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RESEARCH ARTICLE

Impact of COVID-19 on Jobs in Ohio's Health Care Sector

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ABSTRACT

Background: This study seeks to measure the impact of COVID-19 on health care jobs in Ohio. We examine whether health care sector workers were similarly affected compared to workers in other industries in Ohio and if there were any significant differences in job categories within the health care sector.

Methods: Using a rich dataset provided by the Ohio Department of Job and Family Services (ODJFS), we study the employment levels for different health care subsectors in Ohio by calculating job creation, destruction, and reallocation rates and analyze the disruption in labor markets caused by COVID-19.

Results: Certain health care subsectors such as ambulatory health care services and hospitals recovered almost immediately after the lockdown but are still below their pre-COVID-19 employment levels. The social assistance subsector eventually recovered but also has not reached its pre-COVID-19 employment level. The nursing and residential care subsector has experienced a continuous decline in jobs. Although both job creation and destruction rates reached their relative peaks for all health care subcategories, the gap between pre-COVID-19 and post-COVID-19 levels was higher for job destruction rate.

Conclusion: Ohio's health care sector has not yet fully recovered from the COVID-19 lockdown imposed in 2020.

Keywords: COVID-19; Health care; Labor economics; Secondary analysis

INTRODUCTION

The Centers for Disease Control and Prevention (CDC) confirmed the first case of coronavirus disease 2019 (COVID-19) on January 28, 2020.[1] Since then, there have been more than 82 million cases and 995 000 deaths in the United States (US) due to COVID-19 as of May 2022.[2] To contain the deadly virus in the US, states implemented various safety measures such as stay-at-home orders and mask mandates. These events led to a nationwide shock as people struggled to accept this new reality.

Along with being a global health crisis, COVID-19 has also been an economic crisis.[3] The US gross domestic product (GDP) declined by a record 32.9% in the second quarter of 2020[4] and unemployment rate reached 15%.[5] The federal government passed the CARES Act with an aim to provide economic support to US citizens. On March 22, 2020, Governor DeWine issued a stay-at-home order for all Ohioans. This required closure of all nonessential businesses and ensured a statewide lockdown to curb the spread of the virus.[6] Health care workers were uniquely affected by the COVID-19 lockdown as it comprised of services that provided essential care (ie, the sector was not under complete lockdown). Because health care workers form 14% of the total workforce in Ohio,[7] which is one of the highest in the nation, it is important to identify the overall effect of the COVID-19 lockdown on people employed by this sector.

Furthermore, even within the health care sector, the impact may be quite different for different groups. For instance, clinics providing outpatient services such as general practitioners, optometrists, and dentists may experience a more sudden decrease when it comes to in-person interaction as compared to hospitals, which contrastingly may experience a surge in patients admitted due to

coronavirus. In this paper, we analyze the rich dataset provided by the Ohio Department of Job and Family Services (ODJFS) to study the dynamics of such labor markets. A complete definition of locations covered and the associated health care sector and its subsectors is shown in the Methods section.

The COVID-19 recession in this study starts at the time when the lockdown was announced in Ohio. The Great Recession (also known as the Financial Crisis), as defined by National Bureau of Economic Research (NBER), was from the last quarter of 2007 to the second quarter of 2009.[8] There were significant differences between the health care sector and the rest of the sectors (referred as non-health care) in Ohio during the Great Recession. However, these differences were not evident during the economic recession caused by COVID-19. These results are consistent with rest of the country.[9]

Figure 1 shows year-over-year percentage change in the number of employed workers in health care and non-health care sectors in Ohio. The health care sector employment levels did not fall greatly during the Great Recession, even though other sectors saw a significant reduction in job levels. Contrastingly, COVID-19 recession led to a sharp reduction in health care workforce and this decline mimicked the reduction in non-health care sectors, although the decline in health care was not as steep.

The unit-level data in this study allows us to look further than just observing aggregate employment patterns and observe more deeply how people may be affected by the changing state of the economy. Whenever a representative unit hires a new person and adds them to their payroll, a new job is created and whenever a person is removed from the payroll, a job is destroyed. Even within Ohio, thousands of jobs are added and destroyed every day. These new jobs can either be created by existing firms which are expanding their workforce or by new firms entering the market. Analyzing the number of jobs created by new and existing firms in Ohio can tell us how likely is a person to get a job. Similarly, when firms downsize their workforce or exit the market, they destroy jobs. Analyzing the number of jobs destroyed by surviving and exiting firms in Ohio can tell us how likely a person is to lose a job. Together, these variables can tell us about the ongoing shifts in the labor markets.

METHODS

Data

The data for this study comes from the ODJFS and range from January 2006 to June 2021. Ohio Revised Code (ORC) Section 4141.13 (G) requires the ODJFS to collect information from all Ohio employers to determine if they are subject to the state's unemployment insurance laws. According to the ODJFS website, unemployment benefits are financed by taxes paid by employers to the federal and state governments.[10] The federal taxes cover most of the program's administrative costs, and the state taxes fund the actual benefits. Unemployment benefits provide short-term income to workers who lose their jobs through no fault of their own and who are actively seeking work. The ODJFS collects

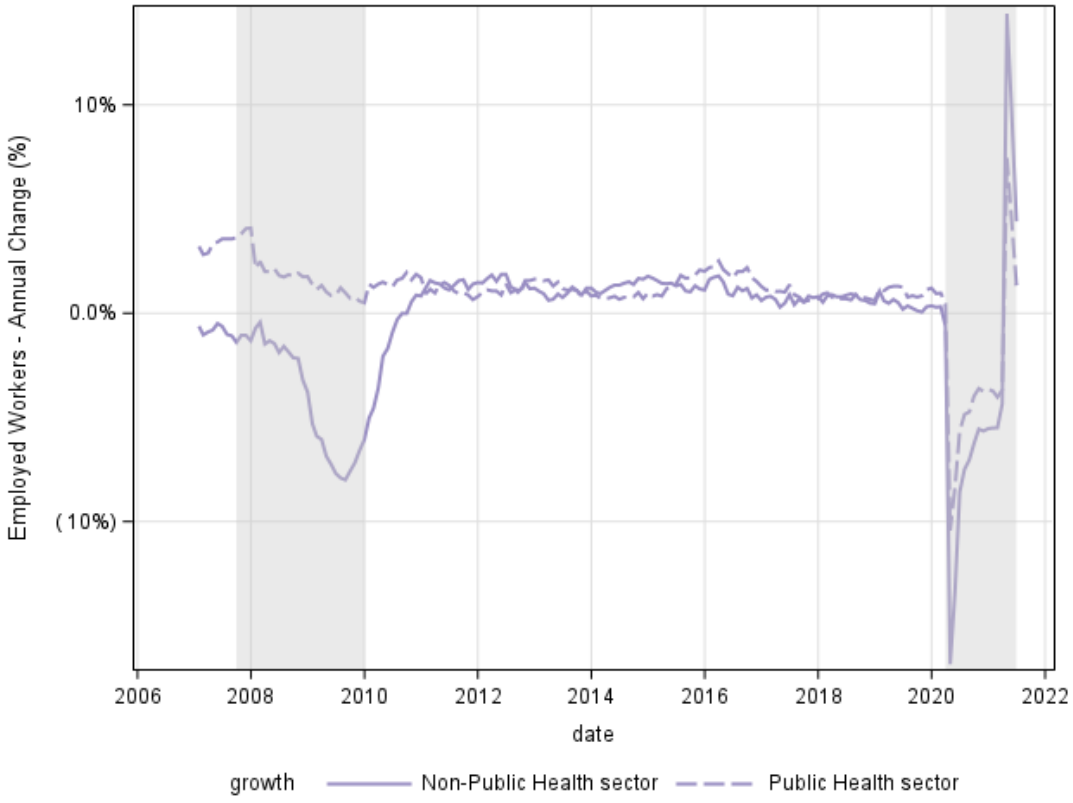

Figure 1. Health Care Versus Non-Health Care Sectors in Ohio

this data via their State of Ohio Unemployment Resource for Claimants and Employers (SOURCE) application. The employers report to ODJFS the number of employees on their payroll and the wages paid to these employees. Each employer has a unique employer identification number (EIN) and is classified as per North American Industry Classification System (NAICS). Data on the number of employees are available at a monthly level, and data on wages is available at a quarterly level. For this study, we use data on number of employees.

We define the NAICS category and major health care subcategories considered for this study. The NAICS records category 62 as health care and social assistance.[11] One important thing to note is that NAICS does not distinguish between health care and social assistance services, citing difficulties in identifying the boundaries of these activities. We follow the same delineation and consider the 4 highest categories under this sector: ambulatory health care (621), hospitals (622), nursing and residential care (623), and social assistance (624).

Ambulatory health care subsector serves patients who do not require inpatient services and are generally associated with outpatient services (ie, they do not require the patient to be admitted overnight). Offices of physicians, dentists, optometrists, mental health practitioners, occupational and speech therapists, and outpatient care centers fall under this category.

Hospitals form the majority of the health care sector and mainly provide medical, diagnostic, and treatment services to inpatients but can also have small-scale outpatient services. These health care institutions are generally much larger in size than units under other sectors and provide specialized facilities that are essential for the region.

The nursing and residential care subsector provides nursing, supervisory, residential, or any other type of care required by its patients, who are sometimes referred as residents. The social assistance subsector provides a wide variety of social assistance services directly to their clients which include, but are not limited to, individual and family services, childcare services, community food services, and temporary shelters and housing services.

Variables

1. Number of employed persons is the variable of interest and is defined as the number of workers that were reported to ODJFS by a unit and were part of its payroll.
2. The NAICS code variable identifies the specific industrial category of a unit as per NAICS.
3. Subcategories variable uses NAICS code and separates sectors into health care and non-health care.
4. Unique location identifier, known as “unit” throughout this paper, was used to identify a particular location or address related to health care sector.

Measures

In order to truly understand the jobs related to Ohio’s health care sector, we need to study the dynamics of Ohio’s health care labor market. In this paper, we do this by analyzing job flows, that is, the creation and destruction of jobs within the health care sector and its subsectors. Job creation rate represents the sum of job gains measured at a unit over 1 month due to either opening of new units or expansion of jobs within an existing unit. Job destruction rate represents the sum of job losses resulting from either closing of a production unit or contraction in the number of jobs by an existing unit. Job reallocation rate is equal to the sum of job creation rate and job destruction rate. Net employment rate is equal to the difference between job creation rate and job destruction rate. All the rates were based on monthly data and were calculated on an annual or year-over-year basis. Below, we mathematically define each of these measures.

Let E_{it} be defined as the number of people on i^{th} company's payroll during t^{th} time period, where $i \in \{1,2, \dots, N\}$ for some $N \in \mathbb{N}$ and $t \in \{1,2, \dots, T\}$ for some $T \in \mathbb{N}$, where $\mathbb{N}$ is the set of natural numbers.

Then,

Let monthly job creation be $JC_t = \frac{1}{N}\sum_{i=1}^{N} JC_{it}$, where

$$JC_{it} = \begin{cases} E_{it} - E_{it-1}, & if\ E_{it} - E_{it-1} \geq 0 \\ 0, & if\ E_{it} - E_{it-1} < 0 \end{cases}$$

Let monthly job destruction be $JD_t = \frac{1}{N}\sum_{i=1}^{N} JD_{it}$, where

$$JD_{it} = \begin{cases} 0, & if\ E_{it} - E_{it-1} \geq 0 \\ -(E_{it} - E_{it-1}), & if\ E_{it} - E_{it-1} < 0 \end{cases}$$

Let annual job creation rate be $JCR_t = \frac{JC_t}{\sum_{i=1}^{N} E_{it}} - \frac{JC_{t-12}}{\sum_{i=1}^{N} E_{it-12}}$

Let annual job destruction rate be $JDR_t = \frac{JD_t}{\sum_{i=1}^{N} E_{it}} - \frac{JD_{t-12}}{\sum_{i=1}^{N} E_{it-12}}$

Let reallocation rate be $RR_t = JCR_t + JDR_t$

Let net employment rate be $NER_t = JCR_t - JDR_t$

Further, let $\tilde{T}$ be the period when lockdown was announced in Ohio.

Let average job creation rate before and after COVID-19 be $\overline{JCR_0}$ and $\overline{JCR_1}$ where $\overline{JCR_0} = \frac{\sum_{t=1}^{\tilde{T}-1} JCR_t}{\tilde{T}-1}$ and $\overline{JCR_1} = \frac{\sum_{t=\tilde{T}}^{T} JCR_t}{T-\tilde{T}+1}$

Similarly, let average job destruction rate before and after COVID-19 be $\overline{JDR_0}$ and $\overline{JDR_1}$ where $\overline{JDR_0} = \frac{\sum_{t=1}^{\tilde{T}-1} JDR_t}{\tilde{T}-1}$ and $\overline{JDR_1} = \frac{\sum_{t=\tilde{T}}^{T} JDR_t}{T-\tilde{T}+1}$

Then, our job loss measure (JL) is defined as

$$JL = \left(\overline{JDR_1} - \overline{JDR_0}\right) - \left(\overline{JCR_1} - \overline{JCR_0}\right)$$

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RESULTS

We first share the results related to jobs generated by each subsector within health care before and after COVID-19. Post-COVID-19 period begins April 2020, after the announcement of the stay-at-home order by the Ohio Department of Health (ODH).

Figure 2 shows monthly number of employed persons within Ohio by each major NAICS subsector under health care. All subsectors experienced a decline due to lockdown imposed by COVID-19, but the sharpest decline was experienced by ambulatory health care services and social assistance sectors. Both these sectors recovered after the shock but have, so far, failed to reach the pre-COVID-19 levels. Hospitals experienced a temporary decline but also recovered promptly. The nursing subsector has experienced a constant decline since the advent of the COVID-19 crisis.

Table 1 shows average pre-COVID-19 and post-COVID-19 lockdown levels for job creation, destruction, reallocation, and net employment rates for health care and its subsectors. Pre-COVID-19 period is up to March 2020 and post-COVID-19 period begins April 2020 (ie, once the stay-at-home order was announced). Each subsector had a positive net employment rate before COVID-19 but had a negative net employment rate after COVID-19. For example, the ambulatory health care subsector had a net employment rate of 0.15% before COVID-19 but had a net employment rate of −0.27% after COVID-19.

All sectors had a higher job creation rate post-COVID-19 than pre-COVID-19. Similarly, all sectors had a higher job destruction rate post-COVID-19 than pre-COVID-19. However, the difference between job destruction rate before and after COVID-19 was much higher than the difference between job creation rate before and after COVID-19. For instance, the social assistance subsector had a pre-COVID-19 job creation rate of 3.45% and a post-COVID-19 job creation rate of 4.19% which led to an increase of 0.74 percentage points (pp). Similarly, it had a pre-COVID-19 job destruction rate of 3.17% and a post-COVID-19 job destruction rate of 4.84% resulting in an increase of 1.67 pp. Note that job destruction rate between the 2 periods is more than double the job creation rate. In other words, the difference between 1.67 pp and 0.74 pp is 0.93, and this number is our measure of jobs lost in Social Assistance subsector between the pre-COVID-19 and post-COVID-19 periods. This difference measure reveals that newer jobs created after the advent of COVID-19-imposed restrictions were not able to fully compensate for the jobs destroyed by these restrictions. In this way, when we compute difference measures for all the health care subsectors provided in Table 1, we find that none of the sectors have been able to recover from the high job destruction rates during the post-COVID-19 period.

All sectors also had a higher job reallocation rate post-COVID-19 than pre-COVID-19, which suggests that health care workers were more likely to switch their jobs after Ohio declared a state of emergency in late March 2020.

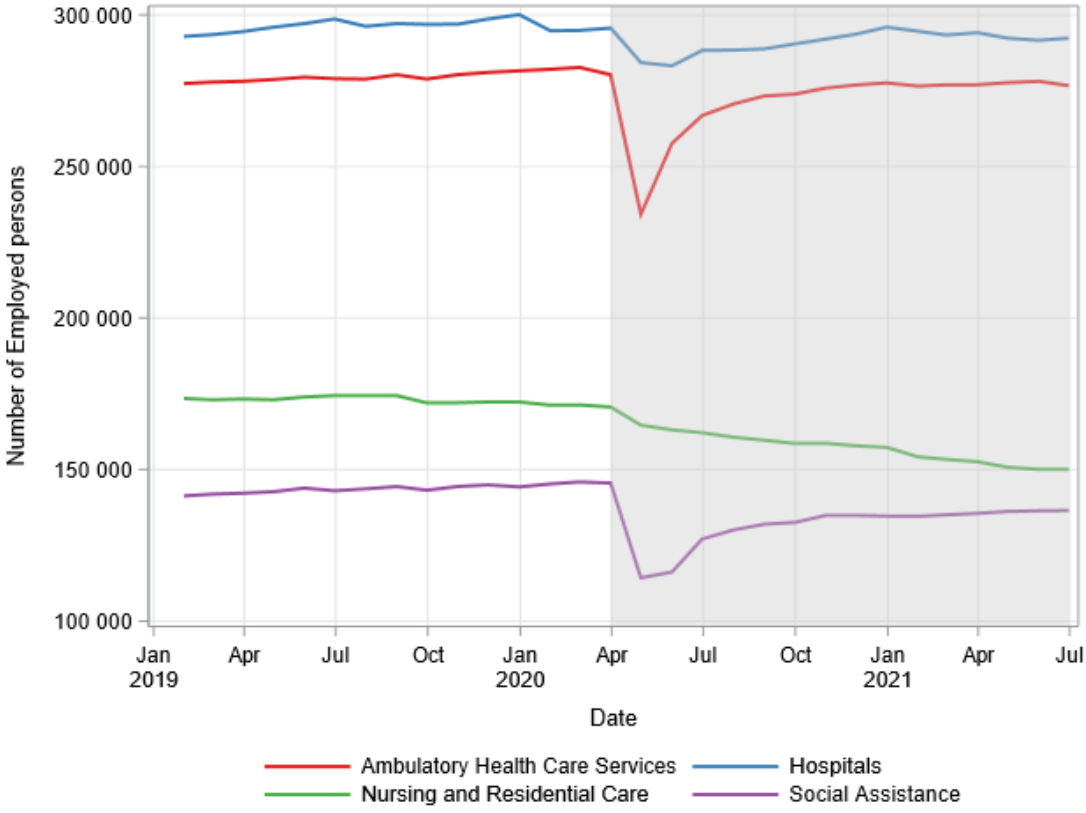

Figure 2. Ohio Health Care Sector: Number of Employed Persons per NAICS Subcategory

Table 1. Job Creation and Destruction Flows as a Percentage of Total Employment

Category	Period	Job Creation	Job Destruction	Job Reallocation	Net Employment	Measure
Ambulatory health care	Pre-COVID-19	3.26%	3.11%	6.38%	0.15%	
Ambulatory health care	Post-COVID-19	3.88%	4.15%	8.02%	(0.27%)	
		0.61	1.04			**0.42**
Hospitals	Pre-COVID-19	1.09%	1.01%	2.11%	0.08%	
Hospitals	Post-COVID-19	1.13%	1.19%	2.33%	(0.06%)	
		0.04	0.18			**0.14**
Nursing and residential care	Pre-COVID-19	2.53%	2.52%	5.05%	0.01%	
Nursing and residential care	Post-COVID-19	2.84%	3.68%	6.52%	(0.83%)	
		0.31	1.15			**0.84**
Social assistance	Pre-COVID-19	3.45%	3.17%	6.62%	0.28%	
Social assistance	Post-COVID-19	4.19%	4.84%	9.03%	(0.64%)	
		0.74	1.67			**0.93**
Health care sector	Pre-COVID-19	2.39%	2.27%	4.66%	0.12%	
Health care sector	Post-COVID-19	2.77%	3.10%	5.87%	(0.33%)	
		0.39	0.83			**0.44**

DISCUSSION

COVID-19 recession was different from the Great Recession in terms of its impact on the health care sector. While other sectors in Ohio experienced a decrease in workforce during the Great Recession, the health care sector experienced no such decline. However, COVID-19 had a very similar impact on both these sectors as all employees were forced to take safety measures. COVID-19 also had a dissimilar impact on different health care subsectors. The ambulatory health care subsector experienced the sharpest decline due to lockdown imposed by COVID-19. This seems reasonable given that all outpatient services were temporarily halted by the stay-at-home order imposed by ODH. Soon after the stay-at-home order was lifted, the subsector recovered from the temporary shock as units in this subsector were allowed to reopen, albeit with COVID-19 restrictions and policies in place. Hospitals were the most stable and were least impacted, at least in terms of payroll jobs, out of all health care subcategories as they were allowed to operate during the lockdown. The relatively small decline in this subsector can possibly be attributed to closure of certain nonessential services or increased COVID-19 spread forcing the workers to stay at home and, as a result, out of the payroll system. On the other hand, one would imagine that hospitals should have experienced a surge in new workforce as there were cases of extreme labor market tightening during the pandemic. However, even when they were the most important institutions during the pandemic, hospitals experienced a moderate decline in net employment rate. The social assistance subsector had an average post-COVID-19 job reallocation rate of 9% and was the highest among the health care subsectors, along with the highest gap between job destruction and job creation rates. This suggests a lot of movement of health care workers away from this subsector as a number of people in this subsector were laid off during lockdown and had to find other jobs. Nursing subsector had the lowest post-COVID-19 net employment rate and is experiencing a continuous decline in workforce. This suggests a deeper problem than a one-time shock. One possible explanation is the decline in demand of such services due to shift in demographics caused by COVID-19. Because the elderly and the disabled were disproportionately affected by COVID-19, this possibly resulted in a higher death rate among these groups and ultimately led to a lower demand for nursing and residential care facilities.

PUBLIC HEALTH IMPLICATIONS

The health care sector in Ohio experienced a tremendous increase in labor market activity due to the effects of COVID-19 and the stay-at-home order issued in March 2020. New jobs were created throughout the health care industry as demand for telehealth, telemedicine, and COVID-19-related health care services increased employment levels. However, this demand was more than offset by the decrease in jobs at some of the existing health care institutions, as they were forced to cut costs by eliminating nonessential services from their payrolls. Contrary to the common misconception that the health care sector is expanding due to increased demand for health care workers caused by COVID-19, the payroll data from ODJFS shows us a decrease in overall health care employment as of June 2021. In the future, some sectors such as hospitals may create new jobs as they seem to have relatively stable job creation and destruction rates. Since this subsector generally comprises of large institutions, doctors and nurses working for large health care-related establishments may experience greater job security than those working for smaller establishments. Furthermore, other subsectors such as nursing and residential care may be on their way towards permanent decline in job opportunities. As a result, nurses and other health care workers in this subsector may start moving toward other health care subsectors such as hospitals or ambulatory health care subsectors in hopes of finding better job opportunities. The recent surge in travel nurses may also continue as a result of limited job alternatives. If these trends continue in the future at the aggregate health care sector level, then we could also see a permanent movement of individuals out of the labor force for the health care sector in Ohio.

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REFERENCES

1. Centers for Disease Control and Prevention (CDC). First Travel-related Case of COVID-19 in United States. 2020. Accessed June 22, 2022. https://www.cdc.gov/media/releases/2020/p0121-novel-coronavirus-travel-case.html
2. Centers for Disease Control and Prevention (CDC). COVID Data Tracker. 2022. Accessed June 22, 2022. https://covid.cdc.gov/covid-data-tracker/#datatracker-home
3. Adams-Prassl A, Cloyne J, Costa Dias M, Parey M, Ziliak JP. The COVID-19 economic crisis. *Fisc Stud*. 2020;41(3):489–492. https://doi.org/10.1111/1475-5890.12248
4. Bureau of Economic Analysis. Gross Domestic Product, 2nd Quarter 2020. 2020. Accessed January 16, 2023. https://www.bea.gov/news/2020/gross-domestic-product-2nd-quarter-2020-advance-estimate-and-annual-update#home
5. Bureau of Labor Statistics, US Department of Labor. *The Economics Daily*. Unemployment rate rises to record high 14.7 percent in April 2020. Accessed January 16, 2023. https://www.bls.gov/opub/ted/2020/unemployment-rate-rises-to-record-high-14-point-7-percent-in-april-2020.htm
6. Ohio Department of Health. Director's Stay Safe Ohio Order. 2020. Accessed January 16, 2023. https://coronavirus.ohio.gov/static/publicorders/Directors-Stay-Safe-Ohio-Order.pdf
7. KFF. Health Care Employment as a Percent of Total Employment. May 2021. 2023. Accessed January 16, 2023. https://www.kff.org/other/state-indicator/health-care-employment-as-total/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D
8. National Bureau of Economic Research (NBER). US Business Cycle Expansions and Contractions. 2021. Accessed January 16, 2023. https://www.nber.org/research/data/us-business-cycle-expansions-and-contractions.
9. Wager C, Telesford I, Hughes-Cromwick P, Amin K, Cox C. What impact has the coronavirus pandemic had on health employment? *Peterson-KFF Health System Tracker*. 2022. Accessed January 16, 2023. https://www.healthsystemtracker.org/chart-collection/what-impact-has-the-coronavirus-pandemic-had-on-healthcare-employment/#Cumulative%20change%20in%20health%20sector%20and%20non-health%20sector%20employment%20since%20January%201990%C2%A0
10. Ohio Department of Job and Family Services. UI Tax for New Employers. Accessed January 16, 2023. https://jfs.ohio.gov/ouio/uctax/UITaxForNewEmployers.stm 2021
11. US Census. North American Industry Classification System. 2022. Accessed January 16, 2023. https://www.census.gov/naics/reference_files_tools/2022_NAICS_Manual.pdf