Our understanding of COVID-19 is evolving rapidly. This presentation is based on our knowledge as of September 17, 2020, 5 PM.
Outline

WHERE WE ARE NOW

CLINICAL UPDATE: CARDIAC MANIFESTATIONS

BEHAVIORAL HEALTH & SUICIDE PREVENTION DURING THE COVID-19 PANDEMIC

QUESTIONS AND DISCUSSION
WHERE WE ARE NOW

• Global incidence has leveled off at approximately 265,000 new cases/day
• Resurgences are occurring in some locations where control was achieved previously
• Daily case counts are stable or decreasing in most U.S. states, but rising in some Southern and Midwestern states
• Several vaccine candidates are in phase III trials
• New York City (NYC) continues staged re-opening, with some in-person public school classes starting September 21
• NYC Health Department is monitoring the impact of reopening and return-to-school policies closely
CUMULATIVE AND RECENT CASES, WORLDWIDE

CUMULATIVE CASES

ACTIVE CASES*

> 29 MILLION CASES
> 942,000 DEATHS

* Active cases defined as total cases – total recovered – total deaths
CUMULATIVE AND RECENT CASES, U.S.

CUMULATIVE CASES

> 6.6 MILLION CASES
> 196,000 DEATHS

AVERAGE DAILY CASES/100,000 IN PAST WEEK

COVID-19, NYC
2/29/20 – 9/15/20

Cumulative counts
• Cases: >234,000
• Hospitalizations: >57,000
• Deaths: >19,000 confirmed; >4,600 probable

Figures:
Daily COVID-19 cases, hospitalizations, and deaths since March 3

NYC Health Department. COVID-19: data.
https://www1.nyc.gov/site/doh/covid/covid-19-data.page
RECENT NYC COVID-19 CASE COUNTS AND DEATHS

NYC Health Department COVID-19 data from 2-week period ending 9/12/2020.
https://www1.nyc.gov/site/doh/covid/covid-19-data.page
COVID-19 CASE RATES, NYC

Shows case rates per 100,000 persons since March 2020 according to select characteristics

REMINDER: IMPORTANCE OF INFLUENZA VACCINATION

• Influenza activity in NYC often starts in October and peaks in February
• Flu vaccination will be especially important this year to reduce burden of respiratory illnesses circulating with COVID-19
• Offer vaccination to all persons aged ≥ 6 months, especially those at high risk of influenza or COVID-19 complications:
  • Risk factors for influenza complications: https://www1.nyc.gov/site/doh/health/health-topics/flu-seasonal-vaccination.page
• Vaccines for Children vaccine distribution has started – order now if you haven’t already
• Information on free immunization clinics: https://www1.nyc.gov/site/doh/services/immunization-clinics.page
TRANSMISSION DYNAMICS OF OUTBREAKS ASSOCIATED WITH CHILD CARE FACILITIES

UTAH APRIL-JULY 2020

- Retrospective review of contact tracing from three COVID-19 clusters in child care facilities
- Two clusters were traced to staff members who worked while household members were ill with COVID-19-like symptoms; source of third cluster was not identified
- Of 184 contacts identified, 31 developed confirmed COVID-19
- Twelve children acquired COVID-19 in child care facilities; all had mild or no symptoms
  - Transmission to 12 (25%) of their non-facility contacts was observed
  - Transmission was found from 2 of 3 asymptomatic children
  - One 8-month-old child transmitted to both parents
  - One parent required hospitalization

TRANSMISSION DYNAMICS OF OUTBREAKS ASSOCIATED WITH CHILD CARE FACILITIES

UTAH APRIL-JULY 2020

• Young children, including those with asymptomatic infection, can transmit COVID-19

• Testing contacts of persons with confirmed COVID-19 in child care settings, including asymptomatic children, may play a role in preventing spread to household contacts

• Note: this report did not assess whether transmission from young children was a key driver of the local outbreak

• Study of deaths associated with SARS-CoV-2 infection among U.S. persons aged <21 years
• SARS-CoV-2–associated deaths were defined as deaths associated with COVID-19 or MIS-C as reported by jurisdictions to CDC
<table>
<thead>
<tr>
<th>Characteristics of Decedents</th>
<th>N=121</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, years (median, IQR)</td>
<td>16 (7-19)</td>
</tr>
<tr>
<td>Sex, No.(%): Female</td>
<td>45 (37.2)</td>
</tr>
<tr>
<td>Male</td>
<td>76 (62.8)</td>
</tr>
<tr>
<td>Race/ethnicity, No. (%)</td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>54 (44.6)</td>
</tr>
<tr>
<td>Black, non-Hispanic</td>
<td>35 (28.9)</td>
</tr>
<tr>
<td>White, non-Hispanic</td>
<td>17 (14.0)</td>
</tr>
<tr>
<td>American Indian/Alaska Native, non-Hispanic</td>
<td>5 (4.1)</td>
</tr>
<tr>
<td>Other</td>
<td>12 (8.3)</td>
</tr>
<tr>
<td>At least 1 underlying medical condition, No. (%)</td>
<td>91 (75.2)</td>
</tr>
<tr>
<td>Location of death, No. (%)</td>
<td></td>
</tr>
<tr>
<td>Home</td>
<td>16 (13.2)</td>
</tr>
<tr>
<td>Emergency department</td>
<td>23 (19.0)</td>
</tr>
<tr>
<td>Hospital</td>
<td>79 (65.3)</td>
</tr>
</tbody>
</table>
Most decedents (75%) had ≥ 1 underlying condition
- Common: asthma (28%), obesity (27%), neurologic/developmental (22%), cardiovascular (18%)

Persons aged 18–20 years accounted for nearly half of the deaths
- Developmentally appropriate follow-up services are essential for people in this age group who develop COVID-19

Out-of-hospital deaths occurred among all age groups
- Highest proportion in infants (33%) and persons aged 14–20 years (37%)
- Although children are more likely to have mild COVID-19 compared to adults, complications can occur

Hispanic, Black, and non-Hispanic American Indian or Alaska Native persons make up 41% of the U.S. population aged <21 years, but accounted for ~ 75% of deaths in this age group
- We must work to address systemic factors that contribute to these and other health disparities

Cardiac Injury and Recovery in COVID-19
Cardiac injury appears to be common in persons with COVID-19

- Cardiac injury has been found among patients hospitalized with COVID-19
  - Retrospective study of 2,736 patients hospitalized with COVID-19 in NYC found elevated troponin in 36% \(^1\)
  - Myocardial injury was associated with worse outcomes (including intubation and death) independent of history of cardiovascular disease and other factors

- Also occurs in persons with less severe COVID-19
  - After recovery from COVID-19, 100 adults in Germany without active cardiac symptoms underwent cardiac magnetic resonance imaging \(^2\)
    - Cardiac involvement found in 78%
    - Ongoing myocardial inflammation found in 60%
    - Findings were independent of comorbidities, severity of COVID-19, and time from original diagnosis
  - 26 competitive U.S. college athletes who tested positive for SARS-CoV-2 underwent comprehensive cardiac magnetic resonance \(^3\)
    - All had experienced mild or no symptoms
    - 4 (15%) had evidence of myocarditis
    - 8 (31%) had evidence of prior myocardial injury
  - Myocardial inflammation found in >50% of patients in two small series from China and Hong Kong involving patients recovered from both mild and severe disease \(^4,5\)
Multisystem inflammatory syndrome in children (MIS-C) that appears weeks after SARS-CoV infection

- 226 reported cases in NYC
- 87% of NYC cases had possible cardiac involvement

Common cardiac findings include acute depression of left ventricular function, elevated BNP and Troponin I.⁶

- Some studies found temporary coronary artery dilation
- Large case report from CDC illustrated a variety of cardiac diagnostic methods⁷
- Echocardiographic findings in series of 28 patients:⁸
  - Left ventricular systolic and diastolic dysfunction
  - Diastolic dysfunction present in patients with normal ejection fraction and in subacute phase of systolic function recovery
  - Findings indicate myocarditis even in subclinical cardiac presentation
  - All patients recovered functionally


Call Provider Access Line to report suspected MIS-C cases: 866-692-3641
POSSIBLE MECHANISMS FOR CARDIAC INJURY

- Cytokine storm/generalized inflammatory response
  - Post-infectious immune reaction (MIS-C)
- Hypoxic stress
- Thrombosis
- Endothelial dysfunction
- Direct viral invasion

CARDIAC CELLULAR INJURY BY SARS-CoV-2

• Treated cardiac stem cells with SARS-CoV-2 in vitro
  • Additionally evaluated cardiac specimens from autopsy of COVID-19 patients

• “Precise, ordered disruptions to the sarcomeric structure and complete dissolution of the cardiac contractile machinery”
  • Heat-killed virus did not generate disruption
  • Observed asynchrony between viral replication and myofibrillar disruption
  • Visualization of this pattern requires special staining

CARDIAC FOLLOW-UP IN PATIENTS WHO RECOVER FROM COVID-19

- Cardiac screening and surveillance in asymptomatic patients who recovered from COVID-19 is at the physician’s discretion\textsuperscript{11-13}
  - Not currently recommended routinely

- Maintain a high suspicion of cardiac injury in patients who develop consistent symptoms after recovering from COVID-19\textsuperscript{3,11-14}

- Consider additional surveillance for patients who engage in high-risk physical activities such as competitive sports\textsuperscript{3,14}
EXAMPLE: “RETURN-TO-PLAY” ALGORITHM FOR ATHLETES AND HIGHLY ACTIVE PEOPLE RECOVERING FROM COVID-1914

**COVID-19 negative**
- No limitations to exercise
- Follow social distancing guidelines
- Close monitoring for development of symptoms

**COVID-19 positive**
- Asymptomatic (considered in setting of screening with known exposure or team/ school/league-based mandatory screening)
  - Mild symptoms; not hospitalized
  - During symptomatic period:
    - Rest/recovery with no exercise
    - Reassess for clinical deterioration and consider further cardiac testing and/or hospitalization if development of cardiac symptoms
  - 2 wk of Convalescence without resumption of exercise after symptom resolution
  - Evaluation by a medical professional for consideration of return to activity:
    - hsTn
    - 12-lead electrocardiogram
    - 2-dimensional echocardiogram
    - Consider additional symptom-guided testing

**NOTE:** If symptoms concerning for COVID-19 develop and testing is negative or not obtained, consider following pathway as if COVID-19 positive.

**COVID-19 positive**
- Significant symptoms; hospitalized
  - During hospitalization:
    - hsTn
    - Consider cardiac imaging per local protocols
  - Normal
  - hsTn >99 percentile and/or abnormal cardiac study
  - Follow myocarditis RTP guidelines

**COVID-19 positive**
- Normal
  - hsTn >99 percentile and/or abnormal cardiac study
  - Follow myocarditis RTP guidelines

**COVID-19 negative**
- Slow resumption of activity under guidance of health care team
- Close monitoring for clinical deterioration

**Image notes:**
- COVID-19 indicates coronavirus disease 2019; hsTn, high-sensitivity troponin I; RTP, return to play.
- Typical testing obtained via a nasopharyngeal swab. All athletes with positive testing should be isolated for 2 weeks regardless of symptoms.
- If clinical and/or cardiac symptoms develop, follow appropriate clinical pathway.
- Given lack of clean pathophysiology, authors of this paper recommend consulting the American College of Cardiology/American Heart Association athlete myocarditis guidelines.


BEHAVIORAL HEALTH & SUICIDE PREVENTION DURING THE COVID-19 PANDEMIC

Myla Harrison, MD, MPH
Assistant Commissioner, Bureau of Mental Health
NYC Department of Health and Mental Hygiene
OVERVIEW

• NYC Suicide Epidemiology
• Behavioral Health Impact of COVID-19 Pandemic
• Suicide Prevention
RATE OF SUICIDE BY SEX, NYC AND U.S., 2007-2016

SUICIDE DEATH RATES FOR PERSONS AGED 10–24: UNITED STATES, 2016–2018


NOTES: Rates are 3-year averages of suicide deaths in 2016–2018 per 100,000 population of persons aged 10–24 in each area. Suicide deaths are identified using International Classification of Diseases, 10th Revision underlying cause-of-death codes U03, X60-X64, and Y87.5.

RATES OF SUICIDE BY AGE GROUP, NYC 2016

+ Interpret rates with caution due to the small number of events

AGE-SPECIFIC SUICIDE DEATH RATES, NYC, 2008–2017

BEHAVIORAL HEALTH IMPACT OF THE COVID-19 PANDEMIC
Most people who experience a traumatic event will be resilient and will not develop long term mental health challenges or illness.

Traumatic events and past crises such as natural disasters, epidemics, civil unrest, and financial recessions impact mental health and are associated with increased:

- Depression
- Anxiety
- Post traumatic stress disorder
- Psychological distress

Lower income & less wealth are associated with greater burden of mental illness.

Health Risk Behaviors
- Misuse of alcohol, tobacco and prescription drugs
- Interpersonal conflict or violence
- Self-harm
- Increased sexual risk behaviors

Distress Reactions
- Difficulty sleeping
- Decreased sense of safety
- Physical symptoms
- Irritability or anger
- Distraction or isolation
- Hopelessness

Psychiatric Disorders
- Depression
- Post-traumatic stress disorder
- Anxiety
- Persistent complex bereavement disorder

Resilience
- Leverage strengths, resources and connections
- Collective action
- Problem-solving
- Sense of efficacy

Individual Responses to Pandemics
COVID-19 AND STRUCTURAL RACISM

• People impacted by structural racism, poverty and other systems of oppression have disproportionately high rates of illness, death and socioeconomic difficulties.

• This reality is compounded by the well-documented health and mental health burdens of racism itself.
PREVALENCE OF SERIOUS PSYCHOLOGICAL DISTRESS, NEW YORK CITY, 2017

- Experienced Racism:
  - Always/A lot/Some: 15%
  - A little/Not at all: 5%

- Not Enough Money for Food:
  - Yes: 25%
  - No: 4%

- Not Enough Money for Rent:
  - Yes: 21%
  - No: 5%

- Neighborhood Safety:
  - Unsafe: 15%
  - Safe: 5%

Source: NYC Social Determinants of Health Survey, 2017


**Prevalence of adverse mental health outcomes and increased substance use to cope with stress or emotions related to COVID-19 United States, June 24–30, 2020**

- Anxiety disorder †: 26%
- Depressive disorder †: 24%
- Anxiety or depressive disorder †: 31%
- COVID-19–related TSRD §: 26%
- Started or increased substance use to cope with pandemic-related stress or emotions ¶: 13%
- Seriously considered suicide in past 30 days: 11%
- ≥1 adverse mental or behavioral health symptom: 41%

† Symptoms of anxiety disorder and depressive disorder were assessed via the four-item Patient Health Questionnaire (PHQ-4).
§ Disorders classified as trauma and stress related disorders (TSRDs) in the *Diagnostic and Statistical Manual of Mental Disorders* (DSM–5) include posttraumatic stress disorder (PTSD), acute stress disorder (ASD), and adjustment disorders (ADs), among others.
¶ 104 respondents selected “Prefer not to answer.”
DEPRESSION SYMPTOMS IN U.S. ADULTS BEFORE AND DURING THE COVID-19 PANDEMIC


NYC WELL TOTAL MONTHLY ANSWERED CONTACTS, CY2019 VS CY2020 (INCLUDES CALLS, TEXTS, AND CHATS)

<table>
<thead>
<tr>
<th>Month</th>
<th>January 2019</th>
<th>January 2020</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>April</td>
<td>+9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>May</td>
<td>+17%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>June</td>
<td>+17%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>July</td>
<td>+25%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>August</td>
<td>+30%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
SUICIDE PREVENTION
• Suicide is preventable.
• Suicide is complex. There is rarely a single reason why someone considers suicide, although behavioral health challenges including depression, anxiety, stress, grief, and changes in substance use are often contributing factors.
• Identification of behavioral health challenges, thoughts of suicide, and other suicide risk factors and subsequent referrals to care can reduce a patient’s suicide risk.
While suicide is rarely the result of a single factor, the following are risk factors that someone may be more likely to attempt or die from suicide:

- Family history of suicide
- Family history of child maltreatment
- Previous suicide attempt(s)
- History of mental disorders, particularly clinical depression
- History of alcohol and substance use challenges
- Feelings of hopelessness
- Impulsive or aggressive tendencies

Source: https://www.cdc.gov/violenceprevention/suicide/riskprotectivefactors.html
Risk factors that someone may be more likely to attempt or die from suicide, continued:

- Cultural and religious beliefs (e.g., belief that suicide is noble resolution of a personal dilemma)
- Local clusters of suicide
- Isolation, a feeling of being cut off from other people
- Barriers to accessing mental health treatment
- Loss (relational, social, work, or financial)
- Physical illness
- Easy access to lethal methods
- Unwillingness to seek help because of the stigma attached to mental health and substance abuse disorders or to suicidal thoughts

Source: https://www.cdc.gov/violenceprevention/suicide/riskprotectivefactors.html
SUICIDE PROTECTIVE FACTORS

- Effective and ongoing care for mental, physical, and substance use disorders
- Easy access to a variety of clinical interventions and support for help seeking
- Family and community support (connectedness)
- Skills in problem solving, conflict resolution, and nonviolent ways of handling disputes
- Cultural and religious beliefs that discourage suicide and support instincts for self-preservation

Source: https://www.cdc.gov/violenceprevention/suicide/riskprotectivefactors.html
SUICIDE WARNING SIGNS

• Talking about death or suicide
• Showing feelings of hopelessness and/or helplessness
• Saying they are a burden
• Avoiding friends and family
• Losing interest in activities
• Displaying extreme mood swings
• Giving away possessions
• Saying goodbye to family and friends
RECOGNIZING BEHAVIORAL HEALTH CHALLENGES IN PATIENTS

Inquire: Ask patients how they are doing emotionally, mentally, and physically.
Normalize and Promote Resiliency: Validate reactions that are expected during this pandemic, including anxiety and difficulty sleeping. Teach patients about how our body reacts under stress and methods they can use to cope.

For more information and materials on coping and emotional well-being visit on.nyc.gov/copingcovid19
Differentiate: Assess whether the person may need professional behavioral health support. Patients who are not able to function at work, care for family, or attend to their own needs may benefit from additional behavioral health interventions.

Consider using the Generalized Anxiety Disorder 2 (GAD-2) to screen for anxiety and the Patient Health Questionnaire-2 (PHQ-2) for depression.
<table>
<thead>
<tr>
<th>Generalized Anxiety Disorder 2-item (GAD-2)</th>
<th>Patient Health Questionnaire-2 (PHQ-2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Over the last two weeks, how often have you been bothered by the following problems?</td>
<td>• Over the last two weeks, how often have you been bothered by the following?</td>
</tr>
<tr>
<td>• Feeling nervous, anxious, or on edge</td>
<td>• Little interest or pleasure in doing things</td>
</tr>
<tr>
<td>• Not being able to stop or control worrying</td>
<td>• Feeling down, depressed or hopeless</td>
</tr>
</tbody>
</table>

For both tools, score each response using the following scale:
0 = not at all
1 = several days
2 = more than half the days
3 = nearly every day

For a total score ≥ 3 on either scale, refer the patient for further care.
RECOGNIZING BEHAVIORAL HEALTH CHALLENGES IN PATIENTS

Refer: If an individual is having difficulty coping with stress, a referral to a behavioral health professional should be placed. The referral can be to the patient’s own behavioral health clinician, a colleague of yours, or a counselor through NYC Well.
NYC Well offers various free well-being and emotional support applications (apps) to help with coping. NYC Well also offers trained counselors 24/7 in over 200 languages. In addition to crisis counseling, these counselors can connect people with ongoing treatment if necessary. Call 888-NYC-WELL (888-692-9355), text “WELL” to 65173, or chat at nyc.gov/nycwell.
For information about employment, rent assistance and more, visit nyc.gov/helpnow or search for comprehensive resource guide at nyc.gov.

For food assistance, visit nyc.gov/getfood.

If your income changes, you may be eligible for food assistance (through SNAP), health insurance (through Medicaid) and financial assistance. Visit access.nyc.gov for more information.

Free financial counseling is available at nyc.gov/talkmoney.


For free mental health support, call 888-NYC-WELL (888-692-9355), text “WELL” to 65173 or chat at nyc.gov/nycwell.
Health care workers face unique stressors and challenges related to the COVID-19 pandemic including:

• Evolving information
• Supply shortages
• Increased risk of infection
• Workload
• Patient death toll
• Learning how to adapt services to telehealth while staying connected to patients and coworkers.

Many are experiencing these stressors on top of worrying about family, taking care of children, financial stressors and navigating physical distancing. It is natural to feel overwhelmed and have trouble coping.
TAKE CARE OF YOURSELF

- Take breaks
- Engage in fun, relaxing activities
- Limit your exposure to the new
- Eat and sleep regularly
- Check in with family, friends and loved ones
- Check in with colleagues while working
- Identify and use your support network
- Stay connected

More information on self care and emotional wellbeing for HCWs:

LOOK OUT FOR YOUR COWORKERS

• Pay attention to the way your coworkers talk and behave. This can help you recognize when someone may be struggling emotionally and thinking about suicide.

• It can be more challenging to notice warning signs of suicide in others if you are working in a busy setting or remotely.

• Check in with your coworkers to see how they are coping, especially those with a history of suicide attempts, depression, anxiety or other mental illness, or those who have experienced a recent loss.
QUESTIONS?
• Log onto the CPE website - http://cme.nychhc.org
• 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