## Supplemental materials:

Supplemental Table 1: 2018 American Community Survey (ACS) 5-year estimate variables collected via *tidycensus* R package for ZIP code tabulation area (ZCTA) units.

ACS Variable Name	Short description	Explanation
B19013_001	Median income	Measure of neighborhood-level access to financial/economic resources
B06012_002	Federal Poverty Level (below 100%)	
B06012_003	Federal Poverty Level (between 100-150%)	
B23025_005	Unemployed	
B22003_002	Households with supplemental nutrition assistance (SNAP)	Financial/economic resources and food access
B01003_001	Total population per ZCTA	For adjustment and crude population incidence calculations
B22003_001	Total households per ZCTA	To create household-based proportions
B27010_017	Uninsured (Under 19 years old)	Access to care and medical information/warnings
B27010_033	Uninsured (19-34 years old)	
B27010_050	Uninsured (35-64 years old)	
B27010_066	Uninsured (65+ years old)	
B08301_021	Work from home	Capacity to socially distance in early stages of pandemic
C24050_002	Employed by: Agricultural industry	Industries that are likely to employ essential workers
C24050_003	Employed by: Construction industry	
C24050_005	Employed by: Wholesale trade	
C24050_007	Employed by: Transportation industry	
C24050_011	Employed by: Education and Healthcare industry	
B08126_017	Employed by: Agriculture, Commute: personal car	Mode of transportation for industries employing essential workers
B08126_047	Employed by: Agriculture, Commute: Public Transit	
B08126_018	Employed by: Construction, Commute: personal car	
B08126_048	Employed by: Construction, Commute: Public Transit	
B08126_020	Employed by: Wholesale trade, Commute: personal car	
B08126_050	Employed by: Wholesale trade, Commute: Public Transit	
B08126_022	Employed by: Transportation, Commute: personal car	
B08126_052	Employed by: Transportation, Commute: Public Transit	
B08126_026	Employed by: Education/Healthcare, Commute: personal car	
B08126_056	Employed by: Education/Healthcare, Commute: Public Transit	

Supplemental Fig. 1 Cumulative infections and COVID mortality per 100,000 by ZCTA as of May 7, 2020 and May 23, 2020 respectively.
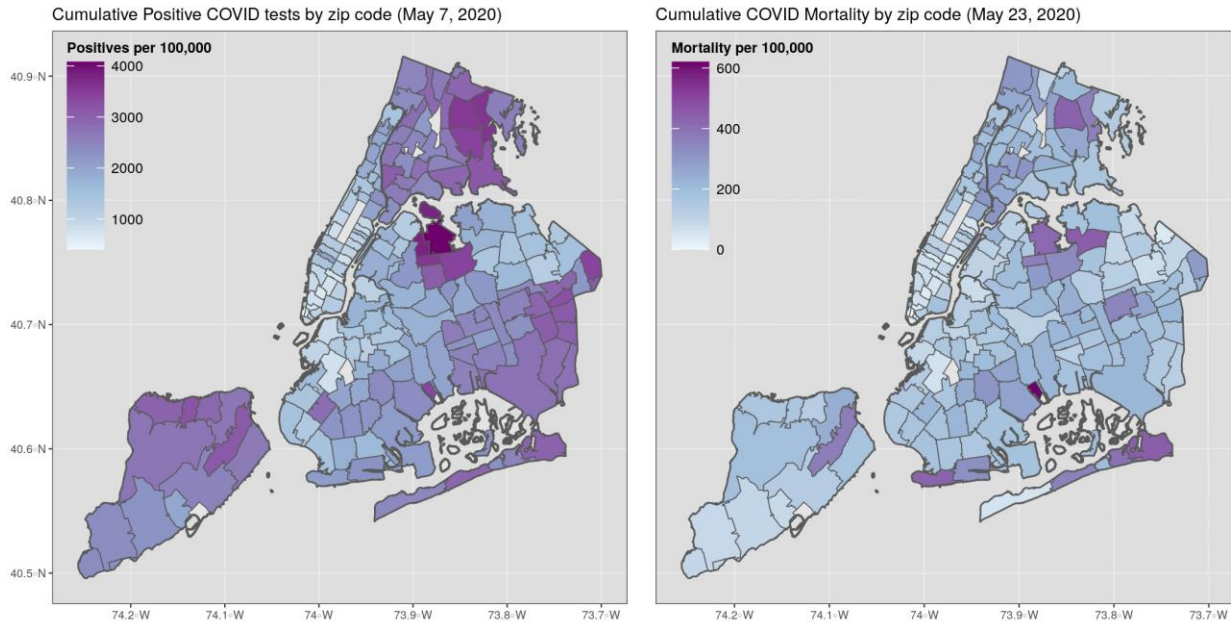

Supplemental Fig. 2 Race/ethnic composition of ZCTAs that fall within various quantiles of the BWQS infection risk index. Race/ethnic data from the 2018 ACS. NYC total demographic breakdown provided as reference.
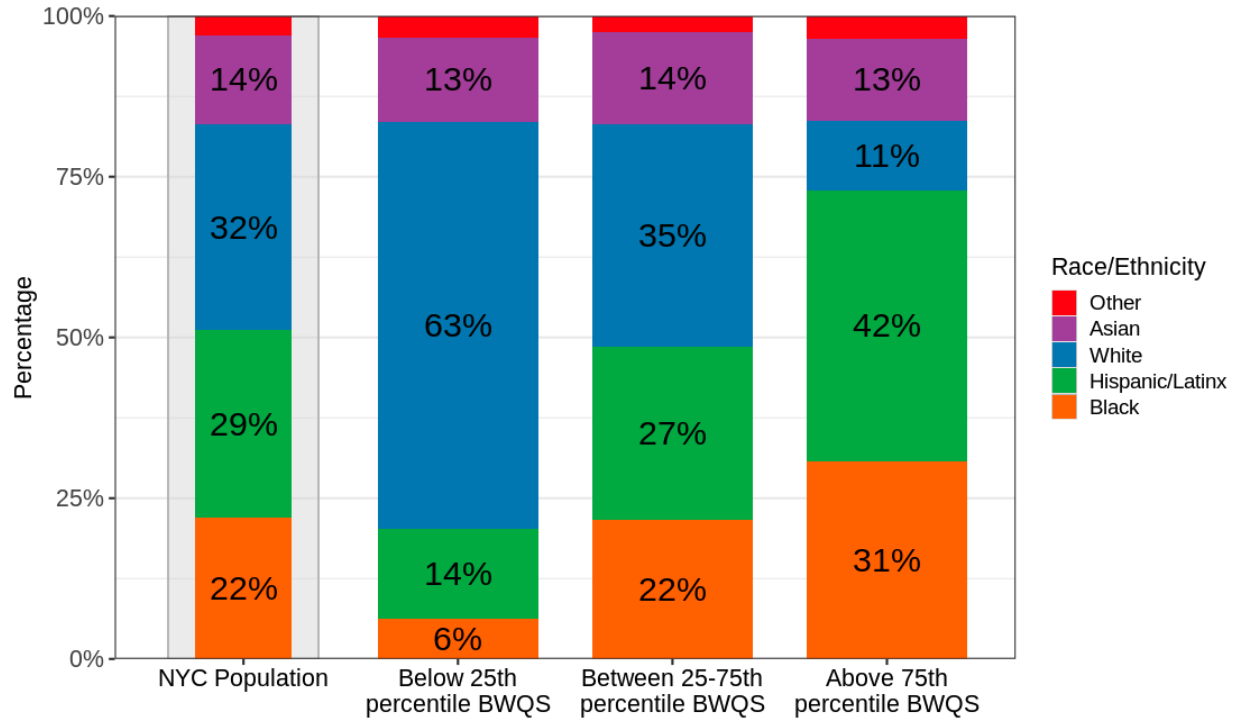
Supplemental Table 2: Kendall's tau correlations for social determinants with per capita cumulative SARS-CoV-2 infection incidence as of May 7, 2020 by NYC ZCTA.

Variable	Correlation	P value
1/median income	0.317	<0.0001
Not insured (%)	0.231	<0.0001
Unemployed (%)	0.296	<0.0001
1/grocers per 1000 people	0.261	<0.0001
Essential workers (%)	0.544	<0.0001
Essential workers commuting via public transit (%)	0.174	0.0001
Essential workers commuting via car (%)	0.493	<0.0001
People who do not work from home (%)	0.454	<0.0001
Population density according to housing volume (people per cubic foot)	0.096	0.058
Average household size (#)	0.467	<0.0001

Supplemental Fig. 3 UHF neighborhoods by population-weighted neighborhood infection risk index. Six UHF neighborhoods excluded from the subway ridership analysis are indicated by asterisks. Dots represent subway stations with available data. UHF neighborhoods are colored as high (above median) or low (below median) BWQS infection risk index.
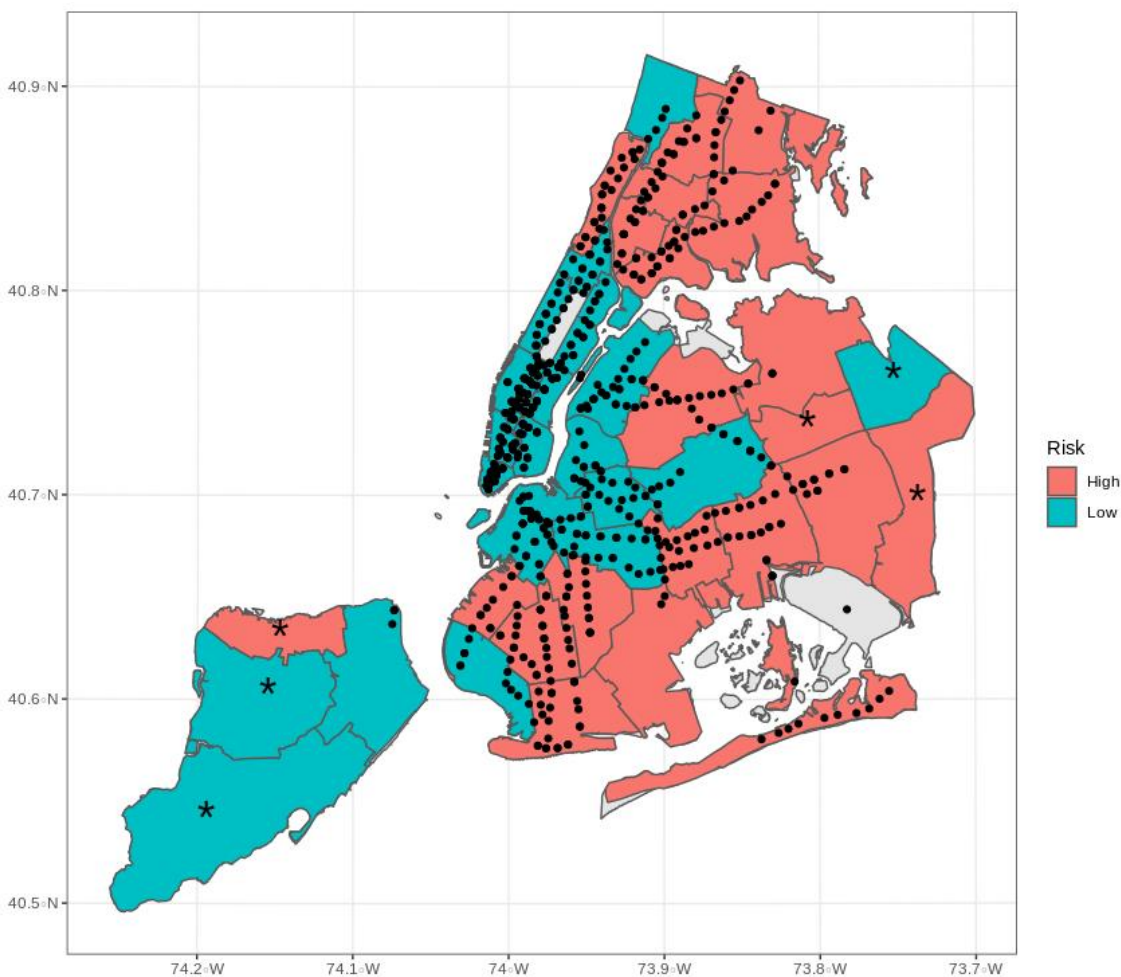
Supplemental Fig. 4 Fit of the generalized Weibull equation curve on the citywide mean of UHF-level ridership.
Outlier on February 15th, a national holiday. Values above 1 indicate above-average ridership per our comparison
with 2015-2019.