



# COVID-19: A Pediatrics Perspective

---

**CAPT Tom Faber, MD, MPH, FAAP**  
**Pediatrics Chief Clinical Consultant**  
**Clinical Director**  
**Zuni IHS Hospital**

**April 30, 2020**

# Disclosure

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



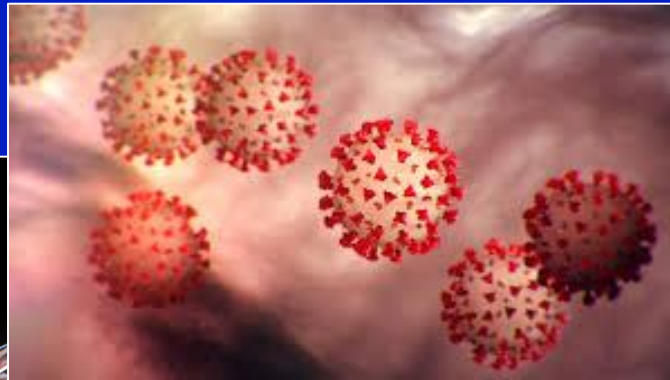


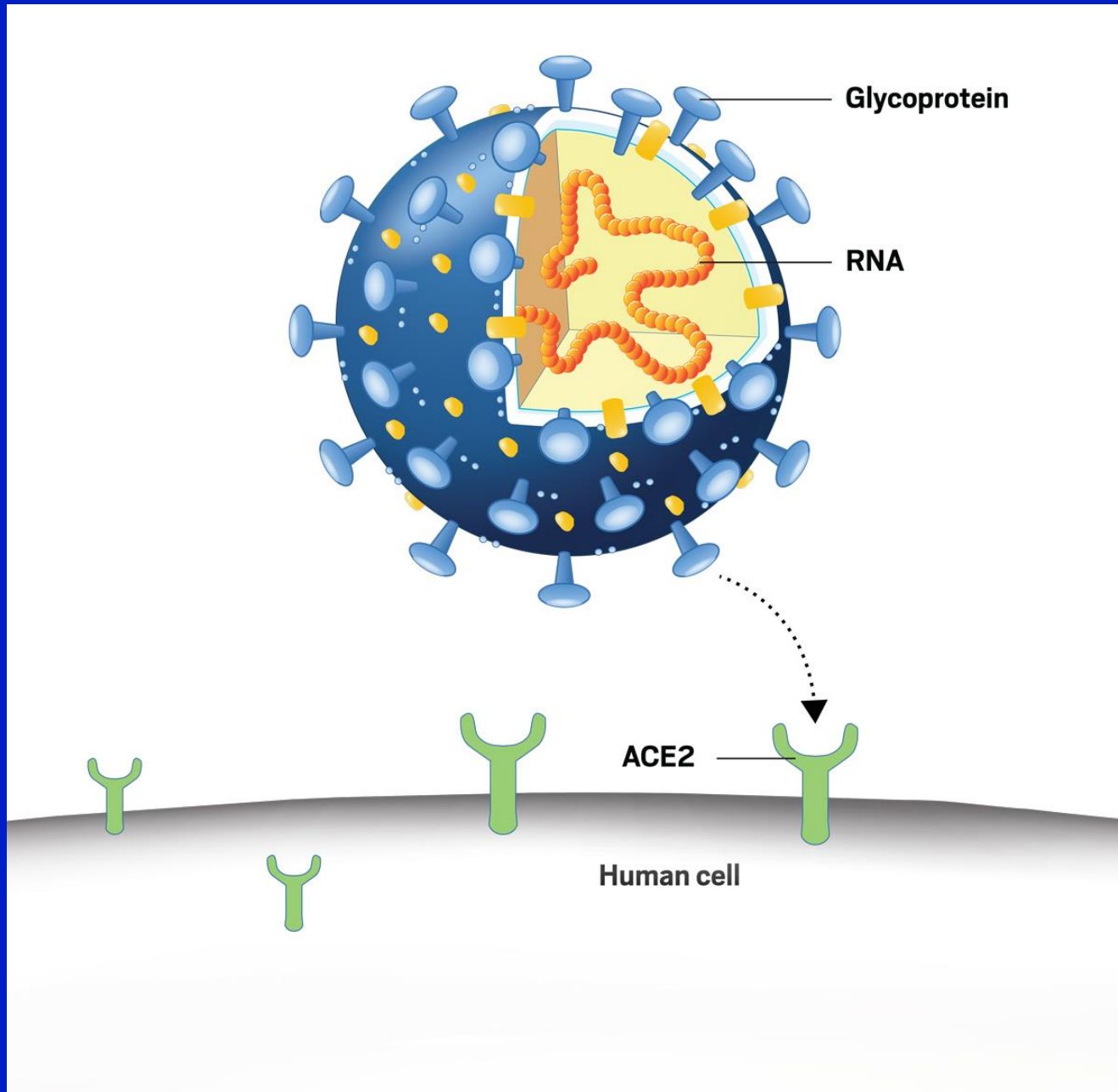
# Objectives

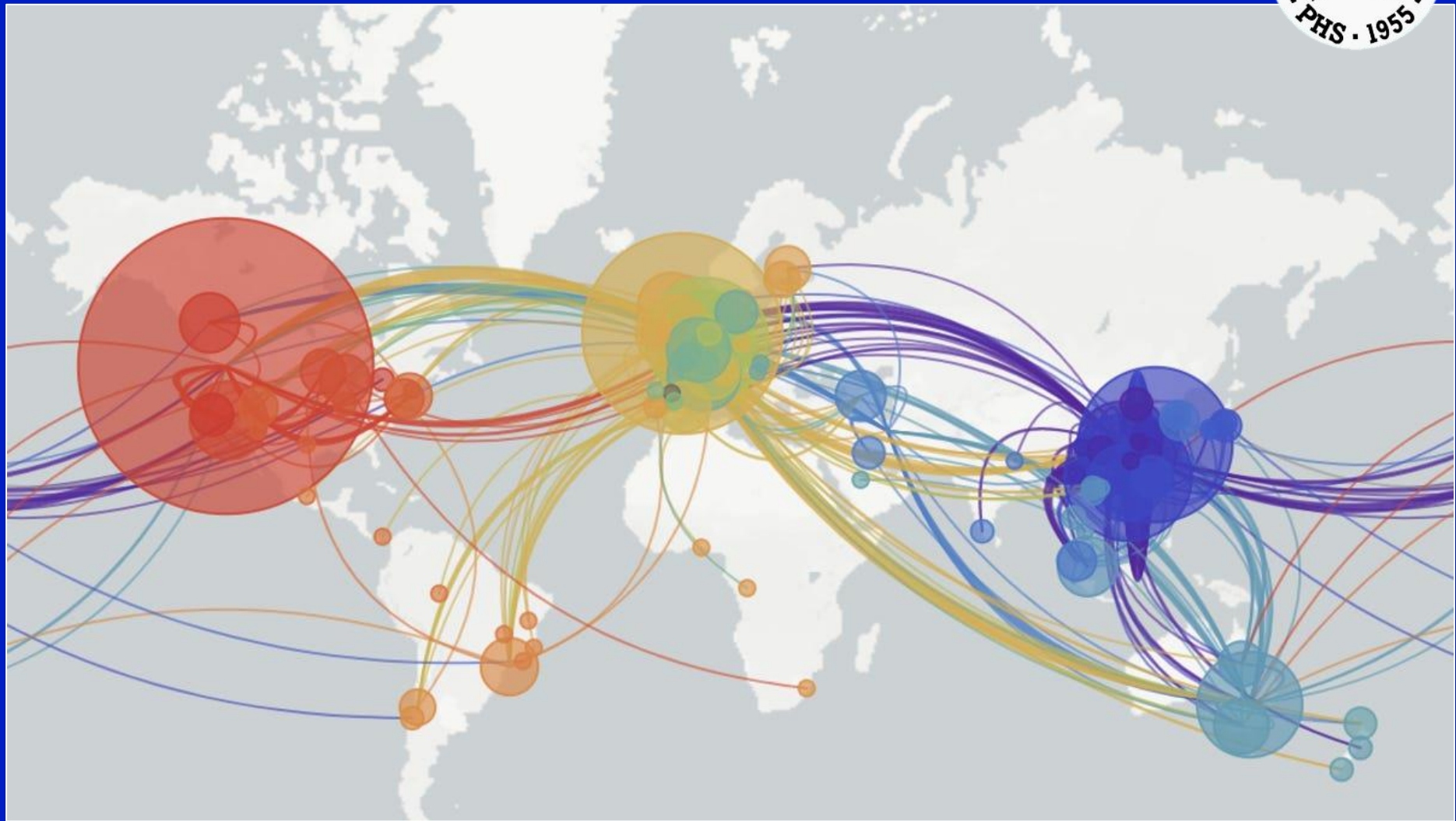
- Understand the pathophysiology and clinical characteristics of COVID-19 as it relates to children
- Describe how the public health response has affected children
- Explore ways to mitigate the negative effects of this response on childhood health



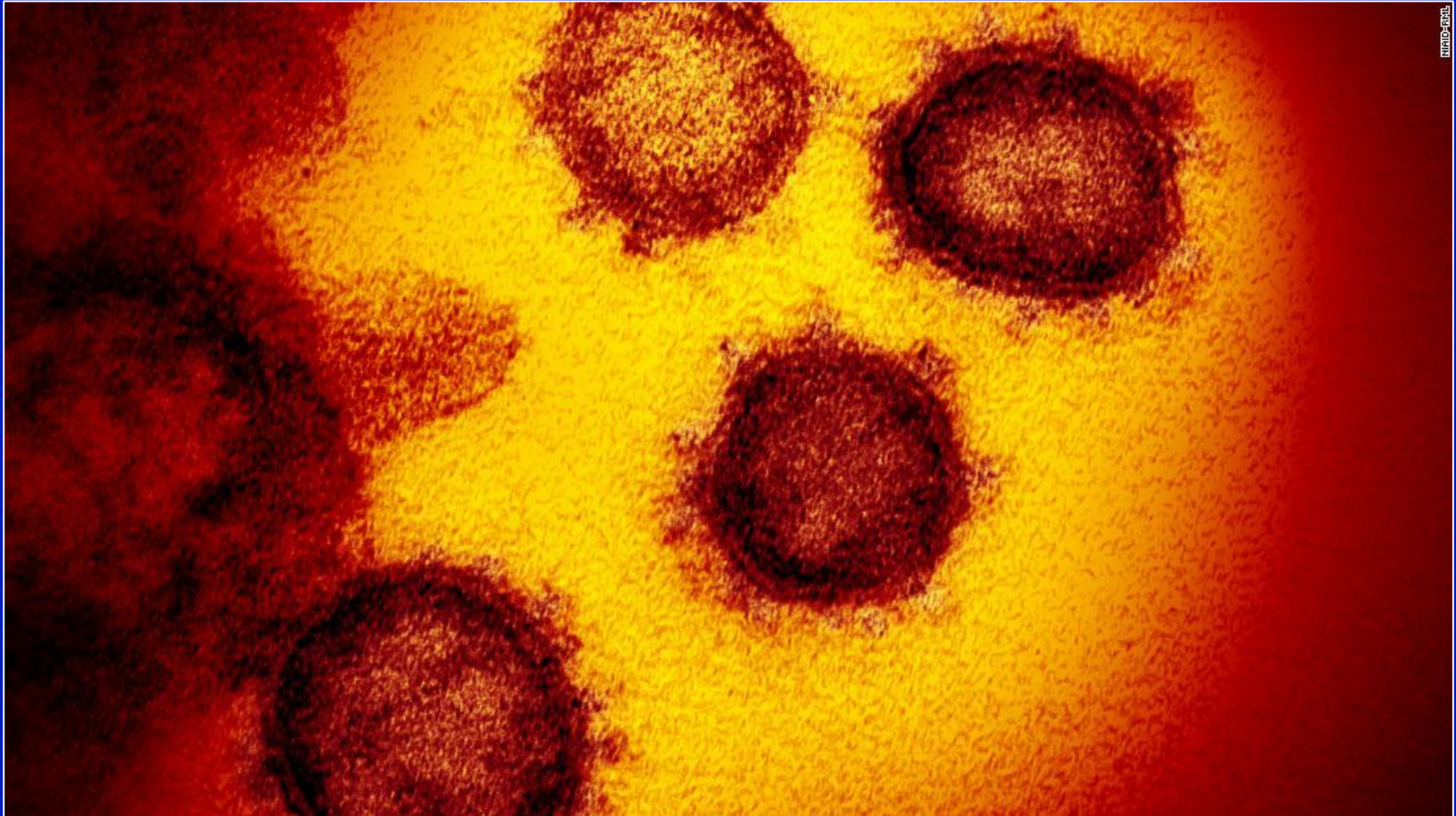
# SARS CoV 2







# How Children are Affected





# Case Series from China

- 2135 pediatric patients with COVID-19 from January 16 to February 8, 2020<sup>1</sup>
  - 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<sup>3</sup>
  - 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-19<sup>4</sup>:
  - 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

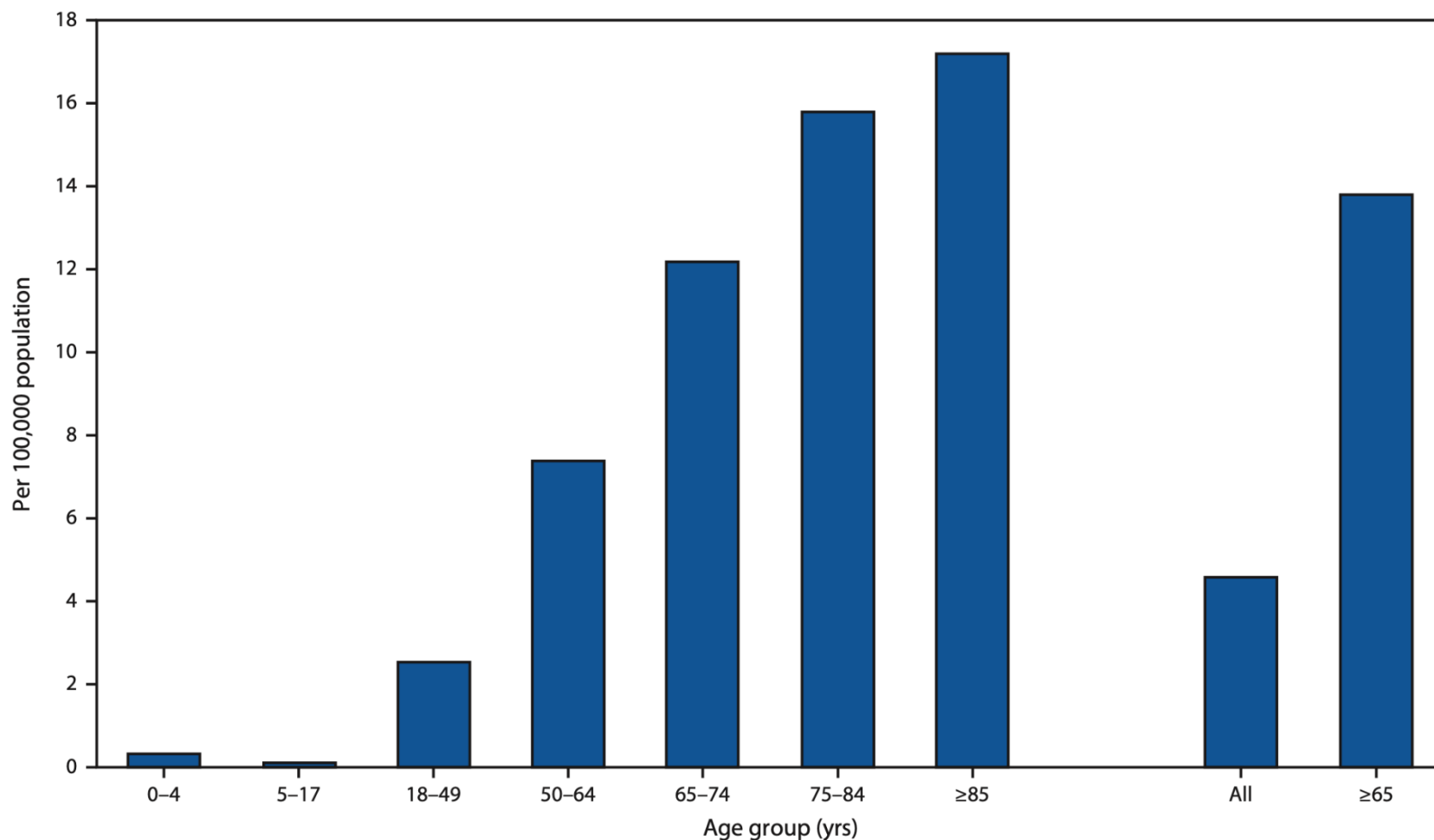
---

- Case Series of COVID-19 Patients Admitted to NY Hospitals between March 1<sup>st</sup> and April 4<sup>th</sup>, 2020<sup>5</sup>
- 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

# Age Distribution US Admissions<sup>6</sup>



FIGURE 1. Laboratory-confirmed coronavirus disease 2019 (COVID-19)-associated hospitalization rates,\* by age group — COVID-NET, 14 states,† March 1–28, 2020





# Study of Household Contacts

- Household cohort study to determine features of disease transmission in China<sup>7</sup>
  - 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

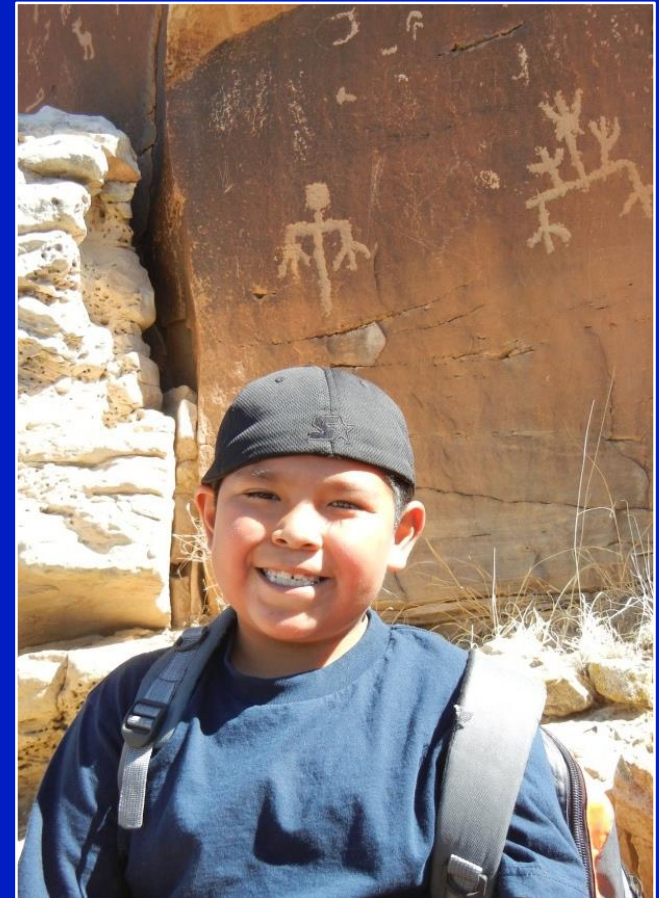


# Neonates

- 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 <sup>8</sup>
  - No Viral RNA found in Amniotic Fluid, Cord Blood, or Placental Tissue<sup>55</sup>
- SARS CoV 2 has not been found in breast milk<sup>9</sup>
  - AAP recommends expressed breast milk fed by non-infected caregivers or direct breast feeding if “meticulous” precautions

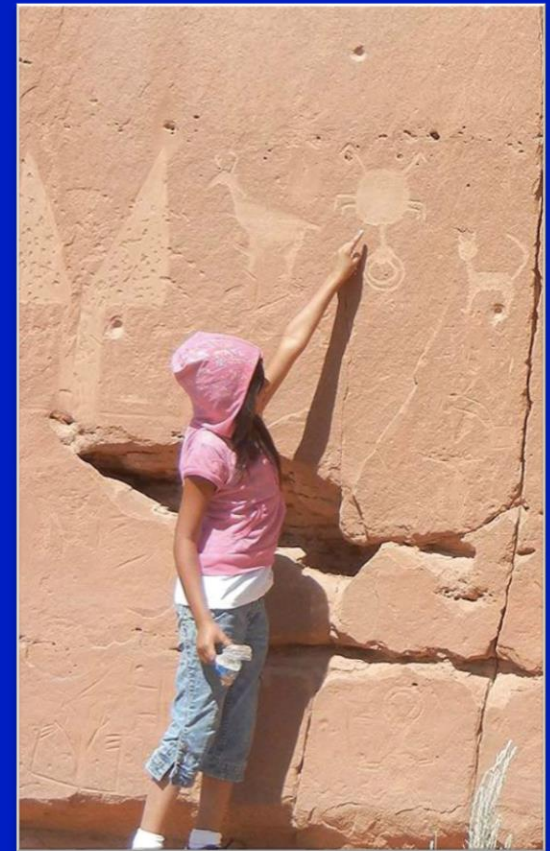
# Unanswered Questions

- High risk populations within pediatrics
  - No literature on high risk populations
- Asthma
  - Case series from China did not show increased risk in adults <sup>10</sup>
  - 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 <sup>11</sup>
  - Fecal shedding may last for weeks, even after NP swabs are negative<sup>12, 13</sup>
  - May have more upper respiratory symptoms <sup>14</sup>





# 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<sup>15</sup>
- Children may be less likely to develop a severe immune response <sup>16, 17</sup>





# Effects of the Public Health Response





# Isolation and Uncertainty

---

- School closing means more than loss of education
  - Socialization, nutrition<sup>18</sup>, 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<sup>19</sup>
- Mental health disorders could worsen during this time:
  - Economic down turns are associated with increased mental health problems among youth<sup>20</sup>
  - 13.2% of adolescents receive mental health services at school<sup>21</sup>
  - Loss of social connections and positive activities
  - Anxiety over finances and the health of loved ones

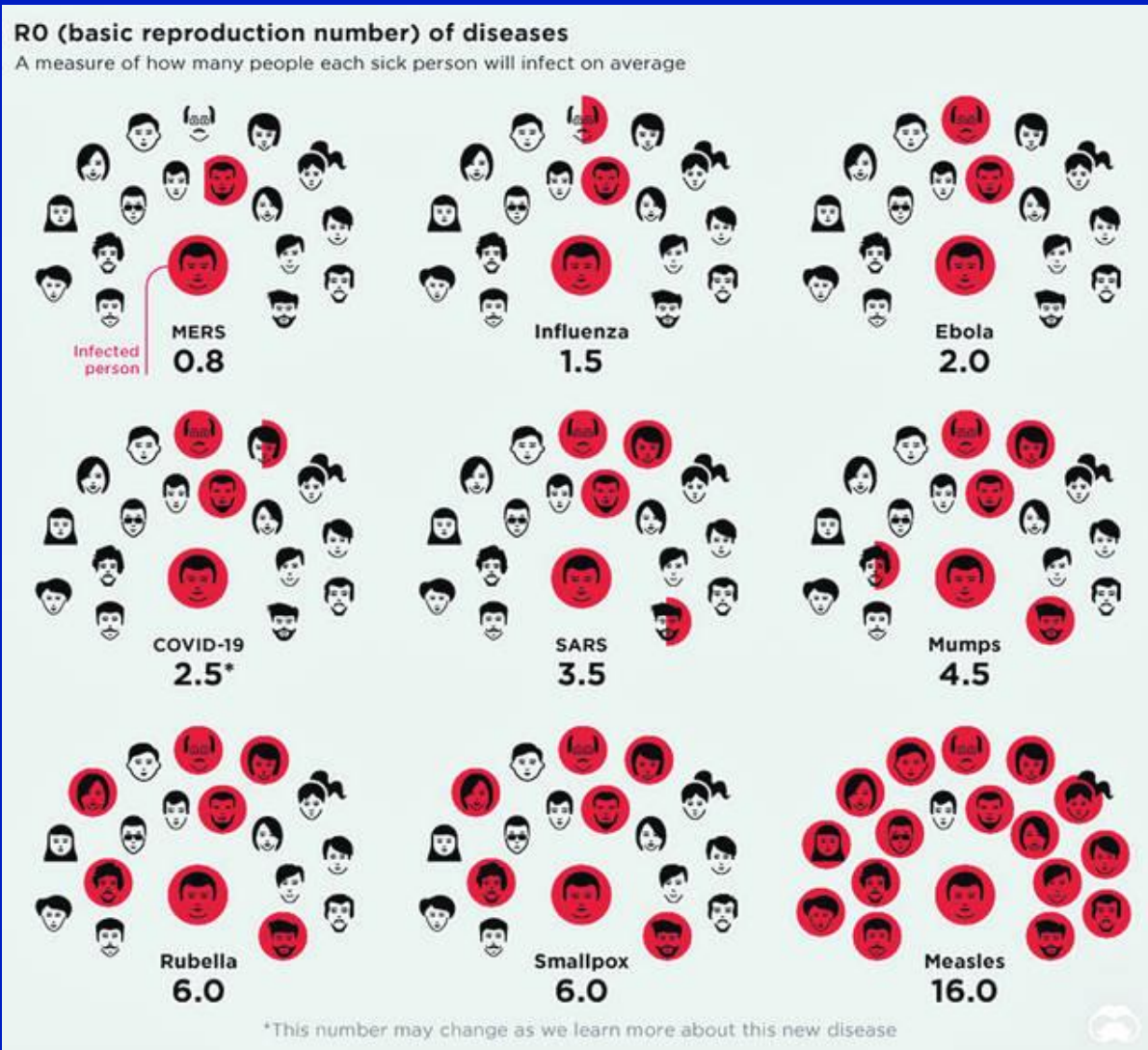


# Risk of Child Maltreatment

---

- Even in non-pandemic circumstances, 1 in 8 children have CPS confirmed maltreatment in their lifetime<sup>22</sup>
- 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<sup>23</sup>
- Schools are the largest source of CPS referrals
  - With medical visits being another important source

# Immunizations





# 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

SMITHSONIAN RECOVERING VOICES PRESENTS

# I:WECHEMANP'SHE

LET'S LOVE & CARE FOR ONE ANOTHER

# ART CONTEST

**THROUGH YOUR ART**  
SPREAD POSITIVE MESSAGES OF LOVE  
CARE, & HOPE FOR A:SHIWI AND  
RAISE AWARENESS OF COVID-19

**PACKETS INCLUDE:**

- Art materials (Youth only while supplies last!)
- Entry & Consent form
- CDC guidelines
- Envelope & info for submission

**CONTEST RULES:**

- Work must be your own
- Work must be 2-Dimensional
- Size: 16x20 (Max) & 8x10 (Min)
- Use correct info and spelling
- No copyright infringement
- Selected art pieces will be turned into posters
- All submissions will be turned into a mural

**DRIVE THROUGH PICK UP ART PACKET**  
ZUNI ARTZ GALLERY 1192 HWY 53  
MON 4.20.20 • 12-5PM

**DRIVE THROUGH ART SUBMISSION**  
ZUNI ARTZ GALLERY 1192 HWY 53  
MON 4.27.20 • 12-5PM

**ALL AGES**  
KINDERGARDEN - 12TH & ADULTS

**\$100 CASH PRIZE**

**AWARENESS THROUGH ART**

**#IWECHEMAPSHE**

**4 MORE INFO** ARTZCOOPERATIVE@SMAIL.COM  
ON CALL/TEXT (505)728-1260

- 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!



KEITH EDAARIE



**ZUNI  
COMPREHENSIVE  
COMMUNITY HEALTH  
CENTER**

805 712-4441  
PO BOX 447  
ALBUQUERQUE AREA  
ROUTE 307 N. 281 W.



# E lah`kwa (Thank You)





# Works Cited

- 1. Dong Y, Mo X, Hu Y, et al. Epidemiological characteristics of 2143 pediatric patients with 2019 coronavirus disease in China. *Pediatrics*. 2020; e20200702. doi:10.1542/peds.2020-0702
- 2. Wu Z, McGoogan JM. Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: summary of a report of 72314 cases from the Chinese Center for Disease Control and Prevention. *JAMA*. Published online February 24, 2020. doi:10.1001/jama.2020.2648
- 3. Lu X, Zhang L, Du H, Zhang J, Li YY, Qu J, et al. SARS-CoV-2 infection in children. *N Engl J Med*. 2020, <http://dx.doi.org/10.1056/NEJMc2005073>
- 4. Castagnoli, Riccardo et al. Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) Infection in Children and Adolescents, A systemic Review. *JAMA Pediatrics*. April 22, 2020; doi:10.1001/jamapediatrics.2020.1467
- 5. Richardson, Safiya et al. Presenting Characteristics, Comorbidities, and Outcomes Among 5700 Patients Hospitalized with COVID-19 in the New York City Area. *JAMA*. April 22, 2020; p E1=E18. 10.1001/jama.2020.0775
- 6. Garg S, Kim L, Whitaker M, et al. Hospitalization Rates and Characteristics of Patients Hospitalized with Laboratory-Confirmed Coronavirus Disease 2019 — COVID-NET, 14 States, March 1–30, 2020. *MMWR Morb Mortal Wkly Rep* 2020;69:458–464. DOI: [http://dx.doi.org/10.15585/mmwr.mm6915e3external\\_icon](http://dx.doi.org/10.15585/mmwr.mm6915e3external_icon).
- 7. Li, Wei et al. “The Characteristics of Household Transmission of COVID-19.” *Clinical Infectious Diseases*. Accessed April 22, 2020. <https://doi-org.libproxy.unm.edu/10.1093/cid/ciaa450>
- 8. Chen H, Guo J, Wang C, et al. Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women: a retrospective review of medical records. *Lancet*. 2020; 395(10226):809–815
- 9. Chen H, Guo J, Wang C, et al. Clinical characteristics and intrauterine vertical transmission potential of COVID-19 infection in nine pregnant women: a retrospective review of medical records. *Lancet* 2020. [http://dx.doi.org/10.1016/S0140-6736\(20\)30360-3](http://dx.doi.org/10.1016/S0140-6736(20)30360-3)
- 10. Guan W-J, Ni Z-Y, Hu Y, Liang W-H, Ou C-Q, He J-X, et al. Clinical Characteristics of Coronavirus Disease 2019 in China. *N Engl J Med*. 2020 Feb. 28. DOI: 10.1056/NEJMoa2002032



# Works Cited

11. Heimdal I, Moe N, Krokstad S, et al. Human coronavirus in hospitalized children with respiratory tract infections: a 9-year population-based study from Norway. *J Infect Dis.* 2019; 219(8):1198–1206
12. 40. Xu, Y., Li, X., Zhu, B. *et al.* Characteristics of pediatric SARS-CoV-2 infection and potential evidence for persistent fecal viral shedding. *Nat Med* **26**, 502–505 (2020). <https://doi.org/10.1038/s41591-020-0817-4>
13. Wu Y, Guo C, Tang L, et al. Prolonged presence of SARS-CoV-2 viral RNA in faecal samples [published online ahead of print March 19, 2020]. *Lancet Gastroenterol Hepatol.* doi:10.1016/S2468-1253(20)30083-2.
14. Dong Y, Mo X, Hu Y, et al. Epidemiology of COVID-19 among children in China. *Pediatrics.* 2020;145(6):e20200702
15. Wrapp D, Wang N, Corbett KS, et al. Cryo-EM structure of the 2019-nCoV spike in the prefusion conformation. *Science.* 2020;367:1260-1263.
16. Henry BM, Lippi G, Plebani M. Laboratory abnormalities in children with novel coronavirus disease 2019. *Clin Chem Lab Med.* 2020;16:16.
17. Simon AK, Hollander GA, McMichael A. Evolution of the immune system in humans from infancy to old age. *Proc Biol Sci.* 2015;282:20143085.
18. United States Department of Agriculture Food and Nutrition Service. National School Lunch, Special Milk, and School Breakfast Programs, national average payments/maximum reimbursement rates. 84 FR 38590. August 7, 2019(<https://www.federalregister.gov/documents/2019/08/07/2019-16903/national-school-lunch-special-milk-and-school-breakfast-programs-national-average-paymentsmaximum#p-31>). opens in new tab).
19. Centers for Disease Control and Prevention. Data and statistics on children's mental health. Accessed March 27, 2020. <https://www.cdc.gov/childrensmentalhealth/data.html>





# Works Cited

- 
20. Golberstein E, Gonzales G, Meara E. How do economic downturns affect the mental health of children? evidence from the National Health Interview Survey. *Health Econ.* 2019;28(8):955-970. doi:10.1002/hec.3885
  21. Lipari RN, Hedden S, Blau G, Rubenstein L. Adolescent Mental Health Service Use and Reasons For Using Services in Specialty, Educational, and General Medical Settings: the CBHSQ Report: May 5, 2016. Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration; 2016.
  22. Wildeman C, Emanuel N, Leventhal JM, Putnam-Hornstein E, Waldfogel J, Lee H. The prevalence of confirmed maltreatment among US children, 2004 to 2011. *JAMA Pediatr.* 014;168(8):706-713. doi:10.1001/jamapediatrics.2014.410
  23. Usher, kim et al. Family violence and COVID-19: Increased vulnerability and reduced options for support. *International Journal of Mental Health Nursing.* Publication pending. doi:10.1111/inm.12735