Disclosure

I have no financial relationships with commercial entities producing related products and/or services
Objectives

• Understand the pathophysiology and clinical characteristics of COVID-19 as it relates to children
• Describe how the public health response has affected children
• Explore ways to mitigate the negative effects of this response on childhood health
SARS CoV 2
How Children are Affected
Case Series from China

- 2135 pediatric patients with COVID-19 from January 16 to February 8, 2020\(^1\)
  - Only 34% laboratory confirmed
  - Median Age= 6.7
  - 5.2% with O2 Sat <92%
  - Infants were at highest risk (10.7% required oxygen)
  - 1 death of a 14 year old

- 171 Confirmed Cases at Wuhan Children’s Hospital\(^3\)
  - 2.3% with O2 Sat < 92%
  - 3 patients intubated, one death (10 month old with Intussusception)
Systemic Review of Pediatric Cases

• 18 Studies Including 1065 Confirmed Cases of COVID-19⁴:
  • 444 patients < 10 years old, 2 newborns
  • One severe case of COVID pneumonia in a 13 month old who recovered
  • No deaths in the age range 0-9
  • One death in the age range 10-18 (no details provided)
  • ”Most children with COVID-19 presented with mild symptoms, if any, generally required supportive care only, typically had a good prognosis and recovered in 1-2 weeks.”
US Admissions for COVID-19

- Case Series of COVID-19 Patients Admitted to NY Hospitals between March 1\textsuperscript{st} and April 4\textsuperscript{th}, 2020\textsuperscript{5}
- Among 2634 discharges or deaths
  - 34 pediatric patients
    - 26 age 0-9
    - 8 age 10-19
  - Average length of stay= 2 days
  - 2 PICU admissions
  - No deaths
Study of Household Contacts

- Household cohort study to determine features of disease transmission in China\textsuperscript{7}
  - 105 confirmed cases during January and February, 2020
  - 392 household contacts

- Secondary attack rates
  - 17\% among adults (28\% for spouses)
  - 4\% among children
  - 0\% among family members of index cases who practiced strict quarantine
Neonates

• Data from China did not show evidence of congenital infection among babies born to mothers with COVID-19
  • Small Series of 9 Patients Delivered via C-Section
  • No Viral RNA found in Amniotic Fluid, Cord Blood, or Placental Tissue

• SARS CoV 2 has not been found in breast milk
  • AAP recommends expressed breast milk fed by non-infected caregivers or direct breast feeding if “meticulous” precautions
Unanswered Questions

• High risk populations within pediatrics
  • No literature on high risk populations

• Asthma
  • Case series from China did not show increased risk in adults $^{10}$
  • Considered a high risk group, but data is lacking
  • Focus on good asthma control
  • *Avoid nebulizer therapy to prevent viral spread*
Unanswered Questions

• Role of Children in Spreading of Infection
  • More likely to be asymptomatic viral shedders \(^{11}\)
  • Fecal shedding may last for weeks, even after NP swabs are negative \(^{12, 13}\)
  • May have more upper respiratory symptoms \(^{14}\)
Why do Children Have Milder Disease?

• More Coronavirus Exposures
  • Antibodies may cross-react with SARS CoV 2

• SARS CoV 2 binds to ACE2 receptors, which may be less common in children’s respiratory tract\textsuperscript{15}

• Children may be less likely to develop a severe immune response \textsuperscript{16, 17}
Effects of the Public Health Response
Isolation and Uncertainty

• School closing means more than loss of education
  • Socialization, nutrition\textsuperscript{18}, health care, physical activity

• Social distancing

• Disconnected from healthcare
  • Preventative care
  • Mental health

• Ubiquitous messaging from news outlets

• Parents are staying at home

• Economic uncertainty, job loss
Mental Health

• Most mental health disorders begin in childhood\textsuperscript{19}

• Mental health disorders could worsen during this time:
  • Economic down turns are associated with increased mental health problems among youth\textsuperscript{20}
  • 13.2\% of adolescents receive mental health services at school\textsuperscript{21}
  • Loss of social connections and positive activities
  • Anxiety over finances and the health of loved ones
Risk of Child Maltreatment

- Even in non-pandemic circumstances, 1 in 8 children have CPS confirmed maltreatment in their lifetime\(^{22}\)
- Parents are home more
  - Working
  - Laid off from work
- Stay at home orders associated with a 20-30% increase in domestic violence in several countries\(^{23}\)
- Schools are the largest source of CPS referrals
  - With medical visits being another important source
**Immunizations**

**RO (basic reproduction number) of diseases**
A measure of how many people each sick person will infect on average

- MERS: 0.8
- Influenza: 1.5
- Ebola: 2.0
- COVID-19: 2.5*
- SARS: 3.5
- Mumps: 4.5
- Rubella: 6.0
- Smallpox: 6.0
- Measles: 16.0

*This number may change as we learn more about this new disease*
Suggestions for Providers
Priorities for Reestablishing Well Child Care

1) Immunizations, especially up to 24 months

2) Modified WCC during immunization visits
   • Length, weight, head circumference
   • Developmental screen and M-CHAT-R
   • Domestic violence and depression for caregiver and/or child
   • If possible, lead, anemia, and dental screening

3) Well-child and adolescent visits with a provider
   • Including mental health
Ensure a Safe Space for Care

• Off-site location or separate area designated only for well visits
• Screen staff and patients for symptoms and exposure
• Space appointments to prevent congregating in a common waiting area
• Encourage only one caregiver accompany child
• Adhere to all CDC recommended IC standards
We can still do a lot remotely

• Telemedicine visits, especially for adolescents
• Promoting physical activity
• Teaching ways to cope with stress
• Mental Health Services
• Advocating for continued nutrition services for school age children
Example #1

- **Challenge:**
  - “Social distancing” does not translate into well the Zuni Language

- **Response:**
  - Youth contest to “create awareness through art”
Example #2

• Challenge:
  • Youth need healthy, outside activities they can do from home

• Response:
  • Earth Day Home Gardening Kits (soil, seeds, tools, watering tub, traditional instructions)
Example #3

• Challenge:
  • Youth sports and school activities have been cancelled

• Response:
  • Physical Activity Kits (jump rope, exercise cube, skip it, water bottle, trail mix, herbal tea, and physical activity and nutrition educational handout)
We Can Do It!
E lah`kwa (Thank You)


Works Cited


