2019 Novel Coronavirus (COVID-19) 
A Primer for Healthcare Providers

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April 2, 2020
DISCLAIMER

• Our understanding of the novel coronavirus and this pandemic is evolving rapidly

• This presentation is based on our knowledge as of April 2, 2020, 1:00PM.
WHERE WE ARE

- We are in the midst of a global pandemic of a novel coronavirus illness, COVID-19
- There is widespread community transmission in New York City
- Over the next few months, a large proportion of New Yorkers will get sick with COVID-19
- Our health care system is being tested as it never has before
- Together, we can and must slow the spread and protect those at higher risk of severe illness and our health care workers from getting sick
BACKGROUND

- Outbreak of respiratory illness of unknown etiology identified in Wuhan, Hubei Province, China, December 2019
  - ~40 cases with history of exposure to live animal market, suggesting animal to human transmission
  - Scientists rapidly identified a novel coronavirus
- Name of the new virus: **SARS-CoV-2**
- Disease caused by the virus: **COVID-19**
Cases and deaths, worldwide

- >981,000 cases; >50,000 deaths

https://www.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6
Cases and deaths, United States

- >226,000 cases; >5,000 deaths

*Source: NY Times, 4/2/2020 at 7:30AM

Case and deaths, NYS and NYC

• New York City* as of April 2, 9:30AM
  – >48,000 cases
  – >1,300 deaths
  – >9,500 hospitalizations

• New York State (outside of NYC) as of April 1, 3:10PM
  – >36,000 cases

*For latest data, visit nyc.gov/coronavirus
Influenza-like illness (ILI) emergency department (ED) visits (defined as presence of fever AND cough or sore throat OR mention of influenza). The lines show the proportion of daily ED visits for ILI comparing four influenza seasons. The recent increase in ILI visits (highlighted by the yellow bar) is unusual for this time of year.

**Caution:** Do not over interpret the downturn as this does not mean the pandemic has peaked. Day of the week variation occurs in ED visits where lower numbers are seen on weekends.
Number of Hospital Admissions with Influenza-like Illness + Pneumonia Syndrome through 3/21/20
### DEATHS IN NYC

**As of April 2, 9:30AM**
- All data preliminary and subject to change
- Includes NYC residents and others receiving care in NYC

<table>
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<th>Age Group</th>
<th>Underlying Conditions¹</th>
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<th>Underlying Conditions Pending</th>
<th>Total</th>
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<td>- 18 to 44</td>
<td>55</td>
<td>5</td>
<td>20</td>
<td>80</td>
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<td>- 65 to 74</td>
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<tr>
<td>- Unknown</td>
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<td>0</td>
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<td>3</td>
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<td>382</td>
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<td>- Brooklyn</td>
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<td>- Manhattan</td>
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<td>- Queens</td>
<td>319</td>
<td>9</td>
<td>120</td>
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<td>- Staten Island</td>
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<tr>
<td>- Unknown</td>
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<td>0</td>
<td>0</td>
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**Total** 1397

¹Underlying illnesses include Diabetes, Lung Disease, Cancer, Immunodeficiency, Heart Disease, Hypertension, Asthma, Kidney Disease, and GI/Liver Disease.
COVID-19 Cases by ZIP Code

Total count of COVID-19 cases based on patient address by ZIP code:

- 6 – 112
- >112 – 182
- >182 – 306
- >306 – 947
- ZIP code unknown = 32

N = 38936 total cases as of March 31, 2020
Percent of patients testing positive for COVID-19 by zip code in New York City as of March 31, 2020

25% – 44%
>44% – 51%
>51% – 58%
>58% – 77%

Zip code unknown = 89%

N = 38,936 total cases as of March 31, 2020
CLINICAL FEATURES

• Incubation period: mean = 5.2 days (range: 2 - 14 days)
• Median patient age reported in China: 49 - 56 years
• Transmission
  – Mainly via respiratory droplets
  – Direct or indirect contact
  – Pre-symptomatic and asymptomatic transmission reported
  – No evidence of airborne transmission to date
  – Virus has been detected in feces; possibility of fecal-oral transmission
• Nonspecific initial symptoms
  – Most common: fever and dry cough
  – Less frequent: myalgias, headache, sore throat, diarrhea
  – Anecdotal: loss of sense of smell, taste being investigated

https://jamanetwork.com/journals/jama/fullarticle/2760782
Anosmia/dysgeusia symptom report from Public Health England:
https://www.entuk.org/sites/default/files/files/Loss%20of%20sense%20of%20smell%20as%20marker%20of%20COVID.pdf
CLINICAL FEATURES

• Laboratory findings
  – Lymphopenia (70%)
  – Prolonged prothrombin time (58%)
  – Elevated lactate dehydrogenase (40%)

• Radiographic features
  – CXR: bilateral patchy infiltrates
  – Chest CT: ground-glass infiltrates

Sources:
US-BASED STUDY: COVID-19 OUTCOMES

- Laboratory-confirmed cases reported to CDC by US states and territories (not including repatriated individuals), Feb 12 – March 16, 2020: N=4,226
- Overall case fatality ratio 1.8-3.4%; highest in older adults:

<table>
<thead>
<tr>
<th>Age (years)</th>
<th>Case Fatality Ratio</th>
</tr>
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<tbody>
<tr>
<td>&lt;20</td>
<td>0</td>
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<tr>
<td>20-54</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>55-64</td>
<td>1-3%</td>
</tr>
<tr>
<td>65-84</td>
<td>3-11%</td>
</tr>
<tr>
<td>85+</td>
<td>10-27%</td>
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- Severe disease not uncommon among younger persons, however. Among 508 hospitalized patients:
  - 38% were 20-54 years old
  - Of the 121 patients admitted to ICU, nearly half were <65 years

RISK FACTORS FOR SEVERE COVID-19

- Risk factors for severe COVID-19 include:
  - Age ≥50 years
  - Chronic medical conditions, including chronic lung disease, heart disease, diabetes, cancer or a weakened immune system
  - Other medical conditions may also increase risk:
    - Blood disorders (eg, sickle cell disease or use of blood thinners)
    - Chronic kidney disease
    - Chronic liver disease
    - Current or recent pregnancy (in last 2 weeks)
    - Neurologic and neurodevelopment conditions (eg, disorders of the brain, spinal cord, peripheral nerves, or muscles)

Source: CDC. Implementation of Mitigation Strategies for Communities with Local COVID-19 Transmission. 03/12/2020.
CURRENT THERAPIES

• Currently, medical care is supportive
• No drugs approved by the US FDA for treating COVID-19
• Several drugs are being explored, including:
  – Hydroxychloroquine and chloroquine
  – Remdesivir
• No reliable data support claims that NSAIDs contribute to poorer outcomes
• Treatments and Vaccines Under Development
  – Tracker created by the Milken Institute and posted online
MANAGEMENT OF CRITICALLY ILL ADULTS

• Multi-national guidelines include recommendations on infection control, resuscitation, ventilation, and therapy

• Therapy
  ▪ Systemic corticosteroids if acute respiratory distress syndrome, but not otherwise
  ▪ Empiric antibiotics for ventilated patients
  ▪ Convalescent plasma
  ▪ Other biologics—monoclonal antibodies
  ▪ Not recommended: IVIG, convalescent plasma, lopinavir/ritonavir
  ▪ Insufficient evidence: other antivirals, chloroquine, tocilizumab, recombinant interferons

• University of Nebraska treatment guidelines includes dosing for remdesivir, hydroxychloroquine and lopinavir/ritonavir for consideration on a case by case basis
PREVENTING TREATMENT SHORTAGES

• Avoid prescribing medications that are under investigation for treatment of COVID-19 to patients with mild or moderate illness
  – Prevent shortages for other approved indications
  – Preserve supplies for persons hospitalized with COVID-19 when indicated

• New York State Executive Order 202.10: No pharmacist shall dispense hydroxychloroquine or chloroquine except when:
  – Prescribed for an FDA-approved indication OR
  – Part of a state-approved clinical trial related to COVID-19
    o No other experimental or prophylactic use shall be permitted
    o Any permitted prescription limited to a 14-day prescription with no refills
VACCINE DEVELOPMENT

- Vaccines under development (US, China, elsewhere)
  - Phase 1 vaccine trial, Moderna (mRNA-1273), Kaiser Permanente Washington Health Research Institute with 45 healthy adults
  - Most estimates: will take at least 1 year before a vaccine is widely available

HOSPITAL EVACUATION COORDINATION CENTER (HECC)

- NYS Department of Health is leading the Hospital Evacuation Coordination Center (HECC) to coordinate patient movement and patient tracking between hospitals and alternate care sites
- NYC hospitals received a notice from NYS DOH describing the transfer and patient tracking process on 3/31
- Greater NY Hospital Association held a webinar for hospital leadership to discuss this process on 4/1
- Transport arranged through the National Ambulance Contract and must be requested through the HECC process
- Patient movement is tracked through the NYS DOH eFINDS system
- Direct questions about eFINDS and HECC to your hospital administration
ALTERNATE CARE SITES

• Javits New York Medical Station
  – Currently accepting low-acuity, non-COVID patients who could be discharged to community setting with home care but need additional assistance with management of chronic or acute medical conditions and/or ADLs
  – Working to increase capability to accept higher-acuity patients

• US Navy Ship (USNS) Comfort
  – Currently accepting medical/surgical level patients
  – MUST be negative for COVID-19 (medical staff living on ship)

• Other sites under development
GOAL: SLOW THE SPREAD OF COVID-19, PREVENT SURGE OF CASES INTO HEALTH CARE SYSTEM

# Adaptive Response

## Disease control

- Early detection (lab testing, alert clinical systems) and case isolation (home, hospital, other facilities)
- Community engagement with clear communication, assessment of community acceptance leading to adjustment of approach
- Appropriate clinical care including staff surge when needed

## Non-pharmaceutical interventions (NPIs)

- Extensive testing
- Contact tracing
- Health care infection prevention and control
- Everyday personal NPIs (wash hands, cover coughs, stay home if ill)
- Environmental NPIs (clean surfaces, increase ventilation)
- Personal NPIs (household quarantine, mask in community if ill)

## Supporting society

- Community NPIs (high-risk group social distancing and closing schools)
- Community NPIs (general social distancing (SD) and closing schools (CS))
- Community NPIs (general SD and CS)
- Community NPIs (general SD and CS)

## Pharmaceutical interventions

- Treatment
- Vaccines

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**Version 2.0, 20 March 2020**

[https://www.drtomfrieden.net/blog](https://www.drtomfrieden.net/blog)
PREVENTION MEASURES

• All New Yorkers – especially health care workers – must act as if they have been potentially exposed to COVID-19

• EVERYONE should self-monitor daily for COVID-19 like illness

• EVERYONE should social (physical) distance
  – Stay at home to the extent possible and only leave for essential tasks
  – Keep a minimum of 6 feet from others

• Continue individual measures
  – Hand hygiene
  – Cover your cough
  – Self-isolation at home if sick
SELF-ISOLATION

• A person with possible or confirmed COVID-19 should self-isolate until all the following are true:
  – It has been at least seven days since the person’s symptoms started
  – The person never had fever OR the person has not had a fever for the prior three days without use of fever-reducing drugs such as Tylenol or ibuprofen
  – The person’s overall illness has improved
WHO SHOULD BE TESTED

• Testing not indicated for patients who are not hospitalized
• Ask most patients with mild or moderate symptoms compatible with COVID-19 to stay home to recover
• Advise patients on reasons not to seek testing:
  – Testing requires medical equipment and other resources that are in short supply and should be reserved for those with severe illness
  – They could expose others while traveling to or visiting a medical clinic
  – They might get infected while traveling to or visiting a medical clinic
  – For most, test result will not change what they should do
  – False negative test results can occur that could send the wrong message
NYC HEALTH DEPARTMENT SUPPORT FOR HEALTH CARE PROVIDERS

- Webpage with updated information, posters, and other clinical resources: [https://www1.nyc.gov/site/doh/providers/health-topics/novel-respiratory-viruses.page](https://www1.nyc.gov/site/doh/providers/health-topics/novel-respiratory-viruses.page)
- Consultation via the 24/7 Provider Access Line (866-692-3641)
- Updated guidance via Dear Provider letters and the Health Advisory Network
- Webinars

** All COVID-19 publications in major journals should be freely available
NYC HEALTH ADVISORY NETWORK (HAN)

- Health Alert #6: COVID-19 Updates for New York City includes guidance for adoption of droplet PPE, testing criteria, instructions for health monitoring and self isolation (3/15/20)
- Health Alert #7: Guidance for Healthcare Worker Self-Monitoring and Work Restriction (3/17/20)
- Health Alert #8: Recommends against unnecessary testing, to conserve PPE and prevent avoidable exposures (3/20/20)
- Health Alert #9: Reminds providers to preserve PPE and informs of facility types that are prioritized by NYC Health Department for PPE (4/1/20)

To access and subscribe:
https://www1.nyc.gov/site/doh/providers/resources/health-alert-network.page
GENERAL FACILITY PREPAREDNESS

• Maintain awareness
  – Update staff on status of outbreak regularly
  – Disseminate NYC Health Department’s Health Alerts and Advisories

• Advise people with mild to moderate illness consistent with COVID-19 to stay home and not seek medical care in person
  – ER must be reserved for the severely ill

• Implement and adhere to policies and practices to minimize exposures to respiratory pathogens including SARS-CoV-2

• Maintain a continuum of infection control measures before and throughout the patient’s visit and until room cleaned and disinfected

• Protect those at increased risk for adverse outcomes from COVID-19
PILLARS OF COVID-19 PREPAREDNESS

• TRIAGE
• ISOLATE
• INFORM
TRIAGE

- For patients that require medical care, advise them to call ahead so you can prepare for their arrival
- Place signage and greeters at entry points to screen
  - Identify persons with COVID-19 like illness (fever, cough, shortness of breath, sore throat)
  - Separate them from other patients while waiting
  - Triage personnel should give facemasks and tissues to patients with COVID-19 like illness upon arrival
  - Source control – put facemask on symptomatic patients
ISOLATE

• Evaluate patient in private exam room with the door closed
  – Airborne infection isolation room (AIIR) **NOT** required unless patient undergoes aerosol generating procedure (e.g., intubation, suction) or requires intensive care
  – Collection of a NP or OP swab is **NOT** an aerosol generating procedure

• If private exam room is not available
  – Identify space where patient can be separated from others by ≥6 feet and with easy access to respiratory hygiene supplies
  – In some settings, have patient wait in their personal vehicle or outside facility and call their cell phone when you are ready to attend to them

• Patient rooms do **NOT** need to be left empty after patient leaves unless aerosol generating procedures were performed
INFORM

- All positive test results will be sent directly from the laboratory to the NYC Health Department
PERSONAL PROTECTIVE EQUIPMENT

• Protecting healthcare workers is a top priority
• Per CDC guidelines, most patients can be managed with **droplet precautions**. Use all of the following PPE:
  – Facemask (procedure or surgical mask)
  – Gown
  – Gloves
  – Eye protection (goggles or face shield)
• What about N95 or Powered Air Purifying Respirator (PAPR)?
  – Not needed for routine (non-aerosol generating) care
  – Recommended when performing aerosol generating procedures (e.g., intubation, suctioning, certain high flow oxygenation strategies) or caring for critically ill patients with COVID-19
REUSE OR EXTENDED USE OF PERSONAL PROTECTIVE EQUIPMENT (PPE)

• Facilities must conserve N95s and other PPE

• In general, extended use is preferred to re-use
  – Reduce risk of self-contamination from repeat donning/doffing

• Reuse = using the same PPE for multiple encounters with patients BUT removing (‘doffing’) between each encounter

• Equipment safely stored between patient encounters

• Previously used PPE should never be taken outside of patient care areas unless decontaminated or placed in a clean breathable container

TESTING FOR SARS-CoV-2

- Molecular assay rRT-PCR
  - Commercial laboratories
  - Hospital-based laboratories
  - NYC Public Health Laboratory
WHO TO TEST

• Only test hospitalized patients, unless test results will impact clinical management of the patient

• Assume that any patients with new fever, cough, shortness of breath, or sore throat has COVID-19
HOW TO TEST

• Refer to commercial and hospital-based labs for guidance

• NYC Public Health Laboratory (PHL):
  – Only testing hospitalized patients with severe acute lower respiratory illness (e.g., pneumonia)
  – Requires pre-approval and an eOrder account
  – Call Coronavirus Testing Call Center at (866) 692-3641 for pre-approval
  – If you do not have an eOrder account, visit the PHL website [https://www1.nyc.gov/site/doh/providers/reporting-and-services/public-health-lab.page](https://www1.nyc.gov/site/doh/providers/reporting-and-services/public-health-lab.page)
ORDERING TESTS FROM PHL

• If approved, send specimens to hospital’s central laboratory with the PHL-assigned unique identification number
  – The central lab should submit requisition via eOrder
  – Call back Coronavirus Testing Call Center for transport if needed

• Ordering provider is responsible for giving patients’ results

• Collect one NP and one OP swab packaged in the SAME viral transport medium collection tube
  – One lower respiratory track specimen (eg, sputum) can also be submitted if it can be easily collected (eg, bronchial or tracheal aspirate in patients on ventilator support)

Detailed laboratory guidance can be found online at: https://www1.nyc.gov/assets/doh/downloads/pdf/labs/guidance-lab-2019-ncov-specimen-testing.pdf
DISCHARGING PATIENTS

• NYC Health Department DOES NOT require a negative COVID-19 test to release a patient from a health care facility
GUIDANCE FOR HEALTH CARE WORKER (HCW) SELF-MONITORING

• All HCW are at risk for unrecognized exposures and should self-monitor for illness consistent with COVID-19

• Take temperature twice daily and evaluate for new onset of any of the following:
  – Measured temperature >100.0F (37.8C) or subjective fever
  – Cough
  – Shortness of breath
  – Sore throat

• Be on the lookout for other, less common symptoms
GUIDANCE FOR HCW SELF-ISOLATION

• For HCWs who develop mild or moderate illness, **stay home and self-isolate** until **all** of the following are true:
  - It has been at least seven days since their symptoms started
  - They never had fever OR they have not had a fever for the prior three days without use of fever-reducing drugs such as Tylenol or ibuprofen
  - Their overall illness has improved

• Employers may:
  - Require active monitoring – check and report temperature and symptoms daily
  - Have additional guidance for staff caring for high-risk populations (e.g., older adults or immunocompromised people)

• NYC DOHMH does not require HCWs to undergo quarantine or have a negative test for COVID-19 to return to work

• HCWs should check with their employer before returning to work at completion of isolation

• HCWs at Article 28 facilities must follow guidance from the NYS Department of Health
ANTICIPATE SUPPLY SHORTAGES

- Supplies of PPE must be reserved for high-risk procedures due to potential supply chain constraints
- Now utilizing existing stockpiles
  - Local, State, Federal
  - NYC Health Department only distributing to hospitals, nursing homes, visiting nurses caring for patients with possible or confirmed COVID-19, EMS, dialysis centers, and group homes licensed by NYS Office of People Living with Developmental Disabilities
- Medications and other medical supplies
- Hospital beds, health care personnel, ventilators
- Plan now for contingency and crisis care in setting of limited resources

For additional information on how to manage diminished PPE supplies: https://www.cdc.gov/coronavirus/2019-ncov/hcp/healthcare-supply-ppe-index.html
ENVIRONMENTAL CLEANING

- Clean and disinfect room before returning to routine use
  - Use EPA-registered, hospital-grade disinfectants effective against coronaviruses in accordance with manufacturer’s instructions
  - Clean all areas, with focus on high-touch surfaces
  - Treat contaminated waste as routinely regulated medical waste
  - Follow standard operating procedures for containing and reprocessing used linens
STEPS TO TAKE NOW

• Priority: prevent nosocomial outbreaks
  – Review NYC Health Department guidance (updated regularly)
  – Educate and train staff (eg, just in time trainings for infection control and PPE)
  – Take stock of PPE and environmental supplies
  – Create and disseminate risk communication to patients, staff, families/visitors
STEPS TO TAKE NOW

• Implement plans NOW for:
  – Patients surge
  – Healthcare staff self-monitoring and incentivizing staff to stay home if sick
  – Visitor management
  – Handling staff shortages – contingency staffing, cross-training
  – Altered crisis standards of care
  – Environment protocols
STEPS TO TAKE NOW

• Implement triage protocols
  – Options to evaluate patients remotely
  – Screen at entry for symptoms
  – Set up alternate sites for COVID-19 triage
  – Triage of ICU beds and ventilators
• Cancel elective admissions and procedures
• Implement telemedicine services
CRISIS STANDARDS

• Consider how you will approach decision making in setting of resource scarcity

• Crisis Standards of Care: A Systems Framework

• NYS Ventilator Allocation Guidelines

• Minnesota Crisis Care Framework:
  https://www.health.state.mn.us/communities/ep/surge/crisis/index.html
CHECK GUIDANCE AND RESOURCES OFTEN

• NYC Health Department Provider Webpage
  https://www1.nyc.gov/site/doh/providers/health-topics/novel-respiratory-viruses.page

• CDC Novel Coronavirus Webpage

• Daily updated case count and maps, Johns Hopkins University
  https://gisanddata.maps.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6
WHO TO CALL

In New York City:

Call the NYC Health Department’s Provider Access Line (PAL)

866-NYC-DOH1 or 866-692-3641

Available 24/7

In New York State:

Notify your County Health Department

Use link to find your County’s phone number:

https://www.health.ny.gov/contact/contact_information/
Upcoming Webinars

- Friday, 4/10 @ 2 PM
- Friday, 4/17 @ 2 PM
- Friday, 4/24 @ 2 PM