National Committee on Vital and Health Statistics ◆ April 1, 2021

Measuring Racial/Ethnic Disparities in COVID-19 in Children and Teens:
The Problem of Missing Race/Ethnicity Data

Elizabeth Pathak, PhD

The COVKID Project

Women's Institute for Independent Social Enquiry (WiiSE)

The COVKID Project
www.covkidproject.org

◆ Project team
- ♥ Dr. Elizabeth Pathak, WiiSE
- ♥ Dr. Janelle Menard, WiiSE
- ♥ Ms. Rebecca Garcia, WiiSE
- ♥ Dr. Jason Salemi, University of South Florida

◆ Volunteer effort, funded by small donations

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Overview of COVID-19 Data for Kids

3

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Understanding COVID-19 in Kids

◆ To understand **incidence of disease,** we need **testing** and **case** data.

◆ To understand **disease severity,** we need **hospitalization** and **intensive care admissions** data.

◆ To understand **disease fatality,** we need **death certificate** data.

◆ To understand **racial and ethnic disparities,** we need **ALL** of these types of data!

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COVID-19 Testing Data by Age

State COVID-19 Dashboards

No Other Sources of Testing Denominator Data

◆ Only 1 state reports C19 testing denominators for racial/ethnic groups by age: Illinois

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COVID-19 Case Data by Age

State COVID-19 Dashboards

◆ Only 2 states report C19 case counts for racial ethnic groups by age: CA and IL

◆ Michigan provides these data in an excel sheet.

State Case Reporting to CDC

◆ All states report individual cases with age and race/ ethnicity to CDC.

◆ For kids, 45% of cases are missing race/ethnicity.

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COVID-19 Hospitalization Data by Age

State COVID-19 Dashboards

◆ No states report number of hospitalizations for racial/ethnic groups by age.

State Case Reporting to CDC

◆ There is a hospitalization yes/no indicator variable for each case.

◆ High degree of missingness across all states.

DHHS COVID-19 Hospitalization File

◆ No race/ethnicity data reported for any patients.

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COVID-19 Intensive Care Data by Age

State COVID-19 Dashboards

◆ Only 2 states report C19 intensive care admissions by age: Minnesota and Wisconsin

◆ No states report these data by race/ethnicity.

Virtual Pediatric Systems COVID-19 Dashboard

◆ Voluntary hospital registry of PICU admissions.

◆ Race/ethnicity reported for 96% of patients about whom clinical details were provided.

◆ covid19.myvps.org

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COVID-19 Death Data by Age

State COVID-19 Dashboards

◆ Only 2 states report C19 deaths for racial/ethnic groups by age: California and Illinois.

◆ Michigan provides these data in an excel sheet, but suppressed for kids.

State Case Reporting to CDC

◆ There is a death yes/no indicator variable for each case.

◆ Death counts are HIGHER than reported on state dashboards.

NCHS COVID-19 Death Tabulations

◆ Death counts by race/ethnicity and age are available for kids at the national level.

◆ State level data are (effectively) suppressed.

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Results:
Illinois Testing Data

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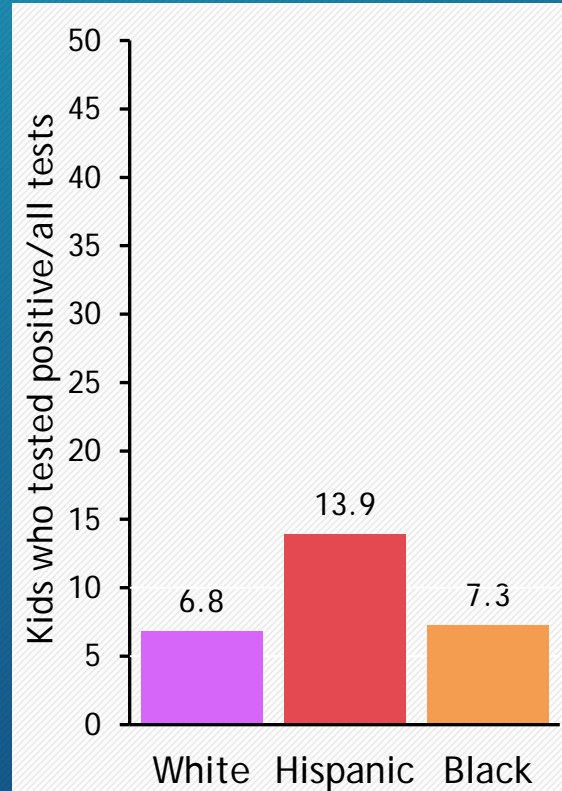# COVID-19 in Kids 0-19 Years in Illinois: Testing, Positivity, Incidence

Testing/case data from Illinois COVID-19 dashboard 3/28/2021. Population data for 2019 from CDC WONDER. Race/ethnicity imputed for all missing test and case data.
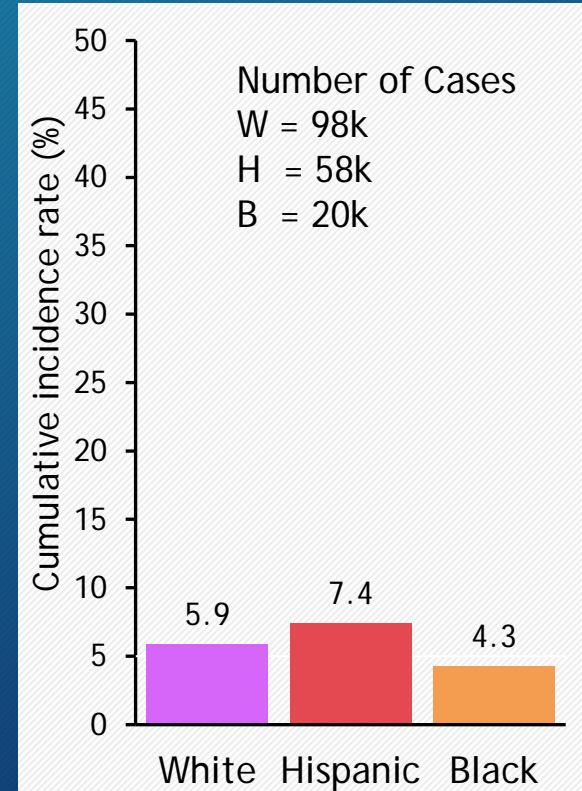
Population Testing
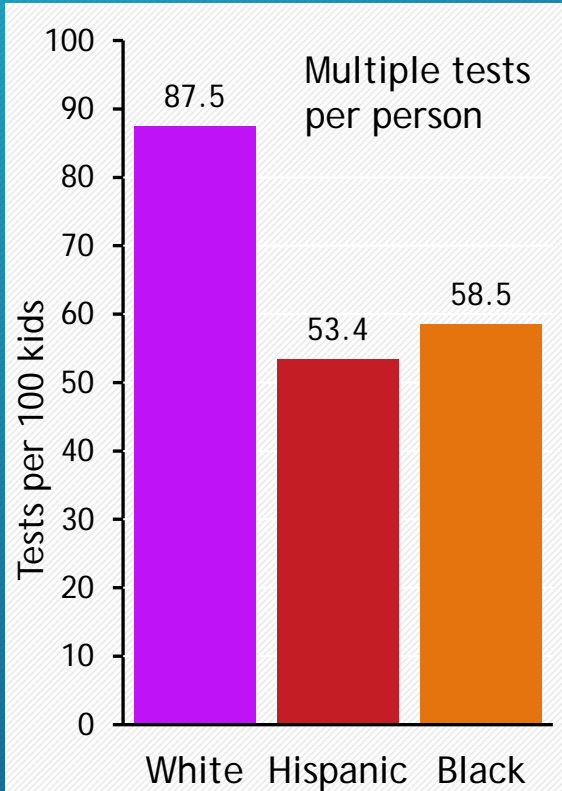
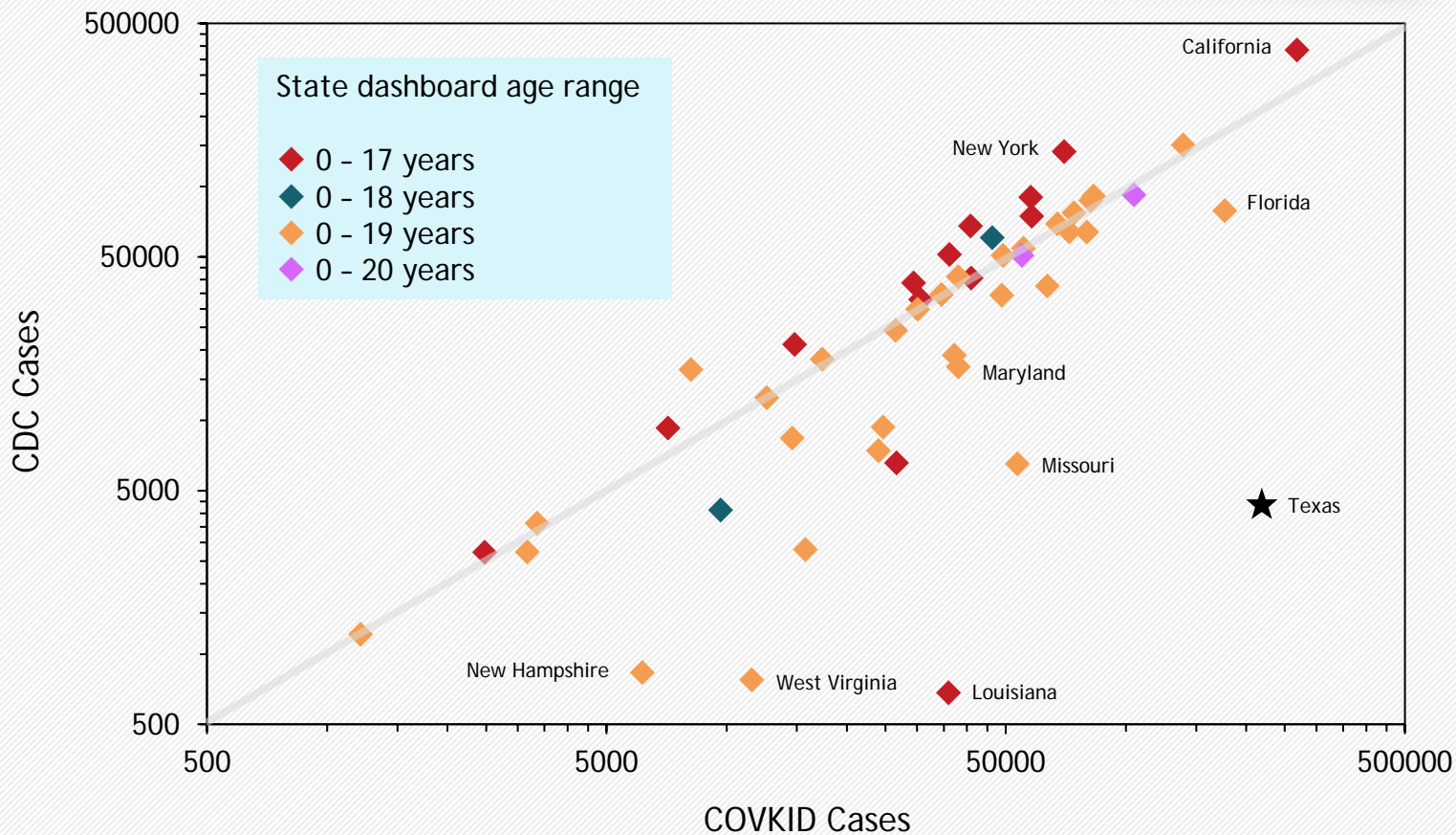## Test Positivity

Population Incidence

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Results:
National Case Data

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CDC vs. COVKID Cumulative COVID-19 Case Counts

13

◆ COVKID cumulative case counts extracted on December 31, 2020

◆ CDC case counts from January 31, 2020 restricted file release, with earliest case date no later than December 31, 2020. Ages 0-19 years for all states.

◆ COVKID Total = 2,556,187

◆ CDC Total = 2,286,554

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Discrepancies in Case Counts Between CDC Restricted File and COVKID Tally for 2020

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Best Estimate of COVID-19 Cases in Kids for CY 2020

◆ COVKID Total = 2,556,187

◆ CDC Total = 2,286,554

◆ Best Estimate = 2,893,855   *55% of increase from CA, NY*

◆ We used CDC totals for 13 states, and COVKID totals for 38 states.

◆ We had to use 0-17 year totals for AL, LA, MS, and 0-18 year old totals for RI and WY.

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Method for Imputing Race/Ethnicity I

◆ **GOAL:** Impute race/ethnicity for aggregate sums to permit calculation of cumulative incidence rates

◆ Imputation at the individual case level is NOT recommended (high degree of missingness across all descriptive variables in the dataset)

◆ **"Simple" method:** assume the racial/ethnic distribution of the "missing" cases is the same as the "non-missing" cases.

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COVID-19 in Kids 0-9 Years in 2020: Raw vs. Best Estimate Counts

RAW = CDC file. Best Estimate = COVKID/CDC best count with R/E imputation.

Ages 0-9 Years (RAW)
n= 643,816
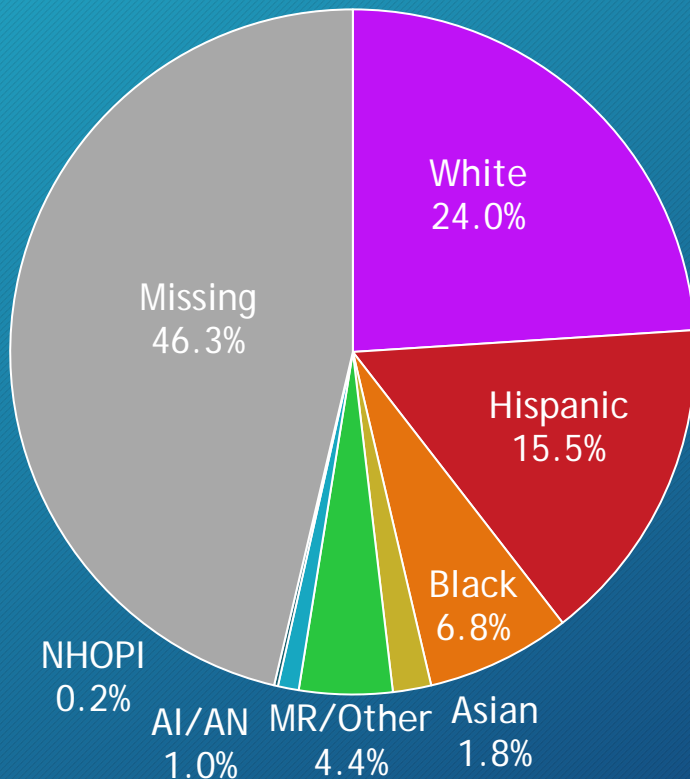
Ages 0-9 Years (Best)
n= 811,796
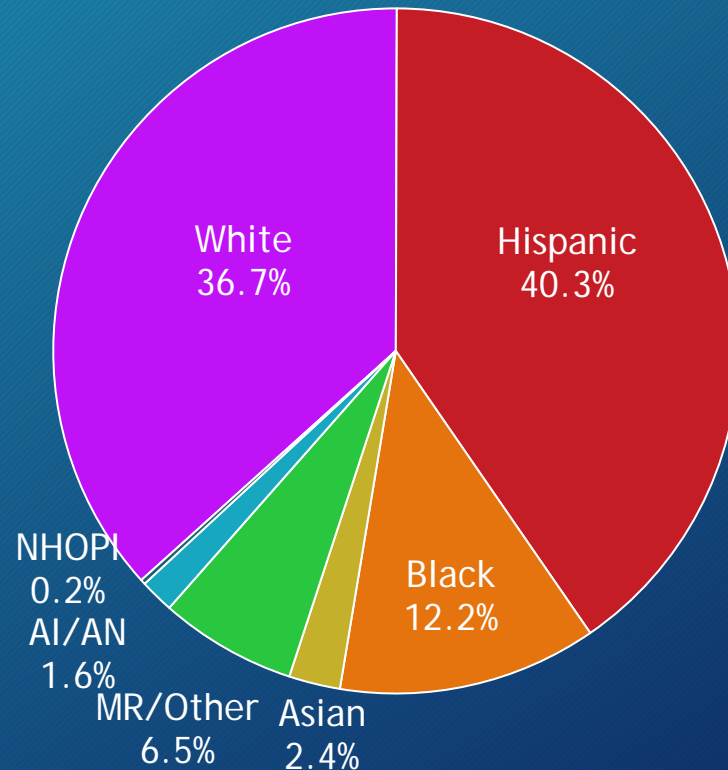
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COVID-19 in Kids 0-9 Years in 2020: Cumulative Incidence Rates (CIR)

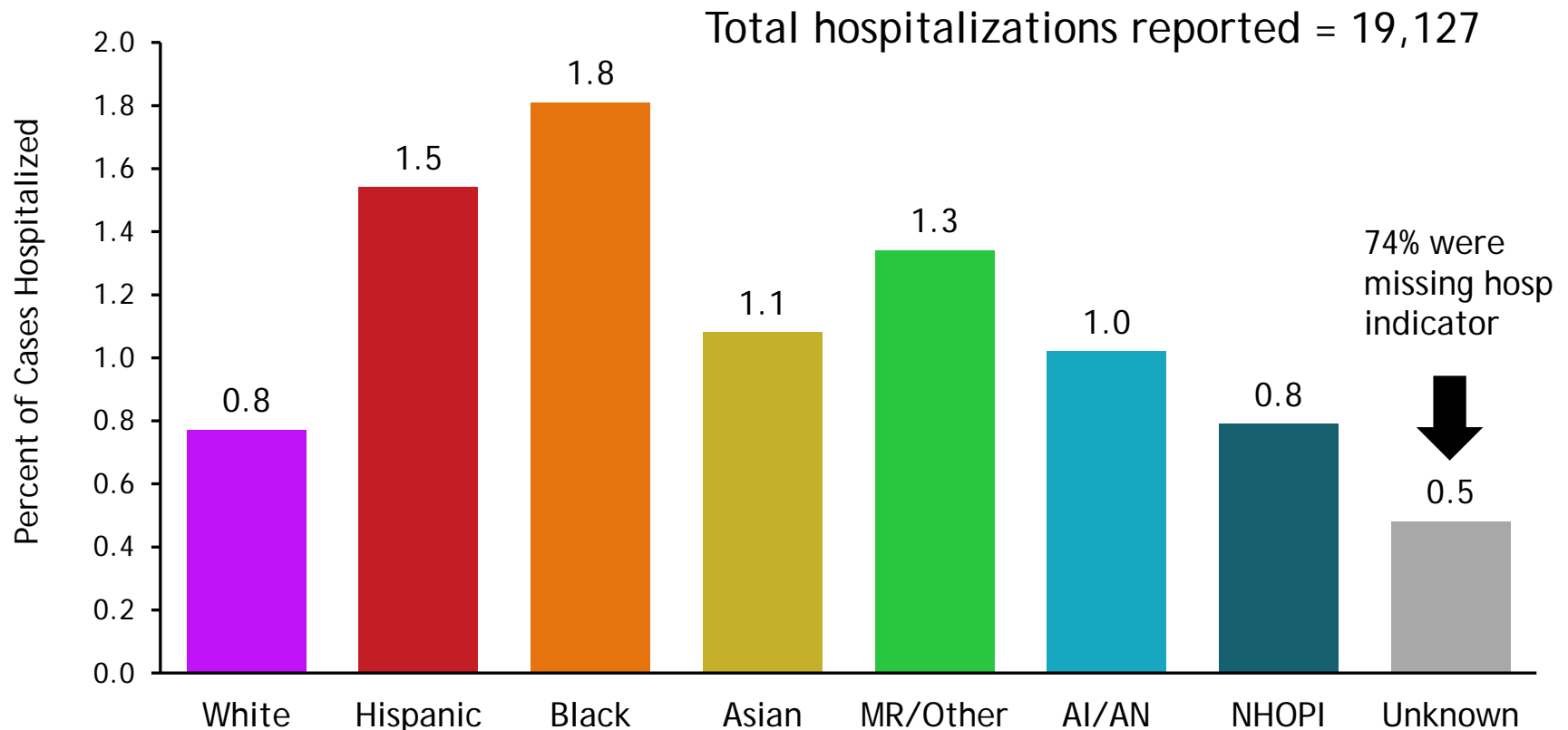*RAW = CDC file. Best Estimate = COVKID/CDC best count with R/E imputation.*

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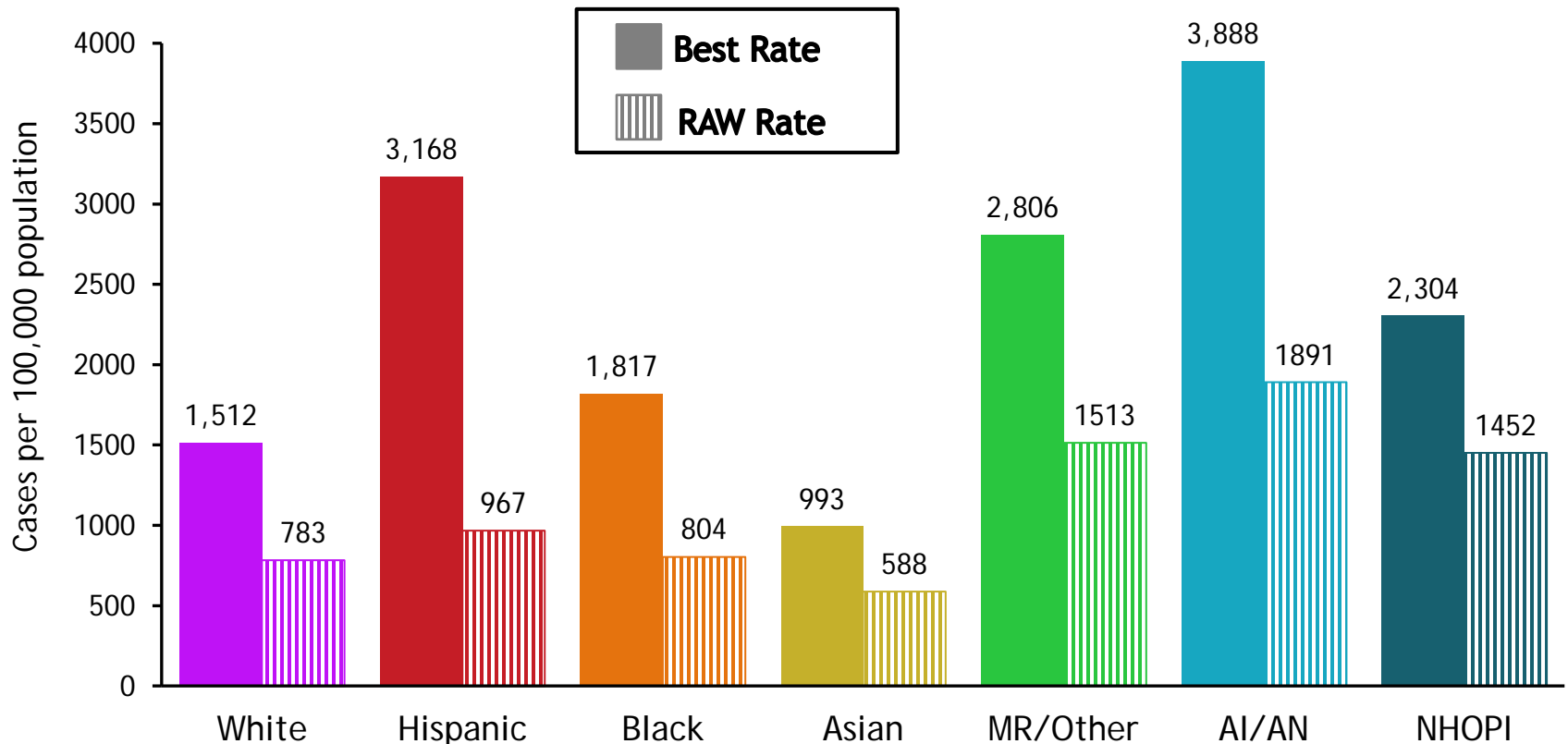
Results:
National Hospitalization Data

19

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COVID-19 Hospitalization Indicator from the CDC Case File, Kids 0-19 Years
January 31. 2021 release. Missing/UNK hosp = 59%. Missing/UNK R/E = 45%.

Total hospitalizations reported = 19,127

Percent of Cases Hospitalized

White	Hispanic	Black	Asian	MR/Other	AI/AN	NHOPI	Unknown
0.8	1.5	1.8	1.1	1.3	1.0	0.8	0.5

74% were missing hosp indicator

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Results:
National Intensive Care Data

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COVID-19 Intensive Care Admissions for Children 0-17 Years Old

Data extracted from https://covid19.myvps.org on March 28, 2021

Race/ethnicity of patients
n= 1,818
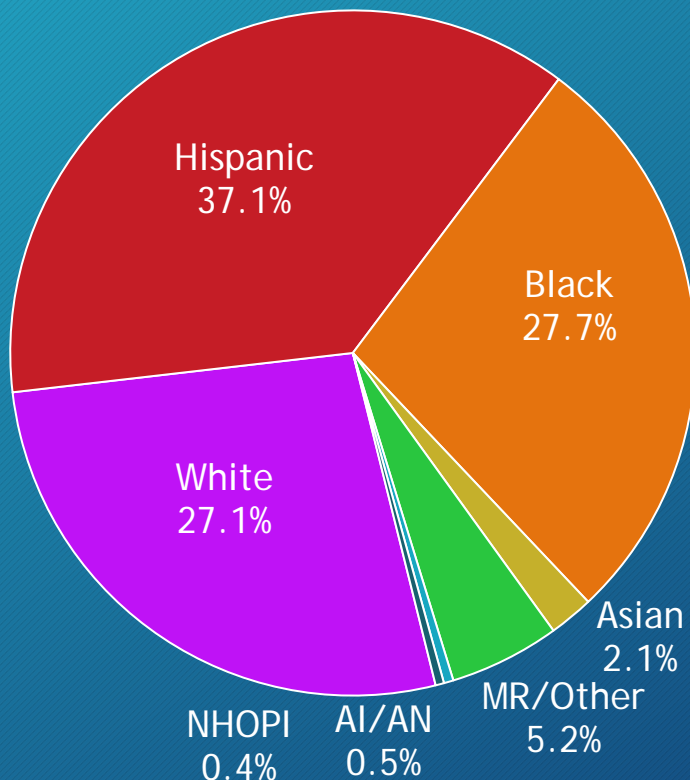
- Voluntary hospital registry with 185 hospitals participating.
- Hospital non-participation rate is unknown!
- 2,772 PICU admissions of US patients aged 0-17 years.
- Detailed clinical data submitted for 1,901 US patients.
- Race/ethnicity available for 96% with clinical data

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Results:
National Death Data

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Visit The COVKID Project Disparities Dashboard

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https://www.covkidproject.org/disparities
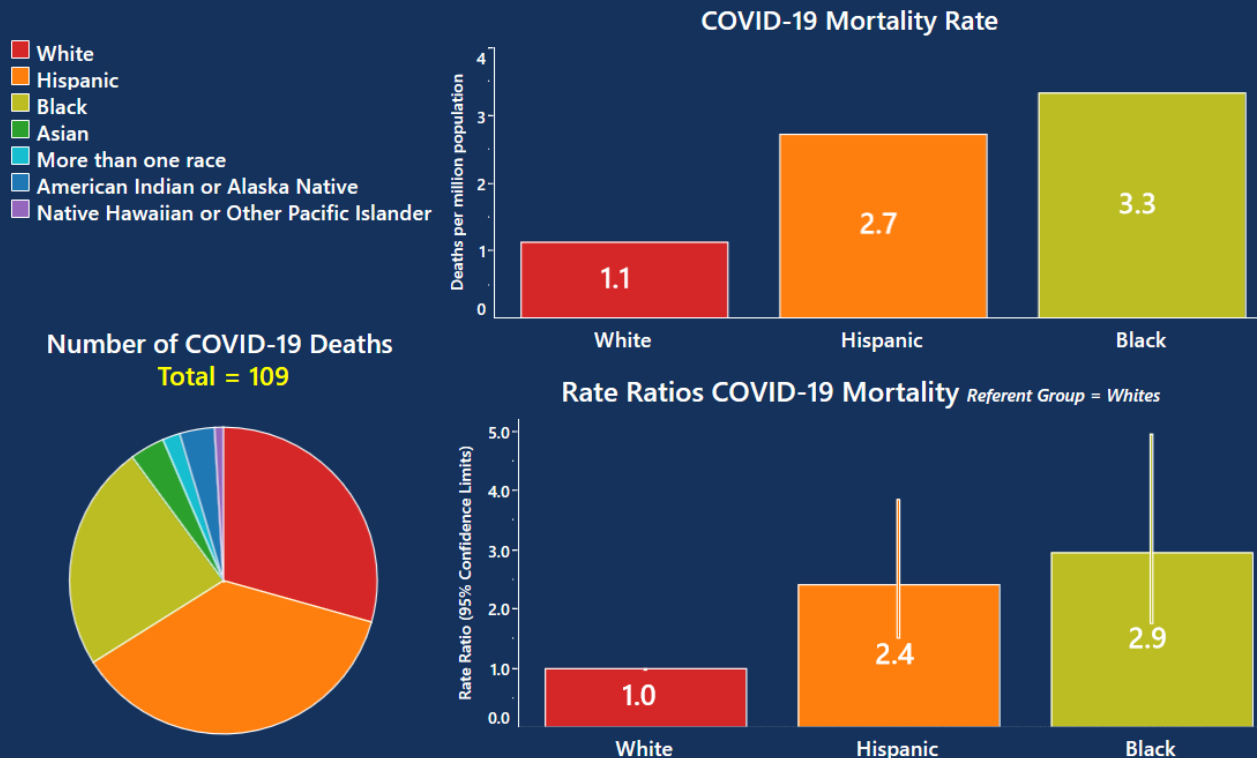

COVID-19 Mortality Among Children 1-14 Years in the United States
January 1, 2020 to March 6, 2021

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Priorities

26

Priorities for all data types

◆ Race/ethnicity data without age stratification is of very limited utility.

◆ Missingness of race/ethnicity data needs to be systematically investigated and then actively intervened upon.

   ◆ STILL HAPPENING in 2021!!

◆ End excessive suppression of data, particularly death counts.

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Priorities for states

◆ Expand state dashboard reporting for kids

◆ Use standardized cutpoints and definitions to improve comparability among states.

◆ Include vaccination, testing, case, hospitalization, and death data.

◆ Report all data items by race and ethnicity.

◆ See COVKID Project Report Card for detailed suggestions: https://www.covkidproject.org/state-report-card

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Priorities for hospitals/DHHS

◆ We need mandatory hospital reporting of all COVID-19 hospitalizations of kids, with demographics, length of stay, and discharge disposition.

◆ We need expanded clinical registries for all intensive care hospitalizations of kids.

◆ We need emergency department visit registries.

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◆The state of Florida releases a COVID-19 case-line data file every single day.

◆Data on nearly 2 million cases released to the public – no restrictions!

◆Dr. Jason Salemi, epidemiology professor at University of South Florida publishes a daily dashboard with over 75 detailed metrics and visualizations.

◆https://covid19florida.mystrikingly.com/

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1. Overview of Outcomes Among Cases

Deaths, hospitalizations, and ED visits

The only thing missing is race and ethnicity!

D9	D10	H1a	H1b	H2	H3a	H3b	H4	H5	H6	H7	H8	H9a	H9b	H10	H11	H12a	H12b	H12c	O1	O2	O3a

Mortality status

Residents selected:	All
Counties currently selected:	All
Age groups currently selected:	None

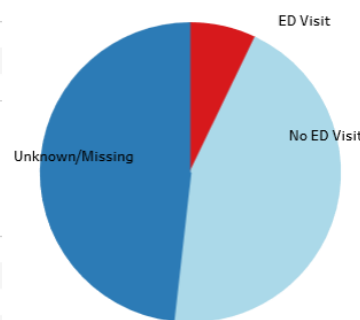|	Total cases	% of Total Nu..
NA	1,748,413	98.2%
Recent	40	0.0%
Yes	32,418	1.8%
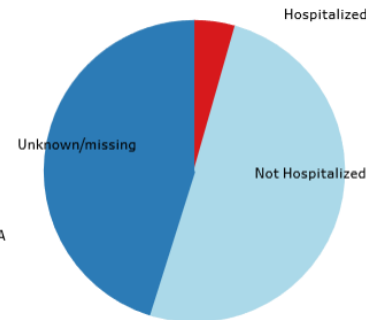
Hospitalization documented?

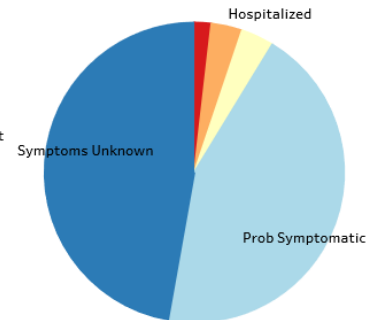|	Tota.	% of To..
Not Hospitalized	898,330	50.4%
Unknown/missing	803,729	45.1%
Hospitalized	78,812	4.4%

ED visit documented?

	Total cases	% of Total Number ..
Unknown/Missing	858,481	48.2%
No ED Visit	795,406	44.7%
ED Visit	126,984	7.1%

Case classification

	Total cas..	% of Tot..
Died	32,418	1.8%
ED Visit	63,256	3.6%
Hospitalized	59,644	3.3%
Prob Symptomatic	785,146	44.1%
Symptoms Unkno..	840,407	47.2%

Mortality status

Recent / NA

Hospitalization documented?

Hospitalized / Unknown/missing / Not Hospitalized

ED visit documented?

ED Visit / No ED Visit / Unknown/Missing

Case classification

Hospitalized / Symptoms Unknown / Prob Symptomatic

Case Dt

3/2/2020 — 2/7/2021

Resident status
- (All)
- FL resident
- Non-FL resident

Age 5-year (census)
- (All)
- Null
- 0-4
- 5-9
- 10-14
- 15-19
- 20-24
- 25-29
- 30-34
- 35-39
- 40-44
- 45-49
- 50-54
- 55-59
- 60-64
- 65-69
- 70-74
- 75-79
- 80-84
- 85+

County
- (All)
- Alachua
- Baker
- Bay
- Bradford
- Brevard
- Broward
- Calhoun
- Charlotte
- Citrus
- Clay
- Collier
- Columbia
- Dade
- Desoto
- Dixie
- Duval
- Escambia
- Flagler
- Franklin
- Gadsden
- Gilchrist
- Glades
- Gulf
- Hamilton
- Hardee
- Hendry
- Hernando
- Highlands
- Hillsbor...
- Holmes
- Indian R...
- Jackson
- Jefferson
- Lafayette

+ableau

Thank you for your attention!

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SUPPLEMENT: DATA, METHODS, AND BIAS

33

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The COVKID Project
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◆ Coronavirus in Kids Tracking and Education Project

◆ Public-facing dashboard reporting incidence, hospitalization and mortality data for kids 0-19 years

◆ Primary data sources:

  ◆ State health departments for case data

  ◆ Virtual Pediatric Systems (myvps.org) for PICU admissions data

  ◆ National Center for Health Statistics (NCHS) for death certificate data

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April 1, 2021

"Mandatory" COVID-19 Case Reporting to the CDC

◆ State health departments are required/requested to submit COVID-19 case data to the CDC using a uniform and detailed data reporting form.

◆ Age, gender, and detailed race/ethnicity categories are requested.

◆ This is the main data source for all CDC analytic studies and reports of national trends.

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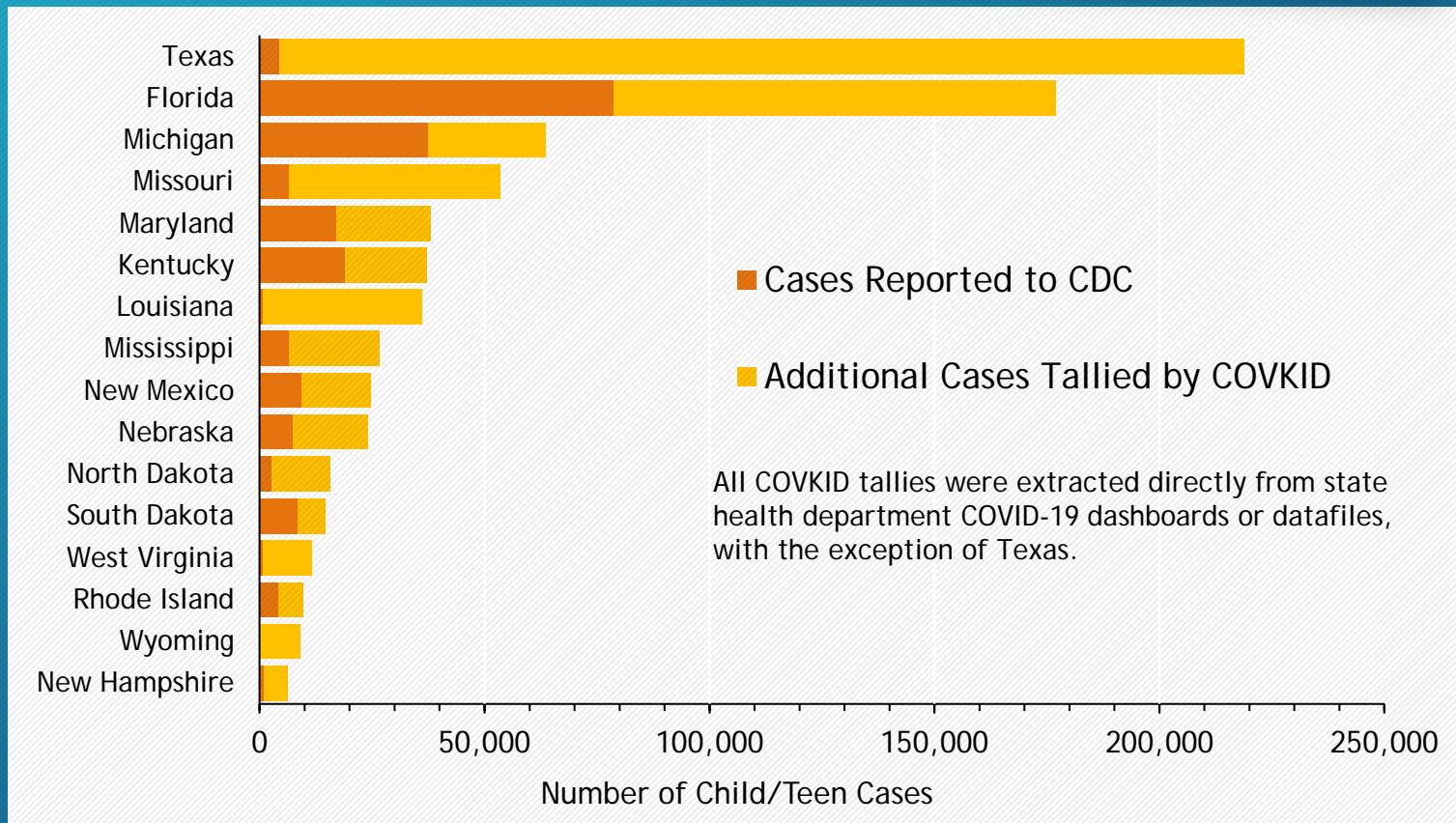March 9, 2021

CDC Restricted Access Case File

◆ CDC makes available a case-level datafile to researchers after application and approval.

◆ This datafile contains all cases reported to CDC from state health departments.

◆ Some dates are redacted, and age is aggregated into 10-year ranges.

◆ The file is updated monthly – latest update (Feb 28) contains approximately 20 million case records.

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States for which CDC Case Total is <60% COVKID Tally *(problem states)*

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The Problem with Texas

◆ Total COVID-19 cases (all ages) reported by Texas on its dashboard 12/31/2020

   = 1,563,758

◆ Percent of cases with **any** demographics reported

   = 2%

◆ COVKID Solution: We obtain the age distribution of cases from Harris and Dallas County TX local health department COVID-19 dashboards, and multiply the percent 0-19 by the state total

◆ Assumes that age distribution of cases for entire state is same as Houston/Dallas area.

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April 1, 2021

Method for Imputing Race/Ethnicity II

◆ **IMPORTANT:** Imputation must happen at the state level – apply state-specific race/ethnicity distributions to the "missing" cases.

◆ **WHY?**

◆ Not all states report all of the available race/ethnicity categories.

◆ Race/ethnicity of kids varies widely across states, per census.

◆ Missingness of race/ethnicity varies widely by state.

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Imputation Details

◆ We used the state-level racial/ethnic (R/E) distribution of all child/teen cases with non-missing R/E, from the CDC case file, to impute R/E for all cases.

◆ Separate imputation for 0-9 years and 10-19 years.

◆ Exceptions:

◆ California – we used the state dashboard R/E distribution for cases 0-17 years as recorded by COVKID.

◆ Delaware and Wyoming – we used the state dashboard R/E distribution for all ages

◆ Louisiana and North Dakota – we used the census population R/E distribution for ages 0-19 years, because state dashboard case R/E distributions did not include Hispanics.

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Misclassification for Smaller Ethnic Groups I

◆ Some states grouped numerically smaller ethnic groups (i.e. Asians, Native Hawaiians, other Pacific Islanders, American Indians, Alaska Natives) into the "Multi-Race/Other" category.

◆ Hawaii reported 66% of kid cases were Asian, 7% Hispanic, 2% White, 25% MR/O, and 0% NHOPI.

◆ Multi-racial children are likely undercounted by the census, which would result in higher rates.

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Misclassification for Smaller Ethnic Groups II

◆ Misclassification of the AI/AN cases results in a bias of the disparity RR *toward the null.*

◆ Missclassification of the Asian cases results in a bias of the disparity RR *away from the null.*

◆ Grouping all these groups together for rate calculation solves the misclassification problem, but averages out the differences among these groups.
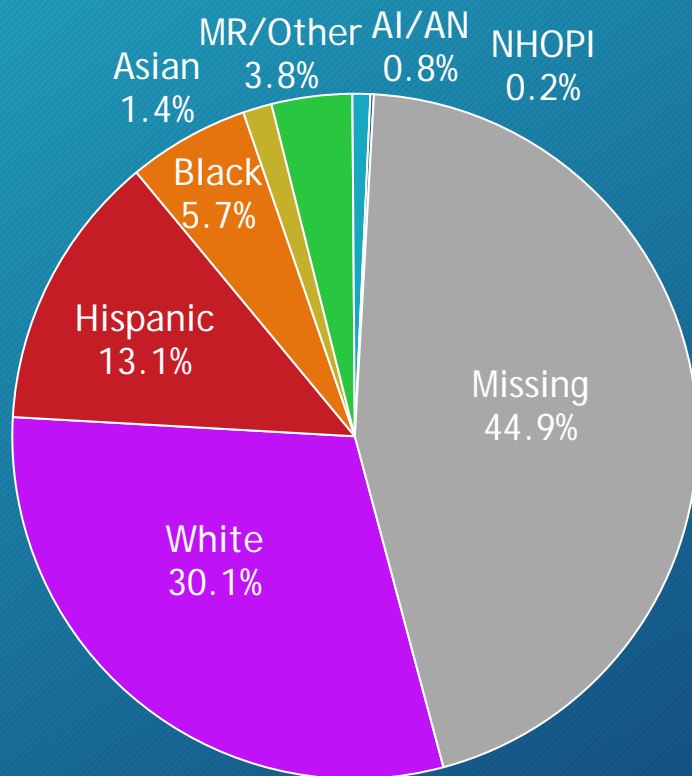
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COVID-19 in Kids 10-19 Years in 2020: Cumulative Incidence Rates (CIR)

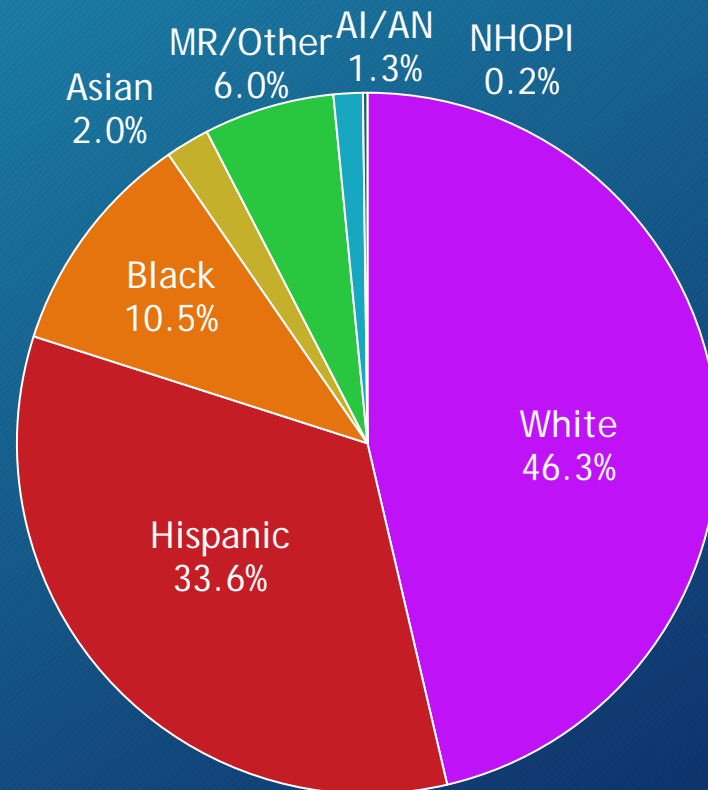*RAW = CDC file. Best Estimate = COVKID/CDC best count with R/E imputation.*

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