Lost Possibilities

The Impacts of Inadequate Child Care on Montana's Families, Employers and Economy

Bureau of Business and Economic Research
University of Montana—Missoula

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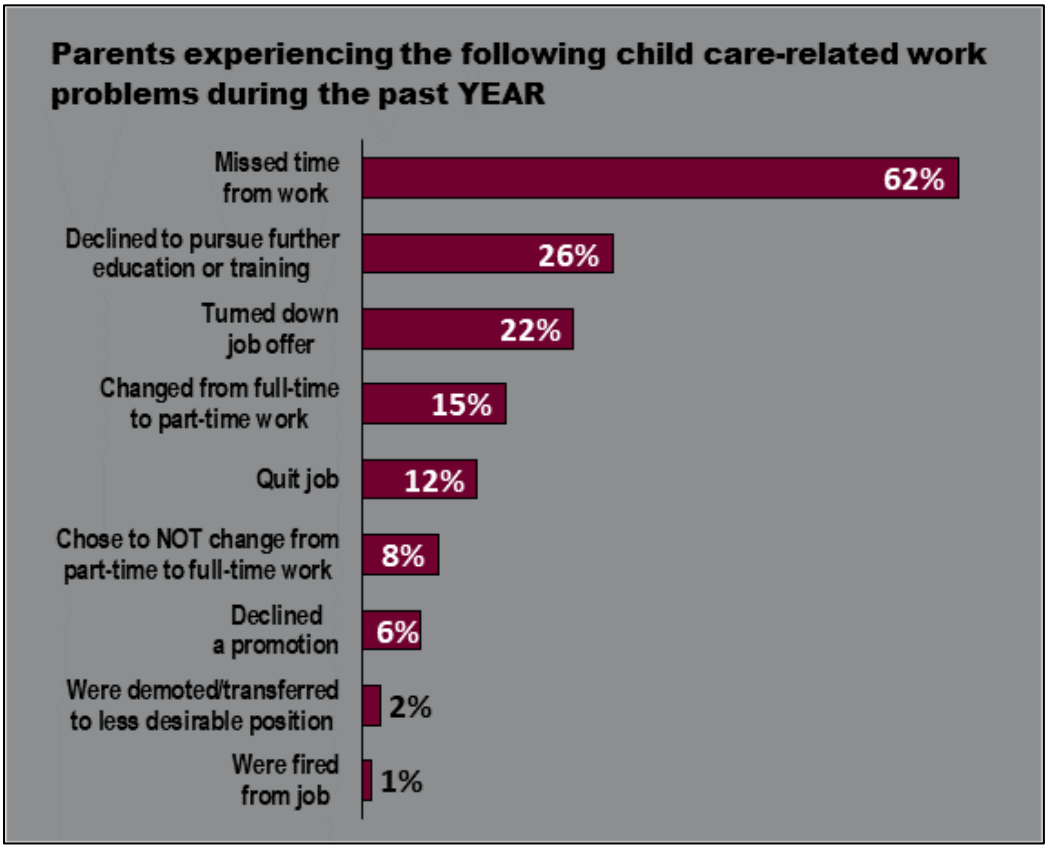
Highlights

From January through April of 2020 University of Montana's Bureau of Business and Economic Research (BBER) conducted a survey to examine the economic impact inadequate child care has on Montana parents, employers and taxpayers. The survey was paid for by the Federal Reserve Bank of Minneapolis. The survey randomly sampled Montana households with children ages 0-5. BBER collected data from 404 Montana households. The responses are weighted so the results reflect the statewide population of households with children ages 0-5. Most respondents replied prior to the impact of the COVID-19 pandemic on Montana. Responses received after the pandemic were not substantially different than those received before the pandemic.

The survey found:

1. 57% of households reported that finding affordable child care is a challenge
2. 46% of respondents left work early in the past month due to inadequate child care
3. 44% of respondents missed a full day of work in the past month due to inadequate child care

Over the past year Montana parents experienced the following work-related problems due to child care issues:



Detailed descriptions of the methods used in this study may be found in the appendices of this report. Inadequate child care in this report refers to a lack of access to reliable child care. The term does not refer directly to the quality of child care provided.

The analysis includes comparisons by household income, race, and geography. First, households earning $30,000 or less lost about $3,400 in wages per year due to issues related to inadequate child care, more than 10 percent of their income. Families with fewer economic resources are likely to face greater challenges in the child care market which can present a substantial barrier to economic opportunities. Parents in low-income households were more likely than high-income households to:

1. decline to pursue further education or training in connection with their employment (38% versus 21%)
2. turn down job offers (36% versus 12%)
3. change from full-time to part-time work (24% versus 10%)
4. quit their jobs (26% versus 5%).

Second, the results compare the experiences of American Indians, the second largest racial group in the state, with White Montanans. American Indian respondents were more likely than White respondents to:

1. decline to pursue further education or training in connection with their employment (47% versus 24%)
2. turn down job offers at a higher rate (37% versus 22%)
3. quit their jobs (27% versus 10%).

Third, urban and rural households did not have substantial differences in the impact of inadequate child care on employment and income; however, urban households reported greater difficulty finding affordable child care than rural households (60% versus 49%).

In the year prior to the survey the economic burden on the Montana economy caused by inadequate child care was substantial. Parents of children ages 0-5 suffered this burden primarily through lost wages caused by missing work to care for a child. Businesses bore the burden because of lower productivity caused by employee absenteeism and by incurring employee turnover costs. Taxpayers experienced this burden because income tax receipts were reduced since parents earned less when they missed work.

The figure below summarizes the past year economic losses suffered by the Montana economy due to inadequate child care.

Losses from the Montana economy caused by inadequate child care (2019)

	Loss to households	Loss to businesses	Loss to taxpayers
Average per household	$5,700	$2,150	$1,260
Total	$145,146,000	$54,562,000	$32,036,000

Introduction

All Montana parents[1] need some form of child care arrangement for their children before they reach school age[2]. It can be as clear-cut as one parent staying home with the child full time, or as complex as parents utilizing a combination of several different child care alternatives to meet their needs while all available wage earners are working full time.

At least 73% of Montana households with children ages 0 to 5 years old—younger than school-aged—require some form of child care arrangement away from home to allow for all available wage earners to earn a pay check. Such arrangements are often inadequate, failing to meet the needs of a parent. For example, providers in the child care market may not cover the hours a parent needs to work, or a sudden closure or sick provider may leave them unexpectedly without care.

Regardless of adequacy, child care for young children is often expensive relative to a family's economic resources. Issues related to inadequate child care also impact a family's economic well-being. Inadequate child care can influence a parent's job selection, increase absenteeism, and detract from their work performance. These issues, in turn, affect employee earning potential, their employers and the greater state economy.

This report provides the results of the Montana Child Care Survey, assessing the issues related to inadequate access to reliable child care faced by Montana households with at least one child age 0-5. It does not include a discussion of the quality of child care available, nor the myriad benefits associated with quality early childhood education.

Descriptive Analysis

From January through April of 2020, the Bureau of Business and Economic Research (BBER) at the University of Montana, conducted the Montana Child Care Survey to examine issues related to inadequate child care in Montana. The survey was sponsored by the Federal Reserve Bank of Minneapolis. It obtained 404 completions—all Montana households with at least one child ages 5 years or younger. BBER collected more than 70% of survey responses before Montana K-12 schools switched to on-line instruction in response to COVID-19. Analysis of survey responses found little, if any, effect of COVID-19 on survey responses (please see the detailed analysis later in this report).

[1] To facilitate legibility, this report uses the term "parent" to refer to biological parents, step-parents, adopted parents, guardians and others who care for a child.
[2] While the authors recognize that there is a need for after-school child care as well, once children reach school age, this report addresses issues related to the care of children ages 0-5 only.

The survey sample was randomly selected at the household level. Responses were collected via the internet and mail. All estimates presented in this report are weighted to represent the population of Montana households with children under the age of 6. The characteristics of the survey respondents (not households) are summarized in Table 1 and Table 2. The questionnaire can be found in Appendix 1, and a detailed description of the survey methods used can be found in Appendix 2. Differences in the percentage of responses from specific demographic groups are only emphasized in this document if they are significant at the 95% confidence level unless noted otherwise.

Table 1: Survey respondent characteristics

Respondent[a] characteristics	Percent of total
Sex	
Female	78%
Male	22%
Highest level of schooling completed	
Less than high school diploma	3%
High school diploma	12%
Some college credit but no degree	25%
Associate's degree	11%
Bachelor's degree	33%
Master's degree	11%
Professional degree	3%
Doctorate degree	2%
Ethnicity	
Hispanic or Latino	3%
Not Hispanic or Latino	97%
Race[b]	
White	91%
American Indian/Alaska Native	12%
Black	3%
Asian	2%
Native Hawaiian/Other Pacific Islander	2%
Location of home	
Urban county	65%
Rural county	35%
Annual household income	
$30,000 or less	24%
$30,001 - $55,000	25%
$55,001 - $95,000	26%
$95,001 and over	25%

[a] Respondents were one parent, guardian or caregiver who answered the survey on behalf of the sampled household.

[b] Respondents could indicate more than one race.

Table 2: Survey respondent employment status

Current employment status	Percent of total
Employed, working 35 hours or more per week	51%
Employed, working LESS than 35 hours per week	24%
Not employed and NOT looking for work	16%
Not employed and looking for work	5%
Disabled and not able to work	2%
Retired	2%
Student or enrolled in job training program	1%

Twenty-seven percent of responding households had at least one child age 18 months or younger (Table 3). Forty-eight percent had a child aged 19 to 35 months, and 58 percent had a child age 36 months (3 years) to 71 months (5 years).

Table 3: Ages of children in household

Ages of children under age 6	Percent of households
Ages 0-18 months	27%
Ages 19 months - 35 months	48%
Ages 36 months - 71 months	58%

According to the National Survey of Children's Health, 53 percent of Montana children ages 0-5 receive child care from someone other than their parents for at least 10 hours per week. The Montana Child Care Survey provided a breakdown of the variety of child care types Montana parents utilize for their children ages 5 years and younger (Table 4). The majority of households used more than one kind of care, predominantly (58%) having children staying at home with a parent, step-parent or guardian at least some of the time. One-quarter (25%) of households had children who attended pre-K or kindergarten, while almost as many (24%) had children staying with a different family member. Twenty-three percent of households had children attending a licensed child care center, and 11 percent had children attending a licensed home-based family or group care provider. Further, 9 percent of households had a child attending Early Head Start or Head Start, 6 percent had a child staying with an (unlicensed) unrelated person who cares for a few children, 3 percent used a babysitter or nanny, and 1 percent utilized other arrangements.

Table 4: Types of child care arrangements utilized

Households with children who are…	Percent of total
…staying at home with parent, step-parent or guardian	58%
…attending pre-K or kindergarten	25%
…staying with other family member (older sibling, grandparent, etc.)	24%
…attending licensed child care center	23%
…attending licensed home-based family or group care provider	11%
…attending Early Head Start or Head Start program	9%
…staying with unrelated person who cares for a few children	6%
…staying at home with babysitter or nanny	3%
…utilizing other options	1%

Table 4 presents the child care arrangement households are actually using; however, they are not necessarily the arrangements parents prefer. Readers should note that some responding parents may not have been aware of the distinction between pre-K and licensed child care. Montana does not offer publically-funded pre-K. Thus, there is likely some overlap in the responses to the pre-K and licensed child care options.

Responding households are experiencing a number of challenges in trying find suitable care for their young children. Child care cost is by far the greatest issue for households, with 57 percent reporting that finding affordable care is a challenge (Figure 1, Table 5). A large percentage (41%) faces problems with finding care for when their primary arrangement is not an option—if their child is sick, for emergency care, or back-up care in general. Finding high-quality care, and care that accommodates work schedules pose significant challenges as well, with 35 percent and 32 percent of households, respectively, dealing with these issues. Less than one-quarter (22%) of responding households indicated that they experience no challenges when it comes to accessing child care.

Figure 1: Challenges in accessing child care

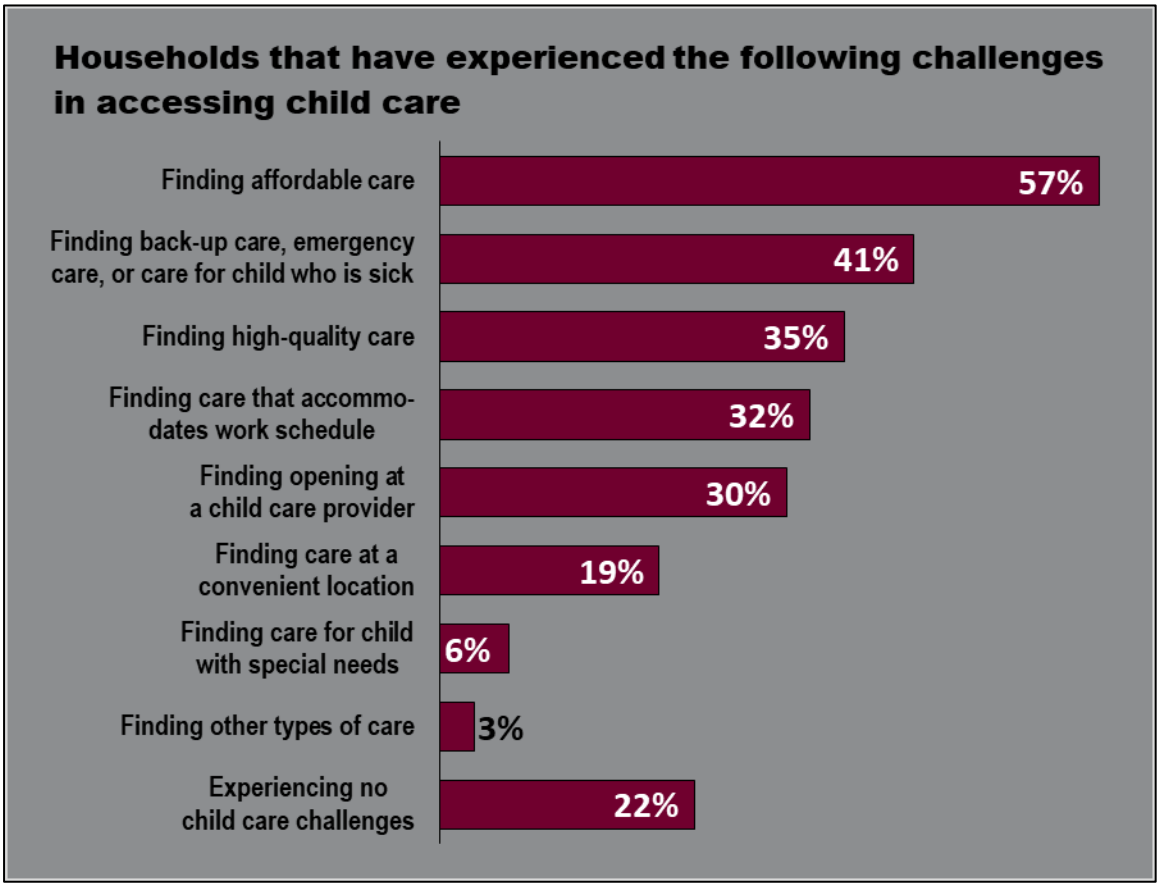


Table 5: Child care challenges faced by parents of children ages 5 years and younger

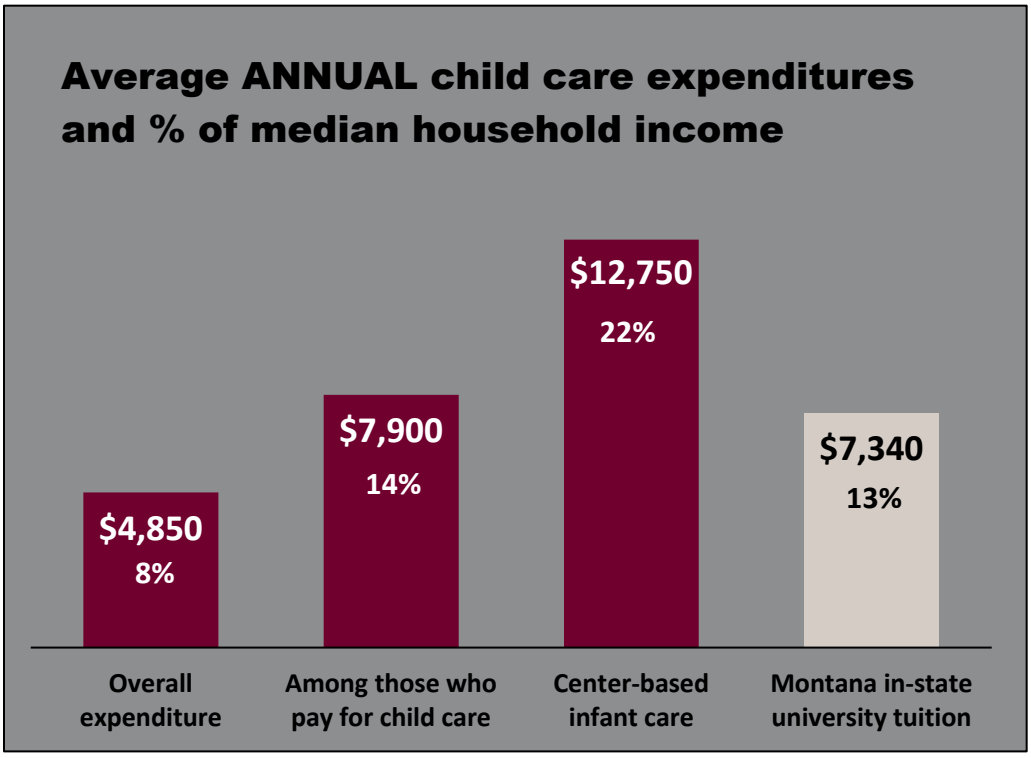
	Total	American Indian	White	Urban	Rural	Household income low 1/3	Household income high 1/3
Finding affordable care	57%	62%	58%	60%[a]	49%[a]	62%	52%
Finding back-up care, emergency care, or care for child who is sick	41%	50%	40%	44%[b]	34%[b]	35%	44%
Finding high-quality care	35%	27%	35%	36%	32%	31%	41%
Finding care that accommodates work schedule	32%	28%	34%	33%	31%	32%	36%
Finding opening at a child care provider	30%	30%	29%	29%	31%	27%	37%
Finding care at a convenient location	19%	22%	19%	20%	18%	20%	20%
Finding care for child with special needs	6%	5%	6%	5%	6%	9%	5%
Finding other types of care	3%	6%	2%	1%[b]	5%[b]	3%	3%
Experiencing no child care challenges	22%	10%[b]	22%[b]	21%	24%	14%[a]	23%[a]

Note: Respondents could indicate more than one option.
[a] Difference significant at the 95% confidence level.
[b] Difference significant at the 90% confidence level.

With regard to the various child care-related challenges that Montana parents face, there are some notable differences between parents in urban versus rural areas. While 60 percent of urban parents face the challenge of finding affordable care, only 49 percent of rural parents do. Further, when it comes to finding back-up care, emergency care, or care for a child who is sick, 44 percent of urban parents reported that this is a challenge, compared to 34 percent of rural parents. Finally, more households in the highest third of incomes (23%) report experiencing no child care challenges than do households in the lowest third (14%). A similar pattern emerges when comparing White households and American Indian households. About 22% of White households report no child care challenges while only 10% of American Indian households report no challenges.

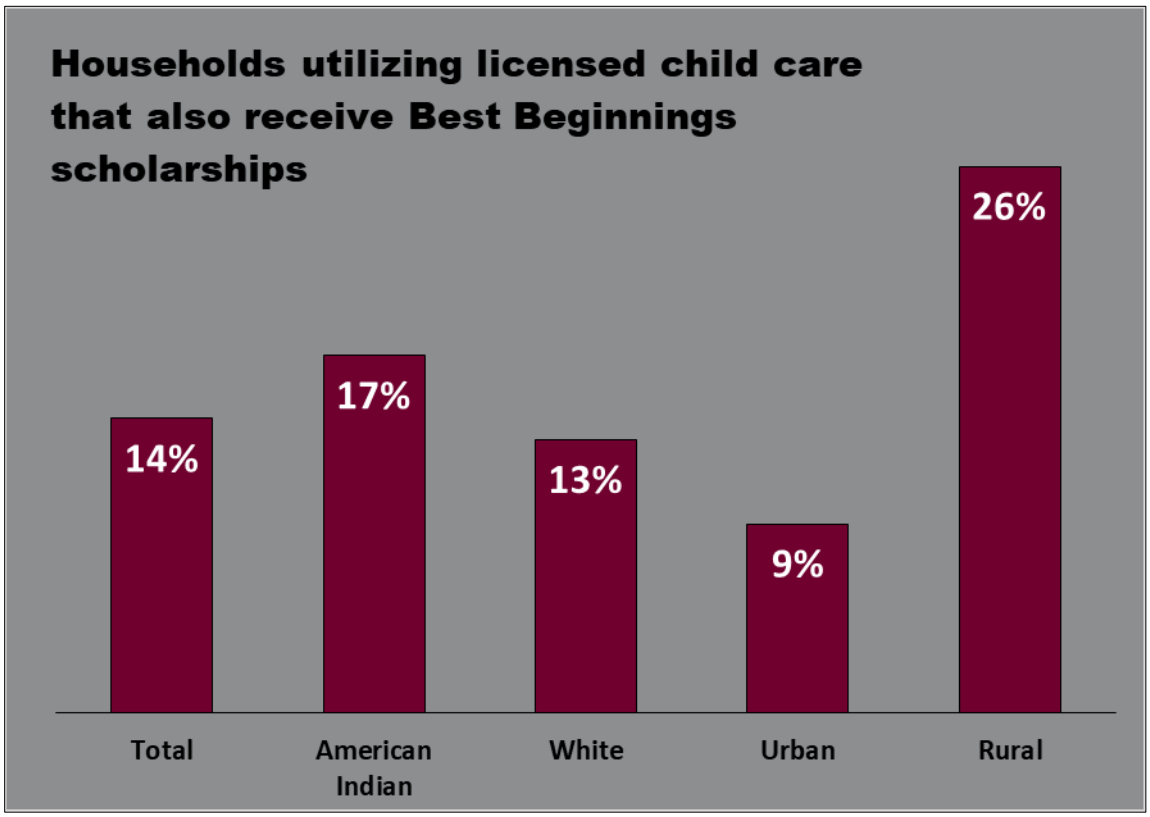
Finding affordable care is a real problem, both in Montana and elsewhere. Averaged across all Montana households with children ages 5 years and younger, regardless of child care arrangements, annual child care expenses equal $4,850 (Figure 2). If averaging only the expenses of households that pay for child care, annual expenses total $7,900. If averaging expenses for center-based infant care—the costliest age and care option—annual expenses top $12,750. As points of comparison, average in-state tuition at Montana universities is $7,340 for an academic year (Montana University System, 2020) and the median annual income for Montana households with children under age 6 was about $58,000 in 2018 (U.S. Census Bureau, 2020).

Figure 2: Average annual child care expenditures per household and % of median household income



Qualifying low-income families can access Best Beginnings child care scholarships, managed by the Early Childhood Services Bureau at the Department of Public Health and Human Services[3]. Among households that use licensed child care options for their children, 14 percent receive a Best Beginnings scholarship (Figure 3). There is a notable difference in the percent of urban and rural families that receive such assistance (9% versus 26%).

Figure 3: Households receiving Best Beginnings child care scholarships



Child care issues affect Montana workers in a variety of ways, all leading to a loss of productivity. In the month prior to responding to the survey, among households with at least one child ages 5 years or younger, 46 percent of workers were forced to leave work earlier than their expected regular working hours (Figure 4, Table 6).

[3] Department of Public Health and Human Services, Early Childhood and Family Support Division manages licensing of state child care providers. In an effort to partially address child care issues in the state the Division's Early Childhood Services Bureau manages a child care assistance program – Best Beginnings child care scholarships – given to qualifying low-income families. The program helps to pay for care when parents are not available to care for their children, 1) During working hours; 2) During school or training hours, if meeting work requirements; 3) If they are a teen parent attending high school; or 4) If they are a parent receiving TANF and who is participating in family investment agreement activities. For additional information, see: https://dphhs.mt.gov/hcsd/childcare/bestbeginningsscholarships.

Figure 4: Child care-related work problems experienced last month

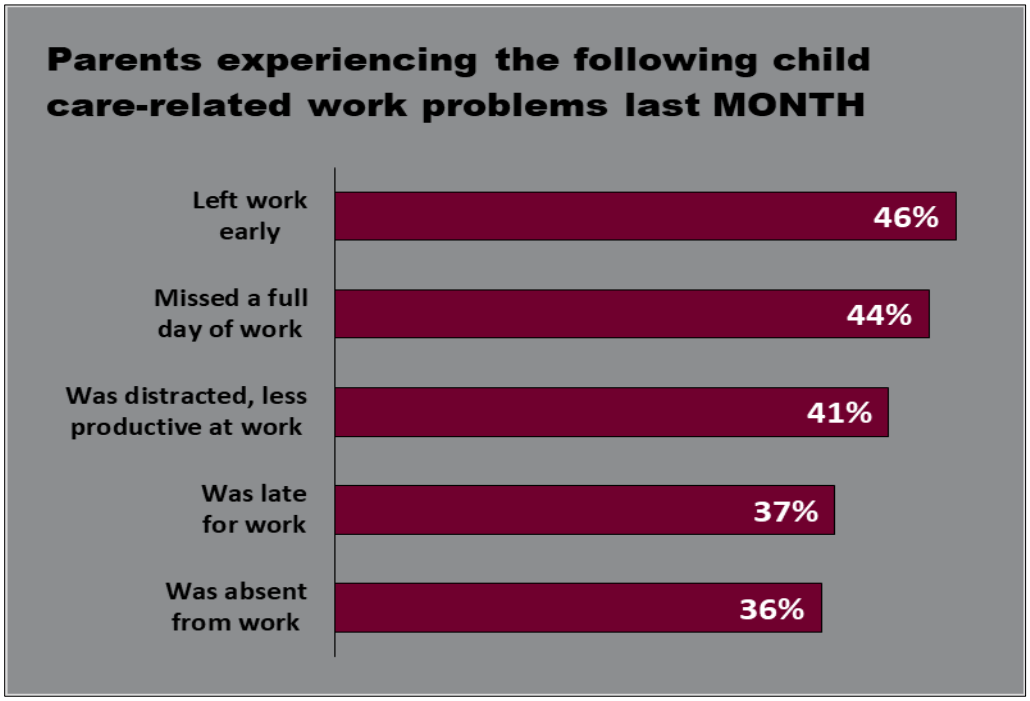


Table 6: Child care-related work problems experienced during last month

Child care challenges	Total	American Indian	White	Urban	Rural	Household income low 1/3	Household income high 1/3
Left work early	46%	46%	46%	44%	49%	41%	54%
Missed a full day of work	44%	45%	45%	42%	46%	43%	43%
Was distracted and less productive at work	41%	50%	40%	39%	43%	43%	41%
Was late for work	37%	40%	38%	38%	36%	34%	40%
Was absent from work	36%	41%	36%	36%	35%	35%	39%

Further, 44 percent missed at least one full day of work. All in all, working households with at least one child aged 5 years or younger lost an average of approximately 13 working hours per month—equivalent to 5 percent of total hours worked (Table 7).

Table 7: Work hours lost due to child care issues

Work hours lost due to child care issues	Per week	Per month
Average hours worked		
Respondent	31 hrs	125 hrs
Second parent	36 hrs	144 hrs
Total, household	67 hrs	269 hrs
Average hours absent		
Respondent		8 hrs
Second parent		5 hrs
Total, household		13 hrs
Absences as percent of hours worked		
Respondent		6%
Second parent		3%
Total, household		5%

In the year leading up to responding to the Montana Child Care Survey, Montana households with at least one child ages 5 years or younger experienced a number of child care-related issues while at work. For example, 62 percent of responding parents experienced time missed from work (Figure 5, Table 8). Further, career advancement was affected, as 26 percent declined to pursue further education or training, and 22 percent declined a job offer. Six percent declined a promotion. Only 1 percent of responding households indicated they had experience losing their job due to child care-related issues; however, household income was directly affected as 15 percent changed from full-time to part-time work, 12 percent quit their job, and 8 percent chose to not change from part-time to full-time work.

Figure 5: Child care-related work problems experienced during the past year

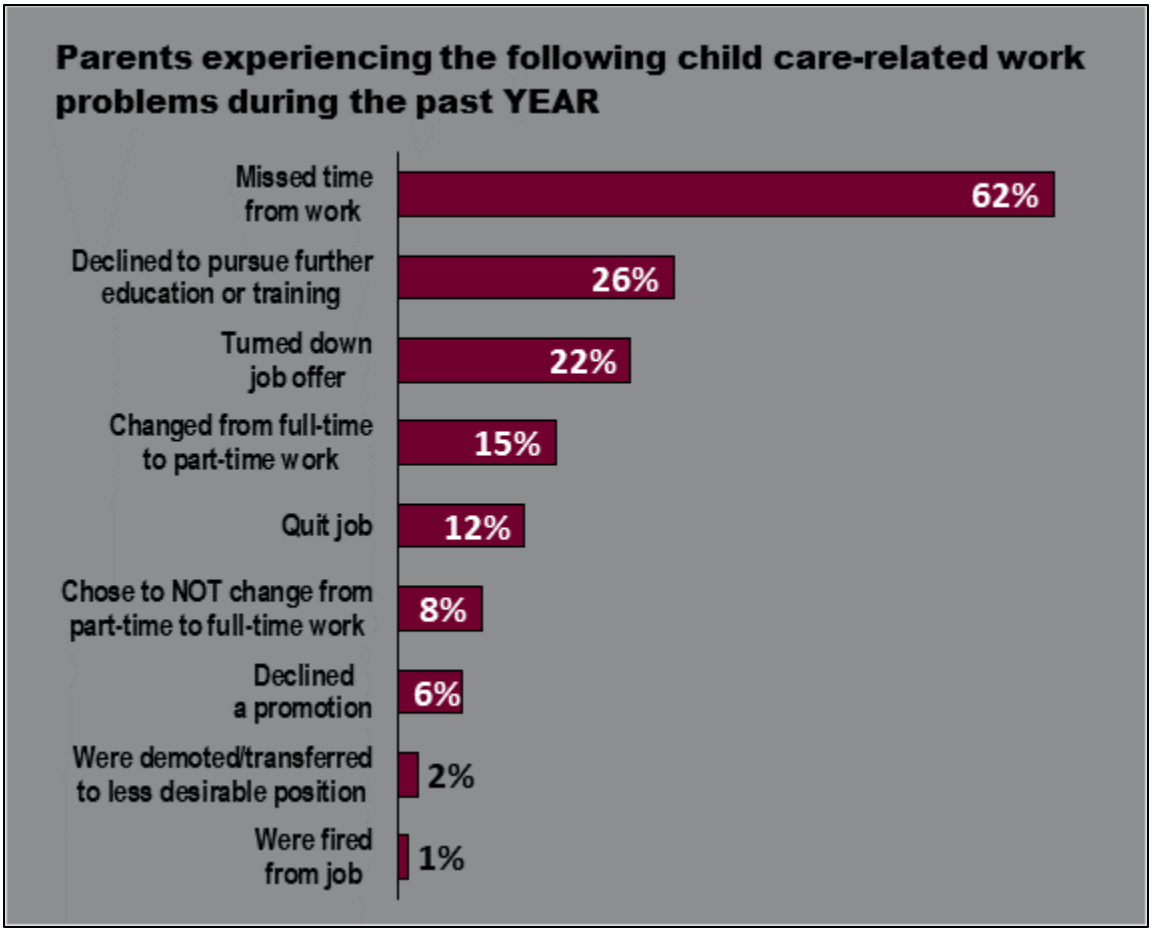


Table 8: Child care-related work problems experienced during the past year, by household type

	Total	American Indian	White	Urban	Rural	Household income low 1/3	Household income high 1/3
Missed time from work	62%	56%	64%	62%	62%	57%	69%
Declined to pursue further education or training	26%	47%[a]	24%[a]	26%	27%	38%[a]	21%[a]
Turned down job offer	22%	37%[a]	22%[a]	24%	19%	36%[a]	12%[a]
Changed from full-time to part-time work	15%	18%	15%	17%	11%	24%[a]	10%[a]
Quit job	12%	27%[a]	10%[a]	12%	10%	26%[a]	5%[a]
Chose to NOT change from part-time to full-time work	8%	6%	9%	9%	6%	9%	5%
Declined a promotion	6%	7%	6%	5%	7%	8%	4%
Was demoted or transferred to less desirable position	2%	5%	2%	2%	2%	4%	2%
Was fired from job	1%	1%	1%	2%[b]	<1%[b]	3%[b]	<1%[b]

[a] Difference significant at the 95% confidence level.
[b] Difference significant at the 90% confidence level.

In the area of child care-related work problems, there are significant differences between the experiences of American Indian and White parents, and between parents in the lowest third of household incomes when compared with parents in the highest third of household incomes. These differences should be viewed with the fact in mind that 38 (unweighted) survey respondents identified as American Indian and 71 (unweighted) survey respondents said they were in the lowest third of household incomes. These numbers of responses are minimally sufficient to report.

Due to child care-related issues, American Indian parents decline to pursue further education or training in connection with their employment at twice the rate of White parents (47% versus 24%). They turn down job offers at a higher rate (37% versus 22%), and they quit their jobs at almost three times the rate of White parents (27% versus 10%).

Child care related issues cause parents in the lowest third of household incomes to decline to pursue further education or training in connection with their employment at a much higher rate than parents in the highest third of household incomes (38% versus 21%). They turn down job offers at three times the rate of parents in the highest third of household incomes (36% versus 12%) and they change from full-time work to part-time work more than two times the rate of parents in the highest third of household

incomes (24% versus 10%). Finally, parents in the lowest third of households quit a job due to child care-related issues at more than five times the rate of parents in the highest third of household incomes (26% versus 5%).

While child care-related issues affect the employment and career trajectories of the lowest third of household incomes more than highest third, when higher-income households confront child care-related issues they tend to report they miss time from work or leave work early more often than lower-income households. While these findings don't meet statistical significance, results at the top of Table 6 and Table 8 are suggestive that higher-income workers with young children either have more flexibility in their work arrangements or more often choose to work fewer hours in response to child care-related issues compared with lower-income workers.

Being fired from a job because of child care-related problems occurs rarely among Montana parents with children under the age of 6, only 1% of parents reported this happening over the past year. However, more than twice the percentage of parents in urban areas than rural areas have had this experience (2% versus less than 1%) and more than three times the percentage of parents in the lowest third of household incomes had this experience when compared with parents in the highest third of household incomes (3% versus less than 1%).

Economic Impact Analysis

BBER estimated the economic impacts of inadequate child care using the reports of parents from the Montana Child Care Survey to directly estimate parents' lost wages caused by inadequate child care. These estimates of lost parental wages formed the basis of estimates of the economic impact of inadequate child care on Montana businesses and taxpayers. A more detailed description of the estimation methods used may be found in Appendix 3.

Household Impacts

One primary economic impact of inadequate child care on Montana families is the lost wages families suffer when parents have to miss work, switch from full-time work to part-time work or turn down a job offer. After responding to questions about work-related problems due to child care issues, the Montana Child Care Survey asked respondents to quantify the lost wages related to these problems. For example, parents often lose wages when they miss work, switch from full-time work to part-time work or turn down a job offer. According to the survey responses, Montana parents of children ages 0-5 years old lose more than $145 million dollars in wages annually because of inadequate child care (Table 9). Individual parents lose, on average, $3,110 annually, while Montana households with children ages 0-5

lose an average of $5,700 in wages annually. Montana's annual per-parent wage burden is very similar to the U.S. average per-parent annual burden ($3,350) published in *The Economic Impacts of Insufficient Child Care on Working Families* by Clive Belfield in 2018.

Table 9: Annual economic burden to parents[a] due to inadequate child care (2019)

	Estimate	95% confidence interval
Montana parents, total	$145,146,000	+/- $20,640,000
Montana parents, per household	$5,700	+/- $840
Montana parents, per parent	$3,110	+/- $460
U.S. parents, per parent[b]	$3,350	na

[a] Parents of children ages 0-5 years old.
[b] Source: (Belfield, 2018).

The annual wage burden varies by household characteristics. Parents in Montana's urban households face almost the same annual wage burden ($5,580) from inadequate child care as parents in rural households ($5,900) (Figure 6, Table 10). In contrast, the wage burden incurred by parents varies significantly whether one or two parents live in the household, and whether one of the parents stays at home. Single-parent households suffer, on average, a $3,500 annual loss in wages due to inadequate child care. Two-parent households where both parents work lose more—an annual average of $7,440. Two-parent households in which one parent works and one parent stays at home lose the least—an annual average of $2,960.

One can conclude from these estimates that the number of wage earners and whether one adult stays at home are central for understanding differences in annual household burden due to inadequate child care. All other things being equal, more wage earners in a household means more wages lost due to child care issues. It is also important to observe that households in which one parent stays at home still report lost wages due to inadequate child care. This is often because lost wages are reported by both the stay-at-home parent and the working parent. One example of this is a household in which the stay-at-home parent works a weekend, part-time job and the working parent occasionally leaves work to care for a child while the stay-at-home parent goes to an appointment.

Figure 6: Average financial burden of inadequate child care (2019)

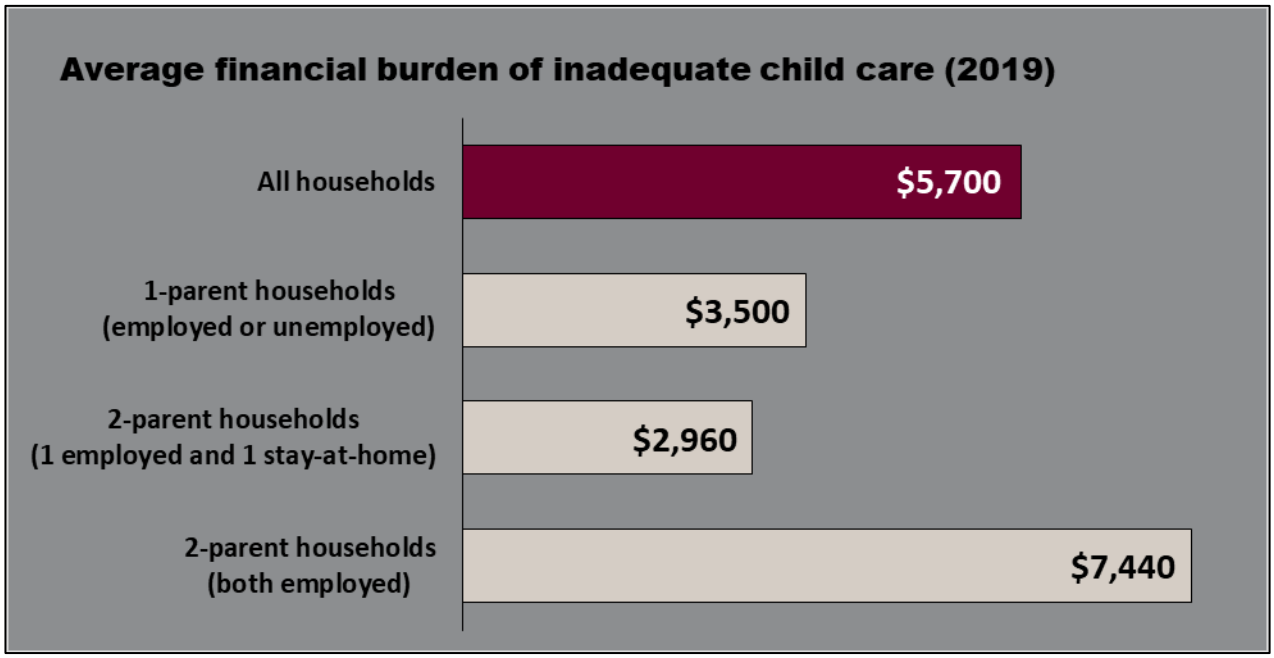


Table 10: Annual economic burden for Montana parents[a] due to inadequate child care

	Estimate	95% confidence interval
All households	$5,700	+/- $840
Urban households	$5,580	+/- $910
Rural households	$5,900	+/- $1,680
American Indian households	$6,270	+/- $2,920
White households	$5,650	+/- $840
1-parent households (employed or unemployed)	$3,500	+/- $2,730
2-parent households (1 employed and 1 stay-at-home)	$2,960	+/- $770
2-parent households (both employed)	$7,440	+/- $1,060

[a] Parents of children ages 0-5 years old.

The amount of wages Montana parents lose annually due to inadequate child care is directly related to household income. Montana's lowest-income households lose less wages annually ($3,440) than do Montana's highest-income households ($9,030) (Table 11). Readers should keep in mind, however, that the lowest-income households lose proportionately more of their income than do the highest-income households.

Table 11: Annual economic burden for Montana parents[a] due to inadequate child care by household income category (2019)

	Estimate	95% confidence interval
All households	$5,700	+/- $840
$0 - $30,000	$3,440	+/- $1,960
$30,001 - $55,000	$4,960	+/- $1,720
$55,001 - $95,000	$5,280	+/- $1,080
$95,001 +	$9,030	+/- $1,630

[a] Parents of children ages 0-5 years old.

Business Impact

Montana businesses bear the second key burden caused by inadequate child care, mainly from reduced revenue due to lower employee productivity and increased employee recruitment costs caused by unwanted employee turnover. Table 12 details some of the most relevant parental work problems caused by inadequate child care and the associated impact on businesses.

Table 12: Business impacts of Montana parents'[a] child care-related problems, past year

Parents' child care problem	Impact on businesses
62% of parents missed work	Reduced productivity
26% of parents declined to pursue further job training or education	Reduced productivity
22% of parents turned down a job offer	Increased employee recruitment cost if parent was unemployed
15% of parents changed from full-time work to part-time work	Increased employee recruitment cost
12% of parents quit a job	Increased employee recruitment cost

[a] Parents with children ages 0-5 years old.

The Montana Child Care Survey gave parents the opportunity to report not only the work problems they experience, but work hours and wages they forego due to inadequate child care. BBER used these reports to estimate the economic burden caused by inadequate child care faced by Montana businesses (Table 13).

Table 13: Annual economic losses to Montana businesses due to child care-related problems (2019)

Total losses to Montana businesses	Losses to Montana businesses per household[a]	Losses to Montana businesses per parent[a]	Losses to U.S. businesses per parent[b]
$54,562,000	$2,150	$1,170	$1,150

[a] Parents of, and households with, children ages 0-5 years old.

[b] Households with children ages 0-2 years old. Source (Belfield, 2018).

Montana businesses lose nearly $55 million dollars annually due to inadequate child care. Work problems experienced by parents with children ages 0-5 cause Montana businesses annual losses of $2,150 per household and $1,170 per parent. Montana business losses per parent are virtually identical to the U.S. business loss per parent ($1,150) as estimated by Belfield (2018).

Tax impact

Taxpayers carry the third major economic burden caused by inadequate child care. Specifically, the federal government and Montana state government obtain lower income tax receipts because of the wages parents forego due to inadequate child care. BBER estimated these lost tax receipts using the information reported in the Montana Child Care Survey (Table 14, Figure 7).

Table 14: Annual economic burden on tax payers due to inadequate child care (2019)

Jurisdiction	Taxpayer loss, total	Taxpayer loss, per household[a]	Taxpayer loss, per parent[a]	U.S. taxpayer loss, per parent[2]
Federal	$22,946,000	$900	$500	na
Montana	$9,090,000	$360	$200	na
Total	$32,036,000	$1,260	$700	$630

[a] Households with, and parents of, children ages 0-5.

[b] Parents of children ages 0-2. Source: (Belfield, 2018).

Taxpayers lose a total of $32 million dollars annually due to inadequate child care. The federal government loses almost $23 million annually in lower income tax receipts, while the State of Montana loses $9 million annually in income tax receipts. Taxpayers lose $1,260 annually per household with children ages 0-5, or approximately $700 per parent. The Montana taxpayer loss per parent is only slightly higher than the U.S. loss per parent estimated by Belfield (2018), and the difference is not statistically significant.

Figure 7: Losses to the Montana economy caused by inadequate child care (2019)

Losses from the Montana economy caused by inadequate child care (2019)

	Loss to households	Loss to businesses	Loss to taxpayers
Average per household	$5,700	$2,150	$1,260
Total	$145,146,000	$54,562,000	$32,036,000

Economic Impact in a National Context

The average economic impacts of inadequate child care borne by parents, businesses and taxpayers in Montana are very similar to the most recent estimates found for the United States as a whole (Table 15). Each of the Montana estimates is well within the margin of sampling error of Belfield's (2018) estimates for the U.S. State-level estimates from other recently completed studies are also provided in Table 15 for reference. The Montana estimates are quite comparable to other state-level estimates presented below.

Table 15: Montana compared to the U.S. and other states

	Annual loss per parent	Annual business loss per parent	Annual taxpayer loss, per parent
U.S.[b]	$3,350	$1,150	$630
Montana[a]	$3,110	$1,170	$700
Indiana[c]	$2,810	$4,605	$304
Louisiana[d]	$4,040	$2,995	$308
Maryland[e]	$2,340	$4,317	$210
Pennsylvania[f]	$3,460	$1,430	$860

[a] Parents of children ages 0-5 years old.

[b] Parents of children ages 0-2. Source: (Belfield, 2018).

[c] Parents of children ages 0-4. Source: (Littlepage, 2018).

[d] Parents of children ages 0-4. Source: (Davis, Bustamante, Bronfin, & Rahim, 2017)

[e] Parents of children ages 0-4. Source: (Talbert, Bustamante, Thompson, & Williams, 2018)

[f] Parents of children ages 0-2. Source: (Bishop-Josef, et al., 2019).

Several other studies estimate the economic impact of child care at the state level; comparable results are listed in Table 15. The Pennsylvania study (Bishop-Josef, et al. 2019) largely follows the methodology in Belfield (2018) based on a survey of working parents with children age 0-2. Like the Montana study, this group of studies reports the direct effects of inadequate child care on households, businesses, and taxpayers. A second group of studies follow the methodology used in the Louisiana study by Davis, Bustamante, Bronfin, & Rahim (2017) based on a survey of households with children age 0-4. The results in this group of studies includes secondary indirect and induced effects based on a multiplier of the direct effects. For example, the multiplier used in the Louisiana study is 2, which in large part explains why the economic results in this group of studies are larger than the results for Montana.

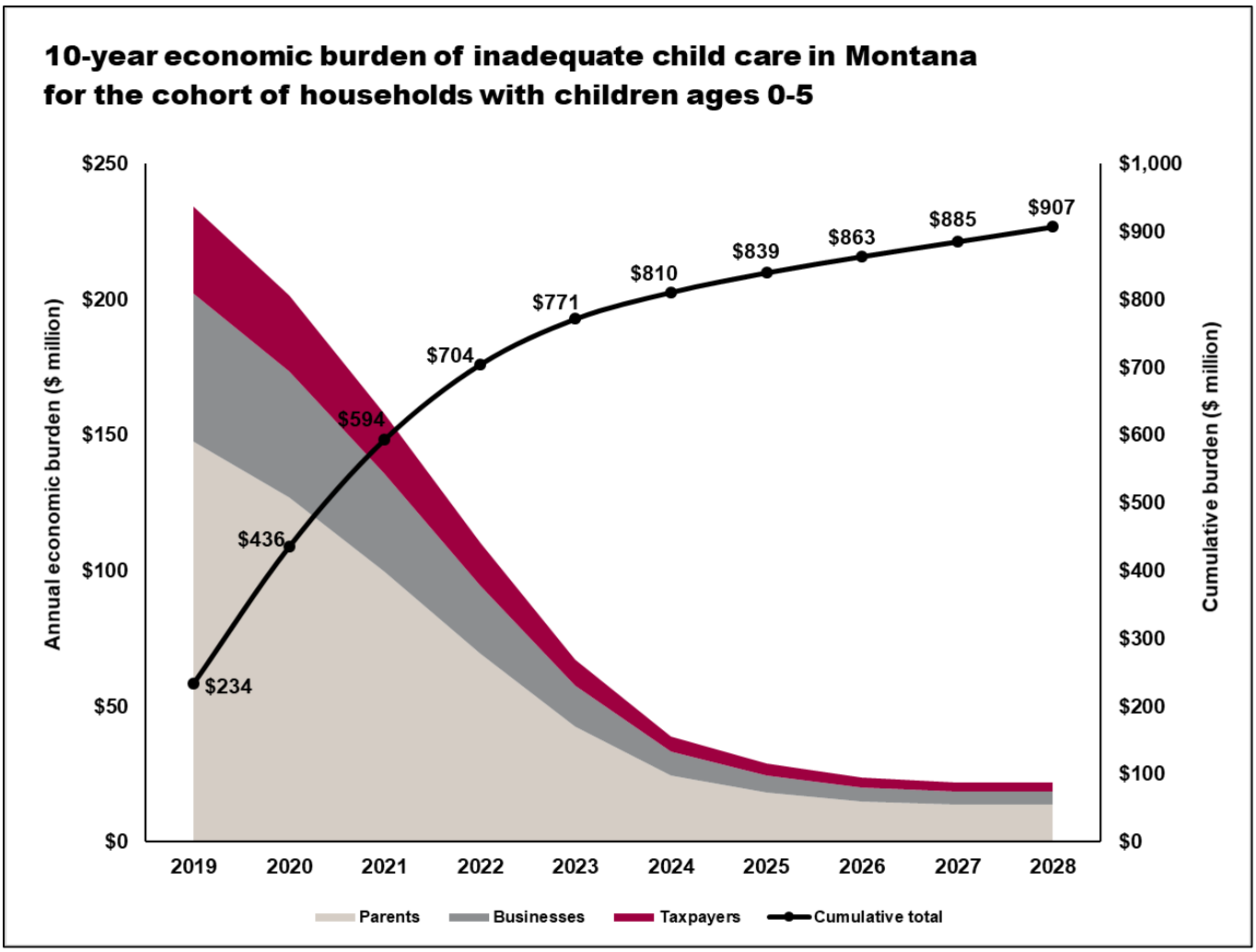
In 2019, the U.S. Chamber of Commerce Foundation released state reports for Iowa, Idaho and Mississippi based on the direct effects of inadequate child care. The results for neighboring Idaho show a $414 million loss due to absences and employee turnover due to child care issues and a $65 million loss in tax revenue (U.S. Chamber of Commerce Foundation, 2019). Even after accounting for Idaho's larger population of parents with young children, the overall economic impact is larger than Montana, although the study methodology was somewhat different.

Long Term Burden of the 2019 - 2020 Cohort

While the annual economic burden to Montana parents, businesses and taxpayers is substantial, the impact of inadequate child care also has implications in subsequent years. Specifically, parents of each cohort of children ages 5 and under incur quite considerable long-term losses which are worth examining if only in a limited way. Estimating long-term economic impact using one, cross-sectional survey is problematic. A longitudinal study or a series of repeated cross-sectional surveys would capture changes over time that this survey cannot. However, this survey does contain information, namely the ages of the children studied, that allows BBER to make plausible estimates of long-term economic burden. BBER estimated the long-term losses for the cohort of Montana households with children ages 5 and under in January through April 2020, with an assumed duration of 10 years.

The impact of inadequate child care lingers beyond 2019 as the youngest children in the cohort continue to attend child care for a few more years, and some child care effects have a long-term impact on career trajectories and household income. After 10 years, when children are age 10-15, the annual impact drops to $22 million in 2028. However, accumulated over the ten-year period, the economic burden of inadequate child care for the cohort totals $907 million (Figure 8 and Figure 9). The largest share of the burden, about 63 percent, falls on parents each year. Businesses' share of the burden is 23 percent and taxpayers carry the remaining 14 percent. See Appendix 3 for more information on the calculations that went into these estimates.

Figure 8: Detailed 10-year burden to the Montana economy caused by inadequate child care for the cohort of households with children ages 0-5



Parents

The 10-year parental burden is calculated from the average cost per year per child's age in household lost wages as reported in the survey. The lost wage burden is assumed to be highest before the child enters kindergarten and would decline thereafter. The resulting estimates show that the 10-year burden per parent is $12,400 and $22,400 per household, using inflation-adjusted lost income. This is equivalent to a statewide loss of $571.8 million over 10 years for the cohort (Figure 9, Table 16).

Businesses

Businesses see a loss in revenue from employee absenteeism stemming from inadequate child care. Using a modified versions of the calculations used by Belfield (2018), the burden is again assumed to be highest before the child enters kindergarten and that business losses due to inadequate child care would drop thereafter. Thus, these calculations are conservative. Long-term burden to businesses total $206.8 million across all Montana households, equivalent to $4,500 per parent or $8,100 per household. Annual cost of living increases are adjusted for each year. As in Belfield (2018) this includes hiring costs.

Taxpayers

The 10-year burden in terms of federal and Montana taxes is estimated at about $128.4 million, or $2,800 and $5,040 per parent and per household, respectively, for the cohort. The loss in federal tax revenue equals $91.9 million, while the loss in Montana tax revenue equals $36.4 million.

Figure 9: Aggregated 10-year burden on the Montana economy due to inadequate child care (2019-2028)

Aggregated 10-year burden on the Montana economy due to inadequate child care (2019-2028)

Total state burden	Household burden	Business burden	Taxpayer burden
$907,000,000	$572,000,000	$207,000,000	$128,000,000

Table 16: Summary of the 10-year economic burden of inadequate child care

	Total (millions)	Average per household	Average per parent[a]
Parents[a]	$571.8	$22,400	$12,400
Businesses	$206.8	$8,110	$4,510
Taxpayers	$128.4	$5,040	$2,800
Total	$906.9	$35,600	$19,800

[a] Parents of children ages 0-5 years old.

The estimates above represent significant losses to the state economy. Differences between the methods used in the Belfield (2018) study and this one preclude comparison of the long-term estimates of economic burden. The estimated 10-year economic loss presented here is by its nature conservative as it represents only one cohort of households. There are, of course, several cohorts of households with children at different ages that affect the economy during any 10-year period.

Impact of COVID-19 on Survey Responses

COVID-19 struck Montana during the data collection phase of this survey. Many factors that could influence parents' responses were affected by the pandemic, including the ability to send children to school, the availability of child care providers, the prevalence of parents working from home and the unemployment rate. BBER therefore examined the survey results to find instances where the results may have changed after the onset of the pandemic.

Perhaps the single most impactful, COVID-19 related event during data collection occurred on March 15, 2020 when Montana Governor Steve Bullock issued an order closing schools (Bullock, 2020). BBER collected 288 completed questionnaires prior to this order and 116 in the following weeks.

Many Montana industries were drastically affected by closures implemented to mitigate the spread of the pandemic. These closures caused a dramatic increase in the unemployment rate. The Montana Child Care Survey asked respondents about their employment status, which made it possible to calculate the unemployment rate of respondents before and after the school closure date (Table 17).

Table 17: Unemployment rate of respondents before and after school closure

		95% confidence interval	
Time period	**Unemployment rate**	**Lower**	**Upper**
Before	5%	2%	11%
After	11%	5%	22%

A change in the unemployment rate of respondents did occur after the school closure order. The survey's point estimate of the unemployment rate doubled from before the closure order (5%) to after the closure order (11%) (Table 18). However, this difference is well within the survey's margin of sampling error and is not statistically significant, as the survey was not designed to obtain enough completions to determine a difference at this level of precision.

Examining the annual wage burden of inadequate child care on households, a key outcome variable in this study, shows a much more attenuated and relatively small effect at a decrease of $620 annually. Again, this difference is well within the survey's margin of sampling error and not statistically significant. This small drop may indicate an effect of the increase in the proportion of parents who worked from home during this period.

Table 18: Annual parental wage burden of inadequate child care before and after school closure

Time period	Annual parental wage burden	95% confidence interval	
		Lower	Upper
Before	$5,880	$4,840	$6,930
After	$5,260	$3,990	$6,530

An exploration of a second important outcome variable, weekly spending on child care services, shows a very similar, attenuated effect (Table 19). There was a small and statistically insignificant difference between weekly spending on child care services before school closure ($91) and after school closure ($112). This small increase may reflect the cost of providing care for some kindergarteners sent home due to the school closure.

Table 19: Weekly spending on child care services before and after school closure

Time period	Weekly spending on child care services	95% confidence interval	
		Lower	Upper
Before	$91	$78	$104
After	$112	$83	$140

In summary, when examining one key descriptive variable (unemployment) and two key outcome variables (annual parental wage burden and weekly child care cost) there were small and statistically insignificant effects that may be attributed to COVID-19 mitigation measures. The impact of these effects on the estimates presented in this report is likely to be very small and almost certainly indistinguishable from the survey's level of sampling error.

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APPENDIX 1: Montana Child Care Survey—Questionnaire

Montana Child Care Survey

"Does inadequate child care impact Montana families?"

Federal Reserve Bank of Minneapolis

January 2020

Administered by:

Bureau of Business and Economic Research

University of Montana—Missoula

Sponsored by:

Federal Reserve Bank of Minneapolis

Montana Child Care Survey

While many families in Montana have access to the child care they need when their children are very young, many do not. Parents, guardians or caregivers without access to adequate child care often report less time at work, less productive work, and fewer career opportunities. The information from this survey will shed light on the child care situation in Montana, especially for families with children age 5 and younger.

To gather this important information, we need your help. The best way we know to improve what we know about the child care situation in Montana is to ask Montana families to share their experiences with us. Your address is one of only a small number that have been randomly selected to help in this study.

Please have an adult who is a parent, guardian or caregiver to a child or children age 5 or younger complete this short survey. Please return the completed questionnaire in the enclosed stamped envelope. Your responses are voluntary and will be kept confidential. Your names are not on our mailing list, and your answers will never be associated with your mailing address. If you have any questions about this survey please contact Ms. Janet Stevens by telephone at 1-406-243-5113 or by e-mail at janet.stevens@umontana.edu.

By taking a few minutes, you will be adding greatly to our understanding of child care in Montana. Enjoy completing the questionnaire. We look forward to receiving your responses.

PLEASE GO TO THE NEXT PAGE AND BEGIN. 

1. Are you an adult age 18 years or older? Choose one answer.

- **0** Yes → Please go to the next question.
- **0** No → Please give this questionnaire to an adult who lives at this address.

2. Do any children age 5 years or younger live or stay at this address? Choose one answer.

- **0** Yes → Please go to the next question.
- **0** No → That is all the information we need. Please return this questionnaire in the envelope provided.

3. Are you a parent, guardian OR caregiver for at least one of the children age 5 years or younger who lives or stays at this address? Choose one answer.

- **0** Yes → Please go to the next question.
- **0** No → Please give this questionnaire to a parent, guardian OR caregiver for at least one of the children age 5 years or younger who lives or stays at this address.

4. How many children age 5 years or younger live or stay at this address? Enter the number of children.

☐ Number of children age 5 or younger

5. How old are each of the children age 5 years or younger who live or stay at this address? Enter the age of each child.

☐ Age of child 1
☐ Age of child 2
☐ Age of child 3
☐ Age of child 4
☐ Age of child 5
☐ Age of child 6

6. What type(s) of child care arrangement(s) is (are) used for the child or children age 5 years or younger who live or stay at this address? Please choose one or more boxes below.

- ☐ Stays at home with parent, step-parent or guardian
- ☐ Stays with other family member, e.g. older sibling, grandparent, etc.
- ☐ Stays at home with babysitter
- ☐ Stays with unrelated person who cares for a few children
- ☐ Attends licensed home-based family or group care provider
- ☐ Attends licensed child care center
- ☐ Attends Early Head Start or Head Start program
- ☐ Attends pre-K or kindergarten
- ☐ Other (please specify) _____

7. For the child or children at this address, what challenges do you or the other parent, guardian or caregiver face when accessing child care? Finding …. Please choose one or more boxes below.

- ☐ An opening at a child care provider
- ☐ High-quality care
- ☐ Affordable care
- ☐ A convenient location
- ☐ Care that accommodates my work schedule
- ☐ Back-up care, or emergency care, or care for sick child
- ☐ Care for a child with special needs
- ☐ Other (please specify) _____
- ☐ None

8. How much money do you or the other parent, guardian or caregiver of the children at this address currently spend per week on child care? Enter the dollar amount below.

$								.00

Total spent on child care each week

9. Over the last year have you received any child care assistance from the State of Montana? For example, some people received a Best Beginnings Child Care Scholarship from the state to help pay for child care. Choose one answer.

0 Yes
0 No

10. <u>Over the last year</u> have you received any of the following types of support for child care from an organization that employed you? Provide one answer for each possible type.

		Yes	No
a.	Child care program on-site	0	0
b.	Reserved space at an off-site child care facility	0	0
c.	Financial support to help pay for child care	0	0
d.	Information on finding child care	0	0
e.	Flexibility and tolerance of child care needs	0	0
f.	Other (specify) _____	0	0

11. <u>Over the last year</u> have any of the following happened to you, yourself, specifically because of child care issues? Provide one answer for each possible child care issue.

		Yes	No
a.	I missed time at work	0	0
b.	I quit my job	0	0
c.	I was fired from my job	0	0
d.	I was demoted or transferred to less desirable position	0	0
e.	I changed from full-time work to part-time work	0	0
f.	I chose NOT to change from part-time to full-time	0	0
g.	I declined a promotion	0	0
h.	I turned down a job offer	0	0
i.	I declined to pursue further education or training	0	0

12. For any of the child care issues listed in 11b through 11h above, about how many work days did you lose <u>over the last year</u>? Your best guess is ok. Enter the total number of days you lost below.

Total days lost over the last year

13. What is your relationship to at least one of the children age 5 years or younger who lives or stays at this address? Please choose one or more boxes below.

☐ Biological or adoptive parent
☐ Guardian
☐ Caregiver

14. Do you currently live with a spouse or partner? Choose one answer.

0 Yes
0 No

15. What is your current marital status? Choose one answer.

0 Now married
0 Widowed
0 Divorced
0 Separated
0 Never married

16. <u>Over the last month</u> have any of the following happened to you, yourself, specifically because of child care issues? Provide one answer for each possible child care issue.

	Yes	No
a. I missed a full day of work	**0**	**0**
b. I was late for work	**0**	**0**
c. I left work early	**0**	**0**
d. I was absent from work during the work day	**0**	**0**
e. I was distracted and less productive at work	**0**	**0**

17. Which of the following categories best describes your current employment status? Choose one answer.

- **0** Employed working 35 or more hours per week → Go to the next question.
- **0** Employed working less than 35 hours per week → Go to the next question.
- **0** Not employed but looking for work → Go to the next question.
- **0** Not employed and NOT looking for work → SKIP to question 28.
- **0** Student or enrolled in a job training program → SKIP to question 28.
- **0** Retired → SKIP to question 28.
- **0** Disabled and not able to work → SKIP to question 28.

18. How many hours per week do you USUALLY work at your main job? Enter the number of hours below.

☐ Number of hours

19. How many hours per week do you USUALLY work at any other job or jobs? Enter the number of hours below.

☐ Number of hours

20. How many weeks do you USUALLY work each year? Enter the number of weeks below.

☐ Number of weeks

21. For your MAIN job, what is the easiest way for you to report your usual total earnings from work BEFORE taxes or other deductions? Choose one answer.

- **0** Hourly
- **0** Weekly
- **0** Bi-weekly
- **0** Twice monthly
- **0** Monthly
- **0** Annually

22. Using the time period you chose in the previous question, what is your best estimate of how much you usually earn from working at ALL of your jobs before taxes or other deductions? Enter the dollar amount of your earnings below.

$								.00

Total earnings from work

23. <u>Over the last month</u> how many hours were you absent from work specifically due to child care issues? Your best guess is ok. Enter the number below. If currently unemployed check the box below.

☐ Not currently employed

[ ] Number of hours absent

24. What is the name of the organization for which you currently work in your main job? Enter the name below. If not currently employed check the box below.

☐ Not currently employed

[ ] Name of organization

25. What kind of business or industry is your main job in? Briefly describe below. If not currently employed check the box below.

☐ Not currently employed

[ ] Type of business or industry

26. What kind of work do you usually do in your main job? Briefly describe below.

[ ] Kind of work I do

27. What are your most important activities or duties in your main (usual) job? Briefly describe below.

[ ] My most important duties

28. Is there another adult parent, guardian or caregiver of the child or children age 5 years or younger at this address? Choose one answer.

0 Yes → Go to the next question.
0 No → Skip to question 35.

29. How many hours per week did the second parent, guardian or caregiver USUALLY work at their main job? Your best guess is ok. Enter the number of hours below.

☐ Number of hours

30. How many hours per week did the second parent, guardian or caregiver USUALLY work at any other job or jobs? Your best guess is ok. Enter the number of hours below.

☐ Number of hours

31. How many weeks did the second parent, guardian or caregiver USUALLY work each year? Your best guess is ok. Enter the number of weeks below.

☐ Number of weeks

32. For the second parent, guardian or caregiver's MAIN job, what is the easiest way for you to report their usual total earnings from work BEFORE taxes or other deductions? Your best guess is ok. Choose one answer.

0 Hourly
0 Weekly
0 Bi-weekly
0 Twice monthly
0 Monthly
0 Annually
0 Does not work for pay, stays at home

33. Using the time period you chose in the previous question, what is your best estimate of how much the second parent, guardian or caregiver usually earns from working at ALL of their jobs before taxes or other deductions? Your best guess is ok. Enter the dollar amount of their earnings below.

$								.00

Total earnings from work

34. <u>Over the last month</u> how many hours was the second parent, guardian or caregiver absent from work specifically due to child care issues? Your best guess is ok. Enter the number below. If they are currently unemployed check the box below.

☐ Not currently employed

Number of hours absent

And now for a few background questions to help us know if we've heard from all kinds of families in Montana.

35. What is the year of your birth? Enter the year below.

YYYY

Year you were born

36. What is your sex? Choose one answer.

0 Female

0 Male

37. What is the highest degree or level of school you have COMPLETED? Choose one answer. If currently enrolled, mark the previous level of school or highest degree received.

- **0** Less than regular high school diploma, GED or alternative credential
- **0** Regular high school diploma, GED or alternative credential
- **0** Some college credit but no degree
- **0** Associate's degree (for example: AA, AS)
- **0** Bachelor's degree (for example: BA, BS)
- **0** Master's degree (for example: MA, MS, MEng, MEd, MSW, MBA)
- **0** Professional degree (for example: MD, DDS, DVM, LLB, JD)
- **0** Doctorate degree (for example: PhD, EdD)

38. Are you of Hispanic, Latino or Spanish origin? Choose one answer.

- **0** Yes
- **0** No

39. What is your race? Choose one or more boxes.

- ☐ White
- ☐ Black or African American
- ☐ American Indian or Alaska Native
- ☐ Asian
- ☐ Native Hawaiian, Guamanian or Chamorro Samoan, or Other Pacific Islander

40. What was your <u>total household income</u> in calendar year 2019? Please include income from all household earners and from all sources. Examples include: wages from jobs, business or farm income, interest, dividends, or rental income, Social Security, public assistance, retirement pensions, VA benefits, child support, and unemployment compensation.

$								.00

Total household income ($) in 2019

BUREAU OF BUSINESS AND ECONOMIC RESEARCH
UNIVERSITY OF MONTANA

FEDERAL RESERVE BANK OF MINNEAPOLIS
NINTH DISTRICT

MONTANA CHILD CARE SURVEY

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APPENDIX 2: Montana Child Care Survey—Survey Methods

Survey Methods

Questionnaire design

The questionnaire was designed by the Bureau of Business and Economic Research (BBER) of the University of Montana and by the Federal Reserve Bank of Minneapolis (FRB-M). BBER programmed and tested the internet version of the questionnaire using software provided by Qualtrics, Inc. FRB-M was the final approval authority for the questionnaire.

Sampling

Sampling was conducted using an addressed-based, stratified, random sample purchased from Dynata, Inc. The study population was Montana households who lived in a dwelling that was listed on the U.S. Postal Service's Computerized Delivery Sequence File and who had at least one resident under the age of 6.

The sample consisted of 3 strata (U.S. Census Bureau, 2020):

1. Urban counties. The urban counties were defined by U.S. Office of Management and Budget as central metropolitan or micropolitan counties (Table 2.1).
2. Rural counties. The rural counties were all Montana counties outside U.S. OMB-defined, central metropolitan or micropolitan counties, excluding census tracts that were oversampled to increase American Indian representation in the survey.
3. American Indian census tracts. These were the 20 Montana census tracts with the highest percentage of American Indian residents (Table 2.2).

Table 2.1. Urban stratum

CBSA Title	Metropolitan/ Micropolitan Statistical Area	County/ County Equivalent	FIPS State Code	FIPS County Code	Central/ Outlying County
Billings, MT	Metropolitan	Yellowstone	30	111	Central
Great Falls, MT	Metropolitan	Cascade	30	013	Central
Missoula, MT	Metropolitan	Missoula	30	063	Central
Bozeman, MT	Micropolitan	Gallatin	30	031	Central
Butte-Silver Bow, MT	Micropolitan	Silver Bow	30	093	Central
Helena, MT	Micropolitan	Lewis and Clark	30	049	Central
Kalispell, MT	Micropolitan	Flathead	30	029	Central

Table 2.2. American Indian oversampled tracts

American Indian Population Rank	FIPS Tract Code	County
1	30047940301	Lake
2	30047940303	Lake
3	30047940400	Lake
4	30047940500	Lake
5	30047940600	Lake
6	30047940700	Lake
7	30005940100	Blaine
8	30005940200	Blaine
9	30015010300	Chouteau
10	30035940200	Glacier
11	30035940400	Glacier
12	30041940300	Hill
13	30073977200	Pondera
14	30085940001	Roosevelt
15	30085940002	Rosebud
16	30087940400	Rosebud
17	30003000100	Big Horn
18	30003940400	Big Horn
19	30003940600	Big Horn
20	30003940700	Big Horn

The sample was screened in 2 steps. In Step 1, Dynata, Inc. used an in-house model to estimate which residential addresses on the U.S. Postal Service Delivery Sequence File were likely to house at least one child ages 0-5 years old. Dynata, Inc. drew the stratified, random sample of addresses from its list of addresses that were likely to house at least one child ages 0-5. In step 2, households and respondents within households were screened by completing three initial survey questions. Those questions were:

1. Are you an adult age 18 or older?
2. Do any children age 5 years or younger live or stay at this address?
3. Are you a parent, guardian or care giver for at least one of the children age 5 years or younger who lives or stays at this address?

Households and respondents within households were defined as eligible for the remaining questions in the survey only if they answered “yes” to all three screening questions. BBER received survey responses from 1,298 households that were not eligible for the study.

The study population was 25,490 households with children ages 0-5 years old, as estimated by the 2014-2018 U.S. Census Bureau American Community Survey 5-year PUMS (U.S. Census Bureau, 2020). The sample consisted of 6,937 addresses. BBER purchased the sample in two waves. The Wave 1 sample included 3,333 addresses. Wave 1 addresses were selected from all three sampling strata. The Wave 2 sample consisted of 3,604 addresses and included addresses only from sampling stratum 1 and stratum 2.

Sampling Error

The 404 eligible responses obtained in this survey yielded a confidence interval of +/- 5%. This means that if the survey were administered 100 times, in 95 of the administrations a proportion of 50% would be found +/- 5%. The sampling error rate for respondents who lived in urban counties is +/- 7% and the sampling error rate for respondents who lived in rural counties is +/- 8%.

Survey Administration

BBER administered the survey on behalf of the FRB-M during the period January 9, 2020 through April 27, 2020.

The surveys were administered by mail and responses were collected over the internet or via a hardcopy questionnaire. Wave 1 potential respondents received up to four mail contacts during the survey as described below, while Wave 2 potential respondents received only contacts 1 and 2:

1. An introductory letter inviting participation via a provided internet link.
2. A follow-up letter thanking respondents and reminding non-respondents to participate via the provided internet link.
3. A 6” x 9” questionnaire packet mailed to non-respondents only, inviting participation via a provided internet link or by completing the enclosed hardcopy questionnaire and returning it in the stamped envelope provided.
4. A second 6” x 9” questionnaire packet mailed to non-respondents only, inviting participation via a provided internet link or by completing the enclosed hardcopy questionnaire and returning it in the stamped envelope provided.

Wave 1 potential respondents received a $2 token of appreciation in the 1st mailing. The survey research literature demonstrates that cash incentives increase survey response rates (Dillman, Smyth, & Christian, 2014).

BBER carefully documented the survey completion status of each household in the sample. This allowed calculation and reporting of a unit response rate. The unit response rate for this survey was 24 percent. This response rate was calculated using American Association for Public Opinion Research (AAPOR) definition 3 where e = .243 (AAPOR, 2016). A 24 percent response rate is typical for a rigorously administered, randomly sampled, mail and internet survey with these stringent screening requirements. (Dillman, Smyth, & Christian, 2014)

Survey Completion Status

AAPOR response rate 3 is defined as:

$$I / ((I + P) + (R + NC + O) + e (UH + UO))$$

Where:

I = Complete questionnaires

P = Partial questionnaires

R = Refusals

NC = Non-contact

O = Other

e = The estimated proportion of cases of unknown eligibility that are eligible.

UH = Unknown household

UO = Unknown other

Using the case statuses outlined above the summary of data collection outcomes for the entire sample is presented in Table 2.3 below.

Table 2.3. Data collection outcomes

Status	N or e value
Complete	404
Partial	0
Refusal	12
Non-contact	0
Other	0
e	.243
Unknown household	4,949
Unknown other	274
Not eligible	1,298
Total sample used	6,937

Data Set Preparation

Following collection and data entry, 100 percent of mailed questionnaires were verified for data entry accuracy. Appropriate data labels were added as well as composite variables and flags to facilitate analysis. Missing values were imputed using the multiple imputation method (Berglund & Heeringa, 2014) (Rubin, 1987). Data were processed using three statistical software packages: IBM SPSS Statistics Version 25 (2017), SAS Version 9.4 (2016), and Statistics Canada's Generalized Estimation System (G-Est) Version 2.03 (2019).

Weighting

The estimates presented in this survey were produced using survey weights. Survey weights improve the accuracy of estimates and help ensure that the survey is representative of the study population. The consensus in the scientific literature is that correctly constructed and applied weights should be used to produce statistics that describe survey data (Kish & Frankel, 1974) (Rao, Hidiroglou, Yung, & Kovacevic, 2010) (Valliant, Dever, & Kreuter, 2013) (Battaglia, et al., 2016) (Haziza & Beaumont, 2017).

Weights for the survey were calculated using a three-step process that is also widely accepted in survey research literature (Haziza & Beaumont, 2017) (Battaglia, et al., 2016) (Haziza & Lesage, 2016) (Lavallee & Beaumont, 2016) (Valliant, Dever, & Kreuter, 2013). In step 1 a base weight was calculated to account for the probability of selection of each household in the sample. The population control total was based on the U.S. Census Bureau's American Community Survey 2018 5-year PUMS estimate for the population of households in Montana with at least one child ages 0-5 years old (U.S. Census Bureau, 2020). In step 2 the base weight was modified to adjust for nonresponse (Haziza & Lesage, 2016) (Battaglia, et al., 2016) (Brick, 2013) (Kreuter & Olson, 2013) (Olson, 2013) (Valliant, Dever, & Kreuter, 2013). The base weight was adjusted for nonresponse using the Gest_NRReweighting module of Generalized Estimation System version 2.03 (October 2019) developed by Statistics Canada. In step 3 the nonresponse-adjusted weight was calibrated to population control totals derived from the 2018 5-year PUMS estimate for the population of households in Montana with at least one child ages 0-5 (U.S. Census Bureau, 2020) (Haziza & Beaumont, 2017) (Lavallee & Beaumont, 2016) (Valliant, Dever, & Kreuter, 2013) (Sarndal, 2007) (Kalton & Flores-Cervantes, 2003).

Survey weight calibration was conducted using the Gest_Calibration module of Generalized Estimation System version 2.03 (October 2019) developed by Statistics Canada. The survey weight was calibrated to population control totals by:

1. U.S. Census Bureau population of households with at least one child ages 0-5 in each sampling strata
2. Household income quartiles.

Household Characteristics

Table 2.4 describes the 404 responding households. 2018 U.S. Census Bureau American Community Survey 5-year population proportions for the study population of 25,490 households are provided for context.

Table 2.4. 2020 Survey Household Characteristics

Characteristic		2018 ACS PUMS 5-Year Estimate (%)	Unweighted Responses (%)	Weighted Responses (%)
Sampling strata	Urban counties	65%	66%	65%
	Rural counties	20%	21%	20%
	Am. Ind. tracts	15%	13%	15%
Household income	LT $31,356	25%	12%	25%
	$31,356-$57,991	25%	16%	25%
	$57,992-$94,218	25%	29%	25%
	$94,219 +	25%	43%	25%
Household type	Married couple	69%	83%	75%
	Other, male householder no wife	10%	3%	4%
	Other, female householder no husband	21%	14%	21%

APPENDIX 3: Montana Child Care Survey—Analysis Methods

Survey Descriptive Analysis

BBER conducted a descriptive statistical analysis of the data obtained through the Montana Child Care Survey, and analyzed the data collected using response frequencies, sums, cross-tabulations, standard measures of central tendency (mean, median, and mode), ANOVA (analysis of variance) and hypothesis tests (chi-square and t-tests). IBM SPSS Statistics version 25, a statistical analysis software, was used to produce the analysis presented in this report. Within SPSS Statistics version 25 the Complex Samples Module was used in this analysis. All survey estimates presented in this report, unless labeled otherwise, are weighted as described in the survey methods section in Appendix 2. All missing responses to survey questions were imputed using multiple imputation, also as described in Appendix 2. All t-tests and chi-square tests were calculated using software that adjusts standard errors to account for the complex sample design and weighting used in this survey. Unless stated otherwise, BBER used a 95% confidence interval for all t-tests and chi-square tests.

Economic Impact on Parents

BBER estimated the economic impact on parents of inadequate child care directly by summing respondents' reports of their wages lost due to various work problems caused by inadequate child care. Specifically, the survey collected respondent reports of the wages they, themselves, lost and also collected respondents' reports of the wages lost by a second parent, guardian, or care giver living in the household. These reports enabled BBER to calculate the amount of wages lost by household and by individual parent. BBER added to the estimate of wages lost an estimate of the cost of a job searches borne by parents who must give up a job, were fired from a job, or must find a more suitable job due to inadequate child care. The job search cost estimate was $142 per household based on evidence from Boushey & Glynn (2012).

Economic Impact on Businesses

Business losses are composed of three parts. One is the proportion (1-x=10%) of lost parental earnings. The second is direct employment on-costs payable by the firm per worker; conservatively, these on-costs are 19.4 percent of lost parental earnings (6.1% in paid leave, 3.3% in supplemental pay, and 10.0% in health insurance (U.S. Bureau of Labor Statistics, 2020)). The third is firm turnover costs. These costs were estimated to be $294 per household based on summaries of evidence across two reviews and is the lower bound of reported estimates (Boushey & Glynn, 2012; Work Institute, 2017).

Economic Impact on Taxpayers

Losses in federal income tax and Montana income tax are derived from values for lost wages applied through the National Bureau of Economic Research (NBER) tax calculator TAXSIM version 32. Taxes are calculated using the average number of children under the age of six and the average child care cost reported. We did the calculations using both two and one parent households. The estimates were done using the difference between taxes paid without lost income due to child care and income with child care. We compare taxes paid for any given level of income with and without child deductions. Thus, the loss of taxes is given as $\Delta T = \tau(Y)\cdot Y - [\tau(Y)\cdot Y - c(N)]$ where Y is income, $\tau(\cdot)$ is the gross tax rate as a function of income and c(N) is the child care deduction for N children. All are state averages. $\tau(Y)$ is from TAXSIM. This differs from calculations done in Belfield (2018) who uses $\tau \cdot \Delta Y$ in his tax loss equation, where ΔY is lost income. Given the progressive nature of taxes in the US, the Belfield method would underestimate tax losses. Taxes were estimated using four types of households present in the Montana Child Care Survey findings. The four type of household were:

1. Single parent households.
2. 2-parent households where 1 works and 1 stays-at-home.
3. 2-parent households where both parents work.
4. 2-parent households where both parents are retired, unemployed or disabled.

Table 3.1. TAXSIM inputs

	Single parent	2-parent household, 1 works and 1 stays-at-home		2-parent household, both work		2-parent household, both retired, unemployed or disabled	
		Respondent	Other parent	Respondent	Other parent	Respondent	Other parent
Mean annual wages earned	$24,750	$14,840	$51,790	$48,900	$51,200	$3,860	$17,270
Mean annual wages lost due to child care	$3,420	$530	$2,190	$3,500	$3,660	$2,080	$1,200
Number of households	4,346	5,631		14,988		525	
Mean respondent age	38	37		38		38	
Mean number of children under 6	1	2		2		1	
Mean annual child care fees paid	$4,390	$1,520		$6,500		$5,630	

Long Term Economic Impact

To make a plausible estimate of the 10-year economic burden for this cohort of households BBER needed information from this single, cross-sectional survey that provided insight into how household economic burden from inadequate child care changes over time. Children's ages can serve as a rough indicator of different points of time in the child care experiences of households. So, BBER calculated the average age of only the children from 0 through 5 years old in each household to represent where each family fell along a hypothetical timeline of child care experiences. Specifically, BBER divided the households into 5 groups:

1. Average age 0-1 years old
2. Average age 1-2 years old
3. Average age 2-3 years old
4. Average age 3-4 years old
5. Average age 4-5 years old

BBER then estimated the average annual economic burden from inadequate child care (as described in the Economic Impact on Parents section above) for each of these five groups. The survey estimates were (see below):

Table 3.2. Annual parental burden by average age of children

Mean annual parental burden (household) by mean age of children in household				
Mean age of children (0-5 only) in household				
0-1	1-2	2-3	3-4	4-5
$5,300	$5,300	$5,300	$6,900	$5,700

The mean annual parental burden is very similar ($5,300) for households with children whose average ages are the lowest. The mean annual burden increases ($6,900) among households with children whose average is between 3 and 4 years old. This may be due to some parents returning to work in the 4th year of their child's life, thus losing more work hours due to child care issues. Among households with children whose average age is between 4 and 5 years old the burden drops ($5,700). This may be due to a portion of these children attending kindergarten in the 5th year of their life.

Using these insights about how parental burden changes as children age as rough indicators of different points in time in the child care experiences of households, BBER then constructed a progressive, 10-year table of mean annual parental burden for each of the 5 groups identified above. A 5-year extract of that table is below.

Table 3.3. Extract of 10-year parental burden table

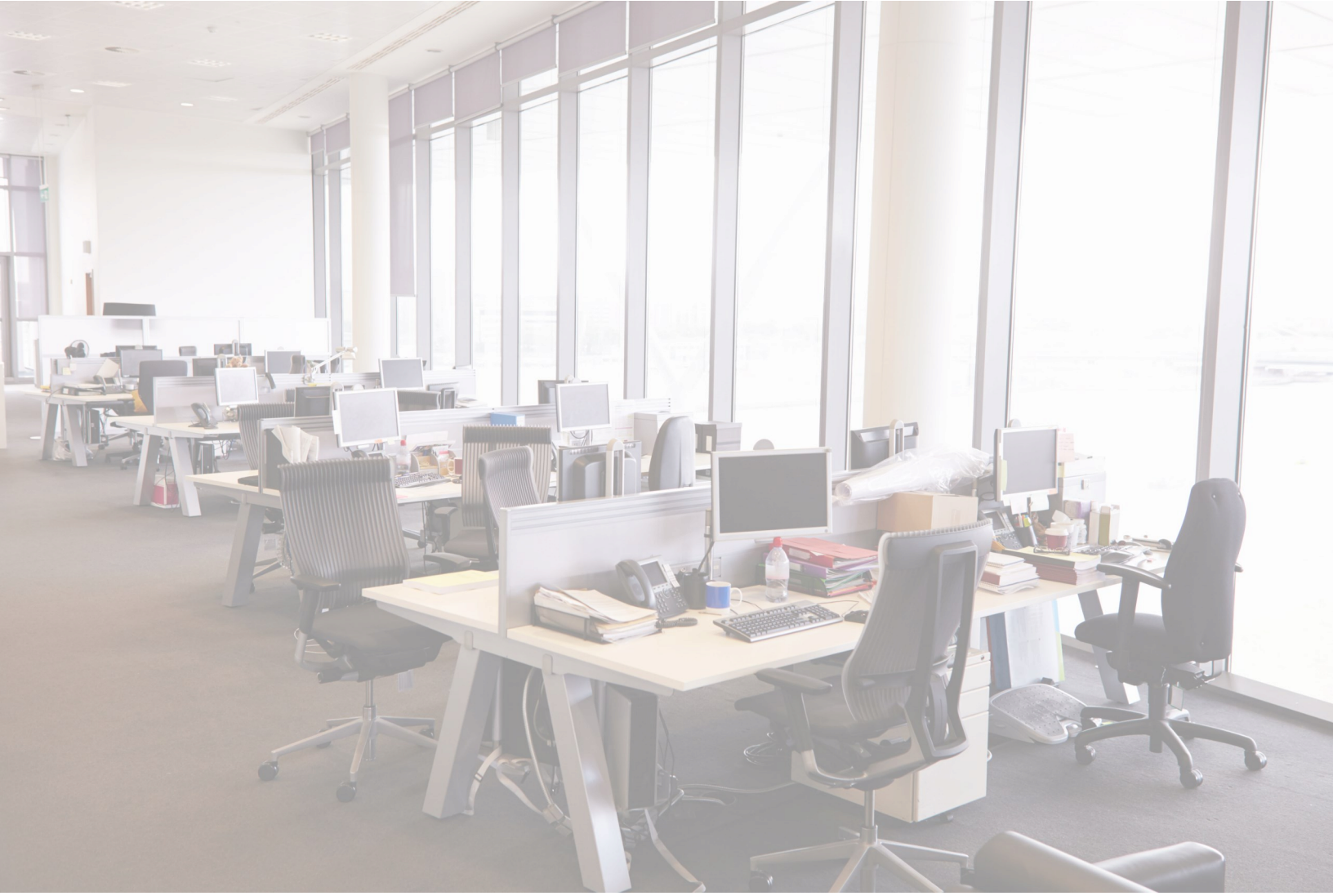
Cohort	Year				
	2019	2020	2021	2022	2023
Mean age 0-1	$5,300	$5,250	$5,200	$6,700	$5,480
Mean age 1-2	$5,300	$5,200	$6,700	$5,480	$1,930
Mean age 2-3	$5,300	$6,700	$5,480	$1,930	$1,460
Mean age 3-4	$6,900	$5,480	$1,930	$1,460	$1,000
Mean age 4-5	$5,700	$1,930	$1,460	$1,000	$540

After producing the parental table, we use the inputs from the parental table to calculate analogous tables for 10-year business burden and 10-year taxpayer burden. In each table we use a standard present value calculation, with a cost of living inflation adjustment. We use 1.5% as the rate of inflation, roughly the average for PCE inflation over the past ten years.[4] The discount rate we use is 2.5% which is mean nominal yield on ten year US bonds over the past ten years. Others have used 3.0% as the preferred discount rate, however, since the end of the 2007 – 2008 financial crisis, nominal yields have remained low by historical standards. The equation we use is:

$$PV(z) = \sum_{t=0}^{T} \left(\beta \cdot (1+\pi)\right)^t \cdot z_t$$

Where π = is the inflation rate, $\beta = 1/(1+i)$ is the discount factor, and z is, alternatively, lost wages, business loss, and tax losses. Note, because we have data for children under the age of six, z is allowed to change over time. The biggest loss due to inadequate child care occurs in the years before each child enters kindergarten, there after lost wages fall, and business and tax losses decline in line with gains in wages.

[4] PCE stands for the Price of Consumer Expenditures from the Bureau of Economic Analysis, it is the Federal Reserve's preferred price index for calculating inflation.



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