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Mobility during COVID-19 by Demographics

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Abstract

Mobility outside residential areas dropped considerably during COVID-19. We study how patterns differed across income, race and ethnicity, gender, and political leaning. We find that mobility dropped more in counties with relatively more wealth, more Whites or Asians, and more Democrats; less where there are more Blacks or Hispanics; and independently of the share of women. We conclude with a discussion of potential explanations. These results shed light on the reasons why COVID-19 impacts different individuals so differently.

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1 Introduction

COVID-19 has had very different effects on different groups of individuals, with consequences being worse for low income households and minorities. Liao and de Maio (2021) find that U.S. counties with lower income and more Black or Hispanic populations suffered worse health consequences. Similarly, the Brookings Institute finds that the economic consequences were harsher for minorities and lower income households.[1] An effective preventive measure against COVID-19 is isolation, so individuals able to stay home have an advantage. In this paper, we study how mobility differed across different groups.

Our indicator comes from Google, which tracks cell phone use at different locations. Several studies have used this to track differences across countries (Nouvellet, P., Bhatia, S., Cori, A. et al., 1997; Maloney and Taskin, 2020, among others). We focus on U.S. counties.

The results show very heterogeneous patterns. First, wealthier counties experienced larger mobility drops. Second, more Black or Hispanic presence relative to Whites reduced the drop, while Asians increased it. Third, more female presence only mattered around residences, reducing the increase. Finally, more Democrats implied greater overall changes.

While we do not study causality, we elaborate on potential explanations. The higher drop among richer households is consistent with Wright et al. (2020b) and may be the result of two different mechanisms. First, Dingel and Neiman (2020) show that jobs that can be remote are disproportionately held by wealthy individuals. Second, wealthier households can afford to remain income-less for longer periods of time. The lower increase by females around residential areas may be a consequence of more females staying home before the pandemic, limiting the potential increase. Republicans may be less responsive because they were following a President that was rather dismissive of the problem. The large differences by race are yet to be studied, but the larger reaction of Asians could be due to increased discrimination faced during the pandemic.

[1] https://www.brookings.edu/blog/up-front/2020/12/21/covid-19-economic-mobility-racial-justice-and-the-middle-class/

2 Data and Methodology

We estimate the following linear regression:

$$y_i = \alpha + \beta_1 \log(GDPpc_i) + \beta_2 black_i + \beta_3 hispanic_i + \beta_4 asian_i + \beta_5 fem_i + \beta_6 dem_i + \gamma Z_i + \epsilon_i$$

where i indexes county; y is the percentage difference in mobility in each of the following: workplaces, residential areas, transit stations, retail and recreation stores, groceries and pharmacies, and parks; $GDPpc$ is GDP per capita; $black$, $hispanic$, and $asian$ are the shares of each ethnic group; fem is the share of females; dem is the share of votes to the Democratic candidate in the 2016 Presidential elections; and Z includes density, mask mandates before May 2020,[2] and state fixed effects as controls. These control for the fact that it is harder to maintain safe distances in denser counties, early mask mandates is a sign of seriousness towards the problem, and state fixed effects account for unobserved characteristic common to counties within a state. The error term is ϵ. The ethnic group left out is overwhelmingly White, so that our results are relative to the White population.

Mobility comes from Google LLC (2021), which tracks cell phone use in different locations and reports the percentage difference with the median data recorded in January 2020 for each day of the week per day per county. We use the average of the reported changes across time until March 26, 2021. GDP in current Dollars corresponds to 2019 and comes from the Bureau of Economic Analysis. From the U.S. Census Bureau we obtain population, the share of females, Blacks, Hispanics, Asians and density in 2019. Votes come from the MIT Election Data. Mask mandates are from Wright et al. (2020a).

Table 1 presents summary statistics. Averaging across counties, all mobility indicators are negative except for residential, implying that mobility dropped everywhere except in residential areas, where it increased.

3 Results

Table 2 shows our main results. Wealth is a crucial determinant of social distancing: a 1% increase in GDP per capita is associated with a reduction in traffic around all non-residential areas between 4% (work) to 10% (transit stations), and an increase in people staying home.

[2] Changing this date hardly affects the results.

	Mean	Std. Dev.	N
Google Mobility (% change relative to pre-COVID)			
Workplace	-28.93	6.56	353
Residential	10.42	3.00	353
Transit Station	-32.04	17.65	341
Retail and Recreation	-21.06	8.19	353
Grocery and Pharmacy	-10.81	5.55	353
Parks	-5.17	16.73	352
GDP per capita ($\times$\$1,000)	67.42	33.59	353
Blacks (%)	12.57	9.57	353
Hispanics (%)	12.57	12.83	353
Asians (%)	4.53	4.79	353
Females (%)	50.98	0.90	353
Democrats (%)	50.14	14.31	353
Density (people per km^2)	5.58	1.12	353
Mask mandate (%)	22.66	41.92	353

Table 1. Summary Statistics.

Race matters. Relative to Whites, increasing the share of Blacks or Hispanics by 1% reduces the drop in workplace mobility by 16% and 10%, respectively, and Asians increase it by 35%. The signs for residential mobility are opposite. More Blacks also reduce the traffic around transit stations and retail and grocery stores, Hispanics reduce more going to parks, and Asians reduce retail shopping more, albeit mildly.

More females do not make a difference except for residential areas, where they increase traffic by less than men. Lastly, more Democrat presence amplifies the changes in both directions. Notice that Karabulut et al. (2021) already find that politics matter, since democracies have higher infection rates. We find that arrangements within a democracy also matter.

Denser counties responded more to a reduction in mobility everywhere except parks and groceries, and residences (where the increase is larger). Early mask mandates are not significant.

4 Discussion

While we do not explain the causes of the observed behavior, we next elaborate on potential mechanisms.

The reason why the drop around the workplace and transit stations is larger in wealthier counties can be the result of wealthier jobs being easier to perform from home (Dingel and Neiman, 2020), and richer households being able to withstand longer jobless periods (Maloney and Taskin, 2020; Rubini, 2021). In terms of retail and grocery stores, car ownership (or larger cars) may allow richer individuals to travel less often to these locations, making larger purchases in each trip. Finally, the reduced traffic around parks may be a reflection of them having bigger yards, needing the respite that parks provide less.

It is noteworthy that Blacks and Hispanics reduce the drop in workplace traffic. Without further analysis, we do not have the tools to understand the reason behind this. Asians amplified the drop in workplace mobility, and stayed more at home. This may be due to increased discrimination, as reported by Human Rights Watch, making them subject to physical and verbal attacks.[3]

In terms of females, the only significant difference is that they increase their traffic around residences by less. This may be because females tend to stay home more often in normal times, making their response less elastic.

The fact that Democrats amplify changes may be a result of the political situation in 2020. The President (Trump) was Republican, and acted very dismissive of the COVID-19 crisis,[4] potentially driving the Republicans' low response.

The density control suggests that, since it is easier to maintain distancing in less dense areas, individuals are in less need to change their behavior.

5 Conclusion

This study provides a breakdown of the changes in traffic during COVID-19 by demographics. It finds that demographic traits strongly affect the observed changes. Mobility

[3] https://www.hrw.org/news/2020/05/12/covid-19-fueling-anti-asian-racism-and-xenophobia-worldwide

[4] https://www.theguardian.com/us-news/2020/oct/03/donald-trump-base-stays-loyal-president-fights-covid-19

dropped more where individuals are wealthier, proportionally more White or Asian, and leaning Democratic. This unveils important information that needs to be considered when studying the unequal consequences of COVID-19.

In particular, it is important to study the reasons behind the lower mobility drops among Blacks and Hispanics, and the higher one among Asians. This may at least partially explain why the effects of the pandemic are so much worse among the former two, and shed light on the economic consequences of discrimination against Asians.

	Workplace	Residential	Transit Stations	Retail & Recreation	Groceries & Pharma	Parks
GDP p.c.	-3.5269***	1.0835***	-9.8886***	-7.8676***	-4.8488***	-9.5151***
	(0.6822)	(0.2715)	(2.7331)	(0.7015)	(0.7891)	(2.4497)
Blacks	15.544***	-9.8718***	51.002***	19.388***	8.7231**	-9.7583
	(2.8895)	(1.1501)	(11.394)	(2.9712)	(3.3423)	(10.313)
Hispanics	10.150**	-7.3726***	15.177	5.9210	-2.6364	-65.805***
	(3.7009)	(1.4731)	(14.663)	(3.8056)	(4.2810)	(13.300)
Asians	-34.570***	27.557***	-6.1452	-14.327*	-4.4924	12.194
	(6.6348)	(2.6409)	(26.278)	(6.8224)	(7.6748)	(23.624)
Females	-5.6059	-10.703	-79.035	3.0787	21.441	-95.081
	(32.679)	(13.007)	(129.18)	(33.603)	(37.800)	(116.54)
Democrats	-20.533***	9.4751***	-59.356***	-30.234***	-15.982***	-34.104***
	(2.5160)	(1.0015)	(9.9679)	(2.5871)	(2.9103)	(9.0014)
Density	-1.3103***	0.3219**	-2.6041*	-0.8128**	-0.4018	0.4682
	(0.2736)	(0.1089)	(1.0770)	(0.2814)	(0.3165)	(0.9754)
Mask	-1.4165	0.9512*	-0.9489	0.6237	0.4608	-0.5880
	(0.9773)	(0.3890)	(3.8155)	(1.0049)	(1.1305)	(3.4797)
State FE	YES	YES	YES	YES	YES	YES
Obs	353	353	341	353	353	352
R-Squared	0.7896	0.8408	0.5656	0.8569	0.6064	0.5897

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 2. How different demographic groups are associated to mobility changes.

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