Increases in Community Transmission of COVID-19 in Certain Neighborhoods of New York City

Overview of SARS-CoV-2 Testing – The Good, The Bad and What to Use When

Our understanding of COVID-19 is evolving rapidly. This presentation is based on our knowledge as of October 15, 2020, 5 PM.
CME Accreditation Statement for Joint Providership
NYC Health + Hospitals is accredited by The Medical Society of the State of New York (MSSNY) to provide continuing medical education for physicians. This activity has been planned and implemented in accordance with the Accreditation Requirements and Policies of the MSSNY through the joint providership of NYC Health + Hospitals and the NYC Department of Health and Mental Hygiene. NYC Health + Hospitals designates this continuing medical education activity for a maximum of 1 AMA PRA Category 1 Credit™. Physicians should claim only credit commensurate with the extent of their participation in the activity.
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UPDATE: COVID-19 IN NEW YORK CITY

Madhury (Didi) Ray, MD, MPH
Critical Care Planning Lead
OUTLINE

WHERE WE ARE NOW

RECENT EPIDEMIOLOGY OF COVID-19 IN NYC

INCREASES IN COMMUNITY TRANSMISSION OF COVID-19 IN CERTAIN NEIGHBORHOODS OF NEW YORK CITY

OVERVIEW OF SARS-COV-2 TESTING: THE GOOD, THE BAD AND WHAT TO USE WHEN

QUESTIONS AND DISCUSSION
WHERE WE ARE NOW

- India still has the highest number of daily cases however daily numbers are slowly declining
- New cases in the Americas, especially the United States, Brazil, and Argentina are fueling much of the global daily increase
- Second surge in European countries also continue to add large numbers to the daily global total
- Cases are on the rise in the United States
- A concerning increase in case counts has been observed in certain NYC areas, though citywide test positivity remains <2%
- Three areas in NYC have been designated by New York State as requiring restrictions on school attendance, businesses, and gatherings
COVID-19 WORLDWIDE

Cumulative:
>38.7 million cases
>1 million deaths
10/15/20

COVID-19, U.S.

Cumulative:
>8 million cases
>217 thousand deaths

10/15/20

NEW CASES IN THE PAST WEEK, U.S. 10/15/20

Cumulative counts:
- Cases: 246,836
- Hospitalizations: 58,059
- Confirmed deaths: 19,264
- Probable deaths: 4,651

Figures show number of daily COVID-19 cases, hospitalizations, and deaths

# RECENT NYC CASES AND DEATHS

## Data shown for the four weeks ending September 26, 2020

<table>
<thead>
<tr>
<th></th>
<th>Most recent 4 weeks</th>
<th>Most recent weekly change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly cases</td>
<td>1,667</td>
<td>2,476</td>
</tr>
<tr>
<td>Weekly deaths</td>
<td>36</td>
<td>25</td>
</tr>
</tbody>
</table>

## Data shown for the four weeks ending October 10, 2020

<table>
<thead>
<tr>
<th></th>
<th>Most recent 4 weeks</th>
<th>Most recent weekly change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly cases</td>
<td>2,190</td>
<td>3,455</td>
</tr>
<tr>
<td>Weekly deaths</td>
<td>30</td>
<td>27</td>
</tr>
</tbody>
</table>

RECENT NYC CASES BY ZIP CODE

Data shown for the four weeks ending October 10, 2020

Principal mode of COVID-19 transmission is via infectious respiratory droplets

Respiratory droplets are produced during exhalation (e.g., breathing, speaking, singing, coughing, sneezing)

Spectrum of droplet sizes divided into two categories based on how long they can remain suspended in air
  - Larger droplets, some of which are visible, fall out of the air within seconds to minutes
  - Smaller droplets and particles can remain suspended for many minutes to hours and travel far on air currents

Concentration of droplets decreases through fallout and dilution into the growing volume of air they encounter

Airborne transmission not equally efficient for all respiratory microbes

The epidemiology of COVID-19 indicates most infections are spread through close contact, not airborne transmission

Airborne transmission of COVID-19 is uncommon but can occur under special circumstances; examples include:

- Enclosed spaces within which an infectious person exposed susceptible people or prolonged exposure to respiratory particles that may be generated with expiratory exertion (e.g., shouting, singing, exercising)
- Aerosol-generating medical procedures (e.g., intubation, suction of oral or respiratory secretions)

Existing interventions appear sufficient to prevent transmission of COVID-19 by airborne transmission

- Interventions include physical distancing, use of face coverings in the community, hand hygiene, surface cleaning and disinfection, ventilation and avoidance of crowded indoor spaces

Update to the list of underlying medical conditions that put adults of any age at increased risk for severe illness from the virus that causes COVID-19

Based on published reports, articles in press, unreviewed pre-prints, and internal data

The list is a living document that will be periodically updated by CDC as the science evolves

CDC SCIENTIFIC EVIDENCE FOR CONDITIONS THAT INCREASE RISK OF SEVERE ILLNESS FROM SARS-COV-2
Updated October 6, 2020

Strongest and Most Consistent Evidence
- Cancer
- Chronic kidney disease
- COPD
- Heart conditions, such as heart failure, coronary artery disease, or cardiomyopathies
- Obesity (BMI ≥ 30 kg/m²)
- Severe Obesity (BMI ≥ 40 kg/m²)
- Sickle cell disease
- Smoking
- Solid organ transplantation
- Type 2 diabetes mellitus

Mixed Evidence
- Asthma
- Cerebrovascular disease
- Hypertension
- Pregnancy
- Use of corticosteroids or other immunosuppressive medications

Limited Evidence
- Bone marrow transplantation
- HIV
- Immune deficiencies
- Inherited metabolic disorders
- Liver disease
- Neurologic conditions
- Other chronic lung diseases
- Overweight (BMI ≥ 25 kg/m², but < 30 kg/m²)
- Pediatrics
- Thalassemia
- Type 1 diabetes mellitus

Multisystem inflammatory syndrome in children (MIS-C) is a rare but severe complication of SARS-CoV-2 infection in children and adolescents.

Recent publication summarizing adult patients with multisystem inflammatory syndrome in adults (MIS-A) in United Kingdom and US from March to August 2020.

Clinical manifestations of 16 patients:
- 12/16 had fever
- 16/16 had evidence of cardiac effects, including electrocardiogram abnormalities such as arrhythmias, elevated troponin levels, or echocardiographic evidence of left or right ventricular dysfunction
- 13/16 had gastrointestinal symptoms
- 5/16 had dermatologic manifestations
- None had severe respiratory illness however 10 had pulmonary ground glass opacities and 6 had pleural effusions identified on chest imaging
The pathophysiology of MIS in both children and adults is currently unknown.

Some patients had a negative PCR but a positive SARS-CoV-2 antibody test result, suggesting MIS-A and MIS-C might represent postinfectious processes.

The majority of patients with MIS-A survived, similar to those with MIS-C.

All but one of the patients with MIS-A described in this report belonged to racial or ethnic minority groups; MIS-C has also been reported disproportionately in these communities.

Further research is needed to understand the pathogenesis, optimal management, and long-term effects of this condition.
Provides information and tips for voting safely during the pandemic, including:

- Requesting an absentee ballot (October 27 deadline)
- Voting during early voting to avoid crowds on Election Day
- Following the “Core 4” (stay home if sick, wear a face covering, practice physical distancing, practice hand hygiene)

INCREASES IN COMMUNITY TRANSMISSION OF COVID-19 IN CERTAIN NEIGHBORHOODS OF NEW YORK CITY

Demetre Daskalakis, MD, MPH

Incident Commander
Deputy Commissioner, Disease Control
NYC Department of Health and Mental Hygiene
There are concerning increases in community transmission in certain neighborhoods in NYC.

NYC is taking action through:
- Regular monitoring of local epidemiology
- Implementing New York State’s Cluster Action Initiative, which includes restrictions in three zones — red, orange, yellow
- Targeted testing, media, and outreach
## Areas of Concern in Brooklyn and Queens*

### Brooklyn (South and West)

<table>
<thead>
<tr>
<th>ZIP</th>
<th>14-day cumulative Test Positivity (previous day)**</th>
</tr>
</thead>
<tbody>
<tr>
<td>11204</td>
<td>6.12%</td>
</tr>
<tr>
<td>11205</td>
<td>1.48%</td>
</tr>
<tr>
<td>11206</td>
<td>1.57%</td>
</tr>
<tr>
<td>11208</td>
<td>2.69%</td>
</tr>
<tr>
<td>11210</td>
<td>5.39%</td>
</tr>
<tr>
<td>11211, 11249</td>
<td>2.11%</td>
</tr>
<tr>
<td>11213</td>
<td>1.98%</td>
</tr>
<tr>
<td>11218</td>
<td>2.97%</td>
</tr>
<tr>
<td>11219</td>
<td>7.73%</td>
</tr>
<tr>
<td>11223</td>
<td>6.90%</td>
</tr>
<tr>
<td>11229</td>
<td>4.19%</td>
</tr>
<tr>
<td>11230</td>
<td>6.52%</td>
</tr>
<tr>
<td>11234</td>
<td>2.35%</td>
</tr>
<tr>
<td>11235</td>
<td>3.41%</td>
</tr>
</tbody>
</table>

### Central Queens

<table>
<thead>
<tr>
<th>ZIP</th>
<th>14-day cumulative Test Positivity (previous day)**</th>
</tr>
</thead>
<tbody>
<tr>
<td>11366</td>
<td>2.10%</td>
</tr>
<tr>
<td>11367</td>
<td>3.99%</td>
</tr>
<tr>
<td>11374</td>
<td>2.35%</td>
</tr>
<tr>
<td>11375</td>
<td>1.96%</td>
</tr>
<tr>
<td>11414</td>
<td>2.17%</td>
</tr>
<tr>
<td>11415</td>
<td>2.34%</td>
</tr>
<tr>
<td>11416</td>
<td>4.06%</td>
</tr>
<tr>
<td>11418</td>
<td>2.13%</td>
</tr>
<tr>
<td>11420</td>
<td>2.95%</td>
</tr>
<tr>
<td>11423</td>
<td>2.51%</td>
</tr>
<tr>
<td>11426</td>
<td>2.23%</td>
</tr>
<tr>
<td>11432</td>
<td>3.25%</td>
</tr>
<tr>
<td>11435</td>
<td>3.07%</td>
</tr>
</tbody>
</table>

### Far Rockaway

<table>
<thead>
<tr>
<th>ZIP</th>
<th>14-day cumulative Test Positivity (previous day)**</th>
</tr>
</thead>
<tbody>
<tr>
<td>11691</td>
<td>5.83%</td>
</tr>
</tbody>
</table>

*Includes ZIP codes outside of the zoned areas.

**Data are preliminary and subject to change; data from the most recent days are incomplete due to testing lags.
COVID-19 CLUSTER ZONES

- New York State-designated zones reflect areas of increased transmission and surrounding areas
  - Red zones have the most restrictions, followed by orange, followed by yellow
- All New Yorkers should know in what zone they live and work so that they know their potential risk of exposure and what restrictions apply to them
- NYC address look-up website: nyc.gov/COVIDZone
  - Can search an address, place, or intersection in NYC
  - Can zoom in to street level to see boundaries of each zone
COVID-19 Zone Finder

Enter an address or intersection or click on the map to find out whether you are in a New York State-designated COVID-19 zone, and get informed about the proper precautions to take for specific activities.

Prevent The Spread of COVID-19 in NYC!

Take These Steps:

- Stay home if you’re sick
- Keep physical distance
- Wear a face covering
- Keep your hands clean

nyc.gov/COVIDZone
### SUMMARY OF RESTRICTIONS BY ZONE

As of October 8, restrictions are now in place in designated COVID-19 zones for a minimum of 14 days.

<table>
<thead>
<tr>
<th>Sector</th>
<th><strong>Red Zone</strong></th>
<th><strong>Orange Zone</strong></th>
<th><strong>Yellow Zone</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Schools</strong></td>
<td>Closed; full remote learning</td>
<td>Closed; full remote learning</td>
<td>Open</td>
</tr>
<tr>
<td><strong>Businesses</strong></td>
<td>Only essential businesses* can remain open</td>
<td>Only essential businesses* can remain open</td>
<td>Open</td>
</tr>
<tr>
<td><strong>Food Service Establishments</strong></td>
<td>Take out and delivery only (no indoor or outdoor dining)</td>
<td>Outdoor dining allowed (no indoor dining); maximum 4 people per table</td>
<td>Indoor and outdoor dining allowed; maximum 4 people per table</td>
</tr>
<tr>
<td><strong>Houses of Worship</strong></td>
<td>25% capacity, up to a maximum of 25 people</td>
<td>33% capacity, up to a maximum of 25 people</td>
<td>50% maximum capacity</td>
</tr>
<tr>
<td><strong>Gatherings (indoor and outdoor)</strong></td>
<td>All nonessential gatherings prohibited**</td>
<td>Maximum of 10 people**</td>
<td>Maximum of 25 people**</td>
</tr>
</tbody>
</table>

*As defined by New York State at: [https://esd.ny.gov/ny-cluster-action-initiative-guidance](https://esd.ny.gov/ny-cluster-action-initiative-guidance)

**Fines up to $15,000/day
We have been deploying resources to significant clusters in Brooklyn and Queens since early September.

We have taken a hyperlocal approach to target zip codes in the Bronx (Tremont), Brooklyn (Sunset Park) and Queens (Ozone Park).

We must take action now to reverse these trends – and we need your help and your voice to change the trajectory.
• Offer diagnostic testing with a nucleic acid amplification (NAA) or antigen-based test to people who:
  • Live or work in areas of NYC with increased COVID-19 activity
  • Have COVID-19 symptoms
  • Have a recent exposure to someone with known COVID-19

• Offer testing in special circumstances:
  • People who attended in indoor gatherings of >50 people
  • People who plan to visit someone with an increased risk for severe COVID-19 (2-3 days before planned visit)

Screen people who do not have symptoms or a known exposure to prevent asymptomatic and pre-symptomatic transmission

Offer monthly screening (using NAA, with certain exceptions) to the following groups every month or as deemed appropriate for the setting and local epidemiology:

- Residents and staff of long-term care facilities (exception: staff must be tested weekly per NYS)
- Health care personnel
- Other workers with frequent contact with large numbers of persons (e.g., child care staff, teachers, first responders)

Offer screening every 1-3 months to people attending events where physical distancing not possible and workers who interact with others

- The exact interval within this range should be based on shared decision-making with the patient, considering possible exposures and risk factors for COVID-19
- It is reasonable to do monthly testing when risk is unknown or unclear

Re-testing individuals who test positive for COVID-19 and remain asymptomatic after recovery is not recommended within 90 days of initial symptom onset (or date of first positive test if asymptomatic)

- If new COVID-19 symptoms develop, an evaluation for re-infection with COVID-19 may be appropriate; consult an infectious disease expert

- Refer to [CDC](https://nyc.gov/assets/doh/downloads/pdf/han/alert/2020/covid-19-diagnostic-testing-10142020.pdf) for additional guidance
WHAT CAN I DO TO HELP?

- Encourage testing – ask patients:
  - Where they live and work and use [nyc.gov/COVIDZone](http://nyc.gov/COVIDZone) to see if they are in a zone with increased COVID-19
  - What they do for a living and recommend periodic testing as appropriate
  - About any recent or planned travel and advise about testing and quarantine

- Promptly report COVID-19 point-of-care test results with all required information (including school and employment) via Electronic Clinical Laboratory Reporting System (ECLRS)
  - Critical to accurately monitor incidence and percent positivity
  - Positive test results trigger contact tracing

- Check in on patients with an increased risk of severe disease
- Explain the importance of face coverings (and how to properly wear one), physical distancing, and other prevention measures
PREVENT THE SPREAD OF COVID-19 IN NYC!

TAKE THESE STEPS:

Stay home if you’re sick
Only leave for essential medical care and testing or other essential errands.

Wear a face covering
You can be contagious without symptoms. Protect those around you by wearing a face covering.

Keep physical distance
Stay at least 6 feet away from other people.

Keep your hands clean
Wash your hands often with soap and water or use hand sanitizer if soap and water are not available.

Get tested: There are free COVID-19 testing sites in all five boroughs. To find a site, visit nyc.gov/covidtest, or text “COVID test” to 855-48.

For the latest information, visit nyc.gov/coronavirus.

NYC Health
NYC Health + Hospitals
JL Test & Trace Corps
OVERVIEW OF SARS-COV-2 TESTING - THE GOOD, THE BAD AND WHAT TO USE WHEN

Megan Hahn, PhD
Post-Doc Fellow, Public Health Laboratory

Mindy Leelawong, PhD
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NYC Department of Health and Mental Hygiene
• Emergency Use Authorization (EUA)

• Under section 546 of the FD&C Act, the Food and Drug Administration (FDA) may allow unapproved medical products to be used in an emergency to diagnose serious or life-threatening diseases
• Generally awarded when there are no adequate, approved, and available alternatives
• Not the same as FDA Approval
• Several SARS-CoV-2 tests with FDA EUA
• No tests yet with FDA approval

TYPES OF TESTS FOR SARS-COV-2\textsuperscript{1,2}

Virology

- RNA (Nucleic Acid Amplification - NAA)
  - Polymerase Chain Reaction (PCR)
  - Isothermal Amplification

Antigen

Serology

Antibody Tests

Clinical Laboratory

Point of Care
LABORATORY TESTING

Test Sensitivity and Specificity

- How much of your target material needs to be present to be detected?
  - Low amounts = High Sensitivity
  - High amounts = Low Sensitivity

- Can your test distinguish your target from similar targets?
  - Only your target = High Specificity
  - Yours and others = Low Specificity
NUCLEIC ACID AMPLIFICATION (NAA) TESTS

PCR is the “gold standard”

Pros
- The most sensitive tests
- Both laboratory-based and point-of-care options are available

Cons
- Expensive
- Too sensitive?

Cepheid GeneXpert Infinity: Sample-to-answer PCR

Abbott ID NOW COVID-19: Point-of-care isothermal NAA
ANTIGEN DETECTION TESTS

Pros

- Fast and easy to perform
- Less expensive
- Specificity is comparable to PCR

Cons

- Lower sensitivity resulting in false negative test result and confirmatory using a NAA should be considered for patients with symptoms or known exposure

Quidel Sofia Antigen Fluorescent Immunoassay

https://www.quidel.com/immunoassays/sofia-tests-kits/sofia-analyzer

Abbott BinaxNOW COVID-19 Antigen CARD

SENSITIVITY COMPARISON

Lower sensitivity

Rapid Tests
Antigen or RNA detection

Quidel Sofia (antigen)
https://www.quidel.com/immunoassays/sofia-tests-kits/sofia-analyzer

Abbott ID NOW (RNA)

Cepheid Xpert Xpress (RNA)

Hologic Aptima (RNA)

Higher sensitivity

Nasal Swab → Nasopharyngeal Swab

Laboratory-Based Tests
Mostly RNA detection

Abbott ID NOW (RNA)
Cepheid Xpert Xpress (RNA)
Hologic Aptima (RNA)
**DIAGNOSTIC VS. SCREENING TESTS**

**Diagnostic**
- Symptomatic or known exposure
  - NAA test
  - Antigen test

**Screening**
- No symptoms, no known exposure
  - NAA test
  - Antigen ONLY in certain settings
SEROLOGY

Clinical Laboratory Tests

Pros
- Possible to determine if a patient likely had a prior COVID-19 infection
- Results can be obtained rapidly depending on test
- Tests are often easy to procure

Cons
- High rate of false positives and negatives (low sensitivity)
- A positive result does not equal immunity to the virus


Point of care tests

https://asianmedic.com/wp-content/uploads/2020/03/One-Step-4_1.png
See Reference #4
OVERVIEW OF SARS-COV-2 TESTING

REFERENCES


NYC Health Department
• Provider page: https://www1.nyc.gov/site/doh/covid/covid-19-providers.page
• Data page: https://www1.nyc.gov/site/doh/covid/covid-19-data.page
• Weekly webinars: Every other Friday, 1 p.m. (sign up on provider page)
• Dear Colleague COVID-19 newsletters (sign up for City Health Information subscription at: nyc.gov/health/register)
• NYC Health Alert Network (sign up at https://www1.nyc.gov/site/doh/providers/resources/health-alert-network.page)
• Provider Access Line: 866-692-3641
• Neighborhood resource snapshots: https://www1.nyc.gov/site/doh/covid/covid-19-communities.page

NYC COVID-19 Citywide Information Portal
• Includes information on >150 testing sites in NYC: NYC.gov/covidtest

Learn more below about zone restrictions
• https://www1.nyc.gov/site/doh/covid/covid-19-main.page

Other sources

Look for the login section (on the right side).

Create a profile if you have not logged in before.

Enter your username (email address) and password. Click on the Go button.

The Welcome Screen will appear. Click on the Go button.

The next screen will display three tabs: “My Programs,” “CPE Tracker” and “My Account Info.”

Click the tab “CPE Tracker.”

On the same row, look to your right. Locate the ‘Select Year’ section. Click on the down arrow and select the year to view. Certificates will be listed by program name.

View credits or print certificates by clicking on the certificate located under the view/print column.

Note: It may take up to 8 weeks for H+H to process credits.