The number of COVID-19 confirmed cases, related deaths, and total tests reported for State and County

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Last Updated</th>
<th>COVID-19 cases in Texas</th>
<th>COVID-19 cases in Harris County</th>
<th>COVID-19 related deaths in Texas</th>
<th>COVID-19 related deaths in Harris County</th>
<th>Total tests performed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Texas</td>
<td>June 4, 2020, 3:50 PM</td>
<td>69,920 (Active cases: 23,354)</td>
<td>13,268</td>
<td>1,767</td>
<td>249</td>
<td>1,174,948 Texas</td>
</tr>
<tr>
<td>2. Johns</td>
<td>June 5, 2020, 7:33 AM</td>
<td>70,758 (Active cases: 23,909)</td>
<td>13,603</td>
<td>1,776</td>
<td>N/A</td>
<td>1,038,555 Texas</td>
</tr>
</tbody>
</table>

a) DSHS updated the method of reporting COVID-19 cases in Texas on March 24, 2020 to provide the public with more timely information. The DSHS daily case count now includes all cases reported publicly by local health departments around the state.

b) Data sources from WHO, CDC, ECDC, NHC, DXY, 1point3acres, Worldometers.info, BNO, state and national government health departments, and local media reports.

c) Data represents total tests from private and public labs in Texas, unless otherwise stated. N/A = not available.
Articles:

Introduction: There is insufficient data regarding vertical transmission of SARS-CoV-2 with limited placental studies.

Methods:
- Pregnant women diagnosed with Covid-19 who delivered at Papa Giovanni XXIII Hospital in Bergamo Italy from March 5, 2020-April 21,2020.
- Mothers and babies nasopharyngeal swabs and placenta collected for RT-PCR and RNA in situ hybridization (ISH) using V-nCov2019-S probe

Results:
- 22 women were Covid-19 positive and 2/22 neonates born to positive Covid mothers were positive for SARS CoV-2 from their NP swabs by RT-PCR.
  o Case 1: neonate’s mother had fever and cough with a positive Covid test at 37.6 WGA. The baby was born vaginally at normal birth weight with APGAR scores of 9 and 10 and an unremarkable umbilical artery pH. The neonate’s NP swabs were positive at birth, after 24 hours, and after 7 days but remained asymptomatic
    ▪ Mother wore surgical mask in L&D, skin-to-skin contact wasn’t permitted, rooming-in and breast-feeding with mask were allowed
    ▪ Placenta: chronic intervillositis with macrophages infiltration
  o Case 2: neonate’s mother had fever and cough with a positive Covid-19 NP swab. The baby was born via c-section at 35.1 WGA due to non-reassuring fetal status. The baby had a normal birth weight with APGAR scores of 9 and 10 and an unremarkable umbilical artery pH. The baby’s NP swab for SARS CoV-2 was initially negative at birth; however, it became positive after 7 days and remained asymptomatic.
    ▪ Separation of infant and mother at birth, with no direct contact
    ▪ Placentas: chronic intervillositis with macrophages infiltration
  o RNA ISH for SARS CoV-2 detection in placenta:
    ▪ Case 1 and Case 2 were mother COVID-19 RT-PCR positive, neonate RT-PCR positive
    ▪ Case 3 was mother COVID-19 RT-PCR positive, neonate RT-PCR negative
    ▪ Case 4 was mother COVID-19 RT-PCR negative, neonate RT-PCR negative
    ▪ Synctiotrophoplasm of Case 1 and Case 2 with positive signal for SARS-CoV-2 spike protein mRNA, but not in Case 3 or 4

Discussion:
- Vertical transmission of SARS-CoV-2 remains controversial and literature is limited
- Case report of positive SARS-CoV-2 testing in mother, neonate and placental tissues, with visualization using RNA ISH, suggesting possibility of mother-to-child transmission
- Limited report on 2 cases, large multicenter studies needed specifically evaluating placental tissue


**Introduction:**
- In May 2020 a new pediatric syndrome associated with SARS-CoV-2 was defined Multisystem Inflammatory Syndrome in Children (MIS-C), however literature remains limited.
- Children's Hospital of Philadelphia (CHOP) reports 6 cases of MIS-C requiring PICU care

**Results:**

**Case (race/ethnicity):** Two 5y/o females (white/non-hispanic, unknown), one 6y/o female (black/non-hispanic), one 9y/o female (white/non-hispanic), one 12y/o male (unknown), and one 14y/o female (black/non-hispanic) were evaluated.
- None had chronic medical conditions (no report of obesity)
- None had documented contact with a SARS-CoV-2 infected patient.

**Symptoms:** All cases presented with GI symptoms (emesis, diarrhea, abdominal pain). Four patients presented with neurological symptoms (headache x1, altered mental status x1, irritability and nuchal rigidity x2). Two had a rash, two had mucous membrane changes, two children had conjunctivitis with one of them also having swollen hands; one child developed conjunctivitis, extremity edema and mucosal changes while admitted. Additionally, three children had respiratory symptoms with one with dyspnea, one with tachypnea, and the other with respiratory distress on admission. Four children had AKI.

**Labs:** All patients on admission had elevated inflammatory markers with CRP levels ranging from 8.3-34.3mg/dL and procalcitonin levels ranging from 15.2 to >100ng/mL. Other lab abnormalities included elevated pro-BNP (518-18,605 pg/mL) and troponin (0.05-1.39ng/mL) in 5/6 of the children (no data available for the 14y/o female). Out of the 6 children, five of them had elevated ferritin levels (512.6-1267ng/mL) (no data on the 9y/o female). All patients had hyponatremia (125-134mmol/L); platelets ranged from 46,000-217,000.

**SARS CoV-2:** All six initial nasopharyngeal SARS CoV-2 PCR testing was negative; however, repeat testing in three (5y/o female, 6y/o female, and 9y/o female) was positive. SARS CoV-2 IgG testing in both of the 5y/o females, 6y/o female, 12y/o male, and the 14y/o female were positive (5/6 patients, last patient wasn’t done).

**Radiographs:** Chest x-rays were obtained all the children: two showed bilateral pulmonary infiltrates in the 14y/o female and 12y/o male, one was normal initially in the 9y/o female, one showed peribronchial thickening with patchy right lower lobe infiltrates in one of the 5y/o females, one showed a prominent cardiac silhouette and mild central vascular congestion in the other 5y/o female, and one showed dense bilateral airspace opacities, greater on the right in the 6y/o female.

**Echocardiograms:** The initial echocardiogram for the 14y/o female and one of the 5y/o females showed moderately diminished left ventricular function. Of note, the 14y/o female’s repeat echocardiogram on HD6 was concerning for right coronary artery dilation. The 12y/o male had mild left ventricular dysfunction with the 9y/o female having a normal echo. One of the 5y/o females had left ventricular
dilation with mildly diminished left ventricular function and the 6y/o female had moderate left ventricular dilation with mildly systolic shortening.

**Respiratory support:** 3/6 of the children required mechanical ventilation, including the 14y/o female, one of the 5y/o females, and the 6y/o female. The 12y/o male and the 9y/o female required non-invasive mechanical ventilation.

**Treatments:** All children received empiric antibiotics.
- The 14y/o female required vasoactive medications, IVIG, methylprednisolone, and low-dose aspirin. Discharged on HD 17.
- The 12y/o male required vasoactive medications, pulse-methylprednisolone, and IVIG. Discharged on HD 12.
- The 9y/o female required fluid resuscitation, IVIG, methylprednisolone, and low-dose aspirin. Discharged on HD 8.
- The first 5y/o female required vasoactive medications, IVIG x2, methylprednisolone, anakinra, pulse-methylprednisolone. Discharged on HD 11.
- The second 5y/o female required vasoactive medications, IVIG x2, and methylprednisolone. Discharged on HD 11.
- The 6y/o female required vasoactive medications, IVIG, methylprednisolone, pulse steroids. Pending discharge

**Discussion:**
- Despite MIS-C mimicking other inflammatory syndromes, distinguishing characteristics include cardiac dysfunction with elevated troponin and BNP, GI symptoms, and thrombocytopenia. Neurologic symptoms were also noted in 4/6 of the patients.
- The treatment for Kawasaki Disease, IVIG and methylprednisolone, appears to be the mainstay of treatment at this time as patients clinically improved after receiving this therapy.
- Additional data regarding immunopathology is needed to determine if MIS-C is a completely separate entity from other inflammatory syndromes and to direct therapeutic interventions

**COVID-19 Literature Review Newsletter Volume #28**
Infectious Disease Fellows: Teena Xu, MD and Alison Robins, MD
Faculty: Prathit Kulkarni, MD
June 5th, 2020

**Update:** Retraction of two papers in NEJM and Lancet


**Articles**
Clinical question: Does short-term high-dose hydroxychloroquine (HCQ) prevent symptomatic infection after SARS-CoV-2 exposure?

Methods:
- Randomized, double-blind, placebo-controlled trial (USA and Canada)
- Asymptomatic adults with household or occupational exposure (within 6 ft for >10 minutes without appropriate PPE) to a person with PCR-confirmed Covid-19 within the past 4 days
- Face mask or respirator
  - Moderate-risk exposure
  - High-risk exposure
  - NOTE: Initial week of enrollment also included healthcare workers with exposure to presumptive positives due to limited testing
- Recruitment through social media and self-referrals, followed by periodic email surveys
- Randomized 1:1 to receive placebo or HCQ for 5 days
  - Day 1: 800mg x1, then 600mg 6-8 hours later
  - Day 2-5: 600mg daily
- Primary outcome: incidence of symptomatic Covid-19 within 14 days of enrollment, defined as:
  - Confirmed PCR-positive
  - Probable Cough or dyspnea, or ≥2 of fever, chills, rigors, myalgia, headache, sore throat, new olfactory/taste disorder
  - Possible ≥1 above symptoms, including diarrhea

Results:
- N=821
  - Young healthy cohort, median age 40 (27% with chronic health conditions)
  - Mostly healthcare workers (66%) with patient exposure (77%)
  - Mostly high-risk exposures (88%), many without any PPE (60%)
- 107 (13%) developed symptoms but only 3% had PCR-confirmed disease
  - 60% enrolled 3-4 days after exposure
  - 22% also took zinc (same in both groups)
  - Adherence lower in HCQ group (75% vs 83%, p=0.01), mostly due to side effects
  - More side effects in HCQ group (40% vs 17%, p<0.001), although no serious adverse events or cardiac arrhythmias

Conclusions/Limitations:
• High doses of HCQ did not prevent illness compatible with Covid-19 when initiated within 4 days after a high-risk or moderate-risk exposure.
• Limitations:
  o Data was entirely self-reported
  o Few laboratory-confirmed cases
  o No testing for asymptomatic infection
  o Most enrolled >48 hours of exposure


Background:
• SARS-CoV-2 cases have exceeded 6 million worldwide
• Still unknown if SARS-CoV-2 is spread through aerosols with varying reports of isolation of virus RNA from air sampling
• We are currently lacking a vaccine and multiple options for effective treatment (including no oral options for mild disease) for SARS-CoV-2, so evidence to support interventions to reduce transmission remain of primary importance

Methods:
• Systematic review of studies on patients with confirmed or probable SARS-CoV-2, SARS-CoV or Middle East respiratory syndrome coronavirus (MERS-CoV), along with their close contacts with varying distances, use of facemasks and respirators, eye protection, or both
  o Included review of both published literature and preprint servers
  o Included healthcare and non-healthcare settings
• Outcomes: risk of transmission
• No randomized trials identified

Results:
• 172 studies identified for systematic review
  o 66 studies focused on distances of virus transmission
  o 30 focused on virus transmission with the use of face masks and respirators
  o 13 studies specifically evaluated eye protection and transmission
  o Many studies included intervention bundles
• 44/172 studies were comparative in nature and used for meta-analysis and quantitative assessment of effect
  o 7/44 comparative studies focused on SARS-CoV-2 specifically
• Risk of bias was felt to be low-to-moderate with no evidence of publications bias
• Closer distances had a strong association with risk of infection with absolute risk of 12.8% for shorter distances compared to 2.6% for further distances
• Use of face masks, whether N95, surgical, or reusable cotton masks, was associated with reduction in risk of infections with RR 0.34
  o Absolute risk of 3.1% with face mask vs 17.4% with no face mask
  o Also with initial signal of stronger reduction in risk with N95 respirator (only 1 study for SARS-CoV-2)
• Lower risk of infection was also seen with eye protection, with a RR 0.34 and absolute risk of 16% with no eye protection used vs 5.5% with eye protection
Conclusion/Limitations:

- Physical distancing, use of face masks or respirators, and eye protection help reduce risk of infection, but there continues to be some risk even with the use of these protective measures.
- Unable to definitively provide support that N95’s are more effective than surgical masks but early suggestions of the concept.
- Studies were non-randomized and therefore are subject to biases.
- Substantially smaller proportion of patients with SARS-CoV-2 compared to SARS-CoV and MERS-CoV.

Additional reading: