

ECONOMIC IMPACT OF COVID-19 IN THE PIEDMONT TRIAD REGION

NC POLICY COLLABORATORY RESEARCH PROJECT

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KEY FINDINGS

- ❖ COVID-19 has disproportionately impacted racial minorities and women in the Piedmont triad region. Minorities make up about 20% of the Piedmont Triad 12-county population but account for over 40% of initial unemployment claims, 38% of continuing claims, and over 32% of COVID-related unemployment. Women account for 56% of COVID-related unemployment claims.
- ❖ The unemployment rate in the Piedmont Triad region peaked in May 2020 at 13.3% with slight variations across counties. The Greensboro-High Point Metropolitan Statistical Area recorded the highest unemployment rate at 14.5% in May. Across the 12-county area, the unemployment rate has fallen to just under 6% in December.
- ❖ The most severely impacted industries include leisure and hospitality, food services and drinking bars, trade and transportation, educational and health services, and manufacturing.
- ❖ A survey of businesses and households in the Triad indicate 64% of businesses had moderate to large negative effects from COVID-19, and 60% will either temporarily or permanently shut down if there is another lockdown. 42% of households have lost employment income since March 2020 directly due to COVID-19. 41% report having difficulty paying their mortgage/rent, 49% have problems paying for utilities, and 50% have trouble paying for groceries.
- ❖ The conservative model estimates that the annual economic impacts of COVID-19 on the economy of the Piedmont Triad region will range from 55,960 lost jobs, \$10.5 billion lost output, and \$1.125 billion lost state and local tax revenues. The worst-case model estimates that these losses could top 157,220 jobs, \$28 billion in output, and \$2.55 billion in state and local tax revenues.
- ❖ Disruptions to North Carolina A&T State University operations could significantly impact the economy of the Piedmont Triad region. For instance, a hypothetical 50% reduction in enrollment and associated revenue would create economic impacts region-wide of up to \$127 million lost output, 1,400 lost jobs and \$33 million in federal, state, and local tax revenues.

INTRODUCTION

North Carolina recorded its first case of the Novel Coronavirus (COVID-19) infection on March 3, 2020 in Wake County. Within one month of the first reported case, there was a rapid increase in cases throughout the state and by the beginning of April, over 90% of counties in the state had recorded cases of the virus. In the Piedmont Triad, Forsyth County was the first to record a case on March 12. Figure 1.1 shows the disease progression statewide and within the Piedmont Triad Area. As seen in the figure, the first wave of COVID-19 cases peaked statewide and in the Piedmont Region around mid- to late-July. By July 18 - 30, the state was reporting an average of 2,100 cases per day while the Piedmont Triad area averaged 300 cases per day. The second wave of infections which started in October is still ongoing as of the beginning of December, with case counts continuing to increase rapidly statewide and in the Piedmont Triad. For example, the state reported an average of 2,065 confirmed new cases per day in October while in November the daily average of new cases increased sharply to 3,100 per day. In December, the average reported new cases statewide once again soared to over 5,600 per day (December 1 – 23).

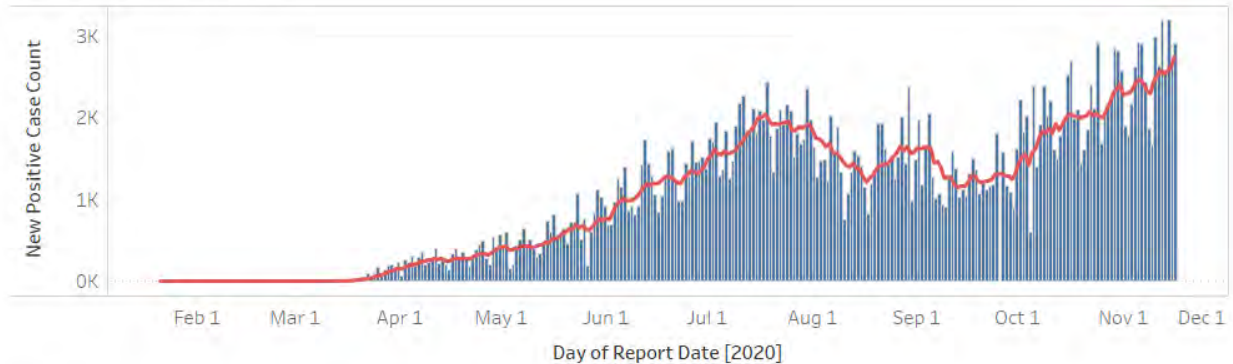
As COVID-19 cases increased rapidly throughout the state in the early spring of 2020, North Carolina Governor, Roy Cooper, declared a state of emergency and imposed restrictions to curb the spread of the virus. By executive order, North Carolina began a statewide lockdown in mid-March, with most businesses—except for those offering essential services—and k-12 schools, closed until May 15. Phased easing of restrictions began on May 8: In phase 1, the statewide stay at home order which lasted from March 30 to April 29, was relaxed. On May 20, the state entered phase 2, transitioning from stay-at-home order to safer at home and encouraging stronger social distancing measures for individuals and businesses. In phase 3, which began September 30, additional COVID-19 restrictions on businesses were lifted.

The decision to impose statewide lockdowns was not a popular one. In the United States as a whole, lots of controversy surrounded the imposition of lockdowns to slow the spread of COVID-19, with some arguing that the “cure”—meaning the lockdown and its economic toll—should not be worse than the disease itself. Some research has shown that lockdowns could be effective in slowing the spread of the virus, especially if the timing is appropriate. A cross-country panel analysis of the effectiveness of COVID-19 lockdowns found that lockdowns were effective in reducing the number of COVID-19 cases in countries that implemented it compared

with those that did not.¹ Lockdowns' impacts were generally felt beginning ten days after imposition and its efficacy continued to grow until twenty days after the implementation. As anecdotal evidence, three Nordic countries—Sweden, Finland, and Norway—are often cited as a classic contrast of how lockdowns can be effective in slowing down COVID-19 spread and reducing the number of deaths. Sweden, where the official policy to combat COVID-19 was predicated upon building herd immunity, did not impose lockdowns or severe social distancing restrictions, saw their cumulative cases soar to over 266,000 (27,000 cases per million people) with 6,972 deaths as of the beginning of December. Norway and Finland, on the other hand, which adopted more stringent COVID restrictions saw slow spread of the disease and total cases much lower than in Sweden. In Norway, total cases were just over 36,000 (or 7,000 per million people) and 334 deaths as of the beginning of December. In Finland, total cases were 24,900 (4,500 per million people) and 399 deaths as of beginning of December.

¹ Alfano, Vincenzo and Ercolano, Salvatore (2020). The Efficacy of Lockdown Against COVID-19: A Cross-Country Panel Analysis. *Applied Health Economics and Health Policy*, 18(4): 509-517. doi: [10.1007/s40258-020-00596-3](https://doi.org/10.1007/s40258-020-00596-3).

NC Daily new cases



Piedmont Triad Daily New cases

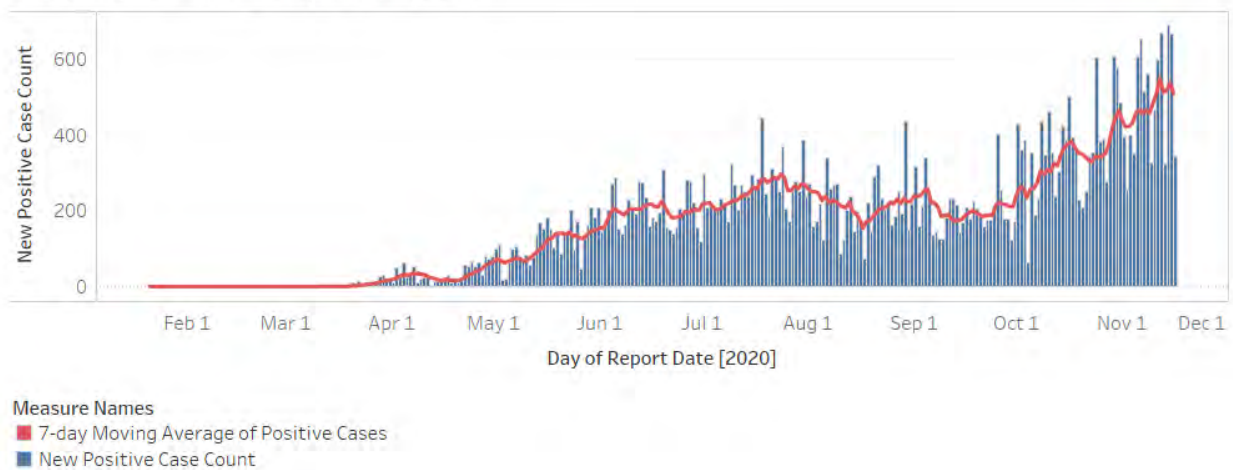


Figure 1.1: COVID-19 Cases in North Carolina and the Piedmont Triad

The Study Area

The study area is the Piedmont Triad region of central North Carolina, covering 12-counties (see map of study area in Appendix). The three major cities in the region, which form the Triad Area are Greensboro, Winston-Salem, and High Point. With an estimated population of over 1.75 million, the Piedmont Triad is the third largest combined statistical area in North Carolina. Five of the largest counties in the region (Guilford, Forsyth, Alamance, Davidson, and Randolph) account for 80% of the population. Table 1.1 shows the household income distribution of the Piedmont Triad region. About 30% of the Piedmont Triad's households are living at or below the federal poverty level in 2020 (\$26,200 for a family of four). The labor force participation rate for the entire region was 58% (53% for females) pre-pandemic and median household incomes of

just over \$46,000 (see Table 1.2 for household income by county). The largest three counties, which are more cosmopolitan and diverse, have minority populations ranging from 26% in Alamance county, 33% in Forsyth county to 44% in Guilford county (Table 1.2). Considering the 12-county area, however, minorities make up just over 20% of the population. The economic output (regional gross domestic product) of the region is estimated at around \$90.7 billion in 2019, with total employment of 994,765. Total business establishments are 134,000, of which 29,000 (or 22%) are minority-owned and 48,000 (or 36%) are women-owned.

Table 1.1: Household Income Characteristics of the Piedmont Triad Region

Income Range	Approximate Number of Households	Percent of Households
Less than 15k	98,208.58	13.97
15-30k	128,570.95	18.28
30-40k	80,353.45	11.43
40-50k	69,211.78	9.84
50-70k	103,517.62	14.72
70-100k	102,937.90	14.64
100-150k	73,403.94	10.44
150-200k	24,141.19	3.43
Greater Than 200k	22,863.30	3.25
Total	703,208.71	100.00

Source: IMPLAN 2019 data for model region (Piedmont Triad 12-County Region)

Table 1.2: Socio-demographic characteristics of the Piedmont Triad Region

County	Pop2019	Female (%)	Male (%)	White (%)	Black (%)	OtherRace (%)	MedianHHinc	Totalfirms	Minority_ownedfirms
Alamance	169509	52.5	47.5	73.6	20.9	5.5	\$45,735	10,990	2,283
Caswell	22604	49.2	50.8	64.5	32.3	3.2	\$43,961	1,106	279
Davidson	167609	51.1	48.9	85.6	10.1	4.3	\$47,271	13,423	1,515
Davie	42846	51.2	48.8	90	6.5	3.5	\$57,611	3,380	235
Forsyth	382295	52.7	47.3	66.6	27.5	5.9	\$50,128	28,792	7,481
Guilford	537174	52.7	47.3	56	35.4	8.6	\$51,072	45,746	14,168
Montgomery	27173	51.1	48.9	76.4	19	4.6	\$42,346	1,890	330
Randolph	143667	50.7	49.3	88.8	6.6	4.6	\$45,006	11,207	1,285
Rockingham	91010	51.7	48.3	77.5	19	3.5	\$42,490	6,193	1,011
Stokes	45591	51	49	93.7	4.1	2.2	\$46,169	2,843	158
Surry	71783	51.3	48.7	92.9	4.2	2.9	\$41,068	5,681	397
Yadkin	37667	50.5	49.5	93.9	3.4	2.7	\$42,876	3,022	118

Source: U.S. Census Bureau (American Community Survey and Survey of Business Owners)

~ Part I ~

Economic Trends

Key Economic Indicators

The Piedmont Triad region, like much of the country, took a direct hit from the COVID-induced economic meltdown in the spring. Businesses across the region shuttered as the state entered various phases of mandatory lockdowns from April to August 2020. Significant economic impacts began to be felt throughout the region as business closed, workers furloughed, and the economy came to a near-standstill in the spring. Data analysis shows the impacts of COVID-19 on job losses, initial and continuing claims for unemployment benefits, as well as the unemployment rate across the Piedmont Triad region (Figures 1.2, 1.3 & 1.4). In Figure 1.2, the number of people filing for first time unemployment benefits in the Piedmont Triad region reached a high of 91,553 in April, of which 74,475 were COVID-related. The unemployment rate increased from 3.7% (pre-COVID) to 13.3% in April-May (Figures 1.4 and 1.5). This implies that most of the jobs lost in the Piedmont Triad area were due to COVID-19. Both initial and continued claims have steadily fallen from their peaks in April-May—as of October, initial and continuing claims have receded to their pre-pandemic levels.

Disparities in Impacts of COVID-19

Analysis reveals a disproportionate economic impact of COVID-19 by gender, race, and type of industry. We have analyzed the impacts on unemployment rates, initial and continuing claims for

unemployment insurance and found that initial and continuing claims for unemployment benefits are higher for females and minorities. Figure 1.3 shows the impacts of COVID-19 on unemployment claims by gender and race. Comparatively, the graphics show a disproportionate impact on racial minorities and women. Minorities make up about 20% of the Piedmont Triad 12-county population but account for over 40% of initial claims, 38% of continuing claims, and over 32% of COVID-related unemployment claims. Research has revealed that minorities are three times as likely to contract COVID-19 and two times as likely to die from it than whites.² A Federal Reserve Bank study showed that nearly 40% of people with household income under \$40,000 lost their job due to COVID-19.³ The same study found that 63% of workers with a bachelor's degree were able to work entirely from home during the COVID-19 lockdown, while only 20% of workers with a high school diploma or less could work at home. Additionally, 67% of workers with a high school diploma or less worked in jobs that could not, under any circumstance, be performed remotely. Minorities are overrepresented in these types of jobs that could not be performed remotely. Thus, it is not surprising that minorities have been more severely impacted.

In terms of gender, females are over-represented in filings for continuing unemployment benefits due to COVID-19. Females make up 51% of the

MINORITIES

20% of the
Piedmont Triad
population

32% of COVID-
19
Unemployment

² The CDC (2020). COVID-19 case-level data reported by state and territorial jurisdictions. The Centers for Disease Control and Prevention, August 2020.

³ The Federal Reserve Bank (2020). Report on the Economic Wellbeing of U.S. Households in 2019, Featuring Supplemental Data from April 2020. Board of Governors of the Federal Reserve System. May 2020.

population of the region but account for nearly 56% of continuing claims for unemployment. Nationally, women have been hit hardest by the economic fall-out from COVID-19. Only 39% of females who were furloughed or laid off due to COVID-19 have gotten their jobs back compared with 58% for males.⁴ Data from the Bureau of Labor Statistics show that women dropped out of the labor force at a higher rate than men. For example, 865,000 women dropped out of the labor force between August and September alone, compared to 216,000 for men. Men's labor force participation rate dropped from 71.7% in February to 68.6% in April (3.1 percentage points drop) while women's participation rate dropped from 59.2% to 56.3% (2.9 percentage points drop). However, the recovery in participation rate has been unequal: As of September, male labor force participation rate has recovered back to 69.9% while women's is 56.8%, meaning that women's participation rate is down 2.4 percentage points since the pandemic began compared with 1.8 percentage points for men.⁵

A recent study found that unlike in previous recessions, women's unemployment rate has risen significantly more than that of men in the COVID recession. Women's unemployment rate during the COVID-19 pandemic recession is 2.9 percentage points higher than that of men.⁶ Two reasons

FEMALES

51% of
Piedmont
Triad
Population

56% of
COVID-19
Unemploy
ment

⁴ Kai, Ryssdal (Host): Marketplace Report, October 2, 2020

⁵ Bureau of Labor Statistics, U.S. Department of Labor, *The Economics Daily*, Labor force participation rate down, employment–population ratio little changed in September. Retrieved from <https://www.bls.gov/opub/ted/2020/labor-force-participation-rate-down-employment-population-ratio-little-changed-in-september.htm> (December 17, 2020).

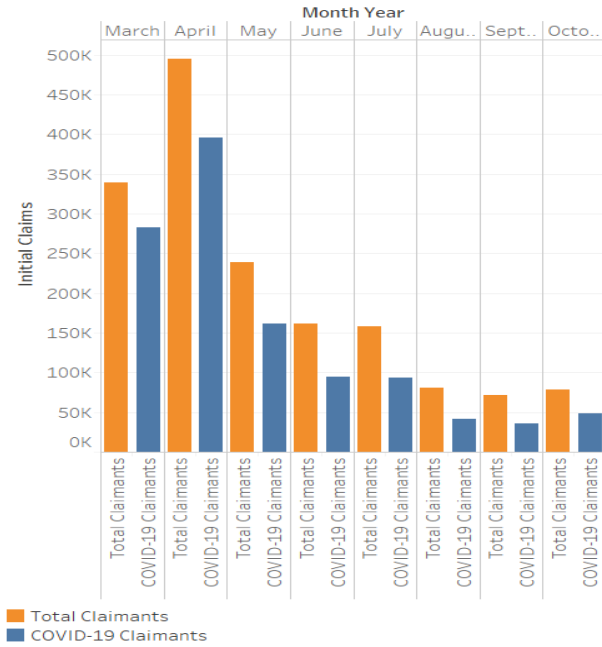
⁶ Alon, T., Doepke, M., Olmstead-Rumsey, J., and Tertilt, M. (2020). This Time It's Different: The Role of Women's Employment in a Pandemic Recession. August 2020. Working Paper

account for this: firstly, women are the main providers of child-care in most households and have had to make the painful decision to exit the job market to take care of kids as schools closed. A survey of the American labor force between May and June found that one in four women lost their jobs during the COVID-19 pandemic because of lack of childcare.⁷ Another survey conducted between February and September found that 2.2 million mothers of children aged 12 and under lost their jobs to the pandemic, compared with 870, 000 fathers in the same period.⁸ Secondly, the occupations that have been hit hardest also happen to be where women are predominantly employed. Women predominate in essential jobs—jobs that can only be performed in-person with no possibilities of telework, such as in hospitality, health care, retail and other personal services.

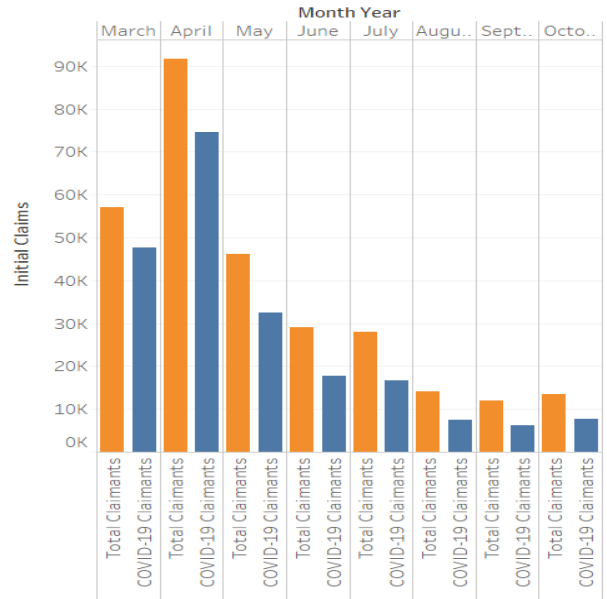
⁷ Bateman, Nicole and Ross, Martha (2020). Why has COVID-19 been especially harmful for working women? Brookings Gender Equality Series, July 29, 2020. <https://www.brookings.edu/essay/why-has-covid-19-been-especially-harmful-for-working-women/>.

⁸ Henderson, Tim (2020). Mothers are three times more likely than fathers to have lost jobs in the pandemic. Stateline Article. *Stateline, An Initiative of the Pew Charitable Trusts*. September 28, 2020. <https://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2020/09/28/mothers-are-3-times-more-likely-than-fathers-to-have-lost-jobs-in-pandemic>.

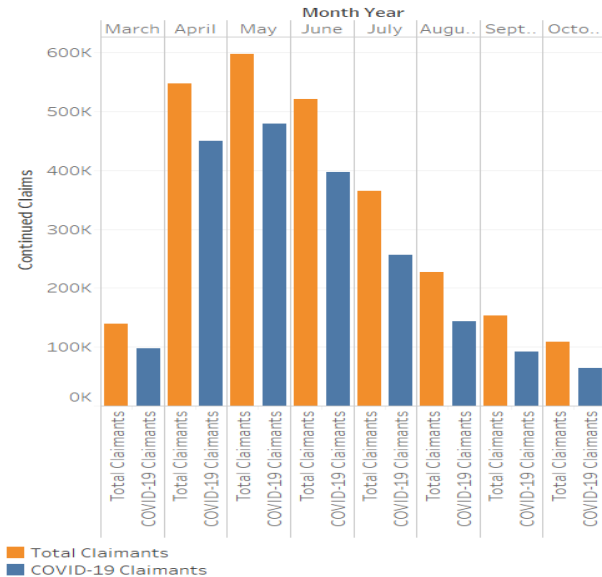
NC Initial Claims



Piedmont Triad Initial Claims



NC Continued Claims



Piedmont Triad Continued Claims

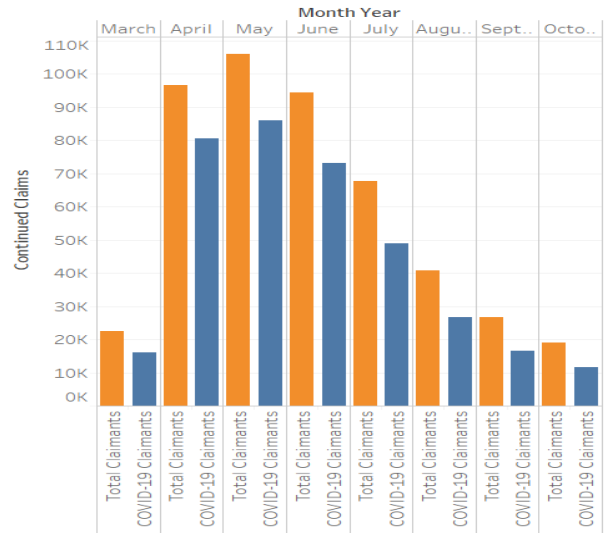


Figure 1.2: Initial and continuing claims for Unemployment Benefits

Figure 1.2 shows total versus COVID-19 initial claims for unemployment in the twelve-county region. Both the total and COVID-19 claims peaked in April and steadily declined in following months. At the peak in April, the Piedmont Triad region saw a total of 74,475 people filing for first time unemployment benefits because of COVID-19. Initial claims reached their lowest level in September and then increased in October. State total initial claims increased from 71,380 in September to 77,971 in October. COVID-related initial claims increased from 36,206 in September to 48,081 in October. In the Piedmont, total initial claims increased from 11,933 in September to 13,491 in October. Piedmont Triad COVID-related initial claims increased from 6,099 in September to 7,772 in October. Figure 1.2 also shows continued claims for unemployment Benefits (State versus Piedmont Triad Region). Total versus COVID-19 claims for unemployment in the twelve-county region. Both the total and COVID-19 continued claims peaked in May and have been steadily falling in the following months. At the peak in May, the Piedmont Triad region saw a total of 85,842 people receiving unemployment benefits because of COVID-19. Continued claims reached their lowest levels in October. State total continued claims hit a low of 108,221 in October. COVID-related continued claims hit a low of 63,489 in October. In the Piedmont, total continued claims hit a low of 19,097 in October. COVID-related continued claims reached a low of 11,666 in October.

COVID-19 IN THE PIEDMONT

December 21, 2020

81,256
Cases**992**
Deaths**876**
Hospitalizations

ECONOMIC IMPACT OF COVID-19 IN THE PIEDMONT TRIAD REGION

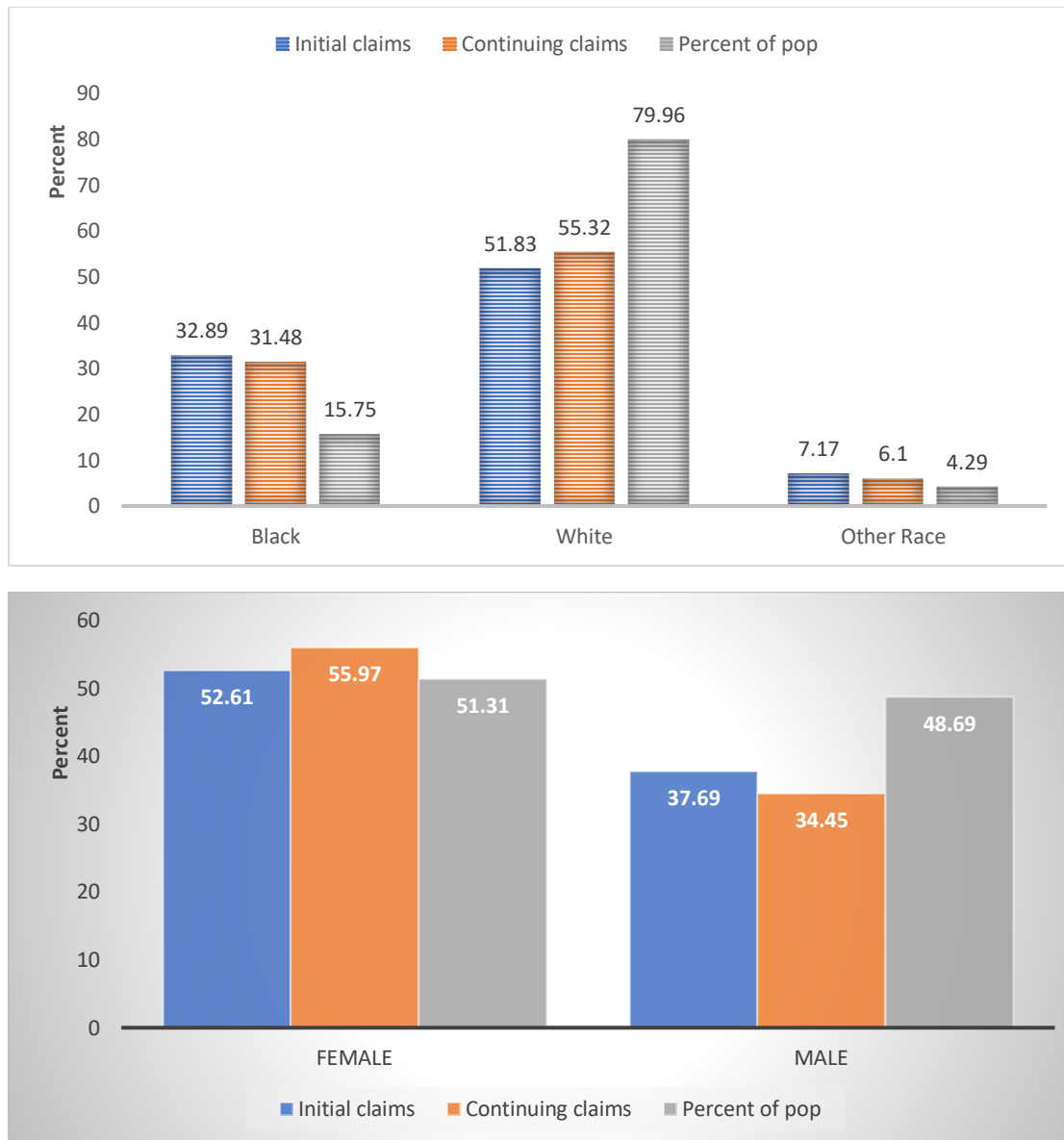


Figure 1.3: Racial and Gender Composition of COVID-Related claims for unemployment benefits

Piedmont Triad Region Unemployment: January 2018 to October, 2020

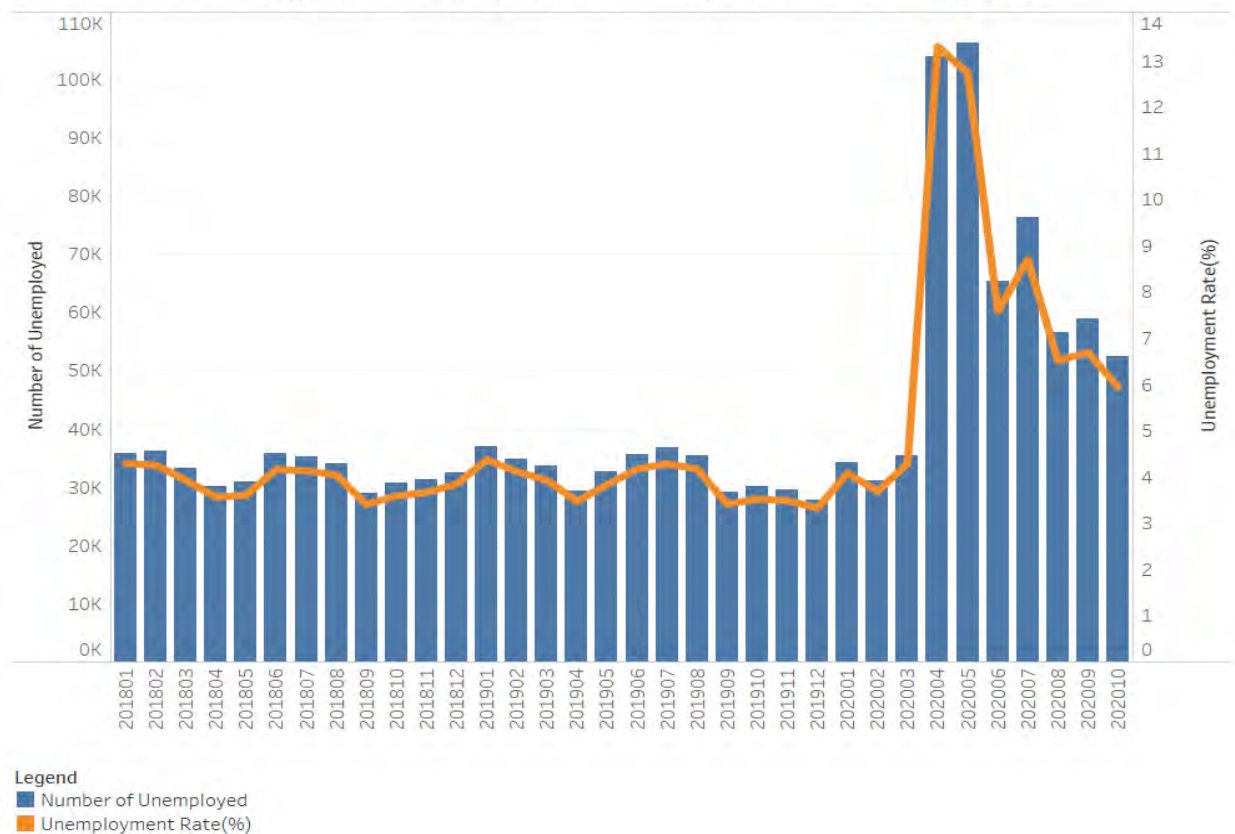


Figure 1.4: Region-wide Unemployment Trends

Figure 1.4 shows the unemployment trends for the Piedmont Triad 12-county area. In February, there was a total of 31,195 unemployed people with the unemployment rate at 3.7%. As COVID-19 spread through the area forcing businesses to close and furlough or lay-off workers, the number of unemployed jumped to 103,846 in April and 106,203 in May. The unemployment rate peaked at 13.3% between April and May. While it did fall considerably from the peak in May, the number of unemployed remains much elevated in October (52,428 people) compared to the pre-pandemic level. The unemployment rate in October standards at 5.6%.

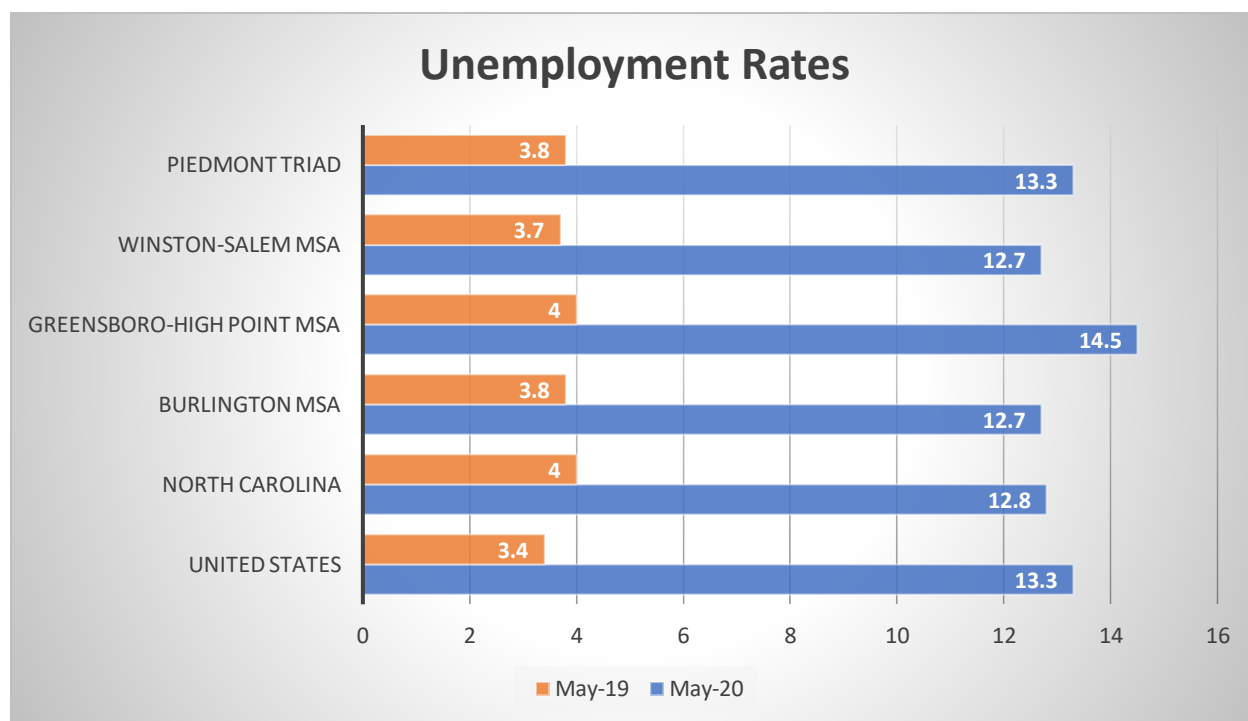


Figure 1.5: Unemployment Rate Comparisons by Region

The unemployment rate comparisons in Figure 1.5 shows that Greensboro-High Point MSA had the greatest unemployment impacts from the COVID-19 pandemic. The unemployment rate of 14.5 in May in Greensboro-High Point Metropolitan Statistical Area was higher than the Piedmont Triad region as a whole, North Carolina, and the United States.

Job Losses by Industry (Greensboro-High Point MSA versus Winston-Salem MSA)

Industries severely impacted include leisure and hospitality, food services and drinking bars, manufacturing, health care and social assistance services, and trade, transportation, and utilities.

The following two graphs (Figure 1.6) compare job changes across 30 industries in the Greensboro-High Point and Winston-Salem Metropolitan Statistical Areas (MSA). From February to May 2020, all industries recorded negative job growth. Appendix Tables A1-A3 show that in April all major industries (except for federal sector) recorded negative job growth in the Greensboro-High Point, Winston-Salem, and Burlington MSAs. While there was recovery in the ensuing months (June – September), the pace slowed down and indeed some sectors reversed

course into negative job growth as the second wave of COVID-19 infections gripped the area in October and November.

Greensboro-High Point MSA: the top three most impacted industries were leisure and hospitality (-15,300 jobs), food services and drinking bars (-15,200 jobs), and manufacturing (-12,700 jobs).

Winston-Salem MSA: the top three most impacted industries were food services and drinking bars (-10,000 jobs), leisure and hospitality (-10,000 jobs), and health care and social assistance services (-6,100 jobs).

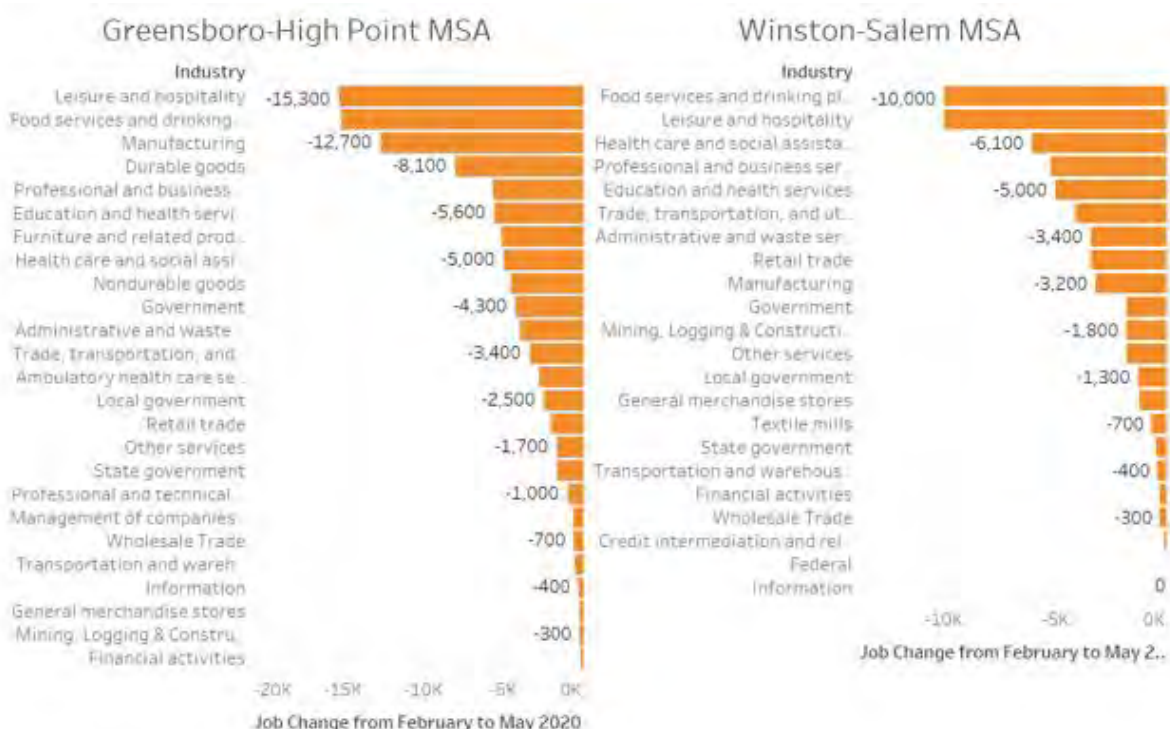


Figure 1.6: Job Change from February to May, 2020

~ Part II ~

Survey of COVID-19 Impacts on Businesses and Households in the Piedmont Triad

Survey of Piedmont Triad Businesses

A business survey was conducted between December 10, 2020 and January 20, 2021 to assess how business of the Piedmont Triad have been directly impacted by the pandemic. Respondents were sampled from across counties of the Piedmont Triad Region, representative of the size, industry, and economic importance of the business in the area. The survey instrument was administered online. Out of the total 50 surveys fielded, 50 were returned completed.

Approximately 40% of the establishments had less than 20 employees, approximately 27% had between 20 and 499 employees, and the rest had more than 500 employees. Non-surprisingly, most of the businesses belong to the Professional, Scientific, and Technical Services and the Health Care and Social Assistance industries, both prominent industries in the area. Of particular interest was the representation of self-employed or sole proprietorship in the region. For this, half of the businesses belong to that category, followed by LLCs, representing a quarter of the businesses surveyed.

Minority or Female Owned Businesses

Approximately 40% of the business are owned by an underrepresented ethnic group. When the type of ownership is broken down by categories, almost 60% of the sole-proprietorship businesses are owned by an underrepresented group. Within this group, 63% of solo-proprietorship businesses owned by an underrepresented ethnic group also hire most of their employees from an underrepresented group.

Effects on COVID-19

Out of the universe of business surveyed that vast majority of sole-proprietor business reported to have suffered moderate to large negative effects from COVID-19. This is not surprising since it is being established that the pandemic has affected more severely underrepresented groups. In

fact, if another lockdown was instituted, almost 40% of businesses owned by an underrepresented group will have to either temporarily shutdown or permanently shut down.

Expectations about the Short Run

Perhaps due to their experience with the Pandemic, most business owned by an underrepresented group are more pessimistic about the time it would take for things to go back to normal.

The below graphics summarize the results of the surveys.

Figure 1: Industry Composition

Industry Composition



ECONOMIC IMPACT OF COVID-19 IN THE PIEDMONT TRIAD REGION

Figure 2: Breakdown of Businesses by Type

Ownership		Employees	
Sole proprietor	50.00%	Less than 20	39.58%
LLC	25.00%	20-499	27.08%
9 S-Corp	10.42%	More than 500	33.33%
Non-profit	8.33%		
Other	6.25%		

Figure 3: Businesses Ownership by Type of Employees

Owner Minority or Female	Ownership / Employees Minority or Female									
	Sole proprietor		LLC		9 S-Corp		Non-profit		Other	
No	24.14%	10.34%	13.79%	13.79%	13.79%		10.34%	3.45%	6.90%	3.45%
Yes	10.53%	63.16%		21.05%		5.26%				

Figure 4: Business Ownership by Type of Employees and Type of Owner

Owner Minority or Female	Ownership				
	Sole proprietor	LLC	9 S-Corp	Non-profit	Other
No	10	8	4	4	3
Yes	14	4	1		

Figure 5: Businesses' COVID-19 Impact Perception

Covid Effect	Ownership				
	Sole proprietor	LLC	9 S-Corp	Non-profit	Other
Large positive effect	■		■		■
Moderate positive effect	■	■			
Little or no effect	■	■	■		
Moderate negative effect	■	■	■	■	
Large negative effect	■	■	■	■	

Figure 6: Businesses' COVID-19 Impact Expectation

If Lockdown	Employees Minority or Female		Expectations	Employees Minority or Female	
	No	Yes		No	Yes
Permanently close a locat..	2	2	There has been little or no..	4	1
Temporarily close a locati..	8	14	This business has returne..	3	1
None of the above	10	6	1 month or less	1	
			2-3 months	2	4
			4-6 months	4	4
			More than 6 months	6	10
			This business has perman..		1
			I do not believe this busin..		1

Survey of Piedmont Triad Households

A household survey was conducted between December 10, 2020 and January 20, 2021 to assess how residents of the Piedmont Triad have been directly impacted by the pandemic. Respondents were sampled from across counties of the Piedmont Triad Region, representative of gender, socio-economic status, as well as racial and ethnic composition of the population. The survey instrument was administered online. Out of the total 800 surveys fielded, 639 were returned completed (nearly 80% response rate). The respondents consisted of 57% white, 34% Black/African American, and 9% other racial minorities.

Loss of employment

About 29% of respondents reported being temporarily out of work. Of those temporarily out of work, different reasons were given, including employer went out of business or temporarily closed due to the pandemic, laid-off due to the pandemic, sick from COVID-19, taking care of kids etc. Of those out of work, 43% said they were not working for reasons directly or indirectly tied to COVID-19.

Loss of employment income

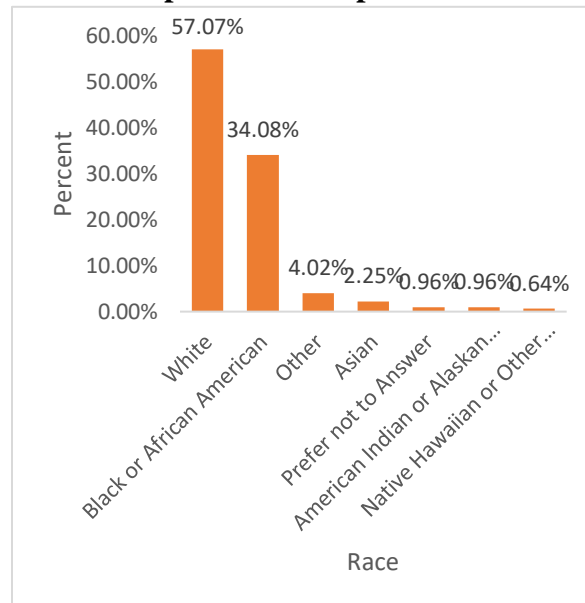
Forty-two percent of respondents reported that their household has lost employment income since March 2020 directly due to COVID-19. The specific reasons cited for loss of employment income range from reduced hours (34.5%) to laid-off (25.9%) to furloughed (9%).

Difficulty paying the bills

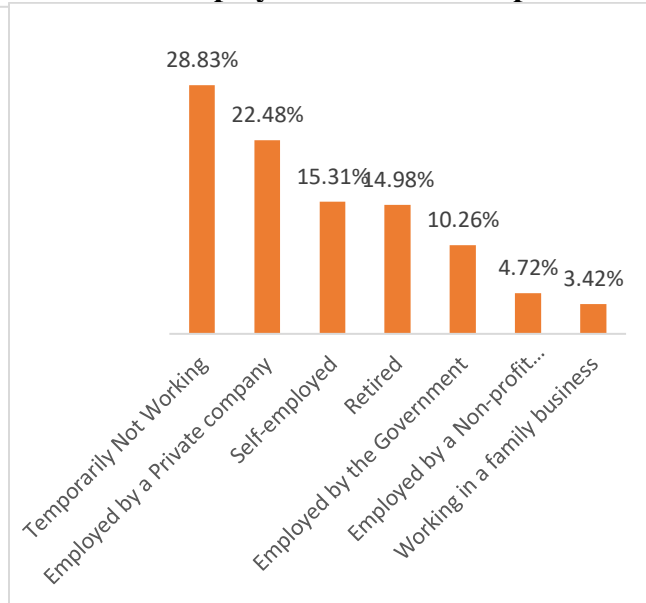
Forty-seven percent of Piedmont Triad residents reported that since the pandemic began, they have experienced a somewhat to very difficult circumstances paying their bills. Specifically, 41% report having difficulty paying their mortgage/rent, 49% have problems paying for utilities, and 50% have trouble paying for groceries.

The below graphics summarize the results of the surveys.

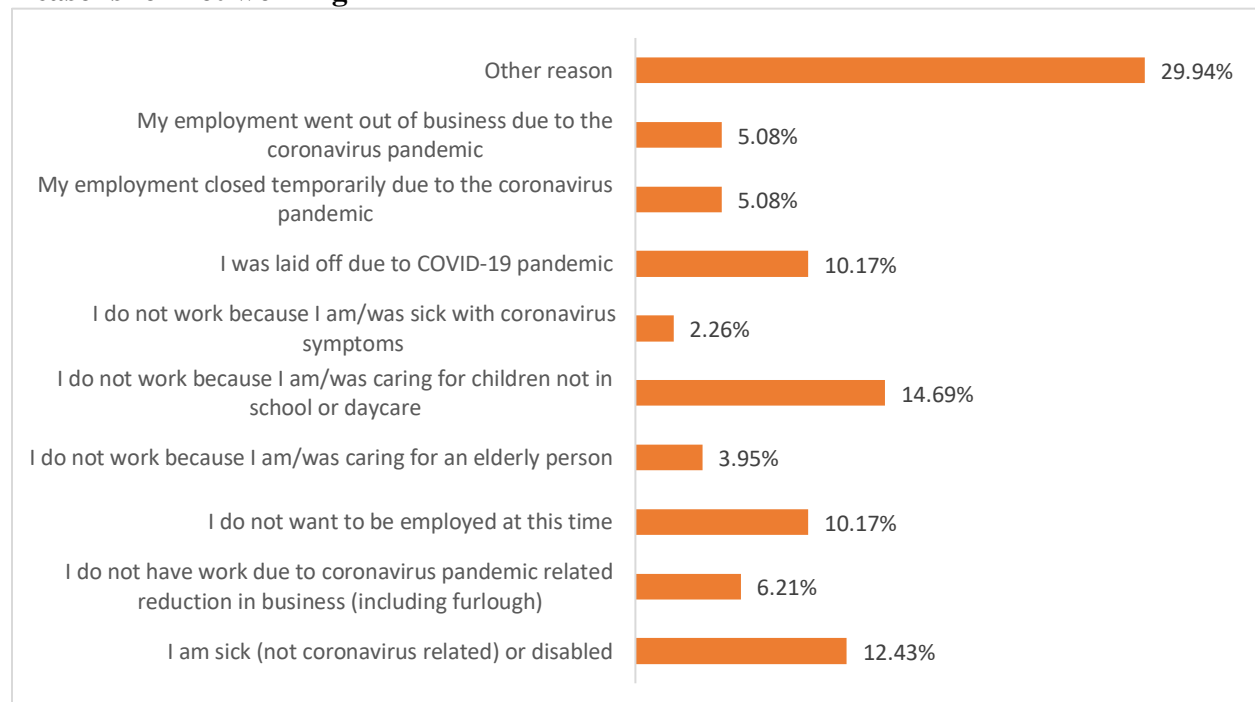
Racial composition of respondents



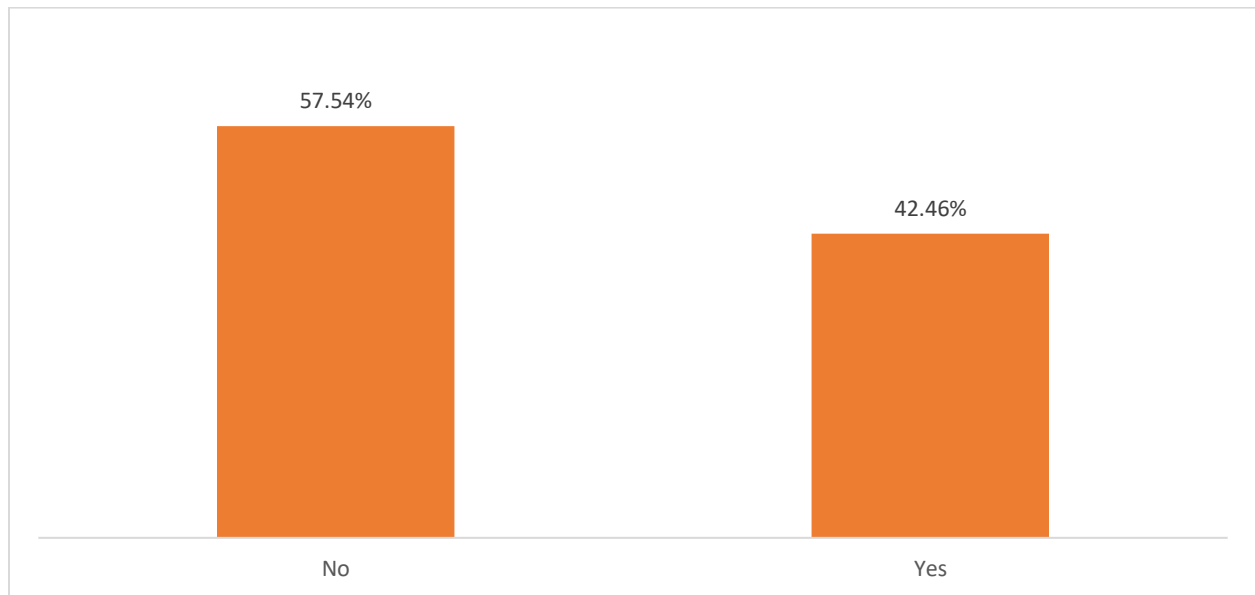
Employment status of respondents



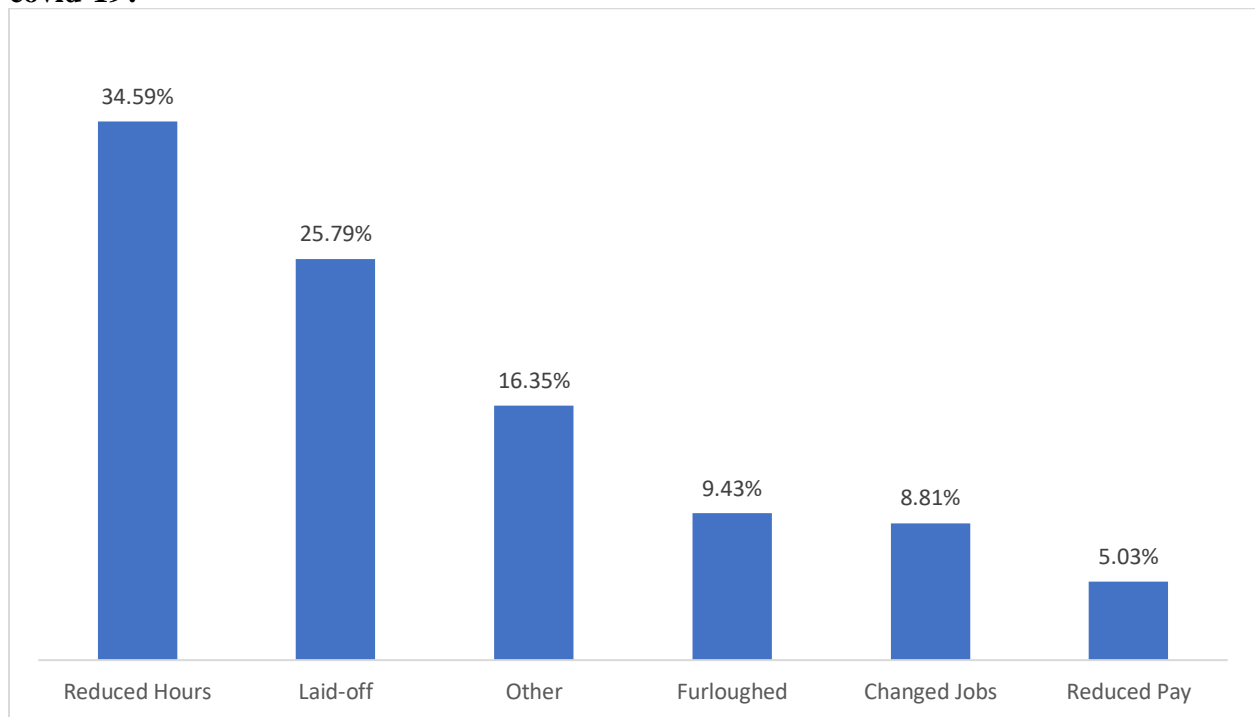
Reasons for not working



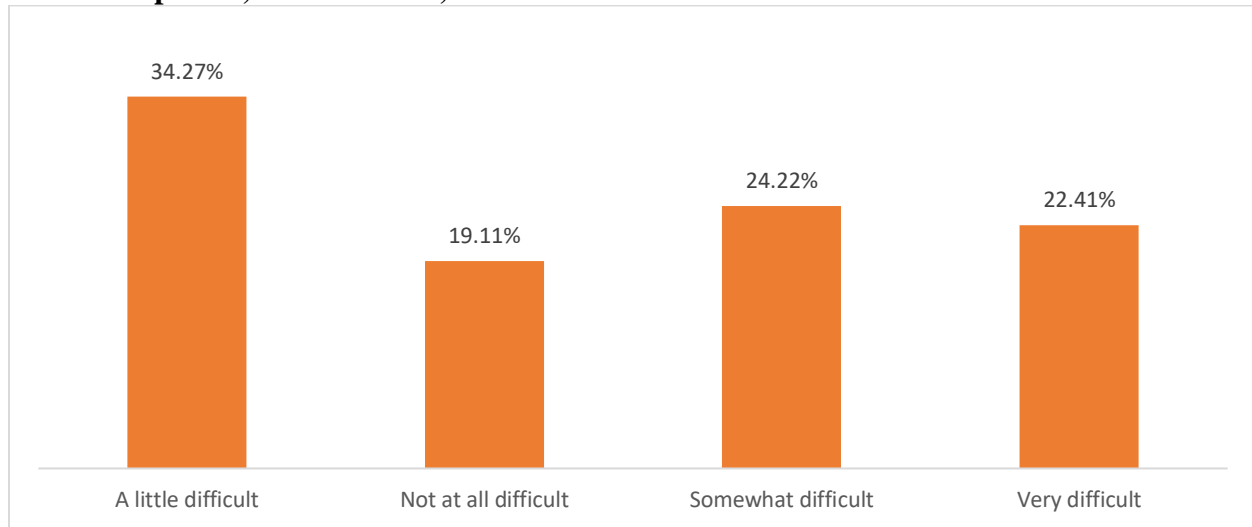
Did your household experience a loss of employment income since March 13, 2020 due to covid-19?



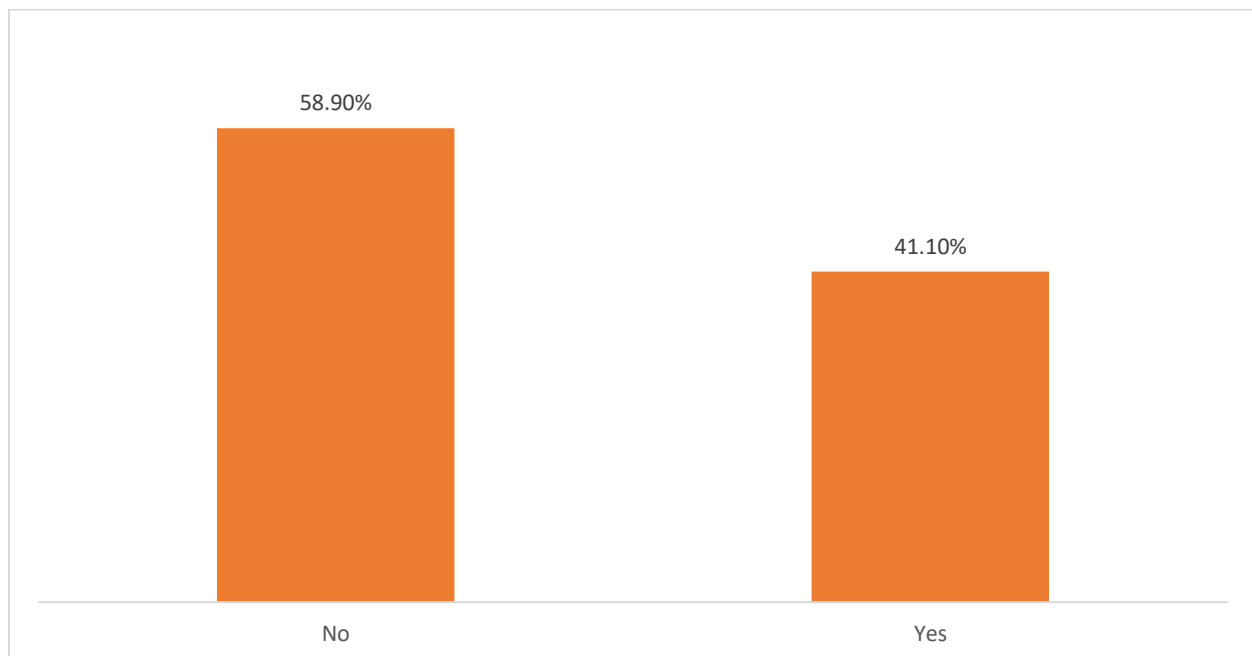
What is the main reason for the loss of employment income since March 13, 2020 due to covid-19?



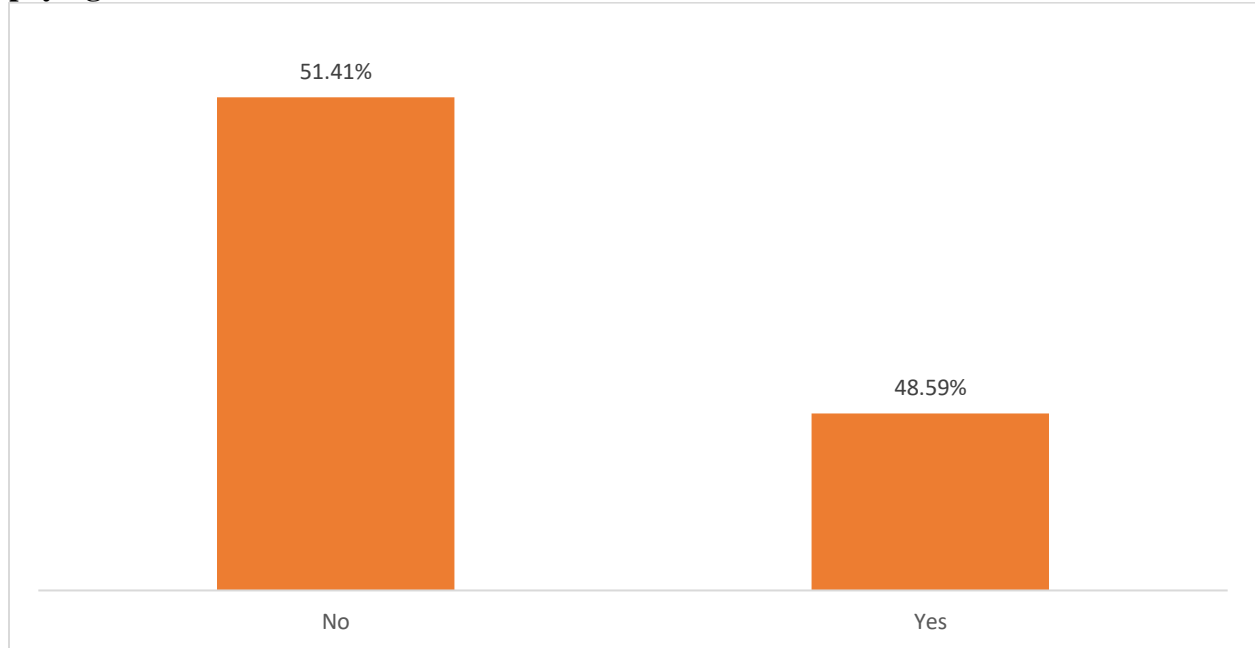
In the last 8 months, how difficult has it been for your household to pay for usual household expenses, including but not limited to food, rent or mortgage, car payments, medical expenses, student loans, and so on?



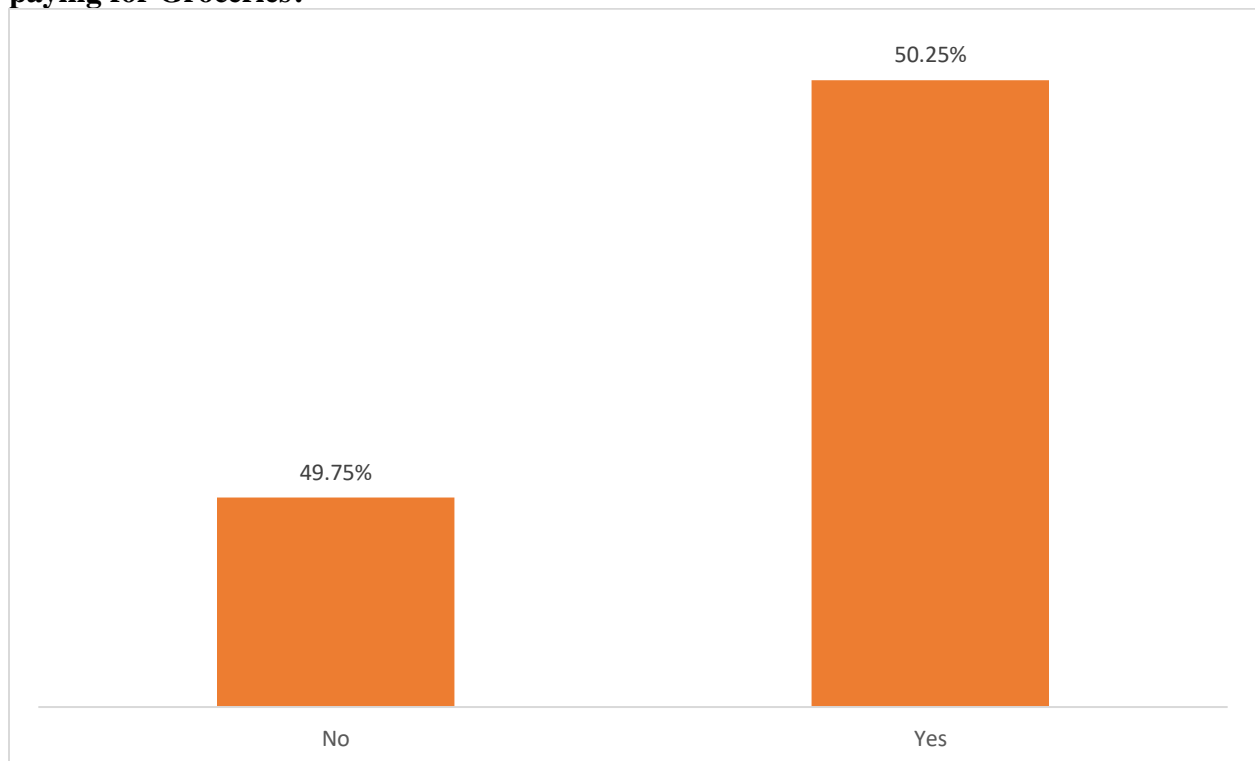
Thinking about your experience in the last 8 months, did your household have problems paying for Mortgage/Rent?



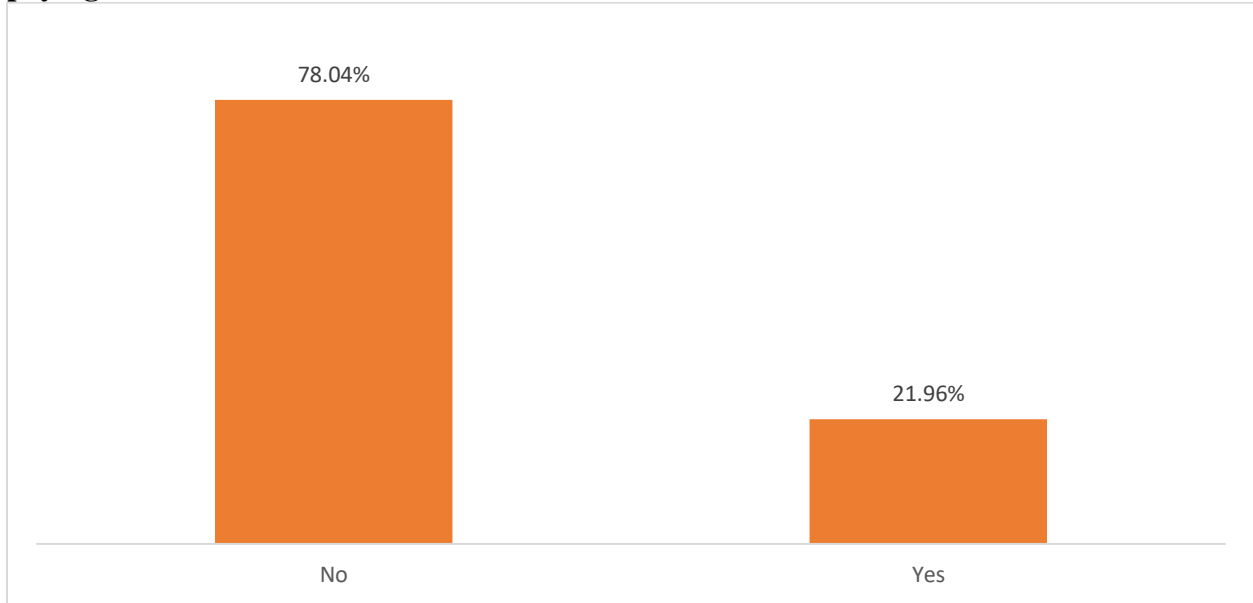
Thinking about your experience in the last 8 months, did your household have problems paying for Utilities?



Thinking about your experience in the last 8 months, did your household have problems paying for Groceries?



Thinking about your experience in the last 8 months, did your household have problems paying for Student Loans?



~ Part III ~

Estimating the Economic Impacts of COVID-19

In this section, we analyze the economic impact of COVID-induced disruptions to businesses, the resulting job losses, and how these create ripple effects to the entire economy of the region.

We assess the negative impacts of job losses across all major industries, while also accounting for the positive impacts created by the Paycheck Protection Program (PPP).

Methodology:

The IMPLAN Model

The study used the IMPLAN modeling system which is an Input-Output model⁹. IMPLAN uses data from the U.S. Bureau of Economic Analysis to build trade flows between businesses, and between businesses and final consumers (The IMPLAN Group, LLC). The IMPLAN model is built with 546 industries of the North American Industrial Classification System (NAICS); thus, it captures the entire economy. We used the most recent database within the IMPLAN system for second quarter 2020 (annualized) to account for COVID-19. Within the IMPLAN program we built an economic model for the Piedmont Triad's 12-county region. This allows us to track the impacts of monetary transactions within the Piedmont Triad economy. Type SAM (Social Accounting Matrix) multipliers from the IMPLAN system were used to estimate the economic impacts associated with all scenarios.

To achieve the objective of modeling impacts by industry, it was necessary to aggregate the IMPLAN sectors. We used IMPLAN custom-aggregation scheme to aggregate sectors into two-digit NAICS industries (Table 2.1). Data on job losses by industry are calculated from county-level unemployment statistics and continuing claims for unemployment insurance during the first three months of the pandemic. Data sources are North Carolina Department of Commerce (Local

⁹ For more information on the IMPLAN modeling process, visit [IMPLAN.com](https://www.implan.com).

Area Unemployment Statistics) and the U.S. Department of Labor's Bureau of Labor Statistics (BLS).

Table 2.1: Job losses by industry for the Piedmont Triad During COVID-19 (April – June)

Aggregated Industry	Number of two-digit NAICS industries/sectors included	Number of jobs lost during the pandemic recession
Construction	13	2,134
Education and Health Services	13	15,601
Financial Activities	8	1,344
Information	16	555
Leisure and Hospitality	16	14,668
Manufacturing	329	19,070
Trade, Transportation, & Utilities	42	18,821
Natural Resources & Mining	38	91
Public Administration	8	558
Professional Services	8	12,307
Other support services	5	2,960

Paycheck Protection Program (PPP) loan recipients: We used data from the U.S. Small Business Administration (SBA) of PPP loan recipients by state. Since the data were stripped of identifying information except the addresses of the business, we had to cross-reference the recipient addresses in North Carolina, that is, geocoding the location of recipients (using their addresses) to determine the number of Piedmont Triad businesses that received PPP money. We then calculated the sum of PPP money that was received in the region and the number of jobs saved as a result. A total of 2,725 Piedmont Triad businesses received PPP loans totaling \$1.13 billion. This is the equivalent of about 52,000 jobs saved.

Three Models of Economic Impacts

Model 1: The economic impact of job losses during the pandemic

In this model, we account for the economic impact of COVID-19- induced job losses. We take the job loss by all industries (Table 2.1) and run it within the IMPLAN model to calculate the

direct, indirect, and induced effects in the region. This gives the total economic impact in terms of lost incomes, lost output, and lost tax revenues across the region.

Model 2: The net economic impact of job losses due to the pandemic and PPP loan payments

In this model we account for job losses across all industries (as in model 1) and then the amount of PPP money received by businesses within the region. This new money spent in the region creates positive economic impacts. Modeling both the impact of jobs lost due to COVID and the inflows of PPP money, we estimate the net impact within the economy of the region.

Model 3: The net economic impact of job losses due to the pandemic and PPP jobs saved

In this model we account for the effect of jobs lost during the pandemic, but rather than control for PPP money inflows as in model 2, we instead add jobs saved due to the PPP program. A major part of the PPP program requirements was for businesses receiving the loans to keep workers on payroll. We estimate that about 52,000 jobs were saved by the PPP money received by 2,725 businesses in the region, an average of 19 jobs saved per business receiving the PPP loans. This model calculates the net impact of these two opposing job changes within the region.

In addition to controlling for the PPP program effects in models 2 and 3, the analyses performed in all three models also account for the impacts of the \$1,200 CARES Act (stimulus) payments to individuals and households. The IMPLAN database we used for the analysis already had the \$1,200 stimulus payments and enhanced unemployment benefits built into it. Thus, it is reflected in household spending and saving behavior.¹⁰

Economic Impact Results

In discussing the results, it is important, first, to explain three types of economic impacts: direct, indirect, and induced effects. In economic impact studies, direct effects refer to the initial shock to an economy, which can take the form of a change in spending or employment within an economy. The initial change—positive or negative—is modeled in IMPLAN in terms of increase/decrease in spending or employment. Indirect and induced effects are the ripple effects to the economy resulting from the business to business and household to business transactions

¹⁰ Clouse, Candi. “Using the Evolving Economy- COVID 2020 Q2 Data.” IMPLAN Support Site, The IMPLAN Group, LLC. October 7, 2020.

that result from the initial change in spending/employment. In all the results presented in the following tables and figures, the impacts are annualized, that is, we assume that the COVID-19 pandemic lasts for a full year. Thus, the initial (direct) impacts, and consequent indirect and induced effects, are calculated for a full calendar year. In other words, these would be the annual impacts on the economy of the region if COVID persisted for a year.

The analyses show negative impacts across the board. First, the direct effects are negative, indicating negative shock to employment, labor incomes, value added, and output due to COVID-19. This then creates additional negative indirect and induced effects as business-to-business spending dropped and households withheld spending. The total impact (sum of direct, indirect, and induced) on regional employment, labor incomes, value added, and output is then calculated.

We now turn to discussing the results under each of the three models. The results presented in the following tables and figures, show that model 1 is an extreme (high) impact scenario, model 2 is a middle-ground scenario, and model 3 is an extreme low (conservative) impact scenario. A note of caution with these impacts, particularly the tax impacts, is that taxes on production and imports in the IMPLAN model are calculated net of government subsidies¹¹. It is entirely possible that the large amount of subsidies granted to various industries under the CARES Act may skew the tax impacts. Also, the tax impact for each level of government is the sum of impact on all tax revenue sources (property tax, sales & excise tax, personal tax, corporate tax etc.)¹²

In model 1 (Tables 2.2 – 2.3 and Figures 2.1 – 2.2), the total impact on employment, if COVID-19 persisted for a year, is 157, 220 lost jobs, \$8.5 billion lost labor incomes and \$14 billion lost value added (contribution to gross regional product), and \$28 billion lost output. Tax revenue losses are \$384 million to sub-counties (municipalities), \$668 million to counties, and \$1.5 billion to state taxes. The top 5 most impacted industries under this scenario are trade,

¹¹ Taxes on production and income net of subsidies consist primarily of excise and sales taxes paid by individuals to businesses. These taxes occur during the normal operation of these businesses but do not include taxes on profit and income (IMPLAN Manual, 1996).

¹² Clouse, Candi. “Taxes: Where’s the Tax?” IMPLAN Support Site, The IMPLAN Group, LLC. August 28, 2020.

transportation & utilities; manufacturing; educational and health services; leisure & hospitality; and financial activities.

In model 2 (Tables 2.4 – 2.5 and Figures 2.3 – 2.4), the total impact on employment is 113,448 lost jobs, \$6.3 billion lost labor incomes and \$10.5 billion lost value added (contribution to gross regional product), and \$21 billion lost output. Tax revenue losses are \$311 million to sub-counties (municipalities), \$541 million to counties, and \$1.18 billion in state taxes. The top 5 most impacted industries under this scenario are trade, transportation & utilities; manufacturing; educational and health services; leisure & hospitality; and financial activities.

In model 3 (Tables 2.6 – 2.7 and Figures 2.5 – 2.6), the total impact on employment is 55,960 lost jobs, \$3 billion lost labor incomes and \$5 billion lost value added (contribution to gross regional product), and \$10.48 billion lost output. Tax revenue losses are \$177 million to sub-counties (municipalities), \$308 million to counties, and \$640 million in state taxes. The top 5 most impacted industries under this scenario are trade, transportation & utilities; manufacturing; educational and health services; leisure & hospitality; and financial activities.

In a nutshell, the tax impact of a year-long COVID-19 pandemic would lead to the state losing anywhere from \$640 million to \$1.5 billion (or 6% of tax revenues). This estimate falls in line with the state official forecast of \$1.64 billion tax revenue losses in FY2019-20 tax collections (6.6%) and \$2.57 billion (9.9%) in FY2020-21.¹³ Similarly, counties in the Piedmont Triad could lose combined tax revenues between \$308 - \$668 million (the equivalent of 3% of their annual revenues), and municipalities could lose \$177 - \$384 million. Other studies of COVID-19 impact on state and local tax revenues have shown losses much higher. The Tax Policy Center estimated that in May state sales tax receipts shrank 21% nationally, while in North Carolina, it shrank by 15.1%.¹⁴ A survey recently found that cities have lost 21% of revenues since the pandemic

¹³ Fiscal Research Division, North Carolina General Assembly (2020). North Carolina General Fund Revenue Consensus Forecast: May Revision. May 22, 2020.

¹⁴ Dadayan, Lucy (2020). The COVID-19 Effect: State sales tax receipts shrank \$6 billion in May. Retrieved from <http://www.taxpolicycenter.org>. July 14, 2020.

started while expenditures have risen by 17% in the same period. As a result, municipalities are facing a budget gap of \$90 billion for 2020 alone.¹⁵

PPP Program Multiplier

Comparing the impacts under model 1 and 3, we derive impact multipliers for the PPP program as follows. In terms of employment impact, total employment impact without the PPP (model 1) is -157,220 and with the PPP job savings (Model 3) total employment impact is -55,960. On net, the difference is 101,260 jobs not lost, implying the PPP program had a multiplier of 1.95 ($=101,260/52,000$). This means that for every job saved by the PPP program, another 2 jobs were saved in the region.

To derive the PPP output multiplier, realize that output declines by \$28,353,918,570 in model 1, and by \$10,488,554,586 in model 3. The difference (\$17,865,363,984) is the amount of output not lost which is attributed to the PPP program. Thus, given that the PPP payments received in the region was \$1.13 billion, it implies that the PPP program created an output multiplier of 15.88. For every dollar of PPP loan money received in the region, \$15.88 in output was saved. By similar calculations, the tax multiplier (State taxes) is 0.75, meaning that each dollar of PPP money saved \$0.75 of state tax revenues that would otherwise have been lost without the PPP program.

PPP Program Multipliers

Employment
multiplier

1.95

Output multiplier

15.88

Tax multiplier

0.75

¹⁵ National League of Cities (2020). The COVID-19 Recession: Without direct local aid, Americans will continue to fight this pandemic with both arms tied behind their backs. December 2, 2020.

Table 2.2: Employment and output impacts of COVID-19 in the Piedmont Triad (Model 1)

Impact	Employment	Labor Income	Value Added	Output
Direct	(88,105.89)	\$(4,917,071,344.73)	\$(8,305,194,671.91)	\$(17,345,278,380.34)
Indirect	(42,871.53)	\$(2,240,948,716.59)	\$(3,362,946,870.43)	\$(6,681,750,724.81)
Induced	(26,243.23)	\$(1,349,778,560.86)	\$(2,367,311,052.07)	\$(4,326,889,464.93)
Total	(157,220.66)	\$(8,507,798,622.18)	\$(14,035,452,594.40)	\$(28,353,918,570.09)

Table 2.3: Tax impacts of COVID-19 in the Piedmont Triad (Model 1)

Impact	Sub-County	County	State
Direct	\$(245,839,055.93)	\$(427,630,730.90)	\$(927,691,387.89)
Indirect	\$(65,476,363.53)	\$(114,023,130.00)	\$(294,627,770.39)
Induced	\$(73,135,749.37)	\$(127,202,289.21)	\$(270,989,350.78)
Total	\$(384,451,168.83)	\$(668,856,150.10)	\$(1,493,308,509.05)

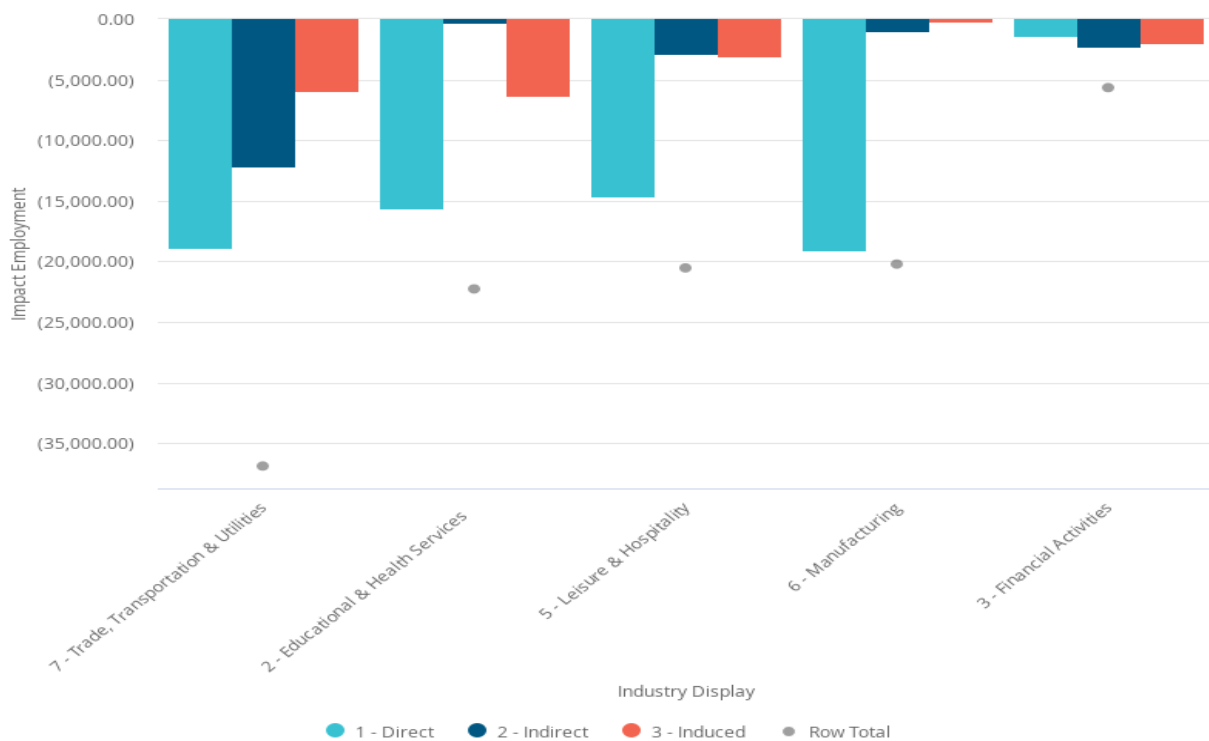


Figure 2.1: Top 5 Employment impact industries (Model 1)

ECONOMIC IMPACT OF COVID-19 IN THE PIEDMONT TRIAD REGION

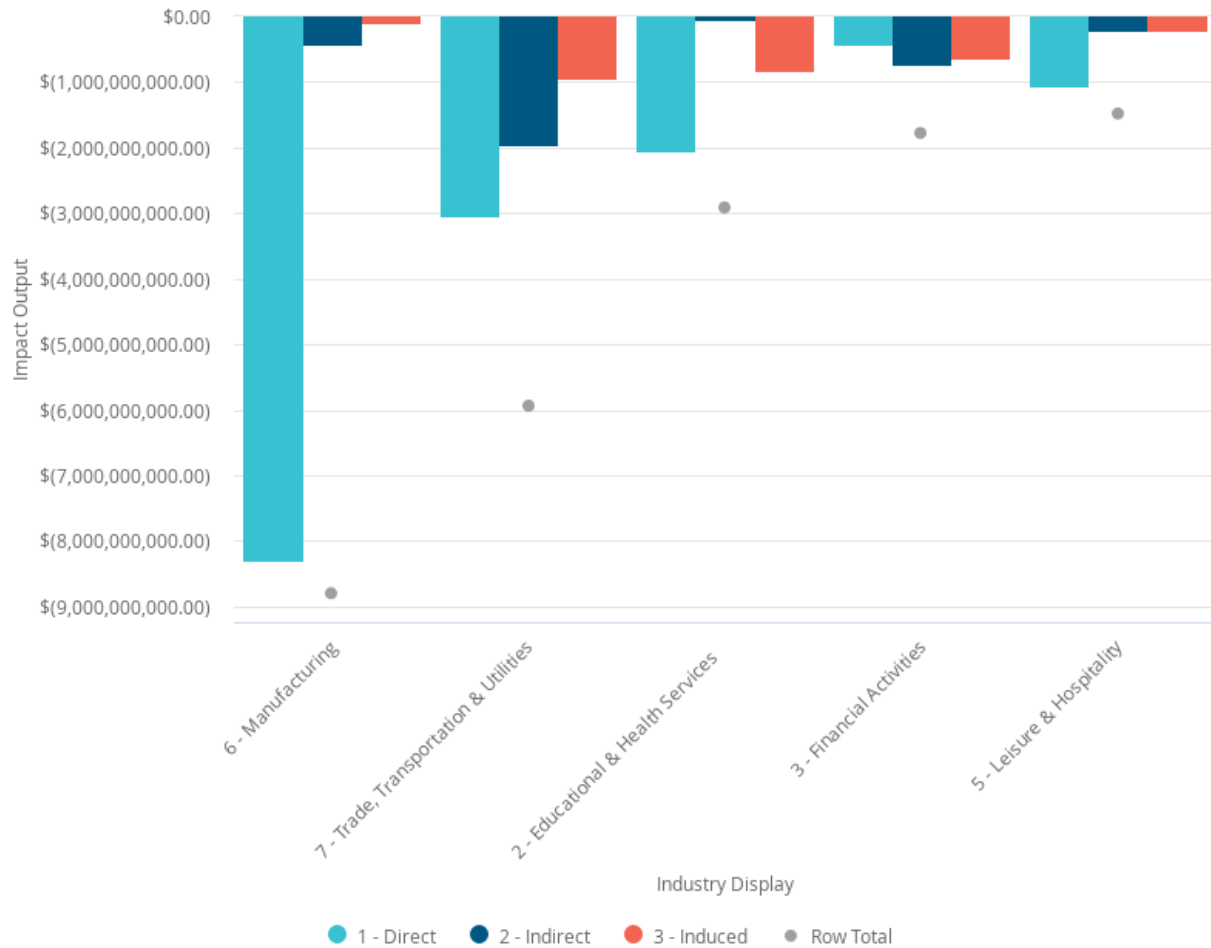


Figure 2.2: Top 5 Output impact industries (Model 1)

Table 2.4: Employment and output impacts of COVID-19 in the Piedmont Triad (Model 2)

Impact	Employment	Labor Income	Value Added	Output
Direct	(61,974.43)	\$(3,623,851,171.29)	\$(6,273,821,864.58)	\$(13,195,490,328.83)
Indirect	(32,051.82)	\$(1,678,126,830.59)	\$(2,521,233,732.07)	\$(5,012,094,539.98)
Induced	(19,422.48)	\$(998,971,972.65)	\$(1,752,057,739.06)	\$(3,202,375,390.34)
Total	(113,448.73)	\$(6,300,949,974.53)	\$(10,547,113,335.70)	\$(21,409,960,259.15)

Table 2.5: Tax impacts of COVID-19 in the Piedmont Triad (Model 2)

Impact	Sub-County	County	State
Direct	\$(206,971,602.40)	\$(359,950,573.47)	\$(754,281,918.36)
Indirect	\$(49,924,296.79)	\$(86,935,929.00)	\$(223,064,355.07)
Induced	\$(54,138,690.47)	\$(94,161,383.47)	\$(200,589,104.18)
Total	\$(311,034,589.67)	\$(541,047,885.95)	\$(1,177,935,377.61)

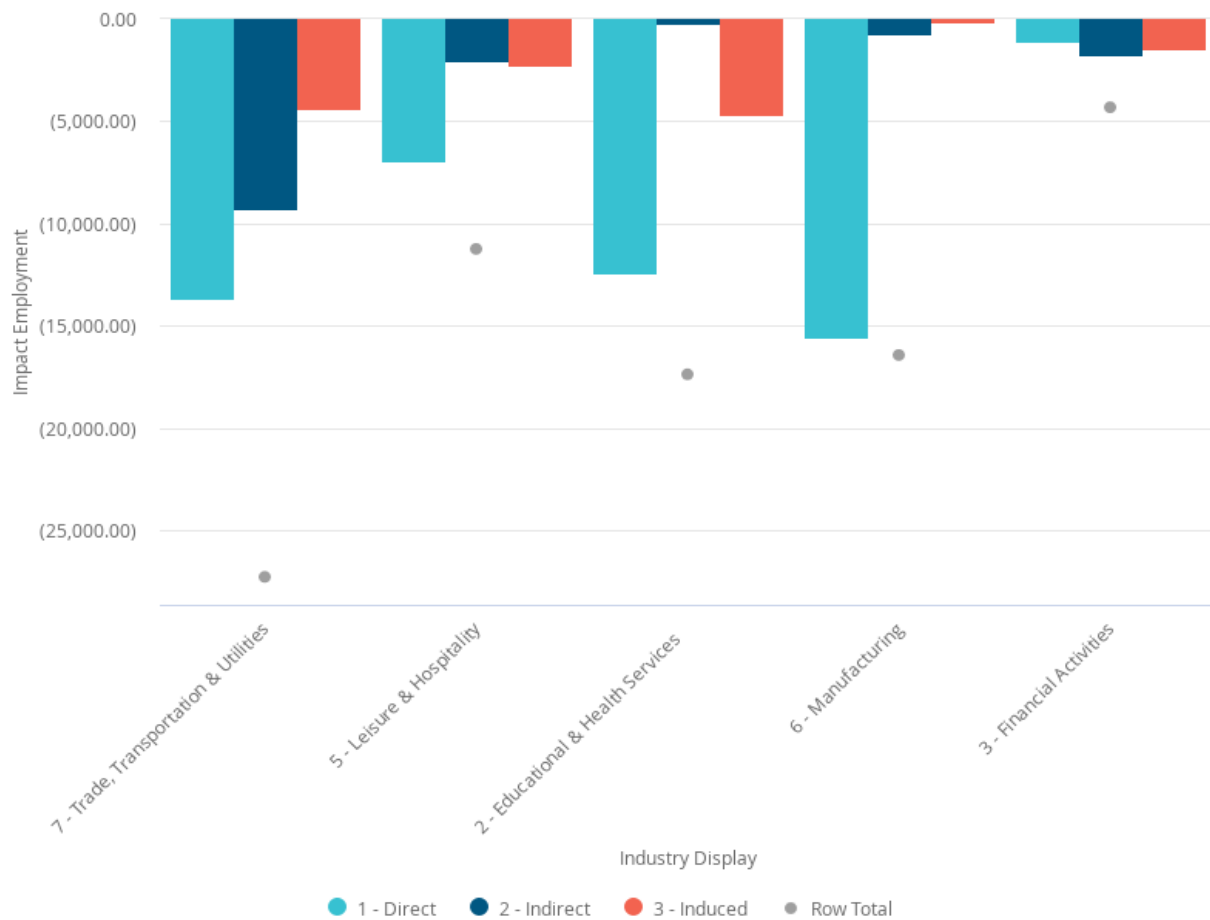


Figure 2.3: Top 5 Employment impact industries (Model 2)

ECONOMIC IMPACT OF COVID-19 IN THE PIEDMONT TRIAD REGION

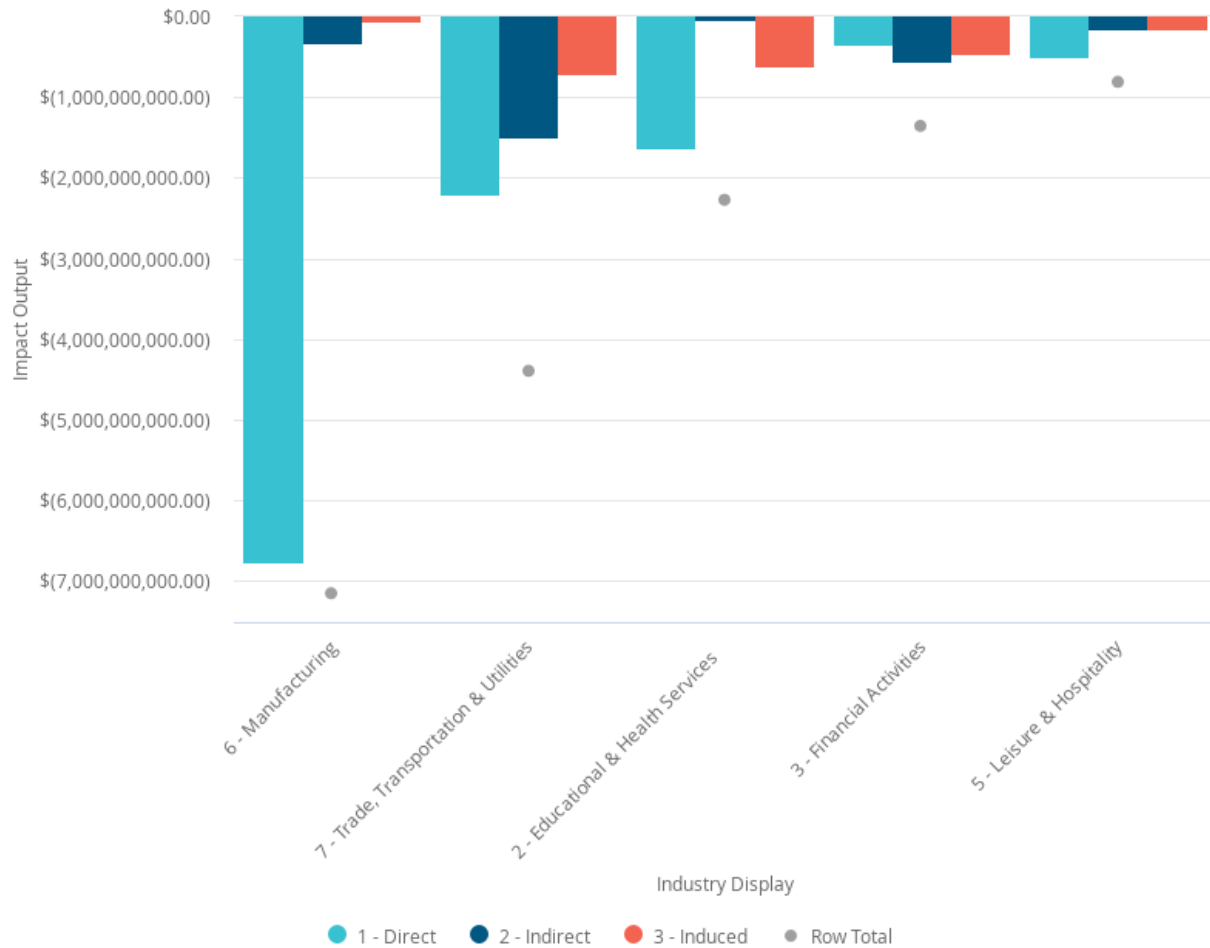


Figure 2.4: Top 5 Output impact industries (Model 2)

Table 2.6: Employment and output impacts of COVID-19 in the Piedmont Triad (Model 3)

Impact	Employment	Labor Income	Value Added	Output
Direct	(31,069.00)	\$(1,704,140,636.65)	\$(3,035,527,572.30)	\$(6,487,518,805.77)
Indirect	(15,638.46)	\$(823,816,876.18)	\$(1,245,970,679.33)	\$(2,475,313,614.50)
Induced	(9,253.35)	\$(475,938,911.49)	\$(834,734,745.50)	\$(1,525,722,166.55)
Total	(55,960.81)	\$(3,003,896,424.32)	\$(5,116,232,997.14)	\$(10,488,554,586.82)

Table 2.7: Tax impacts of COVID-19 in the Piedmont Triad (Model 3)

Impact	Sub-County	County	State
Direct	\$(123,831,276.14)	\$(215,294,769.25)	\$(427,139,007.83)
Indirect	\$(27,543,019.37)	\$(47,948,101.41)	\$(117,779,436.56)
Induced	\$(25,798,085.99)	\$(44,869,626.10)	\$(95,579,683.67)
Total	\$(177,172,381.50)	\$(308,112,496.76)	\$(640,498,128.06)



Figure 2.5: Top 5 Employment impact industries (Model 3)

ECONOMIC IMPACT OF COVID-19 IN THE PIEDMONT TRIAD REGION

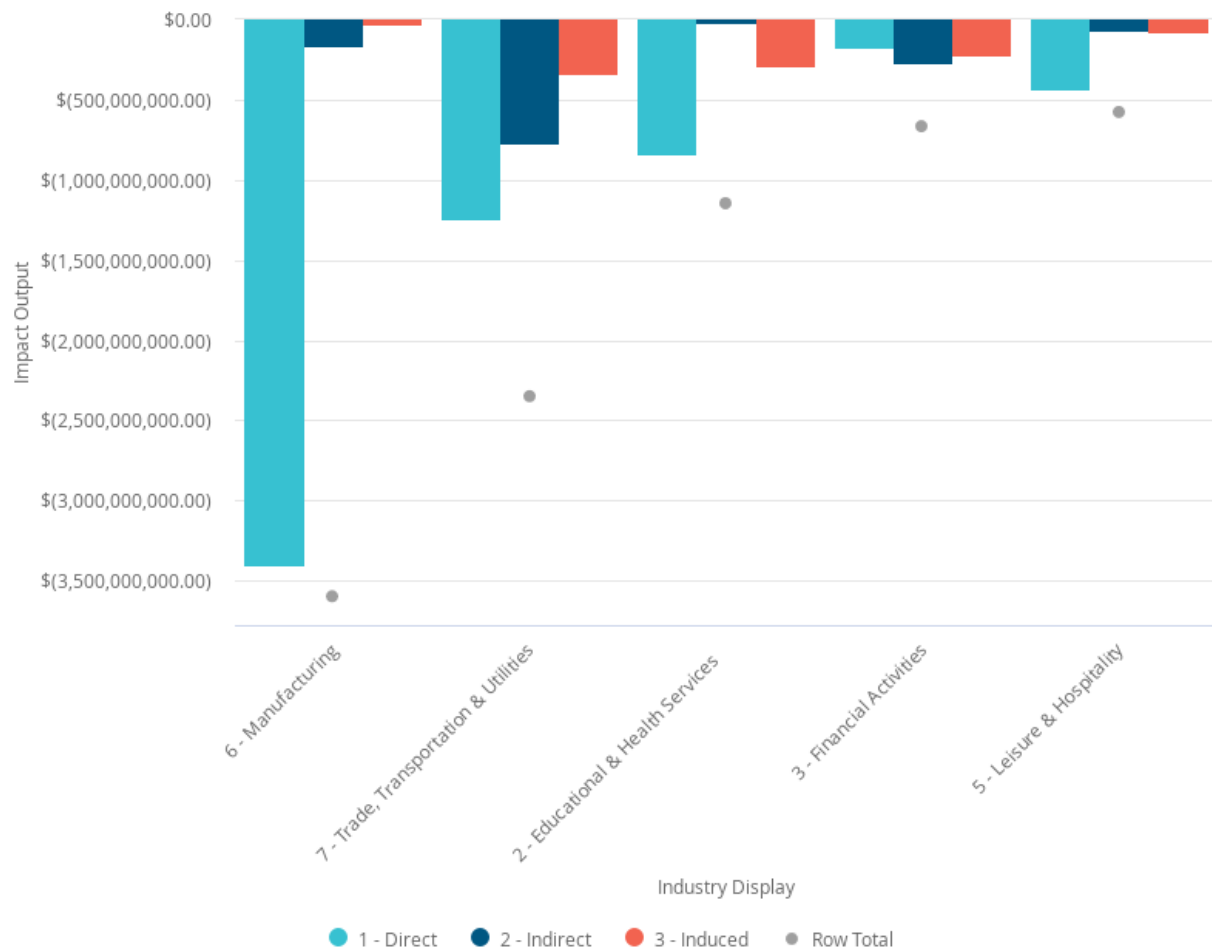


Figure 2.6: Top 5 Output impact industries (Model 3)

~ Part IV ~

Estimating the Economic Impacts of COVID-19

The Impact of COVID-19 on North Carolina A&T State University Operations

The outbreak of COVID-19 in the spring of 2020 forced many colleges in the UNC System, including North Carolina A&T, to move all classes online beginning in March and continuing into the summer and fall semesters. At the start of the fall semester the UNC System directed all campuses to prepare worst-case scenario-planning forecasts of how COVID-19 would impact their enrollment and budgets for the 2020 – 2021 academic year. North Carolina A&T State University presented seven scenarios (Table 3.1). These scenarios range from normal operations or status quo (Scenario A) to going completely online with 50% reduction in enrollment and consequent budget shortfalls (Scenario E). This study is an attempt to quantify the pandemic's impact on the operations of NC A&T State University, its enrollment and revenues, and the ripple effects that would create within the Piedmont Triad economy.

We assess the economic impact to the Piedmont Triad region of three of the hypothetical worst-case scenarios presented in Table 3.1 as well as the fall actual disruptions to NC A&T operations. These four worst-case and actual scenarios are compared in Table 3.2 below.

Table 3.1: North Carolina A&T scenario planning forecasts that would result under different states of closures due to the pandemic.

Estimated Revenue Impact Scenario Planning for 2020-21		"New Normal" (status quo)	Social Distancing Only	Online Fall 2020 Enroll: -2% Δ + Mand. Fees	Online Fall 2020 Enroll: -5% Δ	Online Fall 2020 Enroll: -10% Δ	Online Fall 2020 Enroll: -25% Δ	Online Fall 2020 Enroll: -50% Δ
Revenue Source	Annual Budget	Scenario A	Scenario B	Scenario C1	Scenario C2	Scenario C3	Scenario D	Scenario E
Anticipated Revenue Impacts								
Enrollment (FTE)	11,766	-	-	(235)	(588)	(1,177)	(2,942)	(5,883)
State Appropriation	\$ 95,000,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Tuition Revenue (net)	\$ 50,000,000	\$ -	\$ -	\$ (1,000,000)	\$ (2,500,000)	\$ (5,000,000)	\$ (12,500,000)	\$ (25,000,000)
Student Fees (net)	\$ 24,000,000	\$ -	\$ -	\$ (480,000)	\$ (9,750,000)	\$ (10,500,000)	\$ (12,750,000)	\$ (16,500,000)
Financial Aid (external)	\$ 50,000,000	\$ -	\$ -	\$ (1,000,000)	\$ (2,500,000)	\$ (5,000,000)	\$ (12,500,000)	\$ (25,000,000)
Athletics (less fees)	\$ 3,000,000	\$ -	\$ (750,000)	\$ (1,500,000)	\$ (1,500,000)	\$ (1,500,000)	\$ (1,500,000)	\$ (1,500,000)
Housing (net)	\$ 10,000,000	\$ -	\$ -	\$ (4,520,000)	\$ (4,550,000)	\$ (4,600,000)	\$ (4,750,000)	\$ (5,000,000)
Dining (net)	\$ 13,000,000	\$ -	\$ (3,250,000)	\$ (5,876,000)	\$ (5,915,000)	\$ (5,980,000)	\$ (6,175,000)	\$ (6,500,000)
Parking	\$ 1,500,000	\$ -	\$ -	\$ (678,000)	\$ (682,500)	\$ (690,000)	\$ (712,500)	\$ (750,000)
Sales, Services, & Other Aux.	\$ 4,000,000	\$ -	\$ (600,000)	\$ (1,200,000)	\$ (1,200,000)	\$ (1,200,000)	\$ (1,200,000)	\$ (1,200,000)
Patient Services	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Research & Grants	\$ 35,000,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Gifts & Investments	\$ 26,000,000	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Total Revenue	\$ 311,500,000	\$ -	\$ (4,600,000)	\$ (16,254,000)	\$ (28,597,500)	\$ (34,470,000)	\$ (52,087,500)	\$ (81,450,000)
Percent Change	100%	0.0%	-1.5%	-5.2%	-9.2%	-11.1%	-16.7%	-26.1%

Source: NC A&T State University, Office of the Vice Chancellor for Business and Finance

Table 3.2: Economic Impact Scenarios Analyzed

Scenario	Definition	Anticipated Revenue Change
Scenario A	All classes are in-person in fall 2020 with social distancing. No change in enrollment	-1.5% (-\$4,600,000)
Scenario B	All classes are online in fall 2020. Enrollment decline by 25%	-16.7% (-\$52,087,500)
Scenario C	All classes are online fall 2020. Enrollment decline by 50%	-26.1% (-\$81,450,000)
Scenario D (Actual, Fall 2020)	4.13% of students taking all classes in-person, 34.38% all online, and 61.48% in hybrid/mixed classes.	-8.6% (-\$26, 821,875)

Source: NC A&T State University, Office of the Vice Chancellor for Business and Finance

Assumptions underlying the economic impact analysis

In order to analyze the economic impacts of these scenarios of North Carolina A&T academic disruptions resulting from the COVID-19 pandemic, certain critical assumptions had to be made. One of these is that the university's operational spending occurs locally and that reductions in university revenues translate into reductions in spending. This assumption may not necessarily hold true if the revenue shortfalls have been offset (partially or wholly) by federal subsidies received under the CARES Act. For example, the university received about \$42 million in CARES Act funding, of which \$6 million was used to partially offset some of these revenue losses, and the remainder used to support student scholarships. The university, thus, had to make some operational budget cuts. Any such cuts in spending are expected to generate a negative economic impact in the region, through the multiplier process.

The second important assumption we make, as with all economic impact studies, is that every dollar spent in the local economy generates a multiplier effect which is equal to the sum of direct, indirect, and induced effects to the local economy. Direct effect refers to the initial spending change in the economy, whether positive or negative, and is modeled in terms of increase/decrease in spending. Indirect and induced effects are the ripple effects to the economy resulting from the initial (direct) spending change. Indirect effects are like "downstream" effects created by backward linkages of businesses along the supply chain of the economy, while induced effects result from transactions between households and businesses as households spend their incomes.

Economic Impact under different scenarios

We conducted economic impact analysis under the four scenarios presented in Table 3.2. In addition to the economic impacts of revenue shortfalls, we also model the economic impact of student spending or lack thereof. As a result of the pandemic, some students are taking all their classes virtually. Such students are not residing and spending within the region as would be the case without COVID-19. These lost expenditures are included in the analysis. Using the fall 2020 enrollment, we estimate that about 4,200 A&T students chose to take all their classes wholly online and therefore are not resident in Greensboro.

As shown in Table 3.3 below, 8,015 students have at least one main campus class in Fall 2020. Given fall 2020 total enrollment of 12,215, it means that 4,200 students are not resident in Greensboro due to COVID-19. The estimated lost expenditures of these students (such as spending in local restaurants, transportation/gas, recreation/amusements, etc) of about \$15 million create direct, indirect and induced economic impact in the region.

Table 3.3: NC A&T Fall 2020 Headcount

Category	HEADCOUNT	Percentage
Main Campus Only	505	4.14%
Distance Learning Only	4200	34.38%
Mixed/Hybrid	7510	61.48%
Total	12215	100%

Source: NC A&T State University, Office of the Registrar, fall 2020

Economic Impact Results

We used the IMPLAN modeling program to analyze the economic impacts of the four NC A&T State University revenue scenarios resulting from the COVID-19 pandemic (Table 3.2). These worst-case scenarios of enrollment and budget cuts were modeled to determine how these cuts in spending would ripple across the region. The summary results of the economic impacts are shown in the Tables 3.4, 3.5, and 3.6 below.

Table 3.4: Employment Impacts of NC A&T Budget Reduction Scenarios

Impact Type	Scenario A	Scenario B	Scenario C	Scenario D (Fall 2020 Actual)
Direct	(56.80)	(643.17)	(1,005.73)	(331.19)
Indirect	(1.43)	(114.47)	(123.61)	(106.60)
Induced	(12.62)	(162.83)	(243.36)	(93.54)

Total	(70.85)	(920.47)	(1,372.70)	(531.33)
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Notes: Scenario A: Normal university operations with minimal social distancing. Scenario B: Classes are virtual and 25% reduction in enrollment and budget. Scenario C: Classes are virtual and 50% reduction in enrollment and budget. Scenario D/Fall 2020 actual: 4.13% in-person, 34.38% virtual, and 61.48% hybrid/mixed Classes, \$26.8 million revenue reduction

North Carolina A&T contributes to the economy of the Triad through its spending. Categories of spending by the university include payroll for faculty and staff, operational purchases, and spending by students. A recent economic impact study of the university showed that North Carolina A&T generates a \$1.48 billion impact on the economy of the state.¹⁶ Just as spending increases create positive economic impacts, any cuts in spending create a negative economic impact as well. In this analysis, the reduced spending under the four scenarios create negative economic impacts on jobs, output, incomes, and tax revenues across the region. Table 3.4 shows that reduced spending would create direct job losses of 56.8 (Scenario A), 643 (Scenario B), 1,005 (scenario C), and 331.2 (Scenario D). In fall 2020, if the university were to cut spending by the amount of revenue fall (\$26.8 million), then this would have resulted in 331.2 direct job losses. Presumably, the university would have had to eliminate some part-time and, possibly, full time positions to cope with these budget cuts had it not been for offsets like the CARES Act money that the university received. The indirect and induced effects are also negative. Thus, A&T direct spending cuts triggers a negative ripple effect on business and households, the impact of which is lost business and household spending leading to negative indirect and induced employment effects. Through the multiplier process, additional job losses would occur (indirect and induced effects). Thus, the total job losses under the four scenarios are much higher than the direct job losses (70.85 under Scenario A, 920.47 under Scenario B, 1,372.7 under Scenario C, and 531.33 under Scenario D/fall 2020 scenario). In total, the Scenario A—a mild case of COVID impact whereby the university can maintain all in-person classes with minimal social distancing— would yield a total impact of 70.85 jobs lost in the region. Comparatively, Scenario

¹⁶ Romero, Alfredo and Naanwaab, Cephas (2020). The Economic Impact of North Carolina A&T State University. <https://www.ncat.edu/news/2020/08/ncat-2020-economic-impact.php>

A has the least impact and Scenario C has the worst impact. The realized scenario (fall 2020) turned out to be much better than the worst worst-case scenario (Scenario C).

Table 3.5: Output Impacts of NC A&T Budget Reduction Scenarios

Impact Type	Scenario A	Scenario B	Scenario C	Scenario D (Fall 2020 Actual)
Direct	\$(4,012,131.04)	\$(45,430,842.56)	\$(71,040,885.56)	\$(23,394,103.77)
Indirect	\$(224,428.23)	\$(17,860,967.40)	\$(19,293,526.92)	\$(16,628,289.26)
Induced	\$(1,931,691.85)	\$(24,929,957.15)	\$(37,260,240.17)	\$(14,320,087.18)
Total	\$(6,168,251.12)	\$(88,221,767.10)	\$(127,594,652.65)	\$(54,342,480.21)

Notes: Scenario A: Normal university operations with minimal social distancing. Scenario B: Classes are virtual and 25% reduction in enrollment and budget. Scenario C: Classes are virtual and 50% reduction in enrollment and budget. Scenario D/Fall 2020 actual: 4.13% in-person, 34.38% virtual, and 61.48% hybrid/mixed Classes, \$26.8 million revenue reduction

Table 3.5 shows negative output impacts that would result in losses to Gross Regional Product of the region. In all four scenarios, spending cuts create negative output in the region. The amount of direct output losses range from \$4 million under Scenario A to \$71 million under Scenario C. These initial output losses (direct impacts) then create ripple effects in the form of indirect and induced output losses. Total output losses range from \$6.2 million in Scenario A to \$127.6 million in Scenario C. Once again, the fall 2020 (actual) scenario turned out to be better than the worst-case Scenario C, but worse than would have been the case if the university had normal operations with minimal social distancing requirements (Scenario A). These results show that if covid-19 persists for a year and the university's normal operations (in-person classes) were disrupted, it could have significant economic impacts throughout the region. For instance, a 50% reduction in enrollment and associated revenue shortfalls would create economic impact ranging from \$88 to \$127 million lost output and close to 1,400 jobs lost in the Piedmont Triad.

The tax impacts of NC A&T budget reduction scenarios show that there would be significant tax revenue falls across all four scenarios (Table 3.6). Both state/local and federal tax revenues would significantly fall if NC A&T reduced its spending. Focusing only on the total tax impact (sum of direct, indirect, and induced impacts) Scenario A shows that the region would experience a decreased state and local tax revenue by \$398,781 while federal tax revenue would decrease by \$1,333,475. Under the worst-case Scenario C, state/local and federal taxes would fall by \$8 million and \$25.5 million, respectively. Under the fall 2020 scenario, state/local and federal tax revenues fall by \$3.3 million and \$9.7 million, respectively.

In summary, the COVID-19 pandemic has disrupted NC A&T normal operations as the Scenario D (actual fall 2020) shows. With the university having only 4.14% of classes in-person, 34.38% online, and 61.5% mixed/hybrid, has led to revenue losses of \$26.7 million. Consequently, the economic impact to the Piedmont Triad region as a result of this disruption is projected to a total loss of 531 jobs, \$54 million lost output, \$3.3 million lost state/local tax revenues, and \$9.7 million lost federal tax revenues. These estimates also account for lost student spending due to some students not staying in the area.

Table 3.6. Tax Impacts of NC A&T Budget Reduction Scenarios

	Scenario A		Scenario B		Scenario C		Scenario D (Fall 2020 Actual)	
Impact Type	State & Local	Federal	State & Local	Federal	State & Local	Federal	State & Local	Federal
Direct	\$(170,185.29)	\$(1,183,030.50)	\$(1,927,070.90)	\$(13,395,891.57)	\$(3,013,389.49)	\$(20,947,355.28)	\$(992,323.59)	\$(6,898,064.39)
Indirect	\$(11,250.53)	\$(23,449.18)	\$(739,393.40)	\$(1,945,246.30)	\$(811,207.24)	\$(2,094,925.97)	\$(677,599.56)	\$(1,816,451.05)
Induced	\$(217,345.87)	\$(126,995.66)	\$(2,804,023.12)	\$(1,639,772.48)	\$(4,191,374.89)	\$(2,450,405.10)	\$(1,610,245.02)	\$(942,245.36)
Total	\$(398,781.69)	\$(1,333,475.34)	\$(5,470,487.42)	\$(16,980,910.34)	\$(8,015,971.61)	\$(25,492,686.35)	\$(3,280,168.17)	\$(9,656,760.80)

Notes: Scenario A: Normal university operations with minimal social distancing. Scenario B: Classes are virtual and 25% reduction in enrollment and budget. Scenario C: Classes are virtual and 50% reduction in enrollment and budget. Scenario D/Fall 2020 actual: 4.13% in-person, 34.38% virtual, and 61.48% hybrid/mixed Classes, \$26.8 million revenue reduction

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APPENDIX

Map of NC Piedmont Triad (12-County Area)



Table A1

Month-to-Month Job Change by Industry, 2020

Greensboro-High Point MSA

Industry Title	Month										
	01	02	03	04	05	06	07	08	09	10	11
Federal	0.0%	-2.4%	2.4%	-2.4%	0.0%	2.4%	7.1%	0.0%	-4.4%	-2.3%	
Finance and insuran..	0.7%	0.0%	-0.7%	0.7%	0.0%	0.0%	0.0%	0.7%	0.0%	0.7%	
Other services	0.8%	0.0%	-21.0%	9.2%	15.9%	0.0%	-1.6%	-0.8%	0.8%	0.0%	
Specialty trade cont..	0.9%	0.9%	-4.6%	1.9%	0.9%	0.0%	0.0%	0.9%	0.0%	0.0%	
Financial activities	0.5%	1.6%	-2.1%	-0.5%	1.1%	-0.5%	0.5%	0.0%	0.5%	0.0%	
Transportation and ..	-0.5%	0.0%	-7.5%	4.8%	1.5%	0.0%	1.5%	2.0%	2.0%	1.4%	
Retail trade	-0.8%	1.1%	-7.0%	0.3%	6.0%	0.0%	1.1%	-0.8%	1.3%	2.7%	
Trade, transportatio..	-0.4%	0.5%	-6.2%	1.4%	3.3%	0.0%	1.1%	0.3%	1.0%	2.1%	
Mining, Logging & C..	1.3%	1.3%	-3.8%	0.7%	3.3%	0.0%	0.6%	0.0%	0.0%	-1.3%	
Credit intermediatio..	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.7%	0.0%	0.0%	
Durable goods	0.7%	-0.7%	-37.0%	17.3%	20.1%	0.7%	-3.3%	-0.4%	-0.4%	-1.2%	
Professional and tec..	1.4%	4.3%	-11.6%	0.8%	0.0%	0.0%	0.8%	0.8%	0.8%	2.2%	
Wholesale Trade	0.5%	0.0%	-3.6%	0.0%	0.0%	0.0%	0.5%	0.5%	-0.5%	1.6%	
Administrative and ..	0.0%	2.6%	-17.8%	0.9%	6.1%	0.0%	2.5%	0.8%	2.4%	-1.2%	
Leisure and hospital..	1.1%	-3.5%	-48.2%	17.3%	35.0%	0.7%	-2.7%	5.2%	0.3%	-1.3%	
Private service-prov..	0.2%	0.0%	-15.7%	3.3%	6.7%	0.3%	0.2%	0.8%	0.8%	0.5%	
Professional and bu..	0.4%	2.8%	-15.2%	0.7%	3.9%	0.0%	1.6%	0.7%	1.6%	-0.2%	
Local government	0.7%	0.4%	-6.0%	-3.4%	0.0%	-21.6%	28.0%	13.3%	2.4%	-0.3%	
Total private	0.3%	-0.1%	-17.4%	3.9%	7.3%	0.2%	-0.1%	0.6%	0.6%	0.3%	
Information	0.0%	-2.1%	-6.5%	0.0%	0.0%	0.0%	-2.3%	0.0%	2.4%	0.0%	
General merchandis..	-2.5%	0.0%	-8.9%	5.6%	3.9%	-2.5%	3.9%	-3.8%	1.3%	6.4%	
Service-providing	0.3%	0.0%	-14.0%	1.8%	4.6%	-1.9%	2.4%	2.4%	0.9%	0.4%	
Education and healt..	-0.2%	-1.3%	-12.6%	3.6%	2.2%	1.1%	-0.2%	0.0%	0.0%	0.2%	
Total nonfarm	0.2%	-0.3%	-16.1%	2.6%	5.9%	-0.5%	0.7%	1.8%	0.5%	0.0%	
Goods-producing	0.6%	-0.4%	-23.5%	6.5%	9.9%	0.2%	-1.1%	0.0%	-0.2%	-0.7%	
Management of com..	0.0%	0.0%	-11.9%	0.0%	3.8%	0.0%	0.0%	0.0%	0.0%	-1.9%	
Furniture and relate..	0.0%	0.0%	-64.0%	15.6%	37.8%	2.0%	0.0%	-1.9%	0.0%	0.0%	
Health care and soci..	-0.9%	-0.9%	-15.0%	5.9%	1.9%	0.2%	-0.2%	0.0%	0.5%	0.0%	
Ambulatory health c..	0.0%	0.0%	-26.1%	14.7%	1.3%	0.0%	0.6%	-0.6%	1.3%	0.0%	
Manufacturing	0.4%	-0.9%	-29.4%	8.8%	12.3%	0.2%	-1.8%	0.0%	-0.2%	-0.4%	
Government	1.1%	0.2%	-4.7%	-5.4%	-6.5%	-15.1%	18.1%	12.2%	1.4%	-0.5%	
Food services and dr..	-0.3%	-4.8%	-59.0%	22.8%	39.3%	3.1%	-2.0%	5.6%	1.4%	-1.4%	
Nondurable goods	0.0%	-1.3%	-19.1%	0.0%	2.7%	-0.5%	0.5%	0.5%	0.0%	0.5%	
State government	2.5%	0.8%	-4.0%	-10.8%	-24.3%	-3.7%	-1.3%	15.6%	1.1%	0.0%	

% Difference in Employment broken down by Month vs. Industry Title. The data is filtered on Year and Area Name. The Year filter keeps 2020. The Area Name filter keeps Greensboro-High Point MSA.

Table A2

Month-to-Month Job Change by Industry, 2020 Winston-Salem MSA

Industry Title	Month										
	01	02	03	04	05	06	07	08	09	10	11
Federal	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	31.58%	-4.00%	-12.50%	-9.52%
Other services	1.11%	0.00%	-20.88%	1.39%	16.44%	0.00%	-1.18%	-1.19%	1.20%	0.00%	0.00%
Financial activities	0.72%	0.00%	-2.88%	0.74%	0.74%	0.00%	0.00%	0.00%	0.73%	0.00%	0.00%
Transportation and ..	-1.10%	0.00%	-8.89%	4.88%	1.16%	0.00%	1.15%	2.27%	6.67%	1.04%	0.00%
Retail trade	-0.65%	-0.33%	-18.42%	9.27%	5.17%	0.00%	2.81%	0.68%	-0.68%	2.05%	0.00%
Trade, transportatio..	-0.62%	-0.21%	-14.02%	6.57%	3.42%	0.00%	2.21%	0.86%	0.86%	1.49%	0.00%
Mining, Logging & C..	1.72%	-0.85%	-10.26%	-4.76%	4.00%	1.92%	0.00%	-0.94%	0.95%	0.94%	0.00%
Credit intermediatio..	1.64%	0.00%	-1.61%	0.00%	0.00%	-1.64%	-1.67%	3.39%	-1.64%	0.00%	0.00%
Wholesale Trade	0.00%	0.00%	-3.57%	0.00%	0.00%	0.00%	1.23%	0.00%	0.00%	0.00%	0.00%
Administrative and ..	2.79%	1.09%	-22.58%	4.17%	4.00%	1.28%	6.96%	1.78%	4.07%	-3.91%	0.00%
Leisure and hospital..	0.69%	-4.11%	-37.50%	9.71%	16.15%	4.93%	-1.28%	0.00%	0.87%	-0.43%	0.00%
Private service-prov..	0.16%	-0.57%	-16.21%	3.66%	4.31%	0.46%	2.28%	0.61%	1.39%	-0.05%	0.00%
Professional and bu..	2.25%	-0.27%	-16.53%	2.97%	3.21%	0.00%	3.42%	2.70%	2.92%	-2.27%	0.00%
Local government	0.83%	0.00%	-2.89%	-2.55%	0.00%	-18.34%	12.83%	11.85%	2.12%	0.41%	0.00%
Total private	0.25%	-0.63%	-14.76%	2.52%	4.25%	0.37%	1.85%	0.59%	1.35%	0.09%	0.00%
Information	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
General merchandis..	-1.64%	0.00%	-23.33%	4.35%	2.08%	-2.04%	6.25%	-3.92%	0.00%	6.12%	0.00%
Service-providing	0.27%	-0.40%	-14.29%	2.49%	3.50%	-1.76%	3.39%	1.98%	1.32%	-0.09%	0.00%
Education and healt..	-1.07%	0.54%	-10.25%	0.80%	0.60%	-0.59%	4.57%	-0.19%	1.33%	0.19%	0.00%
Total nonfarm	0.18%	-0.55%	-13.41%	1.39%	3.61%	-0.45%	2.21%	1.54%	0.81%	0.23%	0.00%
Goods-producing	0.67%	-0.89%	-8.52%	-1.96%	4.00%	0.00%	0.00%	0.48%	1.20%	0.71%	0.00%
Health care and soci..	-1.04%	1.05%	-15.18%	1.72%	1.69%	-0.47%	4.76%	-1.36%	1.61%	-0.23%	0.00%
Manufacturing	0.30%	-0.90%	-7.90%	-0.99%	4.00%	-0.64%	0.00%	0.97%	1.28%	0.63%	0.00%
Government	0.95%	0.63%	-2.80%	-3.51%	-0.99%	-14.72%	10.98%	10.60%	0.96%	-0.32%	0.00%
Food services and dr..	0.42%	-5.02%	-45.81%	13.01%	15.11%	1.88%	0.00%	-2.45%	0.63%	-0.63%	0.00%
Textile mills	0.00%	0.00%	-25.00%	0.00%	4.76%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
State government	1.72%	3.39%	-3.28%	-8.47%	-5.56%	-3.92%	-4.08%	12.77%	1.89%	0.00%	0.00%

% Difference in Employment broken down by Month vs. Industry Title. The data is filtered on Year and Area Name. The Year filter keeps 2020. The Area Name filter keeps Winston-Salem MSA.

Table A3

Month-to-Month Job Change by Industry, 2020

Burlington MSA

Industry Title	Month										
	01	02	03	04	05	06	07	08	09	10	11
Federal		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	50.00%	0.00%	0.00%	-33.33%
Other services		4.55%	-4.35%	-18.18%	-5.56%	11.76%	5.26%	0.00%	0.00%	0.00%	0.00%
Financial activities		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.00%	0.00%	0.00%	4.76%
Transportation and ..		0.00%	0.00%	-6.25%	0.00%	0.00%	6.67%	0.00%	0.00%	0.00%	6.25%
Retail trade		-3.37%	2.33%	-11.36%	1.28%	5.06%	0.00%	2.41%	0.00%	1.18%	5.81%
Trade, transportatio..		-1.55%	1.57%	-9.30%	0.00%	3.42%	0.83%	1.64%	-0.81%	1.63%	4.80%
Mining, Logging & C..		3.13%	0.00%	-9.09%	10.00%	3.03%	0.00%	0.00%	0.00%	2.94%	-2.86%
Wholesale Trade		4.17%	0.00%	-4.00%	-4.17%	0.00%	0.00%	0.00%	-4.35%	4.55%	0.00%
Leisure and hospital..		1.20%	3.57%	-48.28%	42.22%	15.63%	1.35%	1.33%	-6.58%	4.23%	-1.35%
Private service-prov..		0.68%	0.45%	-18.74%	9.17%	5.85%	0.24%	2.40%	-1.64%	1.67%	1.87%
Professional and bu..		1.96%	-1.92%	-17.65%	11.90%	4.26%	-2.04%	10.42%	-5.66%	2.00%	1.96%
Local government		1.69%	0.00%	-6.67%	0.00%	1.79%	-14.04%	10.20%	7.41%	1.72%	0.00%
Total private		0.71%	0.18%	-19.72%	8.99%	6.44%	0.57%	1.88%	-1.11%	1.49%	1.29%
Information		0.00%	0.00%	-25.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Service-providing		0.98%	0.58%	-16.86%	7.23%	5.22%	-1.65%	3.36%	-0.20%	1.63%	1.40%
Education and healt..		1.55%	-0.76%	-11.54%	8.70%	4.00%	-0.77%	0.78%	1.54%	0.76%	0.75%
Total nonfarm		0.47%	0.23%	-18.24%	7.24%	6.22%	-0.33%	2.02%	-0.25%	1.16%	0.82%
Goods-producing		0.80%	-0.79%	-23.20%	8.33%	8.65%	1.77%	0.00%	0.87%	0.86%	-0.85%
Manufacturing		0.00%	-1.08%	-28.26%	7.58%	11.27%	2.53%	0.00%	1.23%	0.00%	0.00%
Government		2.86%	1.39%	-5.48%	-2.90%	1.49%	-13.24%	10.17%	9.23%	1.41%	-1.39%
State government		11.11%	10.00%	0.00%	-18.18%	0.00%	-11.11%	0.00%	25.00%	0.00%	0.00%

% Difference in Employment broken down by Month vs. Industry Title. The data is filtered on Year and Area Name. The Year filter keeps 2020. The Area Name filter keeps Burlington MSA.