Vaccines and Related Biological Products
Advisory Committee June 10, 2021
Meeting Presentation

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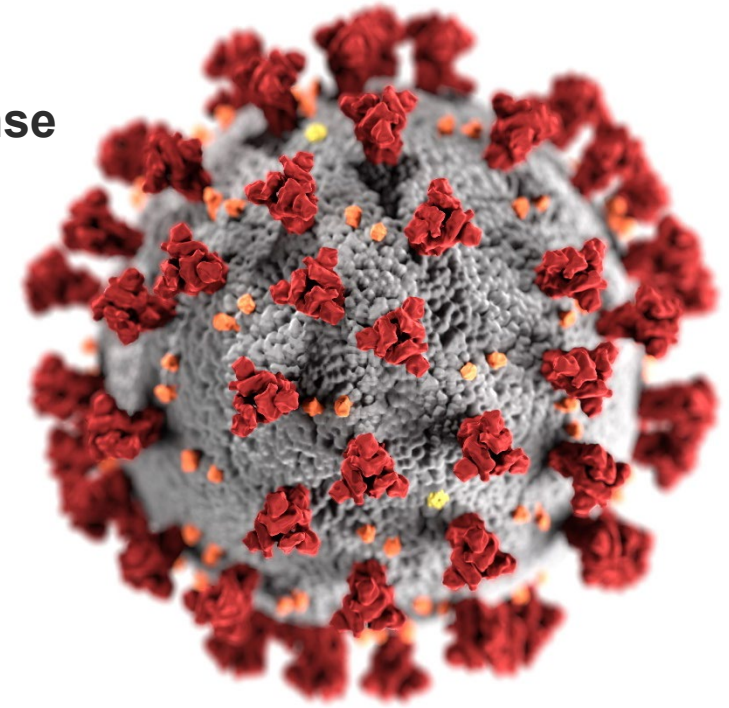
Epidemiology of SARS-CoV-2 in Children and Adolescents

Hannah Kirking, MD
Epidemiology Taskforce, COVID-19 Response

June 10, 2021

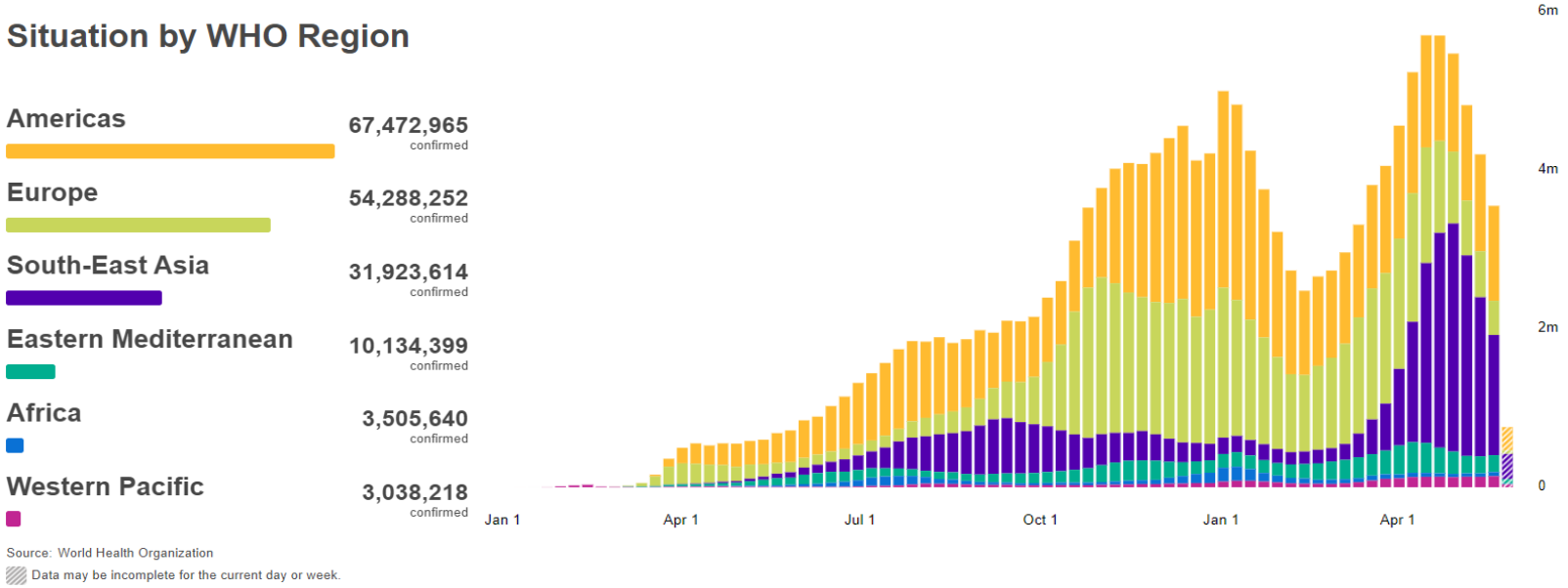


cdc.gov/coronavirus

Overview of Global and US COVID-19 Epidemiology

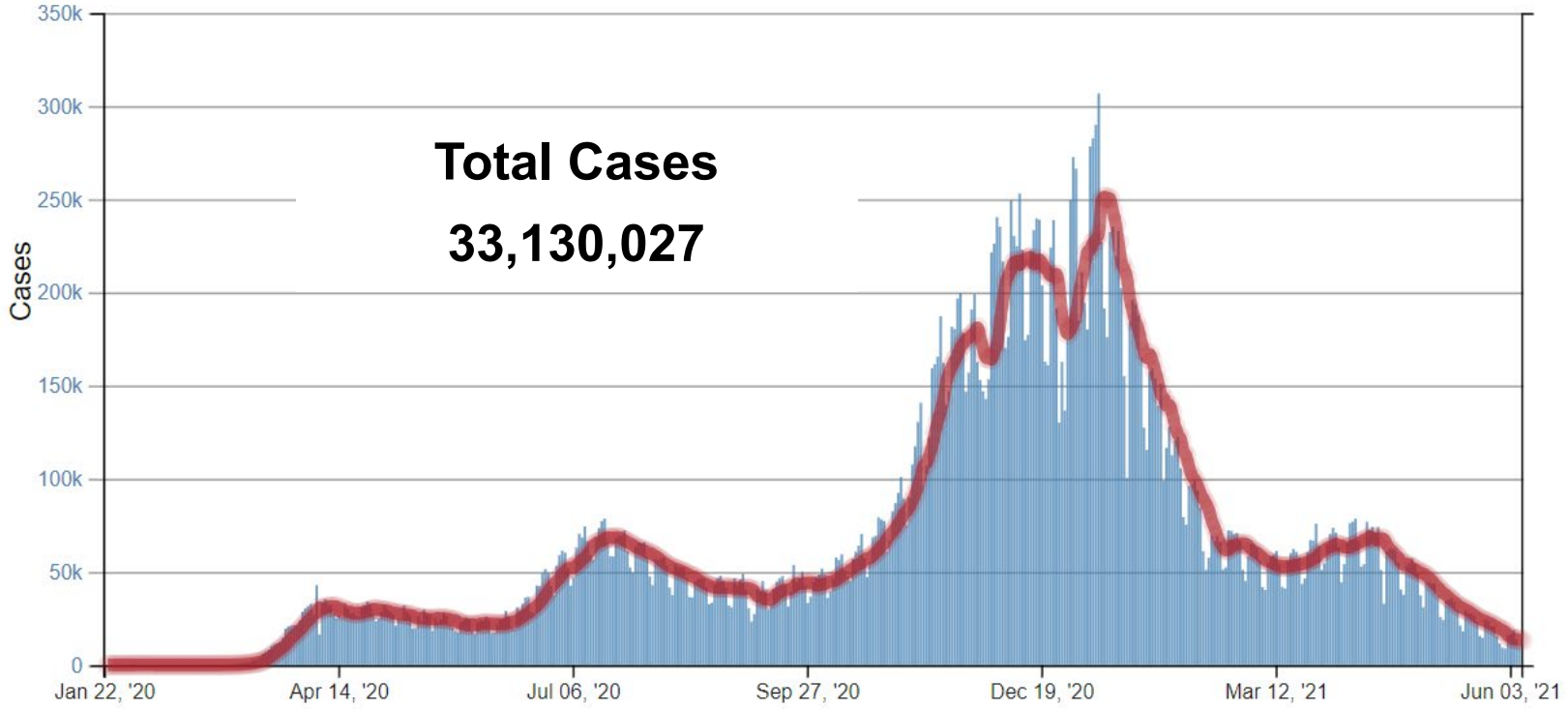
Global Incidence of SARS-CoV-2

- **170,363,088 confirmed cases**
- **3,546,857 deaths**



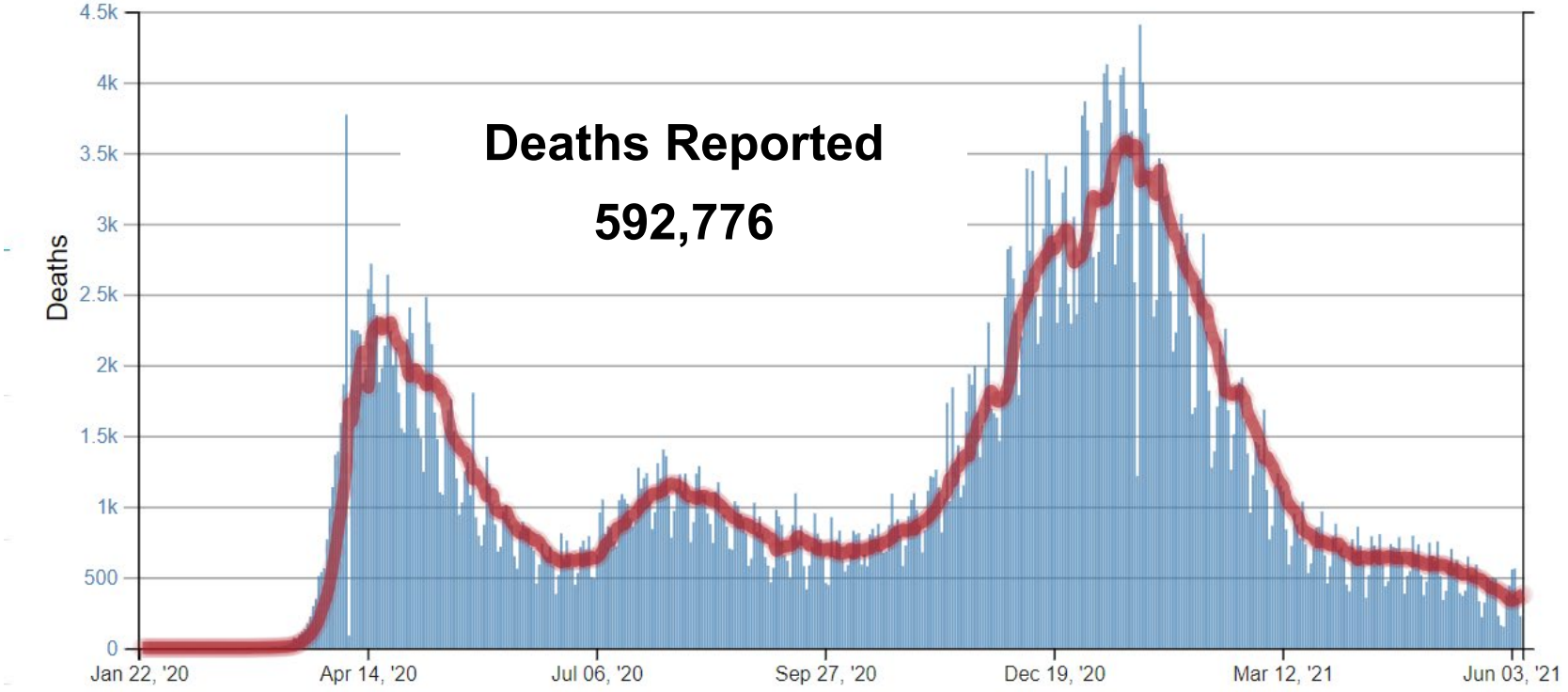
https://covid19.who.int/; accessed 06/01/2021

Incidence of SARS-CoV-2 in the United States



https://www.cdc.gov/coronavirus/2019-ncov/covid-data/covidview/index.html; accessed 06/07/2021

SARS-CoV-2 Deaths in the United States



https://www.cdc.gov/coronavirus/2019-ncov/covid-data/covidview/index.html; accessed 06/07/2021

Epidemiology of COVID-19 in Children/Adolescents

Epidemiology of SARS-CoV-2 in Children: Published Literature

- Numerous published studies and reviews on epidemiology of SARS-CoV-2 in children
  - Early reports on children largely used convenience and/or observational data
  - “Children” often includes all participants <18 years of age
- Published literature on infection and transmission of SARS-CoV-2 and children is mixed
  - Some studies suggest children are infected less; others show similar rates of infection to adults
  - Some studies suggest children transmit less; others show transmission is similar for children as it is for adults

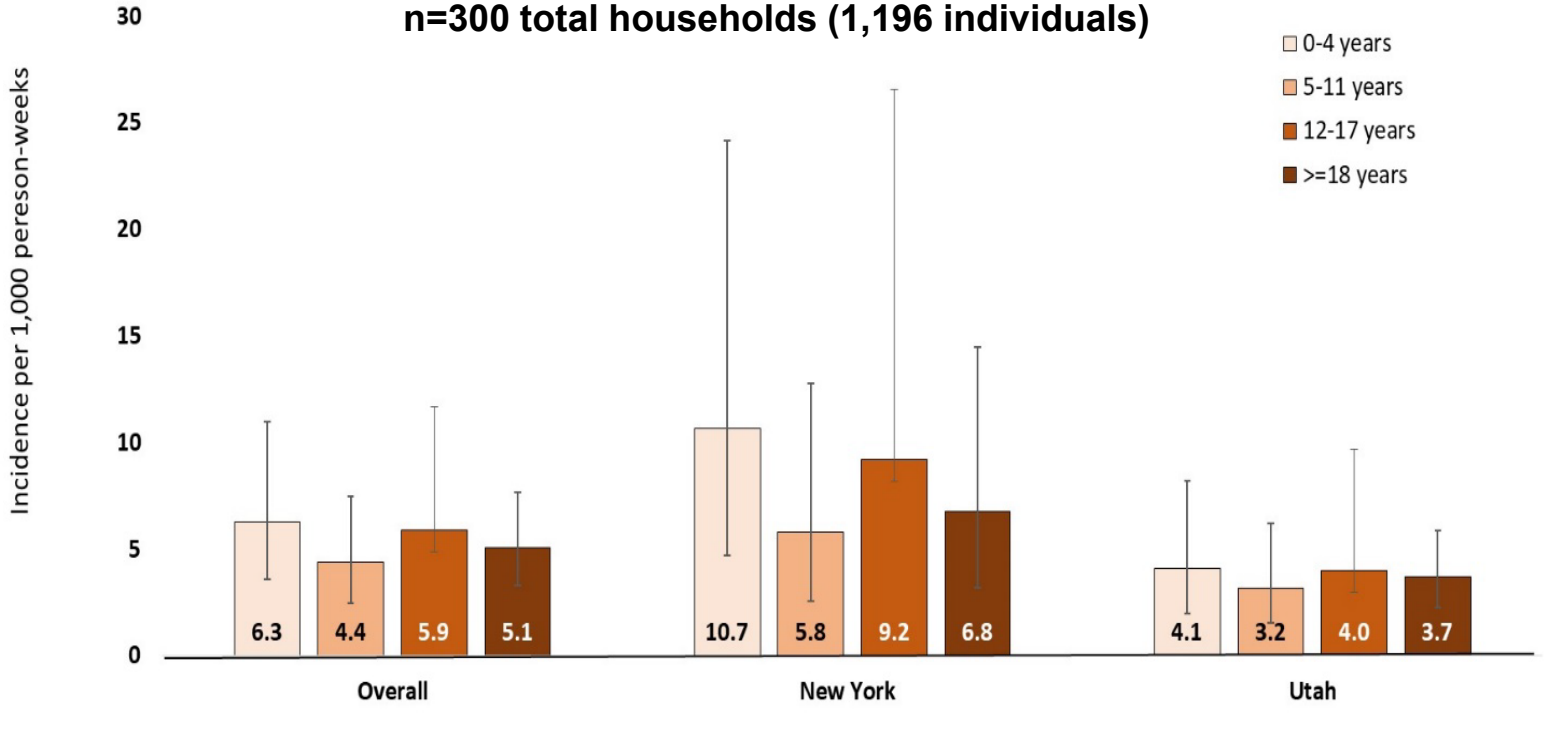
Important Epidemiologic Principles

- Young children are not physiologically or socially equivalent to older children, adolescents, or adults.
  - Age should be disaggregated when possible (e.g. <5 years, 6-11 years, 12-17 years, etc.)
- Beware of biases when interpreting data related to COVID-19 in children.
  - Exposures and behaviors impact observed infection rates
  - Incidence and transmission estimates should be unbiased by care-seeking behavior
  - Universal testing is important (i.e. independent of symptoms)

Epidemiology of COVID-19 in Children and Adolescents

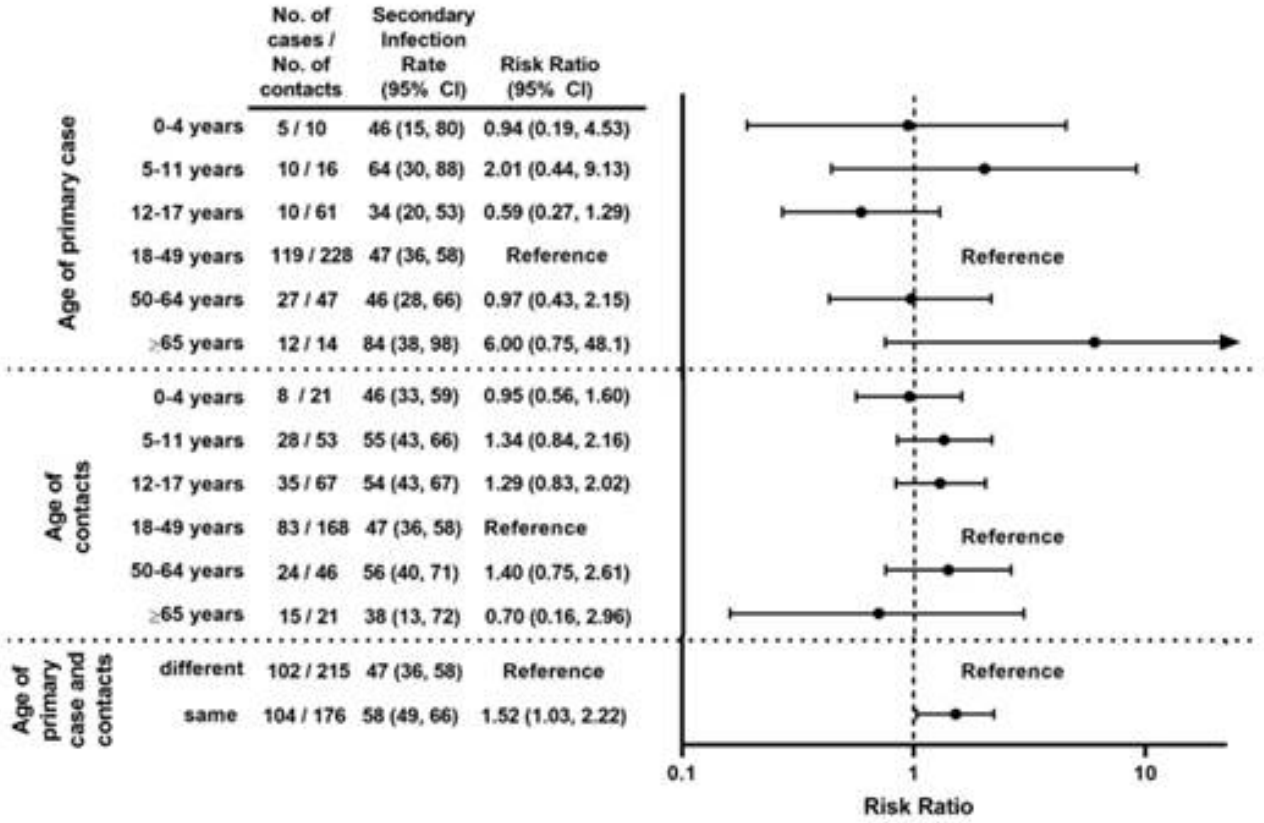
- **Susceptibility** to Infection: Children/adolescents **are susceptible** to SARS-CoV-2 infection
- Risk of **Transmission**: Children/adolescents **can transmit** SARS-CoV-2
- **Medical care**: Children/adolescents are **less likely to seek testing/medical care**
- Risk for **Symptomatic or Severe Illness**: **Lower rates of severe illness** for children/adolescents compared to adults

Infection Incidence per 1,000 Person-Weeks by Age, September 2020–February 2021



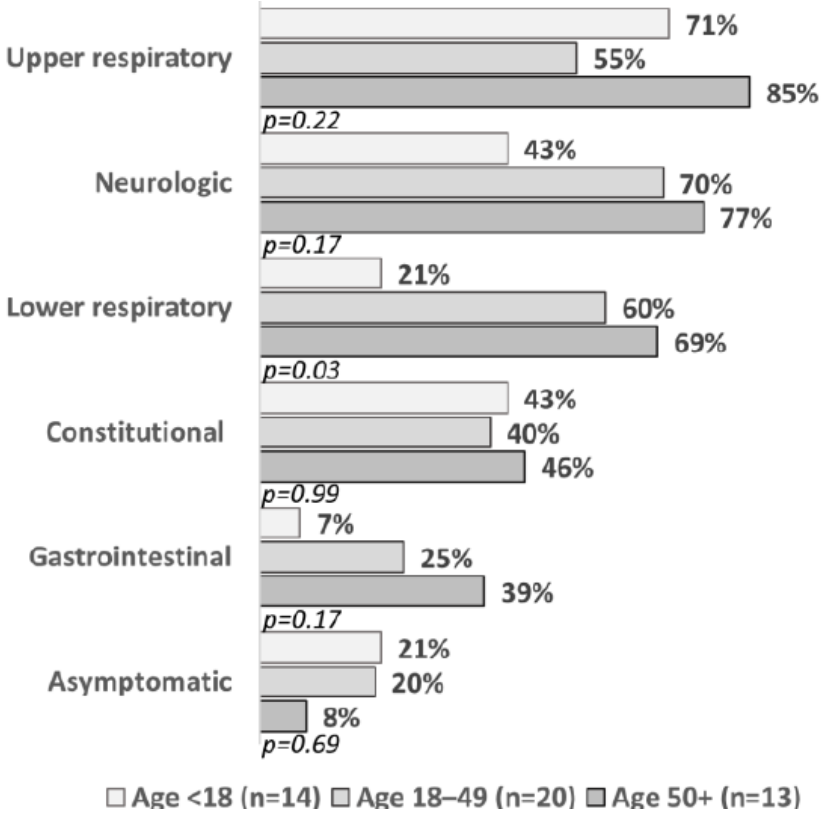
Unpublished CDC data (C-HEART Study), currently under peer-review.

Risk of SARS-CoV-2 Infection and Transmission is Similar Across Age Groups



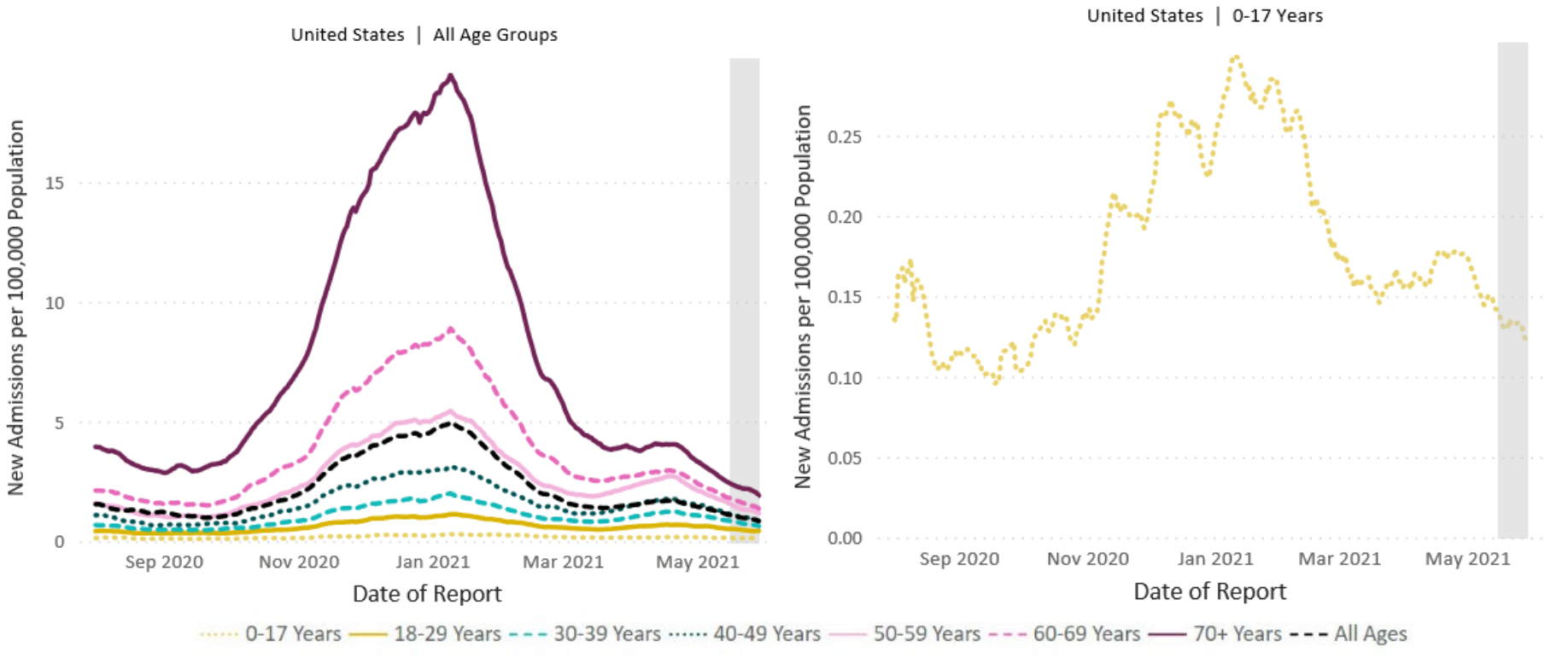
Unpublished CDC data (FluTES-C Study), manuscript in CDC clearance.

Children/Adolescents with COVID-19 Have Fewer Symptoms



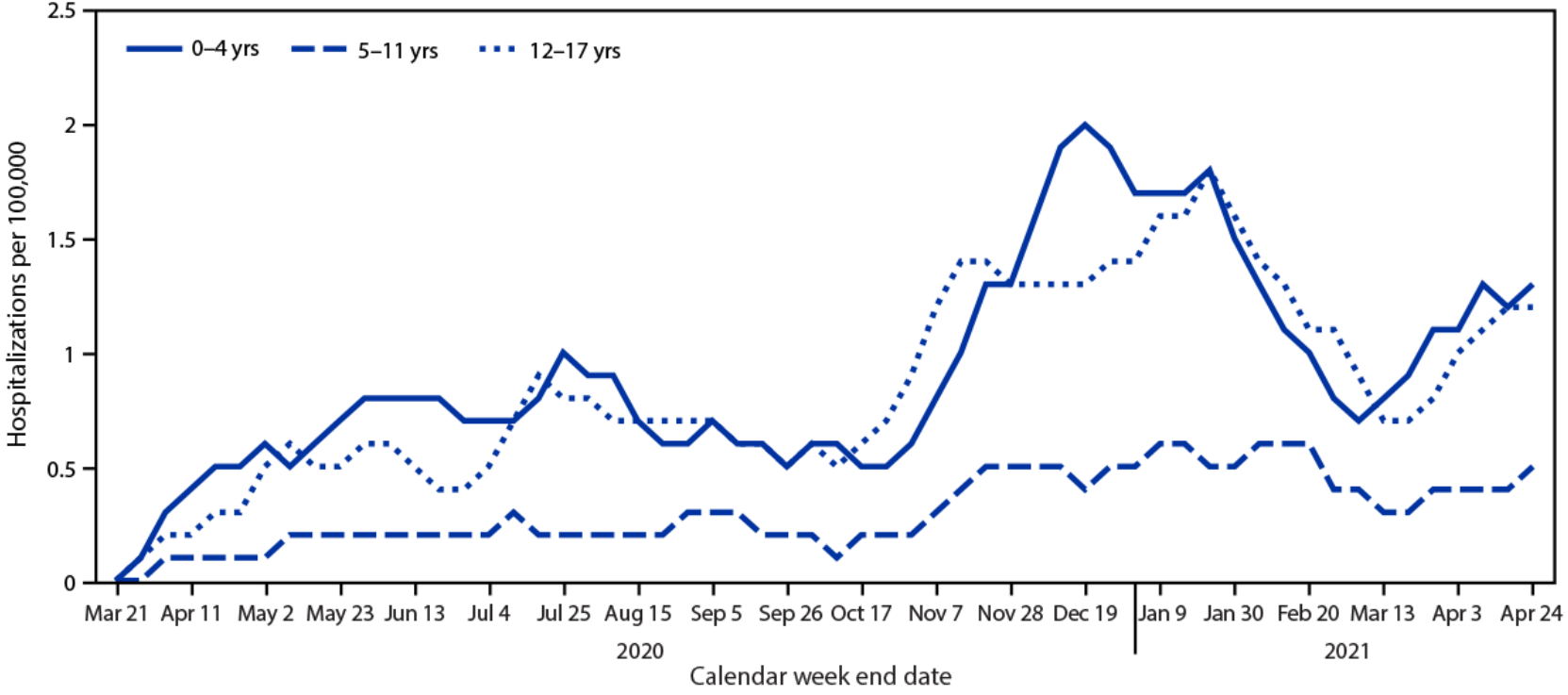
Yousaf A, Duca L*et. al*CID. 2020. doi: 10.1093/cid/ciaa1072.

Children/Adolescents Have Lower Rates of Hospitalization



https://covid.cdc.gov/covid-data-tracker/#new-hospital-admissions; accessed 06/01/2021

COVID-19 Hospitalization Rates* among Children and Adolescents Aged <18 Years, by Age Group, March 1, 2020–April 24, 2021

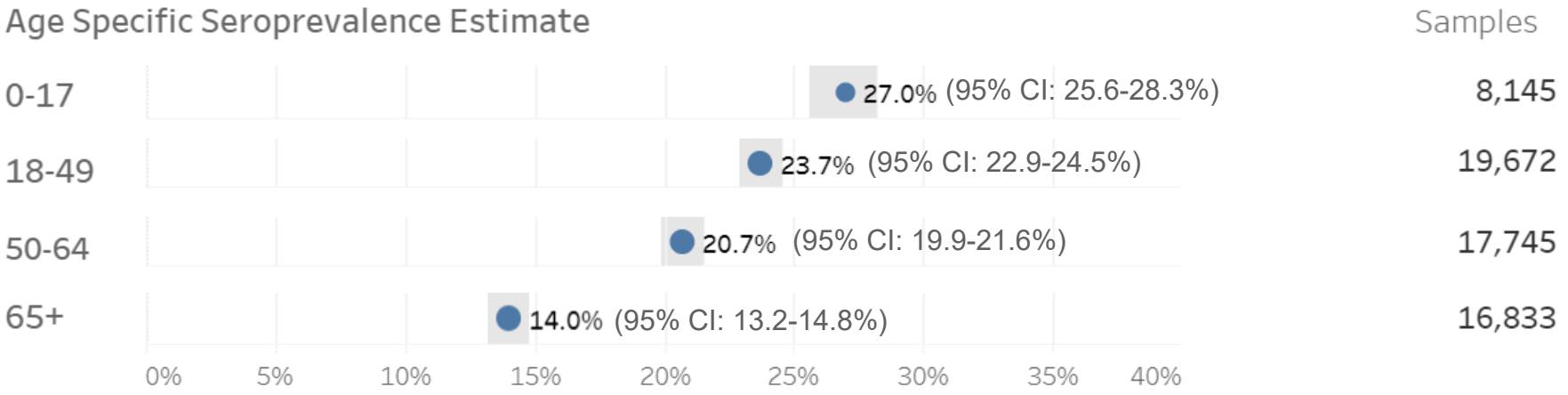


Havers F *et. al.* MMWR Morb Mortal Wkly Rep. June 2021. DOI: http://dx.doi.org/10.15585/mmwr.mm7023e1

Estimated Seroprevalence from US Multi-State Assessment for SARS-CoV-2 Survey in Commercial Laboratories (MASS-C), February 15—March 21, 2021

Catchment Area: **50 States, DC, & PR**

Number of Samples Tested: **62,395**



https://covid.cdc.gov/covid-data-tracker/#national-lab; accessed 06/04/2021

Estimated Rates of COVID-19 Disease Outcomes, per 100,000, by Age Group — United States, February 2020-March 2021

	Infection rate per 100,000		Symptomatic Illness rate per 100,000		Hospitalization rate per 100,000	
Age group	Estimate	95% UI*	Estimate	95% UI*	Estimate	95% UI*
0-4 yrs	22,817	18,598 – 28,622	19,468	16,544 – 23,339	256	209 – 312
5-17 yrs	41,532	33,788 – 52,146	35,408	29,999 – 42,564	265	209 – 334
18-49 yrs	40,581	33,824 – 48,910	34,588	30,486 – 39,478	976	827 – 1,161
50-64 yrs	31,293	26,233 – 37,646	26,673	23,578 – 30,400	2,274	2,001 – 2,604
65+ yrs	22,967	18,527 – 28,879	18,624	16,590 – 21,125	4,872	4,287 – 5,597
All ages	35,047	30,130 – 41,078	29,682	26,533 – 33,482	1,711	1,527 – 1,937

* Adjusted estimates and rates are presented in two parts: an uncertainty interval [UI] and a point estimate. The uncertainty interval provides a range in which the true number or rate of COVID-19 infections, symptomatic illnesses, or hospitalization would be expected to fall if the same study was repeated many times, and it gives an idea of the precision of the point estimate. A 95% uncertainty interval means that if the study were repeated 100 times, then 95 out of 100 times the uncertainty interval would contain the true point estimate. Conversely, in only 5 times out of a 100 would the uncertainty interval not contain the true point estimate.

https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/burden.html; accessed 06/01/2021

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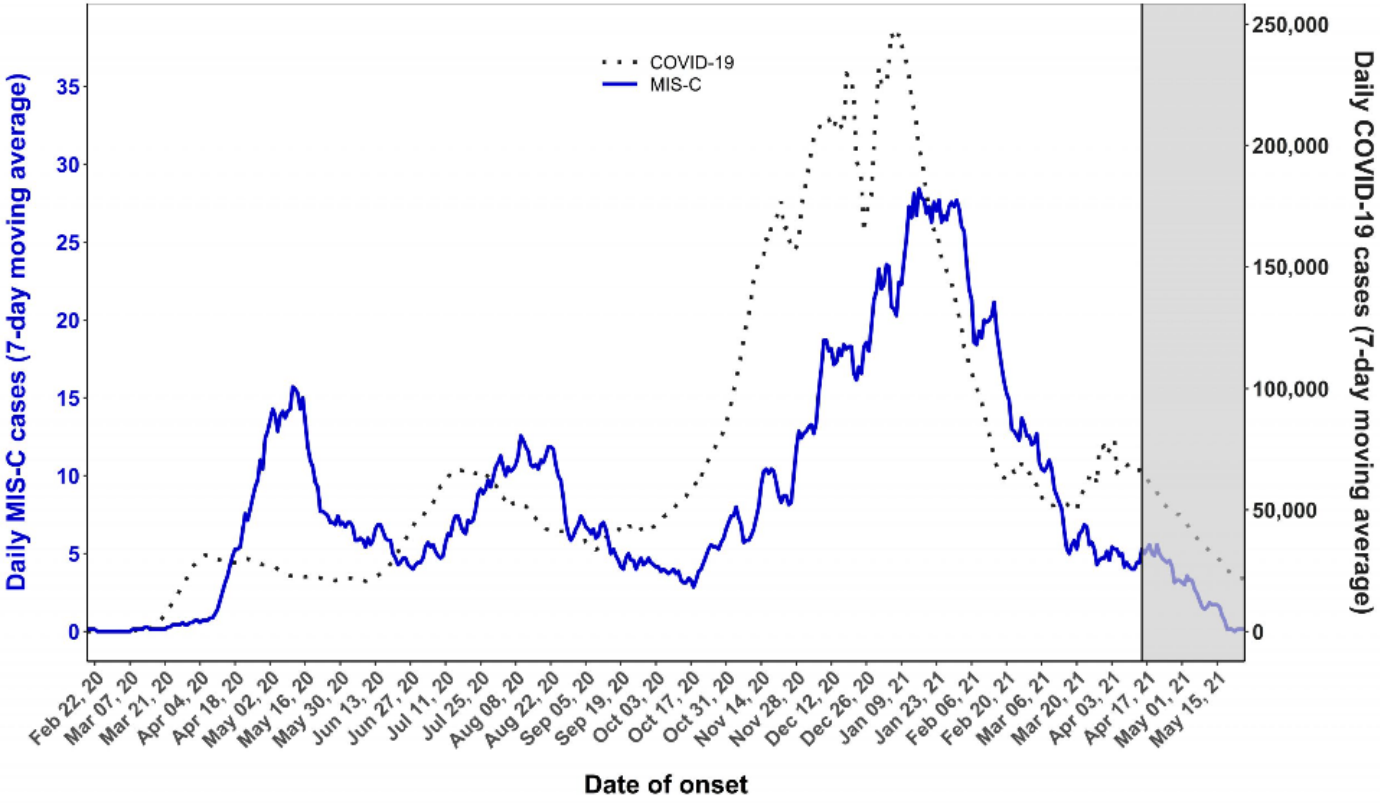
Multisystem Inflammatory Syndrome in Children (MIS-C)

Multisystem Inflammatory Syndrome in Children (MIS-C)

Severe illness in persons aged <21 years characterized by fever, multisystem organ involvement, laboratory evidence of inflammation, and SARS-CoV-2 infection with no alternative plausible diagnosis

4,018 Cases of MIS-C with Onset February 19, 2020–May 18, 2021



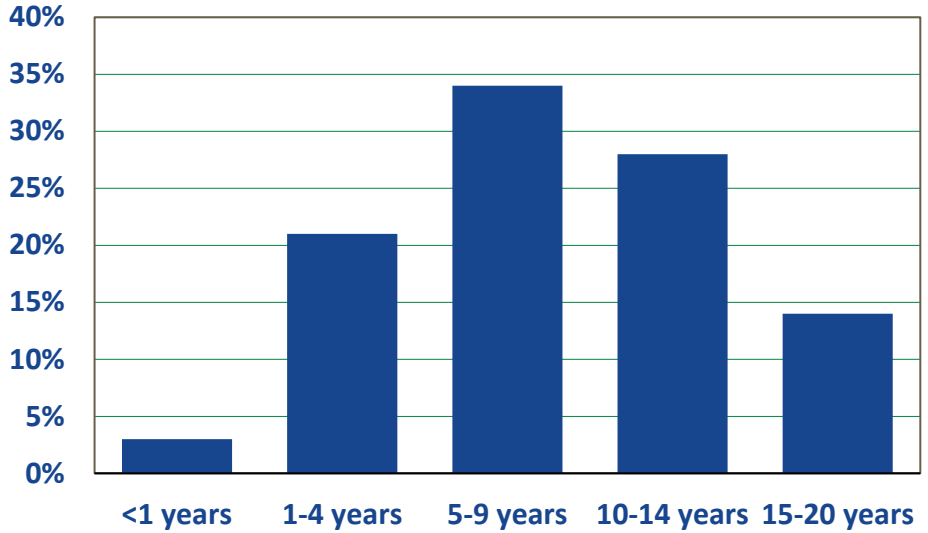
https://www.cdc.gov/mis-c/cases/index.html; accessed 06/08/2021

MIS-C Patient Characteristics

- Median age 9 years, IQR: 4–13 years
- 60% males
- 32% Hispanic/Latino
- 30% non-Hispanic Black

- 37% reported an underlying condition

MIS-C patients by age group (N=3,965*)



*n=53 missing

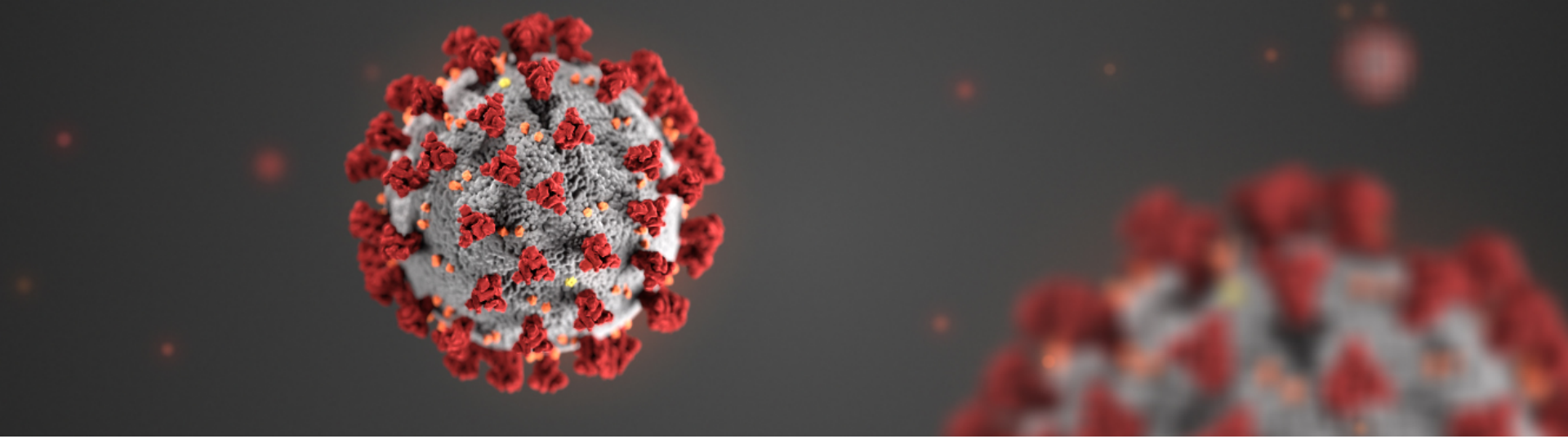
Most MIS-C patients are from racial and ethnic minorities groups

https://www.cdc.gov/mis-c/cases/index.html; accessed 06/01/2021

Summary of COVID-19 Epidemiology in Children and Adolescents

High-Level Summary

- As of May 30, >33 million cases of COVID-19 and >580,000 COVID-19-associated deaths were reported in the United States.
- Children have lower rates of hospitalization and mortality compared to adults.
- Children are susceptible to SARS-CoV-2, though children and adolescents tend to have fewer respiratory symptoms than adults.
- From prospective cohort and household transmission studies, infection rates are similar across age groups; children can transmit SARS-CoV-2 to others and with similar efficiency as adults.
- MIS-C is a severe complication of SARS-CoV-2 infections and has varied clinical presentations.
- MIS-C is highest among Black/African American children and Hispanic/Latino children.



For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

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