Release Date: April 2, 2024

An Examination of Entrepreneurship Among Americans with Disabilities:

Demographics and Economic Outcomes Amid the COVID-19 Pandemic

Premier Quantitative Consulting, Inc.
Orlando, FL 32803

for
Office of Advocacy
U.S. Small Business Administration
under contract number 73351022P0033

Executive Summary

There is a dearth of quantitative research on the intersection of disability status and economic outcomes for American entrepreneurs. Specifically, greater research is needed on how entrepreneurs with disabilities fared during the COVID-19 pandemic. While health risks increased for all during and because of the COVID-19 pandemic, those living with disabilities disproportionately experienced disruption and a decline in income, productivity, and business outcomes. Entrepreneurship can be a powerful means of economic empowerment for individuals with disabilities. Becoming an entrepreneur provides a vehicle for increased and more creative labor force participation, as well as the potential for more flexible work schedules and environments, options which may not exist in traditional wage employment. Indeed, among workforce participants, individuals with disabilities have historically had a higher rate of entrepreneurship than their counterparts without disabilities.

The impetus for this research is the finding that from 2019 to 2020, entrepreneurs with disabilities experienced a decrease in their average earned income despite entrepreneurs without disabilities, wage workers with disabilities, and wage workers without disabilities all experiencing an increase in their average earned income. Using United States Census Bureau American Community Survey (ACS) public use microdata (PUMS), this research examines the potential impact of disability status on entrepreneurial income, including within the context of the pandemic. As part of our research design, we implement both univariate and multivariate analyses to address two research hypotheses that shed light on the impact of disability status upon earned income for entrepreneurs and wage workers. Findings discussed in detail in the report include:

- Earnings growth for entrepreneurs with disabilities trailed the earnings growth of wage workers with disabilities, wage workers without disabilities, and entrepreneurs without disabilities.

- Among entrepreneurs and non-entrepreneurs, having a disability is negatively associated with income achievement relative to the prior year average. There are multiple potential theories to explain these results. It is possible that individuals with disabilities face constraints beyond ability that include discrimination and pervasive negative attitudes related to their capabilities in the work force.

- Time spent working varies across entrepreneurs, wage workers, and disability status. Business owners both with and without disabilities work fewer weeks per year and fewer hours per week than their traditional wage worker counterparts. Further, among entrepreneurs and wage workers, individuals with disabilities work fewer hours per week on average than

non-disabled individuals. This finding is not surprising given the propensity for individuals to pursue entrepreneurship for its inherent autonomy and flexibility, regardless of their disability status.

    - Time spent working can influence business earnings. The results of the econometric analyses demonstrate that reduced time spent on business among entrepreneurs with disabilities contributed to the observed decline in average income from 2019 to 2020.

- Entrepreneurs with disabilities out-earned wage workers with disabilities in all studied years. On average, entrepreneurs with disabilities earned 14 percent more than their traditional wage work counterparts. Factoring in the differences in time spent dedicated to the labor force, this highlights the economic opportunity inherent in entrepreneurship for individuals with disabilities.

- The highest participation in entrepreneurship among individuals with disabilities is among individuals aged 65 or higher. Further, individuals with disabilities are more than twice as likely to continue to work past age 65 than their non-disabled counterparts, whether as entrepreneurs or in traditional employment. Multiple potential explanations exist for this phenomenon including rising costs leading to postponed retirement and potential age discrimination forcing individuals to create their own labor force opportunities via entrepreneurship.

- Entrepreneurs with disabilities are more likely to operate in industries that experienced a disproportionately high COVID-19 impact. This includes service-based industries. High COVID-19 impact industries are proxied as industries in which a high proportion of employer firms applied for Payroll Protection Program (PPP) loans as part of the COVID-19 relief package. Additionally, the hypothesis testing indicates that operating in a high COVID-19 impact industry a disability is negatively associated with income achievement relative to the prior year average.

The results of this research suggest that disability status is significant when considering differences in observed economic outcomes, even controlling for other demographic and economic variables including race, gender, geographic location, and household characteristics. The promotion of entrepreneurship among individuals with disabilities as a vehicle for economic self-determination may be a fruitful policy initiative. Policymakers, stakeholders, and individuals with disabilities must work in tandem to establish relevant best practices to support future success. Given the rise in Americans working past age 65, as well as the increase in disabled Americans as a direct result of the COVID-19 pandemic, developing novel policy and programmatic ideas is critical to maintaining a well-functioning and economically efficient workforce.

Table of Contents

List of Figures & Tables

Introduction

Research indicates that individuals living with disabilities, both business owners and wage workers, disproportionately experienced negative effects due to the COVID-19 pandemic beginning in early 2020. These include mental health impacts as well as economic impacts, such as heightened food insecurity.[1] While multiple factors can and do influence economic outcomes for individuals, those living with disabilities face a unique set of circumstances in general. In this research, we examine and hypothesize a causal link between business owners living with disabilities, business dynamics, including choice of industry, demographics, including race, geographic location, and gender, and the decline in income exclusively observed for business owners with disabilities during the COVID-19 pandemic. While health risks increased for all during and because of the COVID-19 pandemic, those living with disabilities disproportionately experienced disruption and a decline in income and business outcomes. Policymakers, advocates, and government agencies must better understand these impacts to ensure that economic recovery remains equitable and inclusive of all Americans.

There is significant diversity in defining "disability."[2] From a legal perspective, the Americans with Disabilities Act (ADA) defines individuals with disabilities as those with physical or mental impairments that significantly limit their life activities.[3] According to the CDC, approximately one in four Americans had a disability in 2016.[4] Figure 1-1 shows the number of American adults with disabilities by disability type and age.[5] As shown, even within individuals that identify as "disabled," there is significant diversity. The largest group of Americans with disabilities have ambulatory difficulty, and overall, the number of individuals aged 65 and older account for approximately half of all Americans with disabilities. Regardless of age, the number of Americans with disabilities increased prior to the pandemic, which itself was a potentially disabling event. Indeed, the pandemic resulted in an increase of nearly 1.2 million people with disabilities among the civilian noninstitutional population in 2020 alone.[6]

[1] https://publichealthinsider.com/2022/10/18/how-did-covid-19-impact-people-living-with-disabilities/#:~:text=Mental%20health%20was%20the%20most,and%20depression%20during%20the%20pandemic

[2] https://www.census.gov/content/dam/Census/library/publications/2018/demo/p70-152.pdf

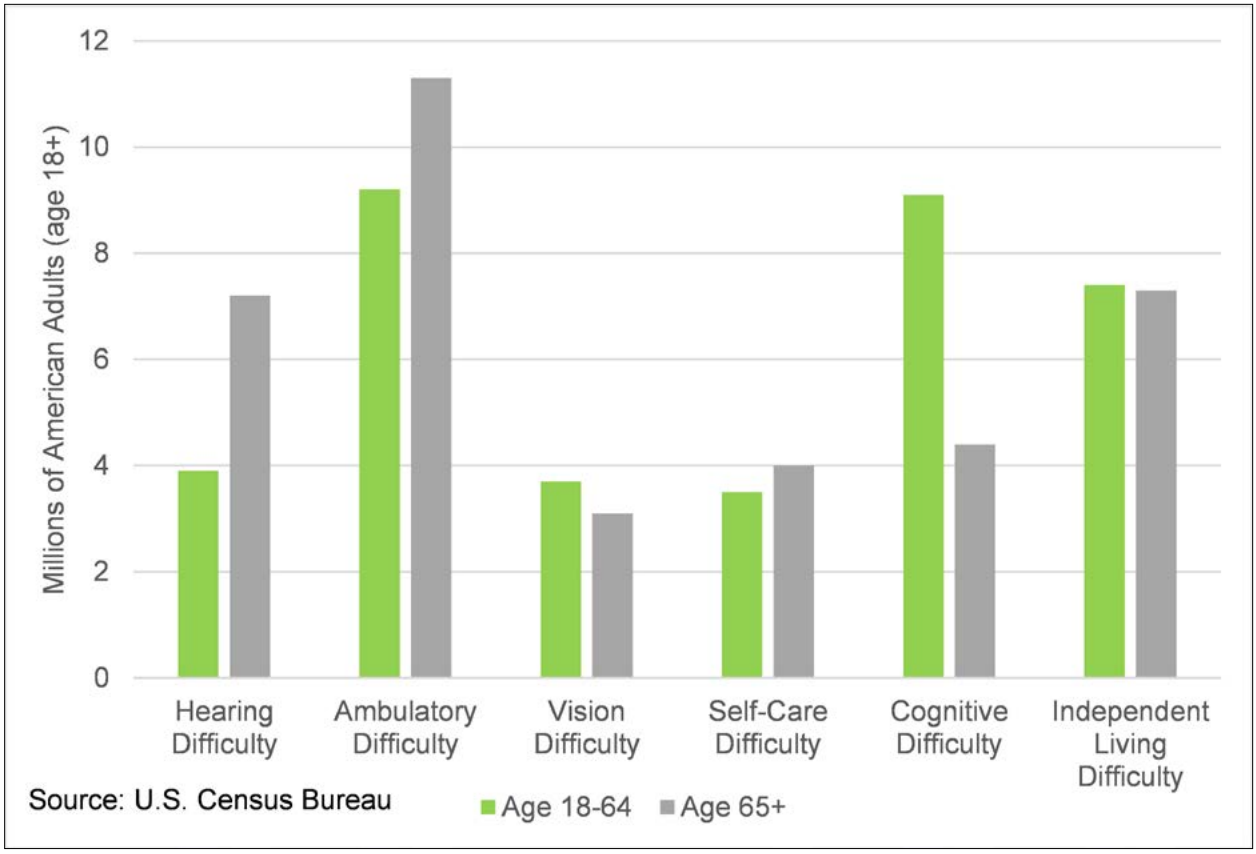
[3] "What is the definition of disability under the ADA?" Americans with Disabilities Act National Network. https://adata.org/faq/what-definition-disability-under-ada

[4] Okoro CA, Hollis ND, Cyrus AC, Griffin-Blake S. Prevalence of disabilities and health care access by disability status and type among adults d United States, 2016. Morbidity and mortality weekly report. 2018. http://dx.doi.org/10.15585/mmwr.mm6732a3.

[5] https://www.census.gov/library/visualizations/2021/comm/living-with-disabilities.html

[6] U.S. Bureau of Labor Statistics. Labor Force Statistics from the Current Population Survey. 2022. https://www.bls.gov/webapps/legacy/cpsatab6.htm

Figure 1-1. American Population with Disabilities



Statistically speaking, individuals with disabilities are underrepresented in the American labor force but overrepresented as entrepreneurs.[7] Recent data from the U.S. Bureau of Labor Statistics (BLS) indicate that 21.3 percent of individuals with a disability were employed in 2022, an increase from 19.1 percent in 2021. Further, 9.5 percent of workers with disabilities are business self-employed entrepreneurs, compared to 6.1 percent of the American population without disabilities. While the BLS data do not provide information on why differences exist in labor force and entrepreneurial participation for people with disabilities, the fact that the unemployment rate for individuals with a disability is more than double that of individuals without a disability may play a role.

Beyond labor force participation, individuals with disabilities and their social networks represent a powerful segment of the economy as consumers. In 2020, Return on Disability published its annual report and described the size of the global population of people with disabilities as follows:[8]

> *With an estimated population of 1.85 billion, people with disabilities (PWD) are an emerging market larger than China. Their Friends and Family add*

[7] https://www.bls.gov/news.release/pdf/disabl.pdf

[8] Donovan R. Report Summary: The Global Economics of Disability. Return On Disability. September 2020. http://rod-group.com/sites/default/files/Summary%20Report%20-%20The%20Global%20Economics%20of%20Disability%202020.pdf

another 3.3 billion potential consumers who act on their emotional connection to PWD. Together, disability touches 73 percent of consumers. Together, the disability market controls over $13 trillion in disposable income.

As such, addressing the issues concerning this growing demographic group continues to mount in importance.

The role of small businesses as the economic engine of the United States economy cannot be overstated. In 2019, 2020, and 2021 small businesses employed approximately 52 percent of employees in the private sector.[9] In 2020, small business owners themselves comprised 10 percent of the entire labor force.[10] Out of those small business owners, approximately 10.6 percent have some form of disability.[11] Additionally, persons with a disability are nearly twice as likely as those without disabilities to be self-employed.[12]

Regardless of disability status, small business owners experienced challenges during the pandemic. On average, revenues of small businesses decreased by 40 percent in the first 3 months after the national emergency was declared in March 2020.[13] One survey of 5,800 small businesses found that 43 percent of small businesses temporarily closed during the start of the pandemic and reduced their active employment by 39 percent on average.[14] Given the recency of the pandemic, there remain few systemic research reports on the impact of disability status on economic outcomes for business owners during the pandemic.

Multiple factors influence the economic impact of the pandemic on individuals and demographic groups. Of particular importance is understanding the impact of having a disability on business owners' income, including whether the impact is due to discrimination, systemic bias, lack of access to resources, increased risk of health complications, or other factors. There is limited research at present on the specific impact of disability status on the outcomes of business owners living with a disability. In this study, we present a multi-year demographic examination of the factors that influence income for business owners by disability status. We employ an econometric approach to identify the unique challenges facing small business owners living with disabilities, highlight the strategies that may be used to navigate those challenges, and help explain why we observe certain trends.

---

[9] BLS. Business Employment Dynamics. National Business Employment Dynamics Data by Firm Size Class. https://www.bls.gov/bdm/bdmfirmsize.htm. A similar data source from the U.S. Census Bureau, the Statistics of U.S. Businesses via their County Business Patterns, produces slightly differing numbers based on differing scopes and methodologies, https://www.bls.gov/cps/eetech_intro.pdf.

[10] Ibid.

[11] Steven Ruggles, Sarah Flood, Ronald Goeken, Megan Schouweiler and Matthew Sobek. IPUMS USA: Version 12.0 [dataset]. Minneapolis, MN: IPUMS, 2022. https://doi.org/10.18128/D010.V12.0

[12] LS. Persons with a Disability: Labor Force Characteristics News Release. Feb 2021.

[13] Olivia S. Kim, Jonathan A. Parker, Antoinette Schoar. Revenue Collapses and the Consumption of Small Business Owners in the Early Stages of the Covid-19 Pandemic. National Bureau of Economic Research. Nov 2020.

[14] Bartik, A.W., et al., The impact of COVID-19 on small business outcomes and expectations. Proceedings of the National Academy of Sciences USA, 2020.

Literature Review

There is a large body of work, within the private and public sectors, examining the impact of an individual's disability status on their economic and employment opportunities. The literature discussed below indicates that business ownership can be a valuable path to pursue for disabled individuals for myriad reasons, such as the ability to customize their own workspace or technology.[15] To that end, developing a comparative understanding the impact of the COVID-19 pandemic on disabled business owners by demographic group is a crucial topic of policy research.

The COVID-19 pandemic proved to be especially difficult for people living with disabilities, including physical, medical, psychological, or cognitive disabilities. Compared to people without disabilities, people living with disabilities reported higher levels of isolation and mental distress during the pandemic,[16] they were more likely to become infected by COVID-19 and more likely to experience a severe infection.[17] In addition, people with disabilities were more likely to become unemployed during the pandemic.[18] A study from the Journal of Occupational Rehabilitation[19] conducted surveys of 733 people with disabilities and 67 employers in the Midwestern United States and found that during the pandemic, employed people with disabilities were more likely to lose their jobs and were less likely to have stable employment with benefits including health insurance. Further, respondents reported higher social isolation, daily activity disruption, and lower quality of life. In another study based on survey data, Koon et al.[20] and found that the area most affected by the pandemic was community engagement, including access to ongoing employment. Other areas affected include access to friends and family, shopping for essential items such as groceries or prescriptions, transportation use and access, and the ability to live independently. These data indicate that people with disabilities faced a larger risk of unemployment than those without disabilities.

Entrepreneurship is one potential mechanism to address traditional labor market challenges and social exclusion faced by individuals living with disabilities.[21] In the wake

[15] Indeed, a survey by Gusto found that 18% of business owners with a disability found that technology advances reduced barriers to entry as business owners. https://gusto.com/company-news/new-business-owner-survey-2023.

[16] American Psychological Association. How COVID-19 impacts people with disabilities 2020. https://www.apa.org/topics/covid19/research-disabilities.

[17] Epstein S, et al. New obstacles and widening gaps: a qualitative study of the effects of the COVID-19 pandemic on U.S. adults with disabilities. Disability and Health Journal. 2021. https://doi.org/10.1016/j.dhjo.2021.101103

[18] Lauren Callender, et al. The impact of pre-existing comorbidities and therapeutic interventions on COVID-19. Frontiers in Immunology. 2020. https://doi.org/10.3389/fimmu.2020.01991.

[19] Jasin Wong, et al. Employment Consequences of COVID-19 for People with Disabilities and Employers. Journal of Occupational Rehabilitation. 2021. https://doi.org/10.1007/s10926-021-10012-9

[20] Lyndsie M. Koon, Lillie Greiman, Jonathan A. Schulz, Kelsey S. Goddard, Isaac M. Nzuki, Jean P. Hall. Examining the effects of the COVID-19 pandemic on community engagement for people with mobility disabilities. Disability and Health Journal. Vol 15, Issue 1. 2022. https://doi.org/10.1016/j.dhjo.2021.101212

[21] De Clercq, Dirk & Honig, Benson. Entrepreneurship as an Integrating Mechanism for Disadvantaged Persons. Entrepreneurship and Regional Development. 23. 353-372. 2011. https://doi.org/10.1080/08985626.2011.580164.

of the COVID-19 pandemic, Ortiz Garcia and Olaz Capitan (2021)[22] investigated the conditions conducive to entrepreneurship among individuals with disabilities. Their central research question revolves around what policies and programs effectively encourage entrepreneurship among disabled individuals. The study concluded that entrepreneurship can be a mechanism by which disabled individuals can navigate existing inequalities in the labor market.

Indeed, research from the Office of Disability Employment Policy (ODEP)[23] shows that entrepreneurship can provide individuals with disabilities an accessible means for entering the workforce. The ODEP commissioned a study of the START-UP program, an initiative run by the Department of Labor. In funding the program, the Senate Appropriations Committee stated:

> *The Committee is aware of the outstanding success of national non-profits working to increase self-employment among people with disabilities. Self-employment can provide income, assets and other elements of self-sufficiency to people with disabilities who are hard to place in traditional work environments because of the flexibility inherent in self-employment.*

The flexibility associated with small business ownership provides a unique opportunity for disabled individuals to optimize their employment. The study found that individuals with disabilities who interacted with the START-UP program were able to capitalize on their individual talents and interests. Unfortunately, like all aspects of social networking, entry into small business ownership for disabled individuals is not without barriers. The study identified key barriers to entry for people living with disabilities including:[24]

- Federal employment policies geared towards wage work, instead of entrepreneurship;
- Benefits programs with eligibility criteria that potentially disincentivize self-employment; and
- Lack of readily available information or assistive programs geared towards disabled individuals considering pursuing entrepreneurship.

Somewhat ironically, while entrepreneurship may be a valuable way for individuals with disabilities to increase their economic power, many of the support mechanisms in place

---

[22] Ortiz García P, Olaz Capitán ÁJ. Entrepreneurship for People With Disabilities: From Skills to Social Value. Frontiers in Psychology. 2021. https://doi.org/10.3389/fpsyg.2021.699833

[23] Self-Employment for People with Disabilities. Office of Disability Employment Policy. 2013. https://www.dol.gov/sites/dolgov/files/odep/pdf/2014startup.pdf

[24] See also Bonaccio, S., C.E. Connelly, I.R. Gellatly, et al. The Participation of People with Disabilities in the Workplace Across the Employment Cycle: Employer Concerns and Research Evidence. Journal of Business Psychology, 35, p. 135-138. 2020.

for people with disabilities are structured in ways that either implicitly or explicitly hinder self-employment.

For the OECD, John Kitching[25] addressed the question of whether entrepreneurship can be used by individuals with disabilities to generate economic power. Key focus areas of the research included the types of businesses started, evaluation of barriers faced and how they differ from non-disabled businesses, and differences across types of disability. Kitching concluded that entrepreneurship can act as a "solution" to increase the labor market participation of disabled individuals, but caveats this with the fact that there is significant variability in disability. For example, disability type, severity, and duration can influence an individual's ability to get started and remain in business. Furthermore, differences and challenges may be magnified for underrepresented groups including women, racial minorities, and older individuals.

Using longitudinal data from the Panel Study of Entrepreneurial Dynamics, researchers identified patterns and trends associated with entrepreneurial success among individuals with disabilities,[26] finding that while individuals with disabilities were more likely to become entrepreneurs than people without disabilities, entrepreneurs with disabilities had a lower business success rate. This suggests that barriers exist for entrepreneurs with disabilities that do not exist for entrepreneurs without disabilities, underscoring the need for additional research.

A report from the National Disability Institute (NDI)[27] provides qualitative context directly from entrepreneurs with disabilities. The work concluded that 74 percent of individuals with disabilities are unemployed and that entrepreneurship acts as a viable option for their labor force entry. A separate study[28] found that the reasons people living with disabilities choose entrepreneurship include: financial gain, flexibility, self-determination, avoiding discrimination, and personal development. Motivations include economics, improved independence, autonomy over workplace environment and hours, avoidance of discrimination. Despite the opportunities associated with entrepreneurship, however, it is not without challenges. The NDI study found that many business owners living with disabilities face heightened barriers to entry including limited access to startup capital due to existing economic inequities and a lack of supports, services, and programs tailored to their unique needs and challenges.

---

[25] Kitching, John. Entrepreneurship and self-employment by people with disabilities. Kingston University. 2014. https://www.oecd.org/cfe/leed/background-report-people-disabilities.pdf

[26] Renko, M., Parker Harris, S., & Caldwell, K. Entrepreneurial entry by people with disabilities. International Small Business Journal, 34(5), 555–578. 2016 https://doi.org/10.1177/0266242615579112

[27] Small Business Ownership by People with Disabilities. Challenges and Opportunities. National Disability Institute. 2022. https://www.nationaldisabilityinstitute.org/wp-content/uploads/2022/07/ndi-small-business-research-report.pdf

[28] Maria Norstedt & Per Germundsson. Motives for entrepreneurship and establishing one's own business among people with disabilities: Findings from a scoping review. Disability & Society. Jun 2021. https://doi.org/10.1080/09687599.2021.1919504

Qualitative data can be particularly instructive when assessing the challenges facing entrepreneurs. For a study in the United Kingdom,[29] researchers conducted 40 in-depth interviews with self-employed people living with disabilities. In these interviews, the respondents discussed a variety of challenges and barriers they face as disabled entrepreneurs. For example, many of the respondents cited difficulties with financing their entrepreneurship because of their health:

> *In terms of day-to-day income, fluctuating health conditions meant that many disabled people were unable to earn for periods of time; this not only meant their self-employment could bring in a particularly fluctuating income but also impacted their ability to take on additional part-time jobs to help finance business costs.*

Another issue discussed in interviews[30] was the increased business expenses that many self-employed people with disabilities may not have had to incur in the absence of their disabilities. For example, respondents with visual or cognitive difficulties cited needing to hire staff or purchase specialized equipment and software to complete administrative and financial tasks. These examples highlight the challenges facing disabled business owners, ***despite the opportunities afforded by entrepreneurship***.

The body of literature and research conducted in the recent past illustrates the need for additional work evaluating the needs of individuals with disabilities and their entrepreneurial endeavors. Given the ongoing challenges facing this demographic group, this is a critical area of research necessary for policy consideration. In this research, we attempt to bridge the informational gap on small business ownership and disability studies, including the vast demographic and occupational diversity of individuals living with disabilities, and act as a springboard for the development of future policy initiatives and programs designed to bolster the entrepreneurial ecosystem for these individuals.

[29] Adams, Lorna, et al. Understanding self-employment for people with disabilities and health conditions. 2019. https://www.gov.uk/government/publications/self-employment-for-people-with-disabilities-and-health-conditions

[30] Ibid.

Research Design and Methodology

Data Source – American Community Survey (ACS)

The American Community Survey (ACS) is an annual survey of the American population sponsored by the United States Census Bureau. The ACS is nationally representative and offers reliable and generalizable data on labor force dynamics, including the prevalence of business ownership and self-employment activity. While the ACS is traditionally used to examine labor force dynamics, it contains detailed demographic information about business owners as well as their households. The combination of identifiable business owners and robust data related to personal and household demographics makes the ACS well suited to this inquiry. This research relies on six separate years of the Public Use Microdata Sample (PUMS) data files for the years 2016 through 2021. The ACS PUMS data permit analysis at the person and household levels and include critical demographic variables including age, gender, disability status, relationship status, and educational attainment, among others. The ACS PUMS data are particularly valuable because they represent timely data, collected on an annual basis.

Key Data Definitions

Defining a business owner within the context of the ACS data is central to this research. The ACS PUMS data include information on "Class of Worker," which can provide information on business ownership activity. Using this variable, this research defines entrepreneurs as individuals who identify one of the following as their primary employment activity:

- Self-employed in own not incorporated business, professional practice, or farm
- Self-employed in own incorporated business, professional practice, or farm

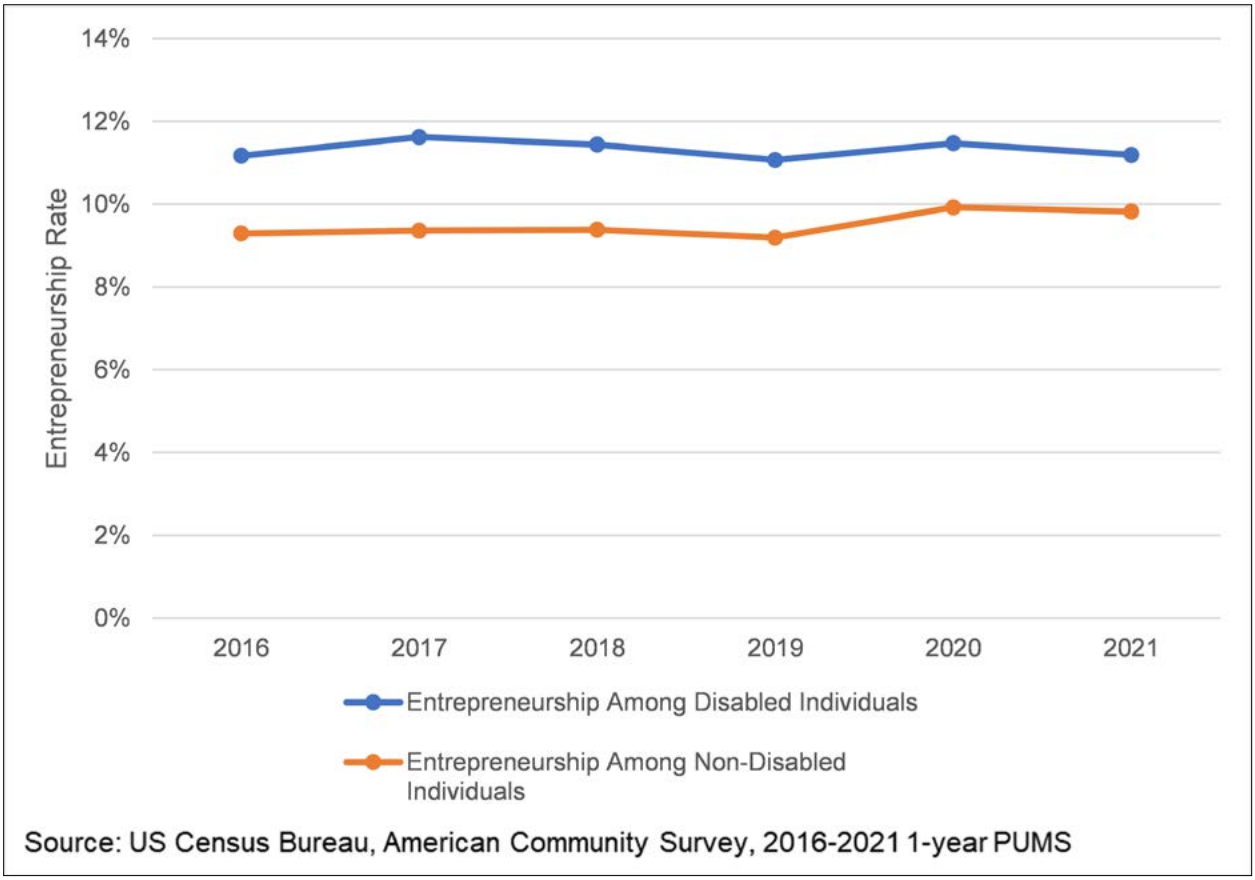
The term "non-entrepreneur" is used to refer to individuals that did not meet this criteria. There are important differences between incorporated and unincorporated businesses, largely related to liability and structure. The business and the owner are legally separate in incorporated businesses, contrasting unincorporated businesses where the owner is personally and legally responsible for the business actions and results. Although self-employment is not a perfect mapping to business ownership, researchers use self-employment as a proxy for business ownership.[31] Further, this research includes only individuals in the sample that were active members of the labor force.[32]

[31] See Chatterji et al. 2014 and Wilmoth 2016 for examples.

[32] This excludes individuals that reported working zero weeks per year and zero hours per week.

This work specifically focuses on individuals living with disabilities. For each survey respondent, the ACS PUMS data include information on whether the individual identifies as a person with a disability. The data differentiate disability types including cognitive, ambulatory, vision, and hearing. In addition, the ACS PUMS data provide information on whether respondents are disabled veterans of the United States Armed Forces. Table 3-1 shows the percentage of disabled individuals by entrepreneurship status annually for 2016 through 2021. As shown, individuals with disabilities in the workforce have a higher entrepreneurship rate than individuals that do not report disabilities.

Figure 3-1. Distribution of Entrepreneurship and Disability Status



This work probes changes over time, including those coincident with the COVID-19 pandemic starting in 2020. This research incorporates a variable specifically to proxy the potential influence of the COVID-19 pandemic on disabled and non-disabled business owners. The U.S. Census Bureau tracked the industries in which businesses were most likely to receive Paycheck Protection Program (PPP) loans as part of the economic stimulus for the COVID-19 pandemic.[33] Here, we include an additional indicator variable that identifies whether the ACS respondent's primary business activity or employment was in an industry where greater than two-thirds of the industry requested PPP loans.

[33] These data refer solely to employer firms and non-employer data by industry was not available as of the date of analysis. https://www.census.gov/library/publications/2022/econ/2020-aces-covid-impact.html.

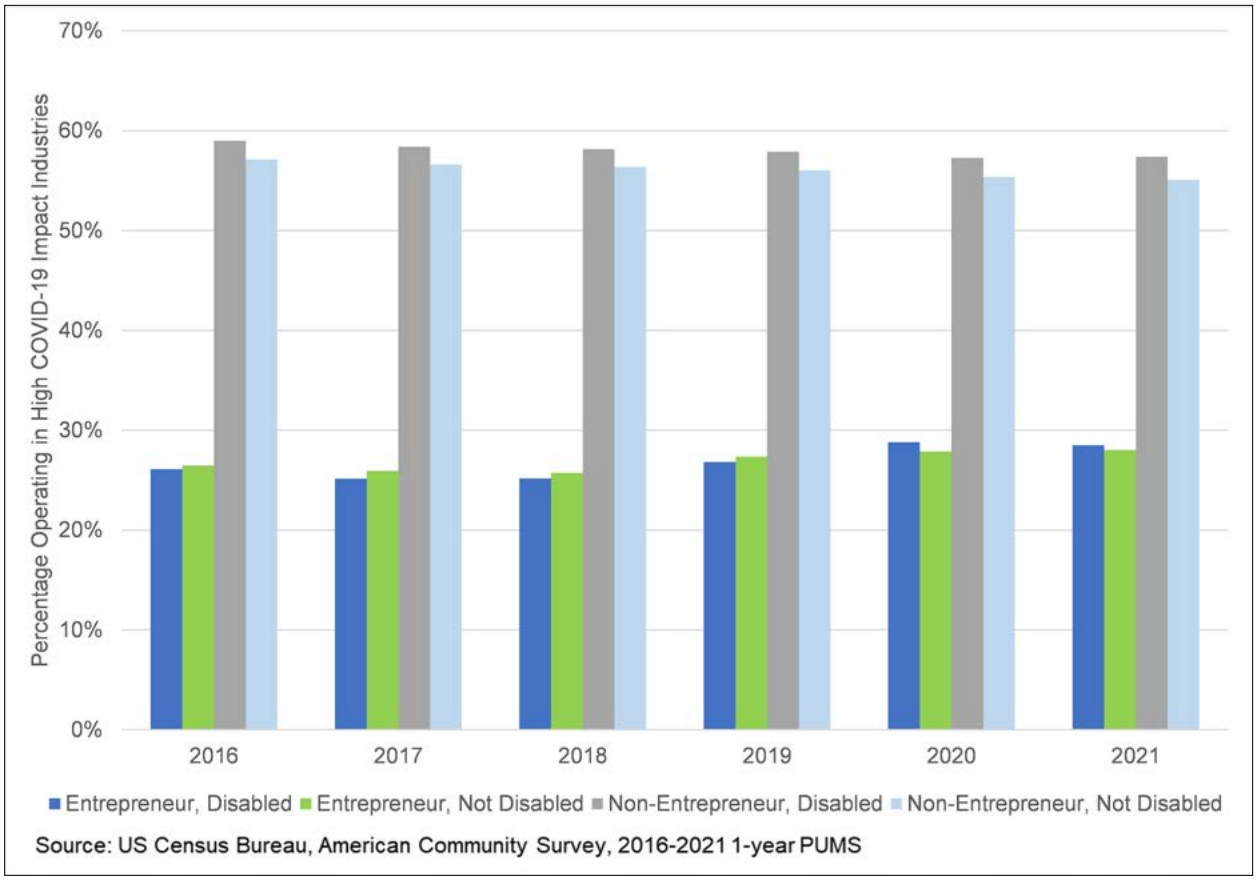
Operation in one of these industries is a proxy for operating in an industry where the COVID-19 pandemic had disproportionate impacts. For example, 74.1 percent of the companies operating in NAICS 72, Accommodation and Food Services, applied for PPP funding. Industries classified as high COVID-19 impact industries under this definition include:

- NAICS 21: Mining
- NAICS 31-33: Manufacturing
- NAICS 42: Wholesale Trade
- NAICS 44-45: Retail Trade
- NAICS 61: Educational Services
- NAICS 62: Healthcare and Social Assistance
- NAICS 72: Accommodation and Food Services

Figure 3-2 contains the share of entrepreneurs and non-entrepreneurs operating in high COVID-19 impact industries in 2020 and 2021.[34] As shown, in 2020 and 2021, entrepreneurs with disabilities were more likely than entrepreneurs without disabilities to operate in a high COVID-19 impact industry. In all years, traditional wage workers were approximately twice as likely as entrepreneurs to operate in a high COVID-19 impact industry, regardless of disability status. This finding may be a byproduct of the industry's most accessible to individuals wishing to start a business, regardless of disability status, as well as industries prominent among traditional wage workers in America.

[34] See www.census.gov/eos/www/naics/ for industry descriptions.

Figure 3-2. COVID-19 Impact Industry Distribution by Entrepreneurship and Disability Status

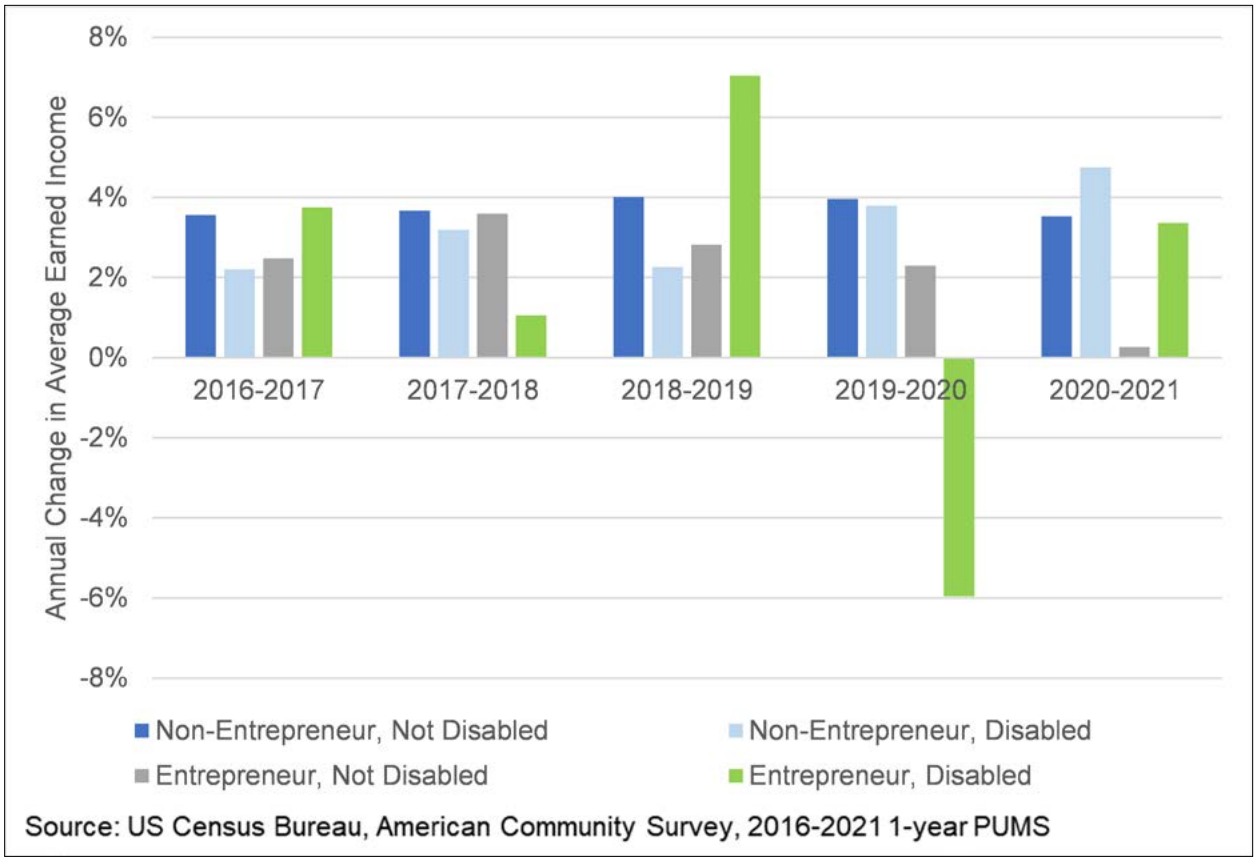


Understanding the impact of the COVID-19 pandemic on entrepreneurs by demographic status is germane to constructing policy initiatives that address existing inequities and challenges. As the COVID-19 pandemic was a large economic event, a key outcome variable is the earned income of individuals. Figure 3-3 shows the percentage change in earned income for wage workers and entrepreneurs by disability status for each year leading up to and including the pandemic. As shown, from 2019 to 2020, entrepreneurs with disabilities were the only group to experience a decrease in their average earned income. Further, entrepreneurs with and without disabilities experienced a slower rebound of their incomes in 2021. Markedly, earned income for entrepreneurs without disabilities was nearly flat despite the inflationary period.[35]

[35] In 2021, average income for each group was the following:

- $58,582 for non-entrepreneur individuals without disabilities
- $42,947 for non-entrepreneur individuals with disabilities
- $67,335 for entrepreneur individuals without disabilities
- $46,087 for entrepreneur individuals with disabilities

Figure 3-3. Annual Change in Average Income by Entrepreneurship and Disability Status



Multivariate Empirical Strategy

Building upon the univariate statistics discussed above, this research employs multiple multivariate regression models to probe the relationship between disability status, entrepreneurship, and the observed decline in average income for disabled business owners coincident with the COVID-19 pandemic. Critically important is the fact that entrepreneurs with disabilities were the only demographic that experienced a decrease in their average income from 2019 to 2020. In contrast, business owners without disabilities and wage workers with and without disabilities all saw increases in their average annual earned income. The models test two hypotheses probing the factors contributing to the disproportionate decrease in earned income among entrepreneurs with disabilities from 2019 to 2020. This section discusses the hypotheses as well as the empirical models utilized to test the hypotheses.

The probability of a characteristic or outcome, such as earned income, is modeled as a function of business factors, personal demographic factors, and household factors. The regression model takes the general form:

$$DV = \alpha + \beta(business) + \gamma(personal) + \delta(household) + \varepsilon$$

Where DV is the dependent variable specified for each hypothesis below, β is the coefficient vector for business-specific variables (such as industry, business location, time spent working), γ is the coefficient vector for personal variables (such as disability status, marital status, race), δ is the coefficient vector for household-specific variables (such as presence and age of children), and ε is the error term. Variables used in both Hypothesis 1 and Hypothesis 2 include:

- Disabled: binary variable equal to 1 if the business owner is disabled, 0 otherwise.
- Minority Race: binary variable equal to 1 if the business owner is non-white, 0 otherwise.
- Partnered: binary variable equal to 1 if the respondent cohabitates with a spouse or partner (not a roommate), 0 otherwise.
- Children Present: binary variable equal to 1 if the household includes children, 0 otherwise.
- Number of Children: continuous variable equal to the number of children under age 18 in the home. Equal to 0 for individuals with no children.
- Black: binary variable equal to 1 if the business owner is Black, 0 otherwise.
- Asian: binary variable equal to 1 if the business owner is Asian, 0 otherwise.
- Hispanic: binary variable equal to 1 if the business owner is Hispanic and/or Latino, 0 otherwise.
- Education – High School Diploma: binary variable equal to 1 if the business owner has a high school diploma or a GED, 0 otherwise.
- Education – Associate's/Bachelor's Degree: binary variable equal to 1 if the business owner has an associate's or bachelor's degree, 0 otherwise.
- Education – Master's Degree or Higher: binary variable equal to 1 if the business owner has a master's degree or higher, 0 otherwise.
- Health Coverage: binary variable equal to 1 if the individual has health insurance coverage, 0 otherwise.
- Population Density: ordered variable from 1 to 4 indicating the population density of the location in which the respondent lives. 1 refers to the most rural

(lowest density) locations and 4 refers to the most urban (highest density) locations.

- Urban: binary variable equal to 1 if the individual resided in an urban area, per the U.S. Census Bureau, 0 otherwise.
- Veteran: binary variable equal to 1 if the individual was or is a member of the U.S. Armed Forces, 0 otherwise.
- Age 65 Plus/Senior: binary variable equal to 1 if the individual was age 65 or greater, 0 otherwise.
- Woman: binary variable equal to 1 if the respondent indicated they were a woman, 0 otherwise.
- Weeks Worked: continuous variable equal to the number of weeks the respondent reported working per year.
- Hours Worked: continuous variable equal to the number of hours the respondent reported working per week.

Hypotheses

Hypothesis 1 includes:

> *The negative economic impacts of the COVID-19 pandemic were augmented for disabled business owners. That is, disabled business owners experienced a decrease in their 2020 annual income relative to the average 2019 income as a result of being disabled, when controlling for other factors.*

Hypothesis 2 includes:

> *Concentration in service-based, customer-facing industries that were disproportionately impacted by the COVID-19 pandemic contributed to the decline in income observed for disabled small business owners relative to all other wage groups from 2019 to 2020.*

For both Hypotheses 1 and 2, the dependent variable is equal to the respondent's income for the current year divided by the average income for the prior year.[36] This is split into two groups: (1) those whose earned income for the current year divided by the

[36] The hypotheses specified herein explicitly reference potential changes in income due to the COVID-19 pandemic and the differences in observed averages by disability status. Namely, the average income for entrepreneurs with disabilities declined while the average income for all other wage groups increased from 2019 to 2020. This research evaluates potential reasons for this change. Therefore, the best dependent variable is not just the individual's income in a particular year, but whether or not their income decreased or increased relative to the prior year average.

average income for the prior year was less than 1 and (2) those whose earned income for the current year divided by the average income for the prior year was greater than or equal to 1. Logistic regression is appropriate because the dependent variable is binary, as defined.

Comparing earned income in 2020 and prior years to the average income in the immediately preceding year permits use of the ACS to evaluate changes in income relative to the population, despite lacking longitudinal data. This is effectively an income normalization, which is standard in econometric analyses.

To ascertain differences among disabled and non-disabled individuals, as well as across entrepreneurship status, the models were run using survey weights and subpopulation commands to ensure accuracy in bifurcating the sample. The main effects are examined by the "disabled" variable, which is a binary indicator for the disability status of the business owner. A positive and statistically significant coefficient on the "disabled" variable would indicate that being disabled is positively related to the propensity of the studied population to earn a higher income.

The next chapter presents analysis and results by research question, providing foundational information related to differences among two key groups:

- Disabled and non-disabled business owners; and
- Disabled wage workers and disabled business owners.

This includes a quantitative demographic profile for entrepreneurs with disabilities, as well as comparisons to multiple labor force demographic subgroups. The research continues with econometric analyses that explore why average income declined only among entrepreneurs with disabilities.

Results

This chapter details the analyses undertaken and highlights key findings related to the relative decrease in average income for small business owners with disabilities from 2019 to 2020. The chapter is organized as follows:

- The first section details demographic and background information related to members of the workforce with disabilities, both entrepreneurs and non-entrepreneurs.
- The second section builds upon the first and contains results on business dynamics including location, operating in an industry with a high percentage of PPP loan recipiency, and business earnings.
- The third section details the results of econometric testing of Hypotheses 1 and 2, evaluating the impact of disability status on income for entrepreneurs and non-entrepreneurs.

Demographic and Background Information

Together, Figures 4-1 and 4-2 show the racial distribution for individuals with and without disabilities for the 2016 through 2021 period, separated by entrepreneurship status. The figures highlight the following trends between disability, entrepreneurship, and race:

- Black/African American individuals comprise a smaller share of entrepreneurs versus wage workers.
- White individuals comprise a larger share of entrepreneurs versus wage workers.
- Overall non-White representation is lower among entrepreneurs than wage workers. The data indicate that across time, for both entrepreneurs and wage workers, individuals with disabilities are a less diverse sub-group than the group of people without disabilities.

The pronounced shift in racial distribution between the 2016-2019 period and the 2020-2021 period is due to an adjustment in the Census Bureau survey instrument. When asking the race questions in the 2020 and 2021 periods, the Census Bureau provided more examples and additional instructions, which in turn, altered the responses received.[37] Nonetheless, the key points discussed above remain true in both periods.

[37] https://www.census.gov/programs-surveys/acs/technical-documentation/user-notes/2021-03.html

Figure 4-1. Racial Distribution by Entrepreneurship Status Among People without Disabilities (2016-2021)

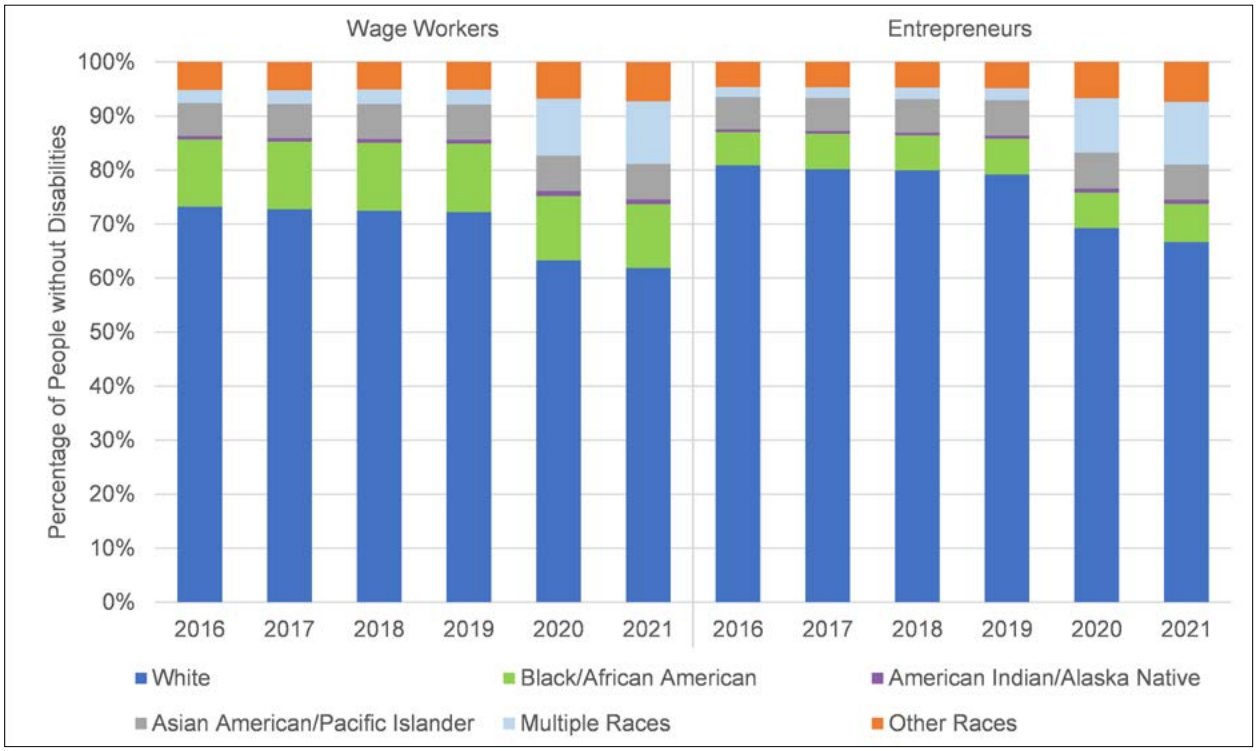
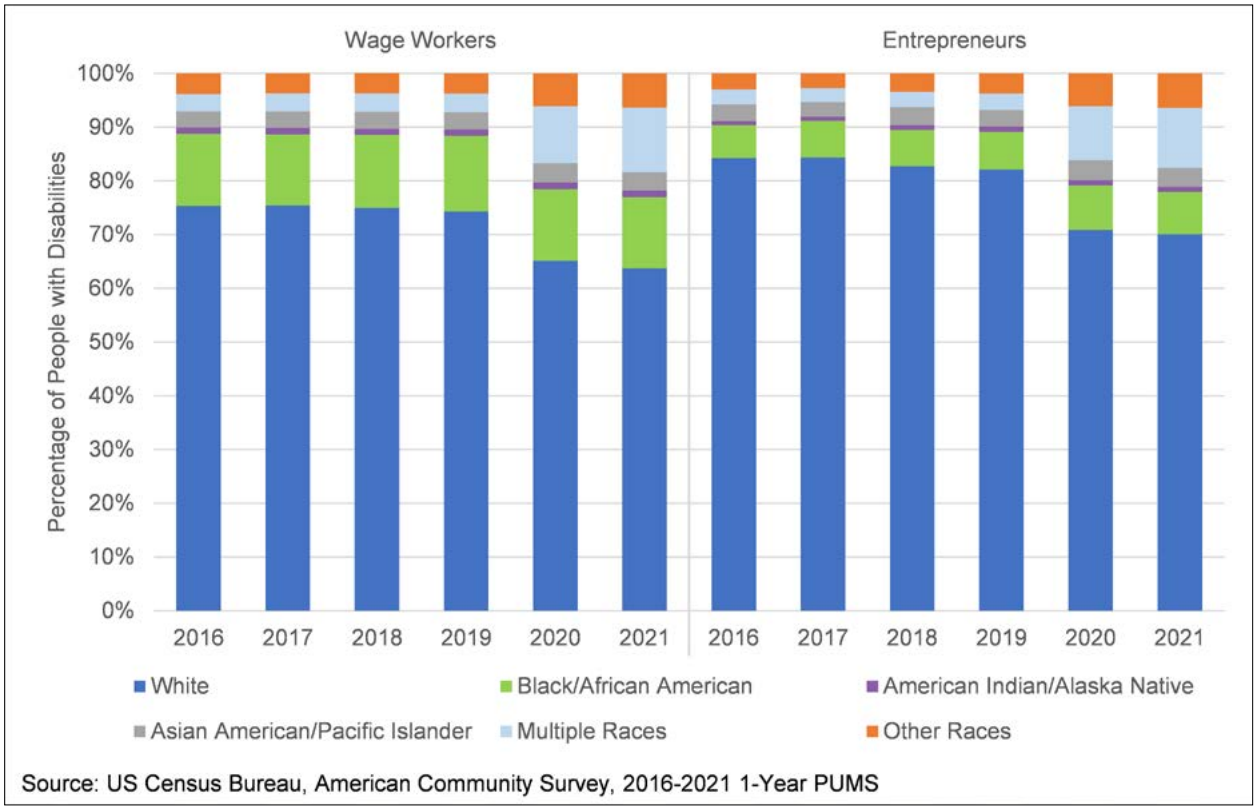


Figure 4-2. Racial Distribution by Entrepreneurship Status Among People with Disabilities (2016-2021)



Source: US Census Bureau, American Community Survey, 2016-2021 1-Year PUMS

The American Community Survey separately identifies Hispanic individuals. Table 4-1 shows the average percentage of the population identifying as Hispanic by origin for 2016 through 2021 by entrepreneurship and disability status. The table indicates that Hispanic individuals represent approximately 18 percent of wage workers without disabilities but less than 15 percent of wage workers with disabilities. Similarly, Hispanic individuals represent approximately 16 percent of entrepreneurs without disabilities but less than 13 percent of entrepreneurs with disabilities.

Table 4-1. Hispanic Race Distribution by Entrepreneurship and Disability Status (2016-2021 Average)

Race	Wage Workers with no Disabilites Reported	Entreprenuers with no Disabilites Reported	Wage Workers with Disabilities Reported	Entreprenuers with Disabilities Reported
Mexican (Hispanic)	10.7%	9.2%	8.5%	6.9%
Puerto Rican (Hispanic)	1.6%	0.9%	2.0%	1.1%
Cuban (Hispanic)	0.7%	0.9%	0.5%	0.6%
Other (Hispanic)	4.7%	5.3%	3.7%	4.0%
Non-Hispanic	82.3%	83.6%	85.3%	87.4%

Source: US Census Bureau, American Community Survey, 2016-20211-Year PUMS; PQC Analysis

Age is another important variable considering the increase in medical challenges and disabilities that can be part of the aging process. Further, America's workforce in general continues to age, with the share of adults aged 65 and higher doubling since 1985.[38] Figure 4-3 below shows the percentage of the population aged 65 and higher by entrepreneurship and disability status. As shown, the subgroup with the highest share of participation by individuals aged 65 and higher is entrepreneurs with disabilities. There are multiple potential explanations for this phenomenon including the need to work longer due to rising costs, age discrimination forcing seniors into entrepreneurship out of necessity,[39] and the flexibility inherent in entrepreneurship. The figure also demonstrates that individuals with disabilities are more than twice as likely to continue to work past age 65 than their non-disabled counterparts, whether as entrepreneurs or in traditional employment. Additional research is required to understand how to best support this group of entrepreneurs and workers.

[38] https://www.aarp.org/work/employers/americans-working-past-65/

[39] Upton, Lee O., Rebecca L. Upton, Emma J. Broming. 2017. "Necessity as a Driver of Women's Entrepreneurship." United States Government, National Women's Business Council. https://www.nwbc.gov/sites/default/files/NWBC%20Necessity%20as%20a%20Driver%20of%20Women%E2%80%99s%20Entrepreneurship.pdf (Upton et al. 2017).

Figure 4-3. Share of Respondents Age 65+ by Entrepreneur and Disability Status

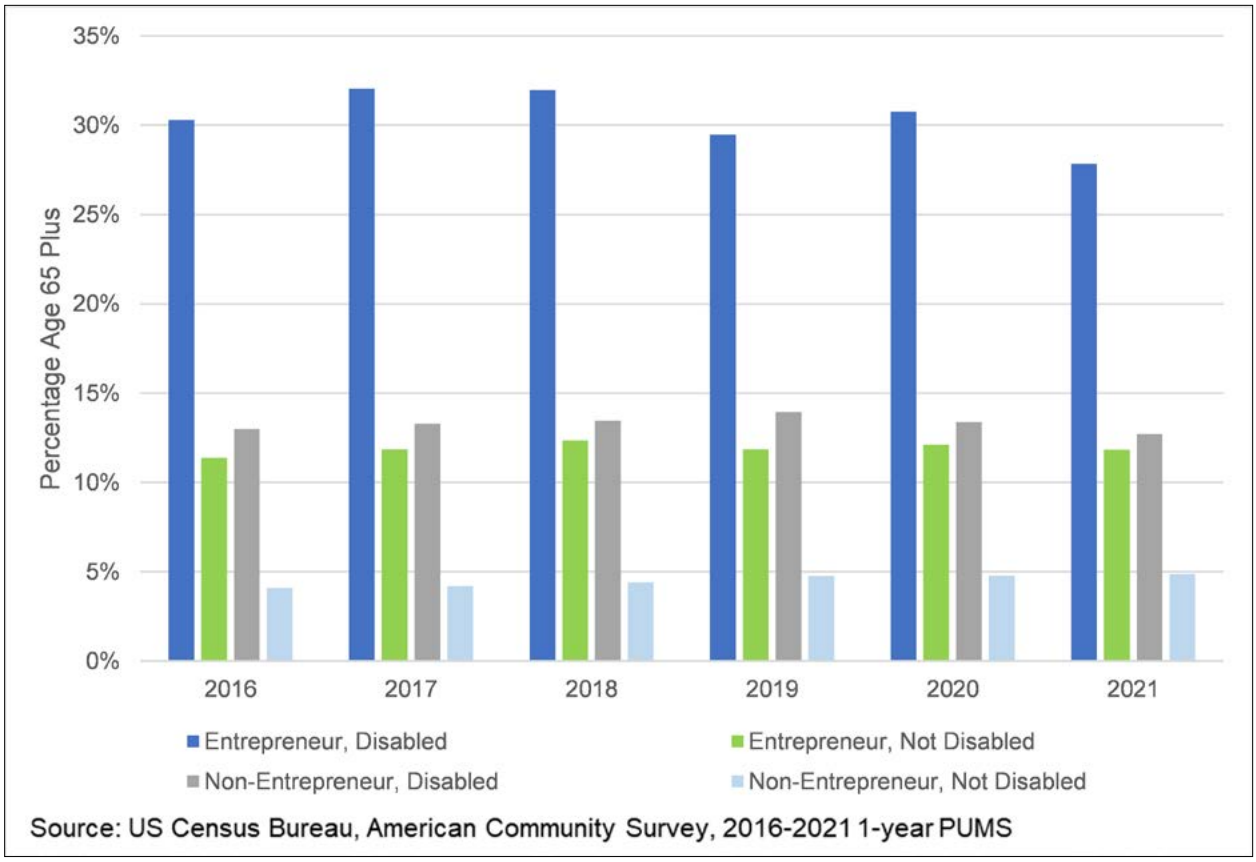


Figure 4-4 presents the gender distribution among people without disabilities separated by entrepreneurship status for 2016 through 2021 and Figure 4-5 depicts the same distribution among people with disabilities. As shown in the figures, the gender distribution among wage workers is an approximately 50/50 split[40], while there is a comparatively large disparity in the average gender distribution for entrepreneurs of 61 percent men to 39 percent women. The gender distribution among individuals with disabilities shifted from 2016 to 2021.[41] As illustrated by Figure 4-5, the proportion of women entrepreneurs with disabilities increased from 2016 to 2021. While women remain underrepresented in this group, the degree of that disparity appears to attenuate over time.

[40] The average ratio of men to women wage workers from 2016 through 2021 is 51.5%/48.5%.

[41] The difference between the percentage of men and women entrepreneurs with disabilities in 2016 was greater than one standard deviation. That difference decreased to less than one standard deviation by 2020 and decreased further in 2021.

Figure 4-4. Gender Distribution by Entrepreneurship Status Among People without Disabilities (2016-2021)

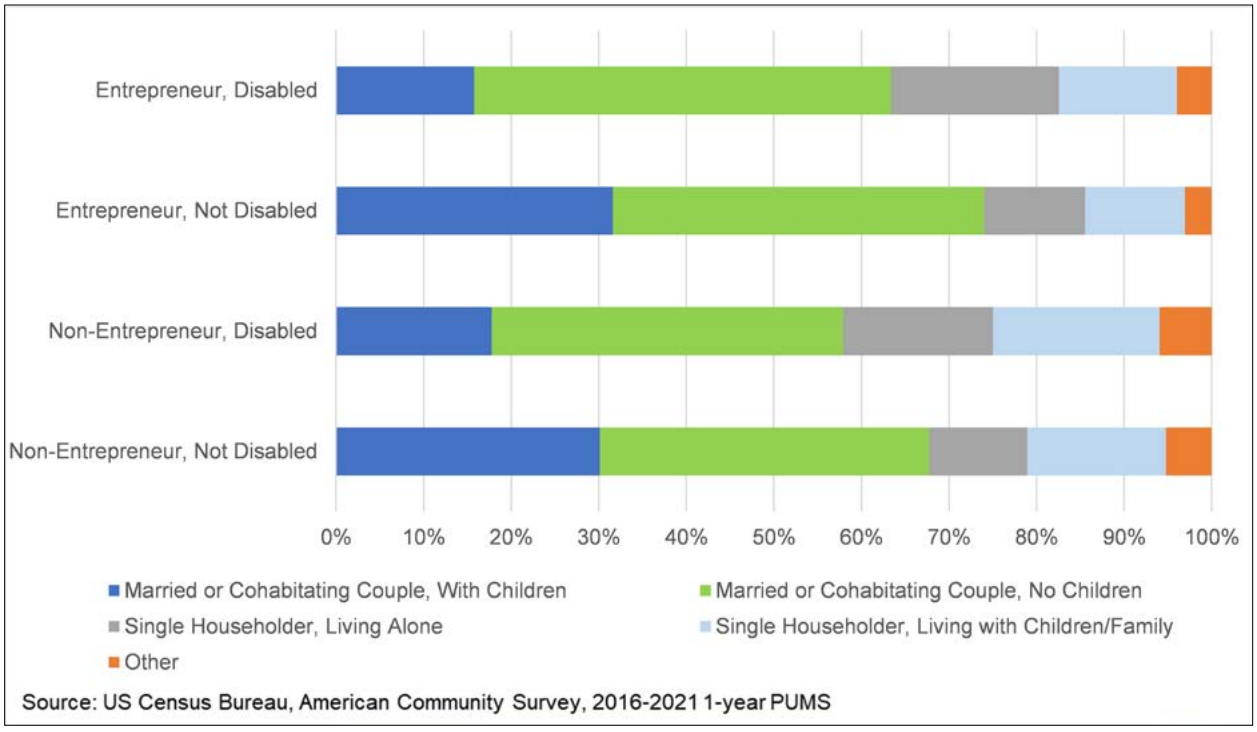
Figure 4-5 . Gender Distribution by Entrepreneurship Status Among People with Disabilities (2016-2021)

Household and family dynamics can and do influence business outcomes and operations for entrepreneurs.[42] Some individuals with disabilities may experience challenges with independent living or require supportive environments. Figure 4-6 shows the household composition distribution by entrepreneurship and disability status for the 2019-2021 period.[43] Observations include:

- Household composition among disabled entrepreneurs and non-entrepreneurs does not vary significantly. Similarly, household composition among non-disabled entrepreneurs and non-entrepreneurs does not vary significantly.

- Individuals with disabilities, regardless of entrepreneurship status, are less likely than their non-disabled counterparts to reside in a coupled setting with children. Further, individuals with disabilities are more likely than their non-disabled counterparts to reside as a single householder, either alone or with children and family (but no partner).

Figure 4-6. Household Status by Entrepreneurship and Disability Status, 2019-2021 Average



42 Broming, Emma J. and Rebecca L. Upton. "An Investigation of Women Business Owners, Industry Concentration, and Family Composition." United States Government, Office of Advocacy, Small Business Administration.

43 In 2019, the Census Bureau changed the survey instrument question. As a result, data from prior years are not directly comparable.

An important group of members of the labor force with disabilities are veterans, both service-disabled and otherwise disabled. According to the U.S. Bureau of Labor Statistics,[44] 26 percent of veterans had a service-connected disability. To that end, examining the intersection of entrepreneurship, disability, and veteran status is germane. Figure 4-7 shows the percentage of veterans that are entrepreneurs and non-entrepreneurs separated by disability status. Approximately 14 percent of entrepreneurs with disabilities were veterans in 2016 and that number shrunk to under 11 percent in 2021.[45] Overall, the data show a general trend in declining veteran labor force participation, either as entrepreneurs or non-entrepreneurs.

Figure 4-7. Veteran Status by Disability and Entrepreneurship Status

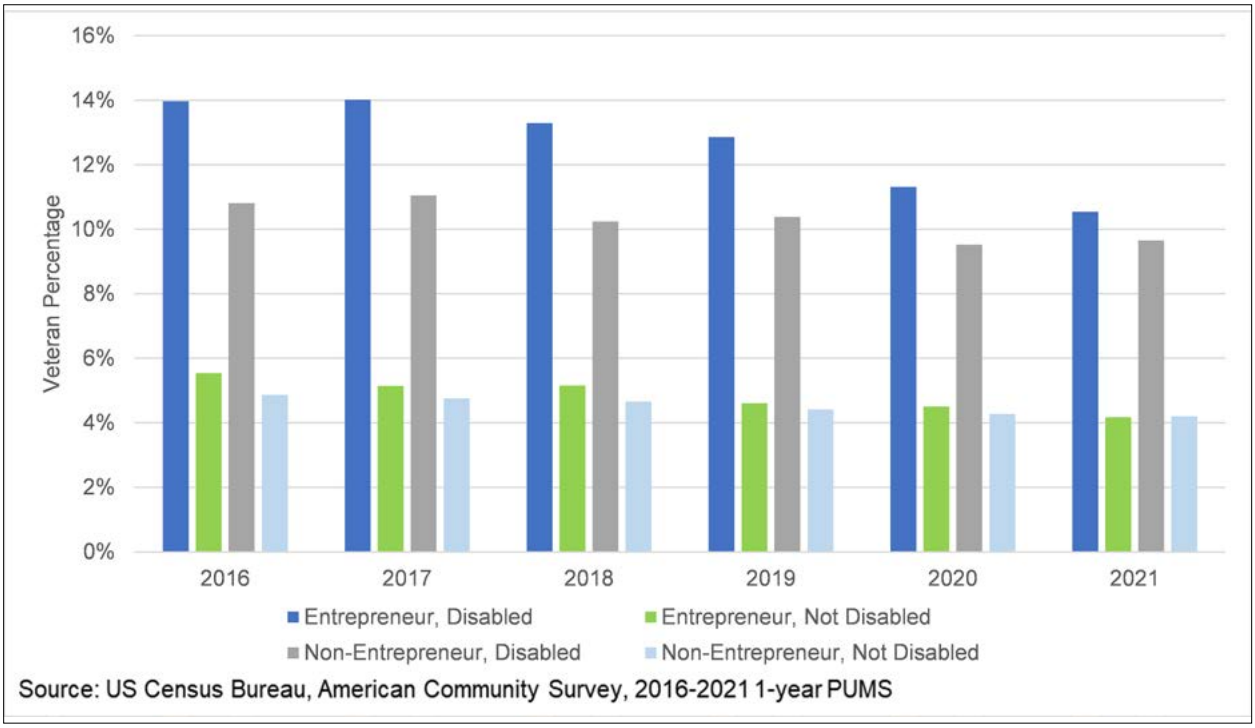
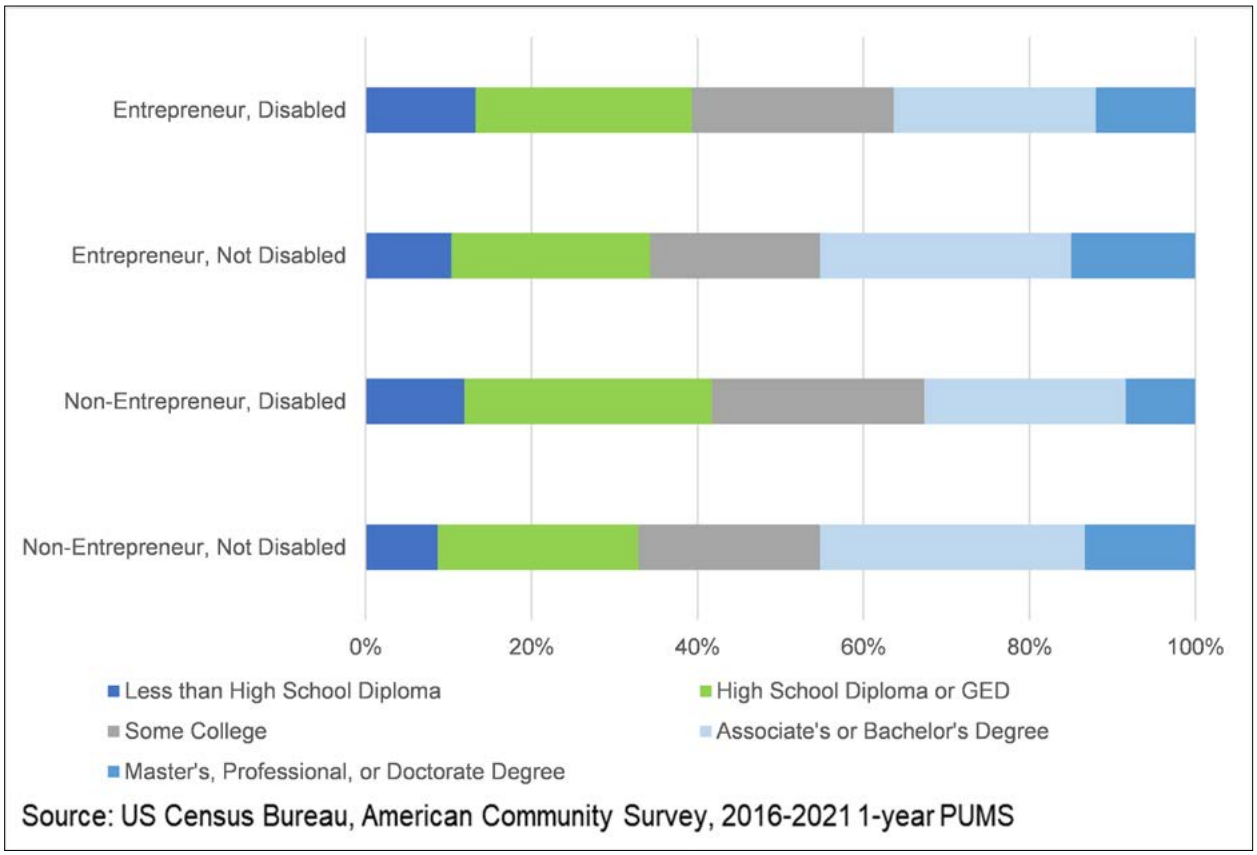


Figure 4-8 shows the average educational attainment for business owners and non-business owners by disability status for 2016 through 2021. As shown, non-disabled entrepreneurs and non-entrepreneurs are more likely than their counterparts with disabilities to have a college degree or higher. Individuals with disabilities were more likely than individuals who did not report disabilities to have a high school diploma or GED. Overall, few differences in educational attainment exist between entrepreneurs and non-entrepreneurs.

[44] https://www.bls.gov/opub/ted/2021/veterans-with-a-service-connected-disability-much-more-likely-to-work-for-the-federal-government.htm

[45] There were no notable differences across years in the analysis.

Figure 4-8. Educational Attainment by Entrepreneurship and Disability Status



Business Dynamics

Central to this research is the exploration of factors that contributed to the average decline in income for entrepreneurs with disabilities from 2019 to 2020 coincident with the COVID-19 pandemic. As noted in the literature review, entrepreneurship and its inherent flexibility and autonomy may present opportunities for individuals with disabilities to achieve economic self-sufficiency outside of the traditional labor market while addressing their individual needs and goals. This section explores trends related to business operations and labor dynamics that can influence individual earnings.

An individual's disability status may influence the time spent on employment activities, entrepreneurship or otherwise. Table 4-2 contains the distribution for weeks worked per year by disability status and business ownership for each year. Key findings include:

- Business owners both with and without disabilities work fewer weeks per year on average than their non-business owner, traditional wage worker counterparts. This is not surprising given the literature on business owner autonomy and flexibility discussed previously. However, time spent on the

business can influence earnings, a key point when evaluating the hypotheses of interest in this research.

- Business owners with disabilities and non-business owners with disabilities work fewer weeks per year than their counterparts without disabilities. Further, business owners with disabilities work fewer weeks per year than their counterparts in traditional workplace employment.

- Over time, the distribution of weeks worked has shifted to fewer weeks for entrepreneurs with and without disabilities but has remained relatively consistent for non-business owners.

Table 4-2. Weeks Worked per Year Distribution by Entrepreneurship and Disability Status

	Business Owners with Disabilities						Business Owners without Disabilities					
Weeks	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
48-52 Weeks	68.5%	68.9%	68.6%	71.8%	66.1%	66.7%	79.9%	80.3%	80.8%	83.0%	76.6%	76.2%
27-47 Weeks	16.8%	16.0%	16.6%	13.9%	14.2%	12.5%	12.8%	12.5%	12.3%	9.5%	12.2%	10.8%
26 Weeks or Less	14.7%	15.2%	14.7%	14.3%	19.7%	20.9%	7.3%	7.2%	6.9%	7.6%	11.3%	13.0%

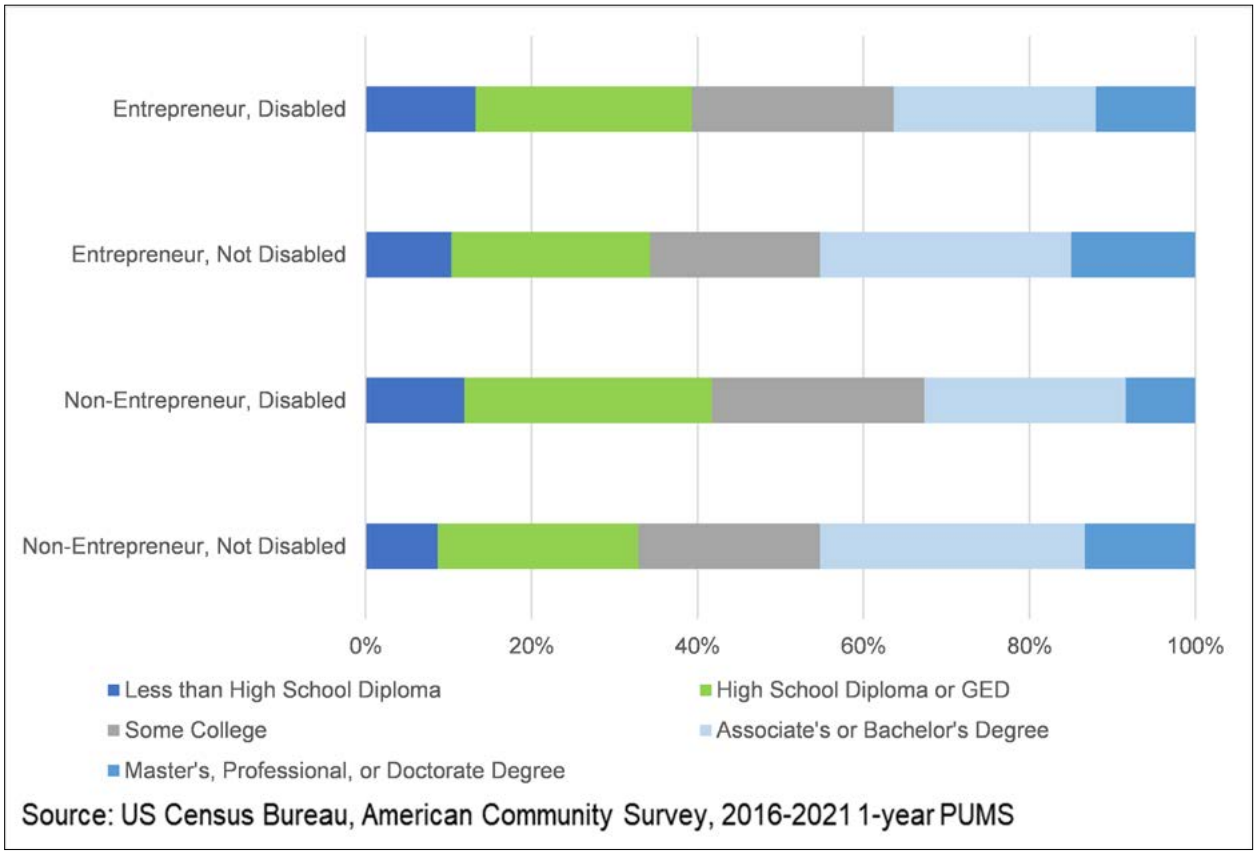
	Non-Business Owners with Disabilities						Non-Business Owners without Disabilities					
Weeks	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
48-52 Weeks	74.1%	74.8%	75.4%	77.2%	74.2%	74.1%	82.2%	82.9%	83.4%	85.1%	81.7%	81.9%
27-47 Weeks	13.6%	13.3%	13.1%	10.3%	10.9%	9.7%	10.3%	10.0%	9.8%	7.4%	8.6%	7.6%
26 Weeks or Less	12.3%	11.8%	11.6%	12.5%	15.0%	16.2%	7.5%	7.1%	6.8%	7.5%	9.7%	10.5%

Source: US Census Bureau, American Community Survey, 2016-2021 1-year PUMS

In addition to analyzing weeks worked per year, this research examines hours worked per week for both entrepreneurs and non-entrepreneurs by disability status. Figure 4-8 shows the average hours worked per week for all members of the labor force disaggregated by entrepreneurship and disability status. All differences in means in Figure 4-8 are statistically significant at the 95 percent level. The results indicate that overall, entrepreneurs work fewer hours per week on average than traditional labor force employees. Among both entrepreneurs and non-entrepreneurs, disabled individuals work fewer hours per week on average than non-disabled individuals.

A key inquiry of this research is the reason for the observed decline in average income for entrepreneurs with disabilities from 2019 to 2020 when all other groups experienced an average increase. Figure 4-8 shows that from 2019 to 2020, entrepreneurs with disabilities decreased the number of hours worked per week on average, compared to relatively small changes among all other studied groups. Combined with the information related to the health and access impacts brought on disabled individuals in general during the COVID-19 pandemic, this may explain part of the observed decline that prompted this research inquiry. Figure 3-2 indicates that entrepreneurs with disabilities are more likely to operate in high COVID-19 impact industries. What Figures 3-2 and 4-9 do not explain is the extent to which the disability status of the individual, when controlling for other factors, influences their ability to work and earn income, particularly during the COVID-19 pandemic. The multivariate analyses discussed in the next section explore this relationship.

Figure 4-8. Average Hours Worked per Week by Entrepreneurship and Disability Status



Related to the number of weeks worked per year and hours worked per week is the personal income that the business owner derives from their venture. Figure 4-9 contains the average individual earned income for entrepreneurs and non-entrepreneurs

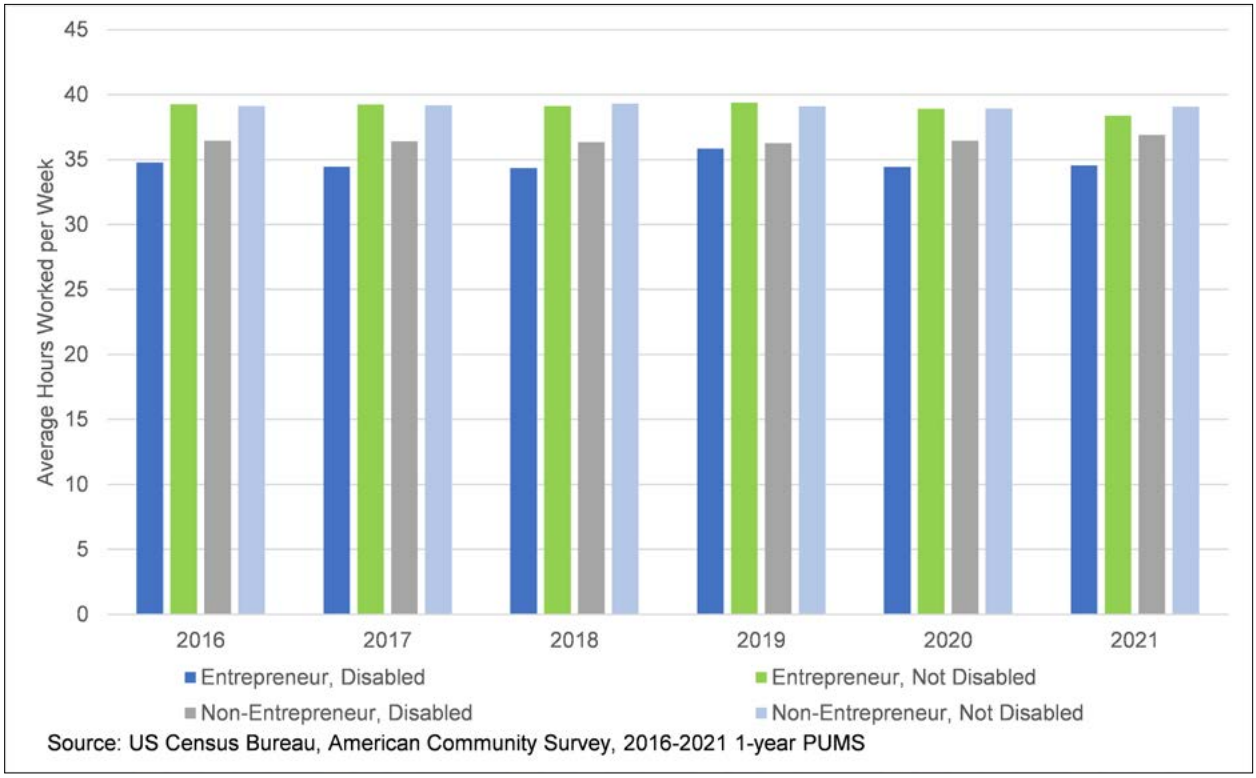
by disability status from 2016 through 2021. All differences are statistically significant at the 95 percent level. Key observations include:

- In each year, the highest average earnings are attributable to entrepreneurs without disabilities. This speaks to the economic opportunity represented by entrepreneurship, despite entrepreneurs not working the most weeks per year or hours per week.

- Disabled entrepreneurs out-earned disabled non-entrepreneurs in all studied years. In particular, on average, disabled entrepreneurs earn 14 percent more than their traditional wage work counterparts. Considering the number of weeks worked per year and hours worked per week, disabled entrepreneurs significantly out-earn disabled non-entrepreneurs on a temporal basis.

- Earnings growth for disabled entrepreneurs trails the earnings growth of all other groups shown. From 2016 to 2021, disabled entrepreneur income grew by approximately 9 percent, compared to 12 percent for disabled wage workers. Further, disabled individuals experienced depressed income growth relative to non-disabled individuals from 2016 through 2021 as wage worker income for entrepreneurs and non-entrepreneurs increased approximately 20 percent and 17 percent, respectively, during the same period.

Figure 4-9. Average Earned Income Over Time by Disability and Entrepreneurship Status



The industry in which individuals work or start businesses has implications for the economic opportunities available for the individual. Table 4-3 shows the 5 most popular industries for entrepreneurs and wage workers by disability status. As shown, there are few industry differences among wage workers with and without disabilities. Though the order of the top 5 industries is not identical, the industries that comprise the top 5 are. Among entrepreneurs, a similar trend exists. While disabilities can influence the accommodations or nature of work suitable for a particular individual, this suggests that industry itself is not an explanatory factor for the wage differences observed.

Table 4-3. Top 5 Industries by Disability and Entrepreneurship Status

Wage Workers without Disabilities

Industry Code	Description	% of Group
7860	Elementary and secondary schools	6.5%
0770	Construction (the cleaning of buildings and dwellings is incidental during construction and immediately after construction)	6.0%
8680	Restaurants and other food services	5.9%
8191	General medical and surgical hospitals, and specialty (except psychiatric and substance abuse) hospitals	5.1%
7870	Colleges, universities, and professional schools, including junior colleges	3.0%

Wage Workers with Disabilities

Industry Code	Description	% of Group
8680	Restaurants and other food services	6.9%
0770	Construction (the cleaning of buildings and dwellings is incidental during construction and immediately after construction)	5.2%
7860	Elementary and secondary schools	5.2%
8191	General medical and surgical hospitals, and specialty (except psychiatric and substance abuse) hospitals	4.0%
7870	Colleges, universities, and professional schools, including junior colleges	2.8%

Entrepreneurs without Disabilities

Industry Code	Description	% of Group
0770	Construction (the cleaning of buildings and dwellings is incidental during construction and immediately after construction)	15.7%
7071	Lessors of real estate, and offices of real estate agents and brokers	4.4%
7390	Management, scientific, and technical consulting services	3.3%
8680	Restaurants and other food services	3.1%
7690	Services to buildings and dwellings (except cleaning during construction and immediately after construction)	3.1%

Entrepreneurs with Disabilities

Industry Code	Description	% of Group
0770	Construction (the cleaning of buildings and dwellings is incidental during construction and immediately after construction)	15.3%
7071	Lessors of real estate, and offices of real estate agents and brokers	4.1%
7690	Services to buildings and dwellings (except cleaning during construction and immediately after construction)	3.1%
7770	Landscaping services	3.1%
8680	Restaurants and other food services	2.9%

Source: US Census Bureau, American Community Survey, 2021 1-Year PUMS

Multivariate Results

Hypotheses 1 and 2 examine the potential relationship between disability status and the earnings of an individual compared to the prior year, postulating that disability status negatively influences growth in earnings relative to the average. It asks the question, does having a disability negatively impact the earnings growth of entrepreneurs? If so, how does this differ from the impact of disability status on non-entrepreneurs? Tables 4-4 and 4-5 contain results from a logistic regression of the factors that contribute to whether the individual's income was higher or lower than the prior year average. In these regressions, the dependent variable is calculated using the ratio of the reported earned income to the average income for the prior year for the evaluated population. Each table contains the results of five separate regressions run for entrepreneurs, non-entrepreneurs, individuals with disabilities, individuals without disabilities, and entrepreneurs with disabilities. This permits comparison across multiple categories.

The results show that for entrepreneurs and non-entrepreneurs, having a disability is negatively associated with income achievement relative to the prior year average. Further, among disabled individuals, entrepreneurship is negatively associated with the dependent variable, increased earnings, in both 2020 and 2021. However, in 2021, there is no statistically significant relationship between entrepreneurship and the dependent variable among non-disabled individuals. There are multiple potential theories to explain these results. It is possible that individuals with disabilities face constraints beyond ability that include discrimination and pervasive negative attitudes related to their capabilities in the work force. This confirms Hypothesis 1, that among entrepreneurs, having a disability negatively influences earnings when controlling for other factors.

The same models were used to test Hypothesis 2, that operating in an industry heavily influenced by the COVID-19 pandemic contributed to the observed decline in average income among entrepreneurs with disabilities from 2019 to 2020. The variable "High PPP Industry" is used as a proxy for operating or working in an industry highly impacted by COVID-19. In both 2020 and 2021, operating in a high PPP industry was negatively associated with the dependent variable for entrepreneurs, non-entrepreneurs, disabled individuals, and non-disabled individuals. Interestingly, when tested on the subcategory of entrepreneurs with disabilities, the coefficient was not statistically significant in either year. One explanation for this is that entrepreneurs with disabilities were less likely to operate in such industries as a result of their disabilities – that is, disabled entrepreneurs chose industries less likely to be affected by the COVID-19 pandemic, not because they knew a pandemic was on the horizon, but because they are the industries best suited to the skillsets and needs of entrepreneurs with disabilities.

While the models support acceptance of Hypothesis 1 and Hypothesis 2, the model results for 2020 and 2021 presented in Tables 4-4 and 4-5 provide helpful information

regarding factors that influence the earned income of labor force participants from 2019 to 2020 and 2020 to 2021 via control variables. Key findings include:

- Across all models presented, higher education positively influences income. The positive and statistically significant coefficients on the education variables indicate that education is an important variable in predicting income changes relative to the prior year average.

- Veteran status was a negative predictor for obtaining an increased income relative to the prior year average for entrepreneurs. The opposite was true for non-entrepreneurs. Further, veteran status was positively associated with the dependent variable among both disabled and non-disabled individuals. Additional information about why veteran entrepreneurs were more likely to experience depressed earned income relative to the prior year average, versus those in the traditional workforce, is necessary.

- The positive and statistically significant coefficients on the senior citizen – age 65 plus variable indicate that being age 65 or higher among entrepreneurs in 2021 and both entrepreneurs and non-entrepreneurs in 2021 was positively associated with achieving an earned income equal to or greater than the prior year average. Further, the variable was positive and statistically significant in the subcategory of disabled entrepreneurs. There are multiple hypotheses to explain this result, including the increased experience associated with age. This result lends support to the economic movement of the Baby Boomer generation towards entrepreneurship.

- Being a woman was negatively associated with increased earned income across all categories of entrepreneurs and disability status. This comports with the large body of prior research on the topic and supports the need for additional resources to address gaps facing women in the workforce.

- Operating in an urban area was negatively associated with increased earned income relative to the prior year average. This result is not surprising considering the cost-of-living differences across urban and rural communities in the United States and does not suggest that individuals with disabilities should move to urban areas to improve their economic outcomes.

- The coefficients on the “partnered” variable support the notion that residing in a household with a partner, either married or not married, is positively associated with income. Of particular interest, there was no relationship between the presence or number of children in a household and income among entrepreneurs with disabilities.

- Prior research indicates that race and ethnicity influence access to capital among entrepreneurs. The tables indicate that while race and ethnicity are statistically significant predictor variables across other entrepreneurship and disability statuses, among the subset of entrepreneurs with disabilities, the coefficients on the race and ethnicity variables are not statistically significant. Important is the fact that the coefficients on the Minority Race, Black, and Hispanic variables are negative and statistically significant for entrepreneurs, non-entrepreneurs, and across disability status, indicating a negative association with membership in one of the listed groups and the outcome variable. However, the sign on the coefficient for the Asian variable changes depending on the model considered. For example, being Asian is negatively associated with the income dependent variable among entrepreneurs, but among non-entrepreneurs and those with and without disabilities, the positive statistically significant coefficients on the Asian variable indicate a positive association between being Asian and a higher earned income as measured by the dependent variable. While this research does not focus exclusively on race and ethnicity, it is important to recognize that minority groups are not homogenous and different policies and support programs may be required for different groups to bridge the gap in observed economic outcomes.

- The coefficients on the time spent working variables, modeled using both hours worked per week and weeks worked per year, were positive and statistically significant in all models for all categories. While it is an intuitive result, it provides theoretical purchase to the idea that reduced time spent on the business among entrepreneurs with disabilities contributed to the observed decline in average income from 2019 to 2020.

Table 4-4. Hypothesis Testing Results – 2020

Demographic	Entrepreneurs Coefficient	Non-Entrepreneurs Coefficient	Disabled Coefficient	Not Disabled Coefficient	Disabled Entrepreneurs Coefficient
Entrepreneur	N/A	N/A	-0.2692***	-0.3307	N/A
Disabled	-0.3229***	-0.2767***	N/A	N/A	N/A
High PPP Industry	-0.0858**	-0.4839***	-0.4567***	-0.4610***	-0.0001
Veteran	-0.0073***	0.2656***	0.1811***	0.2537***	-0.0512
Woman	-0.7033***	-0.6131***	-0.5897***	-0.6222***	-0.6584
Senior - Age 65 Plus	-0.0004	0.0670***	0.0194	0.0645***	0.1689
Minority Race	-0.2101***	-0.2362***	-0.2822***	-0.2302***	-0.2876
Black	-0.5567***	-0.4367***	-0.1288*	-0.4635***	-0.1664
Asian	-0.2758***	0.1438***	0.2770***	0.0911***	-0.0093
Hispanic	-0.5237***	-0.4812***	-0.2501***	-0.4956***	-0.0275
Education - High School Diploma	0.3130***	0.5666***	0.3790***	0.5391***	0.1639
Education - Associate's/ Bachelor's Degree	0.6205***	1.0770***	0.8275***	1.0470***	0.5501
Education - Master's Degree or Higher	0.7741***	1.0192***	0.8928***	1.0015***	0.6978
Urban Area	0.3720***	0.3714***	0.2915***	0.3787***	0.2562
Population Density	0.0651***	0.1350***	0.1114***	0.1267***	0.0378
Health Coverage	0.5223***	1.1035***	0.8125***	1.0013***	0.5029
Partnered	0.2647***	0.2102***	0.2704***	0.2096***	0.2875
Number of Children	0.0470***	0.0184***	-0.0228	0.0233***	0.0033
Children Present	0.0555	0.4573***	0.3266***	0.4217***	0.0853
Hours Worked per Week	0.0367***	0.0699***	0.0583***	0.0636***	0.0365
Weeks Worked per Year	0.0422***	0.0589***	0.0570***	0.0564***	0.0438
Constant	-5.6466***	-8.8677***	-7.8774***	-8.3129***	-5.8313
Count	***108,748***	***930,255***	***66,088***	***972,915***	***8,107***

Source: U.S. Census Bureau, American Community Survey 2020 PUMS

Note: ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively

Table 4-5. Hypothesis Testing Results – 2021

Demographic	Entrepreneurs Coefficient	Non-Entrepreneurs Coefficient	Disabled Coefficient	Not Disabled Coefficient	Disabled Entrepreneurs Coefficient
Entrepreneur	N/A	N/A	-0.2706***	-0.2755***	N/A
Disabled	-0.3380***	-0.2806***	N/A	N/A	N/A
High PPP Industry	-0.0819***	-0.4801***	-0.4604***	-0.4559***	-0.1147
Veteran	-0.1209***	0.2756***	0.2261***	0.2421***	-0.0146
Woman	-0.7415***	-0.6335***	-0.6574***	-0.6388***	-0.6809
Senior - Age 65 Plus	0.0815***	0.0851***	0.0457	0.0914	0.2350
Minority Race	-0.2715***	-0.2499***	-0.2353***	-0.2533***	-0.1347
Black	-0.3692***	-0.3745***	-0.1926***	-0.3839***	-0.3331
Asian	-0.0867*	0.2199***	0.1777***	0.1895***	0.0628
Hispanic	-0.4186***	-0.4388***	-0.2929***	-0.4422***	-0.1239
Education - High School Diploma	0.4585***	0.5677***	0.4400***	0.5586***	0.3513
Education - Associate's/ Bachelor's Degree	0.6210***	1.1069***	0.9242***	1.0705***	0.4201
Education - Master's Degree or Higher	0.8089***	0.9973***	0.8484***	0.9886***	0.8147
Urban Area	0.4201***	0.3603***	0.3708***	0.3701***	0.4958
Population Density	0.0571***	0.1491***	0.0955***	0.1409***	-0.0013
Health Coverage	0.4589***	1.0535***	0.9494***	0.9387***	0.4647
Partnered	0.2355***	0.2133***	0.2482***	0.2108***	0.3884
Number of Children	0.0423***	0.0189***	0.0362*	0.0203***	-0.0281
Children Present	0.1337***	0.4415***	0.2626***	0.4210***	0.1132
Hours Worked per Week	0.0365***	0.0655***	0.0545***	0.0603***	0.0348
Weeks Worked per Year	0.0454***	0.0630***	0.0587***	0.0605***	0.0429
Constant	-5.9179***	-8.9268***	-8.0655***	-8.4228***	-5.9986
Count	***136,631***	***1,155,082***	***87,279***	***1,204,434***	***10,619***

Source: U.S. Census Bureau, American Community Survey 2020 PUMS

Note: ***, **, and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively

Conclusions

This research examines the often-overlooked group of small business owners with disabilities and probes the role of disability status in small business owner earnings amid the COVID-19 pandemic. Work to explore the complex and interrelated factors that affect the economic performance of small business owners and individuals with disabilities is only becoming more relevant as the size of these groups steadily increases. Business ownership remains on the rise – in 2020, over 500,000 new non-corporation business applications were submitted, a 10 percent increase over 2019.[46] Additionally, the COVID-19 pandemic was a mass disabling event that led to an increase in nearly 1.2 million disabled individuals.[47] While past research has explored entrepreneurship as a vehicle for economic opportunity specifically for individuals with disabilities, limited recent quantitative and qualitative studies exist – indeed, the data used in this work only became available during late 2022. To date, little work in the literature has probed the relationship between business earnings, disability status, and industry, including those industries most affected by the COVID-19 pandemic.

From 2019 to 2020, business owners with disabilities experienced a decline in average income, a departure from the observed results for business owners without disabilities and wage workers, regardless of disability status. Using American Community Survey (ACS) Public Use Microdata (PUMS), this research develops a demographic profile of entrepreneurs with disabilities and tests the hypotheses that both industry and disability status influence the observed decline in earned income for entrepreneurs with disabilities. The econometric work examining contributory factors builds upon the quantitative demographic profile presented.

This work develops a time-series profile of entrepreneurs with disabilities and offers helpful comparative statistics with entrepreneurs without disabilities and wage workers with disabilities. Using descriptive statistics, cross tabulation analyses, and statistical difference in means testing (t-test), this research provides insights regarding the who and what of entrepreneurship among individuals with disabilities.

Key findings:

- *Participation in entrepreneurship.* Individuals with disabilities participate in entrepreneurship at a higher rate than their non-disabled counterparts. Multiple hypotheses exist to support this finding, including the potential

[46] US Census Bureau, Business Formation Statistics. Historical Quarterly Data. 2022. https://www.census.gov/econ/bfs/data.html

[47] US Bureau of Labor Statistics. Labor Force Statistics from the Current Population Survey. 2022. https://www.bls.gov/webapps/legacy/cpsatab6.htm

suitability of entrepreneurship among individuals with disabilities due to its inherent flexibility and autonomy.

- Differences in industry participation. In all years studied and regardless of disability status, traditional wage workers were approximately twice as likely as entrepreneurs to operate in an industry that experienced a high impact from COVID-19. Further, entrepreneurs with disabilities were more likely than entrepreneurs without disabilities to operate in high COVID-19 impact industries.

- Findings related to race and ethnicity. Across time and entrepreneurship status, individuals with disabilities are a less racially and ethnically diverse sub-group than the group of people without disabilities.

- Trends by age. Individuals with disabilities are more than twice as likely to continue working past age 65 than their non-disabled counterparts, whether as entrepreneurs or in traditional wage employment. Indeed, when examining individuals in the workforce aged 65 or higher, entrepreneurship with disabilities comprised more than twice the share of entrepreneurs without disabilities, wage workers with disabilities, and wage workers without disabilities. Considering the growing need for Americans to continue to work past age 65, additional work is required to develop strategies and policies to assist this small business demographic.

- Veteran participation in entrepreneurship. In 2016, approximately 14 percent of entrepreneurs with disabilities were veterans of the U.S. Armed Forces. That share decreased to under 11 percent in 2021 as part of a general trend in declining veteran labor force participation among both entrepreneurs and non-entrepreneurs.

- Trends in time spent working on the business. Business owners both with and without disabilities work fewer weeks per year, on average, than their traditional wage worker counterparts. Further, entrepreneurs and non-entrepreneurs with disabilities work fewer weeks per year than their traditional wage worker counterparts. Additionally, entrepreneurs work fewer hours per week on average than traditional labor force employees. Similar to weeks worked per year, individuals with disabilities work fewer hours on average than individuals without disabilities.

- Differences in earnings. On average, entrepreneurs with disabilities earn 14 percent more than their traditional wage work counterparts. Coupled with the findings on time spent working on the business, this supports the finding that entrepreneurs with disabilities significantly out-earn non-entrepreneurs

with disabilities on a temporal basis. However, over time, earnings growth for entrepreneurs with disabilities trails that of wage workers with disabilities and workforce participants without disabilities.

Many of the demographic findings highlighted above raise, rather than answer, questions germane to developing and deploying programs and policies to facilitate entrepreneurship among individuals with disabilities. This research tested two hypotheses related to the factors that contributed to the observed decline in earnings among entrepreneurs with disabilities from 2019 to 2020. Hypotheses include:

Hypothesis 1: The negative economic impacts of the COVID-19 pandemic were augmented for disabled business owners. That is, disabled business owners experienced a decrease in their 2020 annual income relative to the average 2019 income as a result of being disabled, when controlling for other factors.

Hypothesis 2: Concentration in service-based, customer-facing industries that were disproportionately impacted by the COVID-19 pandemic contributed to the decline in income observed for disabled small business owners related to all other wage groups from 2019 to 2020.

Hypothesis testing with multivariate regression models indicates supports acceptance of Hypothesis 1 and Hypothesis 2. Key findings include:

- Among entrepreneurs and non-entrepreneurs, having a disability is negatively associated with income achievement relative to the prior year average. Further, among individuals with disabilities, entrepreneurship is negatively associated with the dependent variable, increased earnings, in both 2020 and 2021. However, in 2021, there is no statistically significant relationship between entrepreneurship and the dependent variable among non-disabled individuals. It is possible that disabled individuals face constraints beyond ability that include discrimination and pervasive negative attitudes related to their capabilities in the work force during and immediately after the COVID-19 pandemic.

- In both 2020 and 2021, operating in a high PPP industry was negatively associated with the dependent variable for entrepreneurs, non-entrepreneurs, individuals with disabilities, and individuals without disabilities. Among entrepreneurs, the negative coefficients on the high PPP industry variable were smaller than those for non-entrepreneurs, suggesting a higher impact for wage workers compared to entrepreneurs. It is possible that this phenomenon is a byproduct of the flexibility inherent in entrepreneurship versus wage workers who may have less flexibility in how, when, or where they work, relatively speaking.

An understanding of the factors that contribute to sub-optimal economic outcomes among individuals with disabilities, particularly entrepreneurs, is essential. Policymakers, stakeholders, and individuals with disabilities must work in tandem to establish relevant best practices to support future success. Given the rise in Americans working past age 65, as well as the increase in disabled Americans as a direct result of the COVID-19 pandemic, developing novel policy and programmatic ideas is critical to maintaining a well-functioning and economically efficient workforce. The results of this research suggest that disability is a significant contributing demographic variable to observed differences in economic outcomes.

Building upon the demographic profile of entrepreneurs by disability status presented herein, this research provides policymakers and resource partners with data necessary to develop action items to encourage and enhance entrepreneurship among individuals with disabilities. This work serves as a springboard for additional studies, both quantitative and qualitative, examining entrepreneurship among individuals with disabilities, the economic opportunities therein, and what policies can promote economic success and equity for all small business owners. Additional work remains to understand the experiences of entrepreneurs with disabilities to develop policies and structural support systems to promote their business success.