 3.1 (2016), and PUMS (2012-2016).

## **Model Limitations**

The models presented in this report have limitations in their major assumptions. One major assumption of such models is that the demand is exogenous or that services/products that drive local economic growth are exported outside of the study region. For example, one of the top 5 industries by labor income in Craven County is physician offices. The I/O models would assume that most of the multiplier impact for this industry comes from the surrounding counties, such as Pamlico or Pitt. This is not a likely scenario for physician offices, but it is also an unlikely assumption for the child care services, in which demand is mostly endogenous or coming from inside Craven County. Hence, the important productivity effect on parents is not incorporated into such models. With this limitation in mind, such models are likely to underestimate the multiplier effect of industries, such as child care, that cater to local demand for child care.

We improve on these limitations by incorporating unique survey data to produce labor income and household income scenarios. These expanded models show more realistically the impact from the lack of child care services on parents and guardians of children. However, while the model on labor income change incorporates the corresponding changes to payroll taxes and adjusts for in-commuters, such models do not include how different income groups may be impacted differently by the lack of childcare. The model on household income change incorporates how different income groups may be impacted differently but does not account for payroll taxes and in-commuters. The survey design focuses on the local Craven County residents. As such, in-commuters do not represent a big problem for our analysis. To avoid making payroll tax assumptions, we provide a range of estimates. We also do not have data to represent the proportions of household income lost due to one job loss. The 34% adjustment models help to account for these limitations.

## Appendix B

### QUESTIONNAIRE: THE ECONOMIC IMPACT OF CHILD CARE

As a parent with a child currently enrolled in child care, your participation in this study is vital to enhancing our understanding of the role that available and affordable child care plays in your daily life. Once the study is complete, the aggregate information gathered through this study will be provided to the organization, Craven Smart Start, Inc. (<http://www.cravensmartstart.org>).

The survey will take approximately 15 minutes to complete. Your responses will be anonymous and you will not be asked to provide any identifying information on this survey. No data will be released or used with your identification attached. This is a confidential survey. The answers you provide will **not** be attributable to you. Only statistical tabulations from the data will be published. There will be no disclosure or mention of those who participate.

Your participation in this research is **voluntary**. You may choose not to answer any or all questions, and you may stop at any time. There is **no penalty for not taking part** in this research study. Please call Dr. Peter Francia at 252-737-5390 for any research-related questions or the ECU Office of Research Integrity & Compliance (ORIC) at 252-744-2914 if you have any questions about your rights as a research participant.

If you are willing to participate in this research, please click on the YES button below and continue with the survey. Otherwise, please close this window or navigate to another page.

Yes

---

For the purposes of this study, *child care services* refer to the supervision and/or instruction of children from six weeks to five years in age by a child care facility or other provider that does not include you or someone in your family.

---

1. Are you currently using child care services?

Yes

No

---

2. For the supervision and/or instruction of your child or children, are you currently using a child care facility or some other provider?

- Child care facility
- Other provider (please specify)

\_\_\_\_\_

3. How many of your children are currently enrolled in a child care facility or receive child care from a provider other than you or someone in your family?

- |                            |                            |                                       |
|----------------------------|----------------------------|---------------------------------------|
| <input type="checkbox"/> 0 | <input type="checkbox"/> 4 | <input type="checkbox"/> 8            |
| <input type="checkbox"/> 1 | <input type="checkbox"/> 5 | <input type="checkbox"/> 9            |
| <input type="checkbox"/> 2 | <input type="checkbox"/> 6 | <input type="checkbox"/> More than 10 |
| <input type="checkbox"/> 3 | <input type="checkbox"/> 7 |                                       |

4. What are the ages of your children currently receiving child care from a child care facility or other provider, and approximately how many hours per week does he or she spend there?

	Age	Hours per week
Child 1 (i.e, youngest child)		
Child 2		
Child 3		
Child 4		
Child 5		
Child 6		
Child 7		
Child 8		
Child 9		
Child 10		

5. What are the ages of any other children you have living in your home **who are not in child care?**

	Age
Child 1 (i.e, youngest child)	
Child 2	
Child 3	
Child 4	
Child 5	
Child 6	
Child 7	
Child 8	
Child 9	
Child 10	

6. Are you currently employed?

Yes

No

---

*Display This Question:*

*If Are you currently employed? = Yes*

6b. On average, how many hours do you work per week?

---

7. Do any other adults (e.g., spouse, partner, grandparent) reside in your household?

Yes

No

*Display This Question:*

*If Do any other adults (e.g., spouse, partner, grandparent) reside in your household? = Yes*

7b. How many other adults reside in your household (excluding yourself)?

---

*Display This Question:*

*If Do any other adults (e.g., spouse, partner, grandparent) reside in your household? = Yes*

7c. For the other adults residing in your home, are any of them employed?

Yes

No

---

*Display This Question:*

*If For the other adults residing in your home, are any of them employed? = Yes*

7d. How many other adults residing in your home are employed?

0

4

8

1

5

9

2

6

More than 10

3

7

---

8. How many work days, on average, did you miss last year due to a lack of childcare availability?

---

*If answered 0 days, then skip to question 10*

9. On the previous question, you indicated that you missed work due to a lack of childcare availability. What was the reason for the lack of available childcare? Please select all that apply.

- My child-care facility does not always open early enough to accommodate my work schedule.
- My child-care facility does not always close late enough to accommodate my work schedule.
- My child-care facility had a closing(s) due to poor weather.
- My child-care facility was closed due to a holiday.
- Other (please specify) \_\_\_\_\_

10. Does any person or agency outside of your household help you to pay for your child care expenses?

- Yes
- No

---

*If answered No, then skip to question 12*

---

*If answered Yes, then go to question 10b*

10b. What would be the impact on you and your family if the subsidies were no longer available? Please select all that apply.

- No impact/I would still utilize child care
- I would work fewer hours per week at my current job to stay home to help care for my child/children
- I would quit my job to stay home to help care for my child/children
- My partner/spouse would work fewer hours per week to stay home to help care for my child/children
- My partner/spouse would quit their job to stay home to help care for my child/children
- I would rely on relatives and friends to help care for my child/children
- I would hire a baby-sitter/nanny
- Other impact (please specify)  
\_\_\_\_\_

11. Who helps you pay for your child care? Please select all that apply.

- Government agency (e.g., NC Department of Social Services)
- National Association of Child Care Resource and Referral Agencies
- Private agency
- My employer
- Head start program
- Child support payments
- Program scholarships

- Church or faith-based organizations
  - Friend or relative
  - Other (please specify) \_\_\_\_\_
- 

11b. Approximately what percentage of your child-care costs are covered by other persons or agencies?

Percent (%) \_\_\_\_\_

*Go to question 13*

---

12. Please indicate the reasons why you do not use any child-care subsidies. Please select all that apply.

- Unemployed
  - I do not know how to apply
  - It is too difficult to apply
  - I do not want the mess with the hassle
  - I probably would not qualify
  - I would probably lose them anyway
  - Other (please specify) \_\_\_\_\_
-

13. What would be the impact on you and your family if the child care services were no longer available in your area? Please select all that apply.

- I would work fewer hours per week at my current job to stay home to help care for my child/children
- I would quit my job to stay home to help care for my child/children
- My partner/spouse would work fewer hours per week to stay home to help care for my child/children
- My partner/spouse would quit their job to stay home to help care for my child/children
- I would rely on relatives and friends to help care for my child/children
- I would hire a baby-sitter/nanny to help care for my child/children
- We would move to another area
- Other impact (please specify)

\_\_\_\_\_

-----

14. How much would you expect to pay a baby-sitter/nanny per hour?

- \$ per hour \_\_\_\_\_

-----

15. Excluding any assistance, approximately how much does your household spend on child care each week?

- \$ per week \_\_\_\_\_

-----

16. Please indicate how strongly you agree or disagree with the following statements.

---

My work schedule causes extra stress for me at home with regard to caring for my child/children.

- Strongly agree
  - Somewhat agree
  - Neither agree nor disagree
  - Somewhat disagree
  - Strongly disagree
- 

My employer is flexible with my work schedule when it comes to my child care.

- Strongly agree
  - Somewhat agree
  - Neither agree nor disagree
  - Somewhat disagree
  - Strongly disagree
-

Craven County needs more child-care facilities.

- Strongly agree
  - Somewhat agree
  - Neither agree nor disagree
  - Somewhat disagree
  - Strongly disagree
- 

My child/children could not get into my child-care of choice because of a waitlist.

- Strongly agree
  - Somewhat agree
  - Neither agree nor disagree
  - Somewhat disagree
  - Strongly disagree
-

My **evening** work schedule limits my child-care choices.

- Strongly agree
  - Somewhat agree
  - Neither agree nor disagree
  - Somewhat disagree
  - Strongly disagree
- 

My **weekend** work schedule limits my child-care choices.

- Strongly agree
  - Somewhat agree
  - Neither agree nor disagree
  - Somewhat disagree
  - Strongly disagree
-

I have had difficulty finding the child care I want.

- Strongly agree
  - Somewhat agree
  - Neither agree nor disagree
  - Somewhat disagree
  - Strongly disagree
- 

The cost of child-care has prevented me from getting the kind of care I want.

- Strongly agree
  - Somewhat agree
  - Neither agree nor disagree
  - Somewhat disagree
  - Strongly disagree
-

I have friends or family in Craven County that cannot work because of child-care costs.

- Strongly agree
  - Somewhat agree
  - Neither agree nor disagree
  - Somewhat disagree
  - Strongly disagree
- 

I am considering leaving the workforce to care for my child/children full-time.

- Strongly agree
  - Somewhat agree
  - Neither agree nor disagree
  - Somewhat disagree
  - Strongly disagree
-

17. In your opinion, is it better, worse, or no difference for young children to be home with their parent(s) than it is for them to be in full-time child care?

- Much better to be at home
  - Somewhat better to be at home
  - No difference
  - Somewhat better to be in child care
  - Much better to be in child care
- 

18. Overall, how satisfied are you with your employer's efforts to accommodate your child-care needs?

- Very satisfied
  - Somewhat satisfied
  - Neither satisfied nor dissatisfied
  - Somewhat dissatisfied
  - Very dissatisfied
- 

19. Do you claim a federal income tax credit for child care expenses?

- Yes
  - No
  - Don't know
-

20. Do you receive the Earned Income Tax Credit?

- Yes
  - No
  - Don't know
- 

21. Do you use a plan through an employer that allows you to purchase child care with before-tax dollars?

- Yes
  - No
  - Don't know
- 

22. Does your employer pay for some child care expenses?

- Yes
  - No
  - Don't know
-

23. Does your spouse/partner's employer pay for some child care expenses?

- Yes
  - No
  - Don't know
- 

24. What is your sex?

- Male
  - Female
  - Other (please specify) \_\_\_\_\_
- 

25. In what year were you born?

\_\_\_\_\_

---

26. Please select the highest level of school you have completed or the highest degree you have received.

- Less than high school degree
  - High school graduate (high school diploma or GED)
  - Some college, but no degree
  - Technical, trade, or vocational degree
  - Associate degree in college (2-year)
  - Bachelor's degree in college (4-year)
  - Master's degree
  - Doctoral degree
  - Professional degree (JD, MD)
- 

27. What best describes your race?

- White
  - Black or African American
  - Asian
  - American Indian or Alaska Native
  - Native Hawaiian or Pacific Islander
  - Other (please specify) \_\_\_\_\_
-

28. Are you of Hispanic, Latino, or Spanish origin?

Yes

No

---

29. What is your marital status?

Married

Unmarried but living with a partner

Divorced

Separated

Widowed

Never been married

---

30. Approximately what is your total annual household income?

- Less than \$10,000
  - \$10,000 - \$19,999
  - \$20,000 - \$29,999
  - \$30,000 - \$39,999
  - \$40,000 - \$49,999
  - \$50,000 - \$59,999
  - \$60,000 - \$69,999
  - \$70,000 - \$79,999
  - \$80,000 - \$89,999
  - \$90,000 - \$99,999
  - \$100,000 - \$149,999
  - More than \$150,000
  - Prefer not to answer
  - Don't know
-

Thank you for participating in this research. Please share any additional comments or feedback in the space provided below.

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## Appendix C

### SURVEY RESULTS

#### I. Impacts of Lack of Child Care Services

<b>Impact if Subsidies were No Longer Available</b>	<b>% Who Selected Yes</b>
No Impact/I would still utilize child care	12.0
Would work fewer hours per week at my current job to stay home to help care for child/children	31.6
Would quit job to stay home to help care for child/children	47.4
Partner/spouse would work fewer hours per week to stay home to help care for child/children	12.0
Partner/spouse would quit their job to stay home to help care for child/children	4.0
Would rely on relatives and friends to help care for my child/children	56.0
Would hire a baby-sitter/nanny	16.0
Other Impact	16.0

<b>Additional Impact if Subsidies were No Longer Available</b>
Would not be able to live independently
Would not be able to go to school
Financial strain

<b>Impact if Child care Services were No Longer Available</b>	<b>% Who Selected Yes</b>
Would Work fewer hours per week at my current job to stay home to help care for child/children	21.6
Would quit job to stay home to help care for child/children	34.1
Partner/spouse would work fewer hours per week to stay home to help care for child/children	10.3
Partner/spouse would quit their job to stay home to help care for child/children	6.0
Would rely on relatives and friends to help care for my child/children	52.1
Would hire a baby-sitter/nanny	25.6
Would move to another area	15.4
Other Impact	17.1

<b>Additional Impact if Child care Services were No Longer Available</b>
Would have to quit school
Try to change shifts
Would search for child care outside the area

<b>Reason for the Lack of Available Child Care</b>	<b>% Who Selected Yes</b>
My child-care facility does not always open early enough to accommodate my work schedule	16.7
My child-care facility does not always close late enough to accommodate my work schedule	15.2
My child-care facility had a closing(s) due to poor weather	60.9
My child-care facility was closed due to a holiday	52.2
Other	41.3

<b>Additional Reasons for the Lack of Available Child Care</b>
Caregiver unavailable for personal reasons
Child care not available
Child's problematic behavior
Child was sick
Cannot afford child care

<b>My Work Schedule Causes Extra Stress for Me at Home with Regard to Caring for my Child/Children</b>	<b>Percent</b>
Strongly Agree/ Somewhat Agree	43.3
Neither Agree nor Disagree	22.2
Strongly Disagree/ Somewhat Disagree	34.4

<b>My Employer is Flexible with my Work Schedule when It comes to my Child care</b>	<b>Percent</b>
Strongly Agree/ Somewhat Agree	55.6
Neither Agree nor Disagree	14.4
Strongly Disagree/ Somewhat Disagree	30.0

<b>Craven County Need More Child-care Facilities</b>	<b>Percent</b>
Strongly Agree/ Somewhat Agree	53.2
Neither Agree nor Disagree	40.5
Strongly Disagree/ Somewhat Disagree	6.4

<b>My Child/Children could not Get into my Child-care of choice because of a waitlist</b>	<b>Percent</b>
Strongly Agree/ Somewhat Agree	31.4
Neither Agree nor Disagree	29.8
Strongly Disagree/ Somewhat Disagree	38.8

<b>My Evening Work Schedule Limits my Child-care Choices</b>	<b>Percent</b>
Strongly Agree/ Somewhat Agree	30.2
Neither Agree nor Disagree	32.6
Strongly Disagree/ Somewhat Disagree	37.2

<b>My Weekend Work Schedule Limits my Child-care Choices</b>	<b>Percent</b>
Strongly Agree/ Somewhat Agree	31.4
Neither Agree nor Disagree	30.2
Strongly Disagree/ Somewhat Disagree	38.4

<b>I Have Had Difficulty Finding the Child Care I Want</b>	<b>Percent</b>
Strongly Agree/ Somewhat Agree	29.2
Neither Agree nor Disagree	35.0
Strongly Disagree/ Somewhat Disagree	35.9

<b>The Cost of Child-care Has Prevented Me from Getting the Kind of Care I Want</b>	<b>Percent</b>
Strongly Agree/ Somewhat Agree	42.6
Neither Agree nor Disagree	29.5
Strongly Disagree/ Somewhat Disagree	27.8

<b>I Have Friends or Family in Craven County that Cannot Work Because of Child-care Costs</b>	<b>Percent</b>
Strongly Agree/ Somewhat Agree	62.3
Neither Agree nor Disagree	20.5
Strongly Disagree/ Somewhat Disagree	17.2

<b>I Am Considering Leaving the Workforce to Care for my Child/Children Full-time</b>	<b>Percent</b>
Strongly Agree/ Somewhat Agree	18.2
Neither Agree nor Disagree	25.0
Strongly Disagree/ Somewhat Disagree	56.8

## **II. Child Care Information**

<b>Child Care Providers</b>	<b>Percent</b>
Child Care Facility	90.8
At Home	3.3
Family Member	1.7
School	1.7
After School/Other Program	1.7
Neighbor	0.8

<b>Number of Children in Care</b>	<b>Percent</b>
1	66.9
2	28.7
3	4.4

<b>Child Care Hours per Week</b>	<b>Percent</b>
40 hours per week or greater	38.7
30 – 39 hours per week	18.8
20-29 hours per week	13.3
10-19 hours per week	16.0
0-9 hours per week	13.2

### III. Financial Help with Child Care

<b>External Financial Help with Child Care</b>	<b>Percent</b>
Yes	20.6
No	79.4

<b>Who Helps Pay for Child Care?</b>	<b>% Who Selected Yes</b>
Government Agency	59.3
National Association of Child Care Resources and Referral Agencies	0.0
Private Agency	7.4
Employer	14.8
Head Start Program	7.4
Child Support Payments	3.7
Program Scholarships	0.0
Church or Faith-based Organization	7.4
Friend or Relative	7.4
Other	7.4

<b>Average Percent of Child care Costs Covered</b>	80.71%
--	--------

<b>Reasons Parents Do Not Use Any Child care Subsidies</b>	<b>% Who Selected Yes</b>
Unemployed	18.3
Do not know how to apply	3.2
It is too difficult to apply	3.2
Do not want to mess with the hassle	8.6
Probably would not qualify	48.4
Would Probably lost them anyways	3.2
Other	29.0

<b>Additional Reasons Parents Do Not Use Any Child care Subsidies</b>
Waitlisted
Waiting list is too long
Already applied
Stigma
Do not qualify

<b>Average Expected Pay for a Baby-sitter/Nanny per Hour</b>	\$9.58/Hour
--	-------------

<b>Average Weekly Household Spending on Child Care (Excluding assistance)</b>	\$154.09/Week
---	---------------

<b>Do You Use a Plan Through Your Employer that Allows You to Purchase Child Care with Before-tax Dollars?</b>	<b>Percent</b>
Yes	6.7
No	86.5
Don't Know	6.7

<b>Does Your Employer Pay for Some Child Care Expenses?</b>	<b>Percent</b>
Yes	6.7
No	88.8
Don't Know	4.5

<b>Does your Spouse/Partner's Employer Pay for Some Child Care Expenses?</b>	<b>Percent</b>
Yes	7.4
No	89.3

<b>Overall, How Satisfied Are You with Your Employer's Efforts to Accommodate Your Child-care Needs?</b>	<b>Percent</b>
Very satisfied/Somewhat satisfied	64.8
Neither satisfied nor dissatisfied	21.6
Very Dissatisfied/Somewhat dissatisfied	13.6

<b>Do you Claim a Federal Income Tax Credit for Child Care Expenses?</b>	<b>Percent</b>
Yes	48.4
No	45.2
Don't Know	6.3

<b>Do You Receive the Earned Income Tax Credit?</b>	<b>Percent</b>
Yes	46.8
No	36.3
Don't Know	16.9

#### IV. General Demographics

<b>Race/Ethnicity</b>	<b>Percent</b>
White	42.7
Black	35.5
Hispanic or Latino/a	9.7
Asian	4.8
American Indian or Native Alaskan	0.0
Native Hawaiian or Pacific Islander	0.0
Mixed	1.6
Other	5.6

<b>Gender/Sex</b>	<b>Percent</b>
Male	7.1
Female	92.1
Other	0.8

<b>Average Age</b>	34.3 years
--------------------	------------

<b>Marital Status</b>	<b>Percent</b>
Married	46.5
Unmarried but living with partner	11.0
Divorced	4.7
Separated	6.3
Widowed	0.8
Never been married	30.7

<b>Education</b>	<b>Percent</b>
Less than high school degree	10.2
High school graduate or GED	20.3
Some college, but no degree	22.7
Technical, Trade, or vocational degree	3.9
Associate degree	10.9
Bachelor's degree	21.1
Master's degree	10.2
Professional degree (JD, MD, PhD)	0.8

#### V. Employment and Financial Demographics

<b>Employment Status</b>	<b>Percent</b>
Employed	72.1
Unemployed	27.9

<b>Full-time Employment vs. Part-time Employment</b>	<b>Percent</b>
Full-time	65.0
Part-time	35.0
<b>Is the Participant the Only Source of Income?</b>	<b>Percent</b>
Yes	31.0
No	69.0

<b>Number of People in Household</b>	<b>Percent</b>
1	2.1
2	14.9
3	29.1
4	31.9
5	12.8
6	7.1
7	0.7
9	1.4

<b>Household Annual Income</b>	<b>Percent</b>
Less than \$10,000	18.7
\$10,000 - \$19,999	15.9
\$20,000 - \$29,999	18.7
\$30,000 - \$39,999	12.1
\$40,000 - \$49,999	5.6
\$50,000 - \$59,999	3.7
\$60,000 - \$69,999	7.5
\$70,000 - \$79,999	2.8
\$80,000 - \$89,999	2.8
\$90,000 - \$99,999	3.7
\$100,000 - \$149,999	6.5
More than \$150,000	1.9

<b>Below Poverty Line (Estimate)</b>	<b>Percent</b>
Yes	37.1
No	62.9

*Source:* <https://www.healthcare.gov/glossary/federal-poverty-level-fpl/>  
 Estimates were calculated using a combination of the participants' annual household income and number of adults and children in the household.

**VI. Additional Results**

<b>Work Days Missed Last Year Due to Lack of Child Care Availability</b>	<b>Percent</b>
1 day	6.4
2 days	4.3
3 days	14.9
4 days	8.5
5 days	12.8
6 days	12.8
7 days	4.3
8 days	8.5
9 days	4.3
10 days	6.4
11 days	4.3
12 days	2.1
15 days	2.1
20 days	2.1
25 days	2.1
65 days	2.1
90 days	2.1

<b>Average Days Missed</b>	9.64 days
----------------------------	-----------

<b>In Your Opinion, Is It Better, Worse, or No Difference for Young Children to Be Home with Their Parent(s) Than It Is for Them to Be in Full-time Child Care?</b>	<b>Percent</b>
Much better/Somewhat better to be at home	31.0
No difference	17.5
Much better/Somewhat better to be in child care	51.6