

New research maps COVID-19 dispersal dynamics in New York's first wave of epidemic
Study Suggests Borough of Queens Was Major Hub of COVID-19 Transmission

During the first phase of the COVID-19 epidemic, New York City experienced high prevalence compared to other U.S. cities, yet little is known about the circulation of SARS-CoV-2 within and among its boroughs. A study published in *PLOS Pathogens* by Simon Dellicour at Université Libre de Bruxelles, Belgium, and colleagues describe the dispersal dynamics of COVID-19 viral lineages at the state and city levels, illustrating the relatively important role of the borough of Queens as a SARS-CoV-2 transmission hub.

Tracking the spread and colonization of variants is critical to understanding COVID-19 epidemiological dynamics. To better understand how the virus was transmitted throughout New York City during the first few months of the pandemic, the authors identified and mapped several spike protein mutations detected during the first New York City epidemic wave using SARS-CoV-2 samples taken from different locations. They then constructed a phylogenetic tree to illustrate the evolutionary relationships of all virus samples. The authors were able to recreate how COVID-19 spread across the city, replicated, and mutated, including which areas of New York City transmitted the virus to other locations with greater frequency. The researchers also identified variants and tracked their dispersal.

The authors found that the borough of Queens played a significant role of COVID-19 transmission in the early phases of the pandemic due to the relatively higher local circulation of viral lineages and the origin of a relatively high number of new variants that spread to neighboring NYC boroughs. While the study provides important new insights into genomic surveillance, it was limited in that researchers estimated the intensity of the virus' impact on each of the 5 boroughs by the cumulative number of hospitalizations, which may have led to underestimating SARS-CoV-2 transmission in some areas.

According to the authors, "As in many other cities around the world, important commuting activity radiating out of central city areas likely played an important role in disseminating viral lineages throughout the state. However, commuting workers are likely not the only drivers of SARS-CoV-2 dissemination across the city".

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