

DISCUSSION PAPER SERIES

IZA DP No. 13266

**The Distributional Impacts of Early  
Employment Losses from COVID-19**

Seung Jin Cho  
John V. Winters

MAY 2020

## DISCUSSION PAPER SERIES

IZA DP No. 13266

# The Distributional Impacts of Early Employment Losses from COVID-19

**Seung Jin Cho**

*Iowa State University*

**John V. Winters**

*Iowa State University, CARD, PSMME and IZA*

MAY 2020

Any opinions expressed in this paper are those of the author(s) and not those of IZA. Research published in this series may include views on policy, but IZA takes no institutional policy positions. The IZA research network is committed to the IZA Guiding Principles of Research Integrity.

The IZA Institute of Labor Economics is an independent economic research institute that conducts research in labor economics and offers evidence-based policy advice on labor market issues. Supported by the Deutsche Post Foundation, IZA runs the world's largest network of economists, whose research aims to provide answers to the global labor market challenges of our time. Our key objective is to build bridges between academic research, policymakers and society.

IZA Discussion Papers often represent preliminary work and are circulated to encourage discussion. Citation of such a paper should account for its provisional character. A revised version may be available directly from the author.

ISSN: 2365-9793

**IZA – Institute of Labor Economics**

Schaumburg-Lippe-Straße 5–9  
53113 Bonn, Germany

Phone: +49-228-3894-0  
Email: [publications@iza.org](mailto:publications@iza.org)

[www.iza.org](http://www.iza.org)

## ABSTRACT

---

# The Distributional Impacts of Early Employment Losses from COVID-19\*

COVID-19 substantially decreased employment, but the effects vary among demographic and socioeconomic groups. We document the employment losses in April 2020 across various groups using the U.S. Current Population Survey. The unemployment rate understates employment losses. We focus on the percentage of the civilian population that is employed and at work. Young persons experienced the largest employment losses. Individuals with less education and lower family income experienced much larger employment losses than their more educated and higher income counterparts. Hispanics and blacks were more adversely affected than whites.

**JEL Classification:** J10, J20

**Keywords:** COVID-19, coronavirus, pandemic, employment, job losses

**Corresponding author:**

John V. Winters  
Iowa State University  
Department of Economics  
460B Heady Hall  
518 Farm House Lane, Ames  
Iowa 50011-1054  
USA

E-mail: [winters1@iastate.edu](mailto:winters1@iastate.edu)

---

\* The authors received no funding related to this work and have no conflict of interest to declare.

## 1. Introduction

COVID-19 has disrupted the global economy and had devastating effects on employment due to mandatory closings of non-essential businesses, voluntary shut-downs, and reduced consumer demand. The economic pain is widespread but not equally spread. Some workers have been severely harmed by mass layoffs while others have shifted to work from home while still earning their regular salary. These effects vary systematically with individual demographic and socioeconomic characteristics. The United States Bureau of Labor Statistics (BLS) reports that the national unemployment rate rose to 14.7 percent in April 2020, the highest on record since the BLS unemployment measure began in 1948 (BLS 2020). However, the April 2020 unemployment rate was even higher for teenagers (31.9 percent), high school dropouts (20.9 percent), blacks (16.7 percent), and Hispanics (18.9 percent), consistent with higher unemployment rates for disadvantaged groups during prior recessions (Hoynes et al. 2012).

While the unemployment rate is a well-publicized measure, it has well-known shortcomings including its exclusion of discouraged workers and others who would like to work but are not currently working or looking for work (Jones and Riddell 1999; Feng and Hu 2013). There was also a substantial rise in April 2020 of individuals reporting they have a job but were absent from work during the reference week, further complicating interpretation of the unemployment rate. BLS (2020) indicates that “persons absent from work due to coronavirus-related business closures [should] be classified as unemployed on temporary layoff. However, it is apparent that not all such workers were so classified” (p. 5). Despite this apparent measurement error, “according to usual practice, the data from the household survey are accepted as recorded” in BLS official reports and rates (BLS 2020, pp. 5-6). The unemployment rate, thus, understates job losses from COVID-19, and this understatement varies across groups.

This paper documents the early impacts of COVID-19 on employment losses across various groups using individual-level data from the Current Population Survey (CPS) obtained from IPUMS (Flood et al. 2020). We compute the percentage of the civilian population that is employed and at work during the reference work. Persons are classified as employed at work if they did any work during the week for pay or profit or at least 15 hours of unpaid work for a family business. This includes persons working from home. Our approach is conceptually similar to the employment-population ratio but accounts for the exceptional increase in persons with a job but absent from work during the pandemic.

## **2. Empirical Analysis**

Our full sample includes all civilians age 16 and older in the January – April monthly CPS for 2019 and 2020. Our analysis uses CPS survey weights. Table 1 reports employment at work rates for each of the eight months for the full sample in Panel A and for various sub-samples in Panels B-F. Among the eight months in Table 1, the employment at work rate for the full sample reached a peak of 59.3 percent in February 2020. The rate fell to 57.3 percent for March 2020 and then plummeted to 47.0 percent for April. The large decrease in employment at work rates was widespread across groups by income, education, age, race/ethnicity, and gender.<sup>1</sup> Every group we examined had severe employment losses.

Table 2 reports year-over-year changes for January, February, March, and April in Columns 1-4 with heteroscedasticity-robust standard errors estimated by linear regression. Notably, 2020 started off strong. The January 2020 employment at work rate for the full sample

---

<sup>1</sup> Family income is reported for the previous 12 months. We use the longitudinal nature of the CPS to measure family income based on the response during the previous survey month, so that it is not directly affected by contemporaneous employment. The income sub-samples thus exclude individuals in their first month of the survey.

exceeded that for January 2019 by 0.6 percentage points with the difference statistically significant at the five percent level; various sub-samples also had statistically significant increases during this period including individuals in high and low income households. February had a 0.3 percentage point increase from 2019 to 2020 for the full sample that was not statistically significant. The employment at work rate decreased by 1.4 percentage points from March 2019 to March 2020. Between April 2019 and April 2020, the full sample rate fell by 12.2 percentage points.

The simple year-over-year changes for March and April do not account for the strong economic conditions at the start of 2020 that we would expect to have continued in the absence of COVID-19 disruptions. Similarly, just making comparisons to January or February 2020 could be affected by seasonality. Our preferred approach to estimate the impact of COVID-19 on employment at work rates is to utilize a difference-in-differences (DID) research design. Specifically, we assume that the January 2020 employment at work rate was unaffected by COVID-19 and that the year-over-year difference for January would also have occurred for subsequent months in the absence of COVID-19. Thus, we define the counterfactual employment at work rate for April 2020 as the April 2019 rate plus the year-over-year difference for January.

Column 5 of Table 2 reports DID estimates for each sample by subtracting the year-over-year difference for January from the year-over-year difference for April. By definition, the DID estimate in Column 5 also equals the actual rate for April 2020 minus the counterfactual rate. Heteroscedasticity-robust standard errors are computed via linear regression. Column 6 converts the Column 5 DID estimates to percentage changes by dividing each DID estimate by the April 2020 counterfactual employment at work rate for the corresponding sample.

Column 5 indicates that the April 2020 employment at work rate for the full sample decreased by 12.8 percentage points relative to the DID counterfactual. Panels B and C confirm large decreases across income and education groups, but the decreases are smallest for persons with high income and high education levels. Individuals age 16-24 had the largest decrease in Column 5 across all panels; the employment at work rate for these young people decreased by 18.8 percentage points relative to the counterfactual. Hispanics and blacks had larger employment losses than whites. Small sample sizes prevent precise analysis for Native Americans and other groups, but other disadvantaged minorities were also likely especially negatively affected. Women and men had comparable decreases in employment at work rates.

Column 6 indicates a 21.5 percent employment decrease for the full sample. The Column 6 percentage decreases are even more unevenly distributed than Column 5 because the hardest hit groups in Column 5 typically had lower employment rates before the pandemic. The Column 6 percentage decrease for ages 16-24 was an astounding 37.5 percent. The Column 6 percentage decrease was 29.1 percent for high school dropouts, 27.2 percent for high school graduates, and 34.6 percent for persons with annual family income below \$40,000. These already vulnerable groups suffered severe job losses from the pandemic.

### **3. Implications**

COVID-19 has imposed startling and widespread job losses. The effects are most severe among the young, less educated, lower income, and racial/ethnic minorities. The policy community should be fully aware that already vulnerable groups have suffered the worst job losses. Policy responses should reflect these disproportionate burdens.

## References

- Bureau of Labor Statistics, 2020. The Employment Situation – April 2020. US Department of Labor News Release, [https://www.bls.gov/news.release/archives/empsit\\_05082020.pdf](https://www.bls.gov/news.release/archives/empsit_05082020.pdf), accessed May 8, 2020.
- Feng, S. and Hu, Y., 2013. Misclassification errors and the underestimation of the US unemployment rate. *American Economic Review*, 103(2), 1054-70.
- Flood, S., King, M., Rodgers, R., Ruggles, S., and Warren, J.R., 2020. Integrated Public Use Microdata Series, Current Population Survey: Version 7.0 [dataset]. Minneapolis, MN: IPUMS. <https://doi.org/10.18128/D030.V7.0>
- Hoynes, H., Miller, D.L. and Schaller, J., 2012. Who suffers during recessions? *Journal of Economic perspectives*, 26(3), 27-48.
- Jones, S.R. and Riddell, W.C., 1999. The measurement of unemployment: An empirical approach. *Econometrica*, 67(1), 147-162.



Table 1: Employment at Work Rates by Month and Group for January - April 2019-2020

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	January	February	March	April	January	February	March	April
	2019	2019	2019	2019	2020	2020	2020	2020
<u>A. Full Sample</u>	58.32	58.99	58.67	59.14	58.96	59.32	57.30	46.95
<u>B. Family Income Group (Annual Income Reported During Previous Month)</u>								
Income < 40K	39.61	40.52	40.40	41.07	40.69	40.29	38.51	27.56
40K - 75K	60.13	59.87	59.80	59.96	59.35	59.91	57.17	44.54
75K - 150K	69.48	70.09	70.07	70.40	68.53	69.14	67.82	57.23
> 150K	71.43	72.85	72.23	72.12	73.06	73.66	71.61	63.78
<u>C. Education Level (Age &gt;= 25)</u>								
No High School Diploma	41.02	40.99	41.36	42.19	41.41	41.49	40.06	30.19
High School Diploma	54.12	54.35	54.11	54.79	54.29	54.46	52.42	40.04
Some College, no Bachelor's	61.25	61.51	60.85	61.51	61.04	61.03	59.32	48.35
Bachelor's Degree or Higher	70.02	70.87	70.28	70.56	70.54	70.61	68.97	61.97
<u>D. Age Group</u>								
Ages 16-24	46.48	48.12	48.49	48.60	47.99	49.76	45.64	31.34
Ages 25-54	77.44	77.76	77.34	78.02	78.42	78.26	76.34	64.14
Ages 55-64	60.97	61.86	61.49	62.20	61.46	62.34	60.98	51.58
Ages 65 and over	18.46	19.15	18.69	18.83	19.09	19.38	18.13	14.17
<u>E. Race/Ethnicity</u>								
Hispanic	61.60	61.92	61.92	62.15	62.69	63.16	59.56	46.28
Black	56.40	56.70	56.16	57.82	56.41	56.71	54.70	43.90
Asian	59.47	60.92	59.92	59.11	59.30	60.60	58.48	46.32
White	57.82	58.46	58.22	58.64	58.41	58.67	57.11	47.85
<u>F. Gender</u>								
Female	53.20	53.90	53.11	53.63	53.94	54.36	52.11	41.63
Male	63.79	64.42	64.60	65.01	64.32	64.63	62.83	52.64

Notes: Employment at work excludes persons who report having a job but were not at work during the survey week. The full sample includes individuals age 16 and over. Panel B income groups are based on family income for the previous 12 months reported in the previous survey. White, black, and Asian groups exclude Hispanics.

Table 2: 2019-2020 Change in Employment at Work Rates by Month and Group

	(1)	(2)	(3)	(4)	(5)	(6)
	Jan. 2020 - Jan. 2019	Feb. 2020 - Feb. 2019	Mar. 2020 - Mar. 2019	Apr. 2020 - Apr. 2019	Apr. - Jan. Diff-in-Diff	Apr. - Jan. DID % Change
<b><u>A. Full Sample</u></b>	0.634* (0.255)	0.338 (0.254)	-1.369** (0.267)	-12.185** (0.271)	-12.819** (0.372)	-21.45%
<b><u>B. Family Income Group (Annual Income Reported During Previous Month)</u></b>						
Income < 40K	1.085* (0.539)	-0.224 (0.557)	-1.899** (0.572)	-13.513** (0.569)	-14.598** (0.784)	-34.63%
40K - 75K	-0.776 (0.570)	0.039 (0.592)	-2.631** (0.607)	-15.421** (0.625)	-14.645** (0.846)	-24.74%
75K - 150K	-0.953 (0.519)	-0.950 (0.533)	-2.252** (0.547)	-13.167** (0.573)	-12.215** (0.773)	-17.59%
> 150K	1.631* (0.694)	0.804 (0.710)	-0.622 (0.734)	-8.337** (0.773)	-9.968** (1.039)	-13.52%
<b><u>C. Education Level (Age &gt;= 25)</u></b>						
No High School Diploma	0.390 (0.900)	0.498 (0.911)	-1.302 (0.954)	-11.996** (0.939)	-12.387** (1.301)	-29.09%
High School Diploma	0.166 (0.521)	0.103 (0.519)	-1.689** (0.543)	-14.758** (0.547)	-14.924** (0.755)	-27.15%
Some College, no Bachelor's	-0.203 (0.524)	-0.480 (0.525)	-1.524** (0.550)	-13.156** (0.561)	-12.953** (0.768)	-21.13%
Bachelor's Degree or Higher	0.516 (0.417)	-0.257 (0.414)	-1.307** (0.435)	-8.592** (0.452)	-9.108** (0.615)	-12.81%
<b><u>D. Age Group</u></b>						
Ages 16-24	1.506** (0.723)	1.637** (0.722)	-2.854** (0.758)	-17.258** (0.737)	-18.765** (1.032)	-37.45%
Ages 25-54	0.976** (0.315)	0.501** (0.316)	-1.003** (0.337)	-13.873** (0.366)	-14.849** (0.483)	-18.80%
Ages 55-64	0.489** (0.602)	0.481** (0.597)	-0.511** (0.623)	-10.618** (0.638)	-11.107** (0.877)	-17.72%
Ages 65 and over	0.630** (0.420)	0.233** (0.425)	-0.561** (0.430)	-4.656** (0.409)	-5.285** (0.587)	-27.17%
<b><u>E. Race/Ethnicity</u></b>						
Hispanic	1.083 (0.653)	1.245 (0.651)	-2.364** (0.697)	-15.865** (0.715)	-16.948** (0.969)	-26.80%
Black	0.012 (0.827)	0.011 (0.829)	-1.459 (0.868)	-13.917** (0.878)	-13.929** (1.206)	-24.09%
Asian	-0.173 (1.067)	-0.318 (1.051)	-1.446 (1.105)	-12.798** (1.121)	-12.625** (1.548)	-21.42%
White	0.588 (0.307)	0.209 (0.307)	-1.114** (0.319)	-10.792** (0.324)	-11.380** (0.446)	-19.21%
<b><u>F. Gender</u></b>						
Female	0.737* (0.359)	0.459 (0.358)	-0.999** (0.373)	-12.007** (0.374)	-12.744** (0.518)	-23.44%
Male	0.524 (0.357)	0.207 (0.357)	-1.765** (0.375)	-12.376** (0.387)	-12.899** (0.527)	-19.68%

Notes: Standard errors in parentheses are robust to heteroscedasticity. The Apr. - Jan. DID % change in Column (6) is computed by dividing the DID estimate in Column (5) by the estimated counterfactual employment at work rate for April 2020; this counterfactual is defined as the April 2019 rate plus the year-over-year difference for January.

\*Significantly different from zero at 5% level; \*\* Significant at 1% level.