



Virtual Training

From Data to Action: Responding to Infectious Disease Outbreaks

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NIHB Infectious Disease Steering Committee

National Indian
Health Board



Continuing Education Credit and Contact Hours Available

ANCC - American Nurses Credentialing Center. NCPD - Nursing Continuing Professional Development 1 credit hour.

ACCME - Accreditation Council for Continuing Medical Education. CME - Continuing Medical Education AMA PRA Category 1 Credit™. Approved by the ASU Office of Interprofessional Continuing Health Education which is accredited by JAICE (Joint Accreditation for Interprofessional Continuing Education) <https://jointaccreditation.org/>.

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About National Indian Health Board



- Founded by Tribes in 1972 to serve as the Tribal advocate for healthcare
- Based in Washington DC
- Board of Directors includes a Tribal leader from each Service Area elected to be the Area's representative



National Indian Health Board

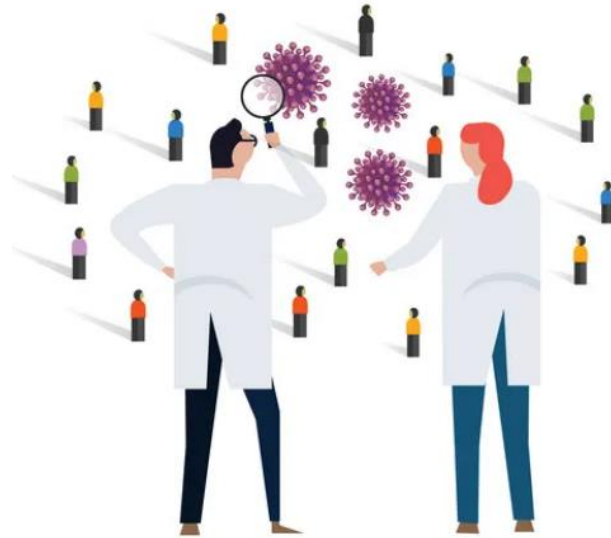


NIHB Mission Statement: Established by the Tribes to advocate as the united voice of federally recognized American Indian and Alaska Native Tribes, NIHB seeks to reinforce Tribal sovereignty, strengthen Tribal health systems, secure resources, and build capacity to achieve the highest level of health and well-being for our People.

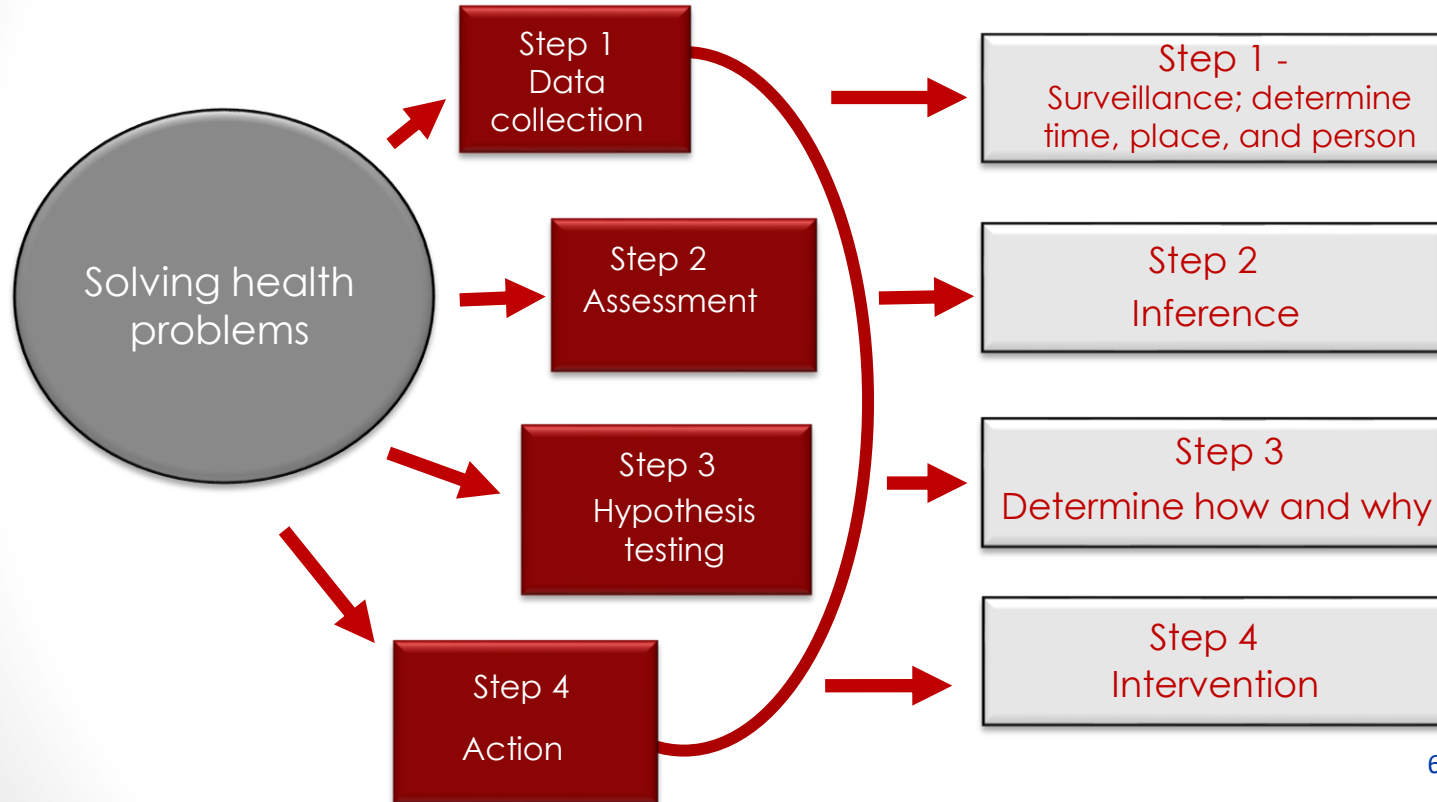
PHPP Vision Statement: Working together to empower sovereign Tribal nations to improve equity, policy, and public health systems that build thriving Native communities now and for the next seven generations.

What is Epidemiology?

- Distribution: who, what, when, where
- Literal meaning of epidemiology: “*study upon the people*”
- Find causes of outbreaks and how we can prevent and/or mitigate them



Solving Health Problems



Terms to Know

- **Epidemic:** outbreak or occurrence of one specific disease from a single source, in a group population, community, or geographical area, in excess of the usual level of expectancy
- **Pandemic:** epidemic that is widespread across a country, continent, or large populace, possible worldwide
- **Incidence:** the extent that people, within a population who do not have a disease, develop the disease during a specific time period



Terms to Know

- **Prevalence:** the number of people within a population who have a certain disease at a given point in time
- **Point prevalence:** how many cases of a disease exist in a group of people at that moment.
- Prevalence relies on 2 factors:
 - How many people have had the disease in the past
 - Duration of the disease in the population



Uses of Data in Public Health

- Population or community health assessment
- Examining social determinants of health
- Public health surveillance
- Disease investigation
- Prevention and control measures evaluation
- Program planning
- Needs assessments



Possible Data Sources

- Indian Health Service (IHS)
- Centers for Disease Control and Prevention (CDC)
- American Hospital Association
- HealthData.gov datasets
- State Health Departments
- Tribal Health Departments
- Tribal Epidemiology Centers (TEC)



Data Limitations

- States have different laws about public health data sharing. This decentralized system made it harder for the U.S. to respond to COVID-19.
- Data is not always well defined
- Data may be missing
- Inaccurate diagnosis or coding
- Poorly conducted data collection, entry or analysis
- Non-representative data!!!



How do we summarize
public health data?

Ratios and Proportions

- **Ratio:** A ratio is a comparison of two similar quantities
- **Proportion:** A figure that represents a portion of something whole, usually in the form of a percentage

$$\frac{\text{Number of people with a characteristic population in a specific time period}}{\text{Total people in population in specific time period}} * 100$$

Interactive Exercise

- **Example:** In 2022, in a population of **5000**, **3000** identify as American Indian/Alaska Native

$$\frac{3000 \text{ people who identify as AI/AN in 2022}}{5000 \text{ people in population in 2022}} * 100$$

= 60% of the population identify as AI/AN

Rates

- **Rate:** Frequency of something happening in a population

$$\frac{\text{Number of people with a characteristic in a specific time period}}{\text{Total population in specific time period}} * 1000 \text{ or } 100,000$$

- Proportions and rates are used for quantifying morbidity and mortality
 - Measure of morbidity: prevalence; incidence rate
 - Measures of mortality: mortality rate
 - Measures of disease severity: case-fatality

Interactive Exercise

- **Example:** In a population of **5000** people, **20** tested positive for influenza in the week ending on **12/4/2022**

$$\frac{20 \text{ people tested positive for influenza in week ending on December 4th, 2022}}{5000 \text{ people in population in week ending on December 4th, 2022}} * 1000$$

= 4 cases of COVID – 19 per 1000 persons in week ending on December 4th, 2022

Incidence

- **Incidence:** Proportion or rate of **new** cases of a disease in a population in a specific time period

$$\frac{\text{Number of new cases of a disease in a specific time period}}{\text{Average population count in specific time period}} * 1000 \text{ or } 100,000$$

Which city is at a greater risk?

	Cases		Total Population	<u># cases</u> Total Population	Incidence Rate
 City A	20	÷	1,000	X	X
 City B	20	÷	5,000	X	X

Answer!

	Cases		Total Population	<u># cases</u> Total Population	Incidence Rate
 City A	20	÷	1,000	0.02 x 100,000	20 per 1,000
 City B	20	÷	5,000	0.004 x 1,000	4 per 1,000

Public Health Significance

- **Proportions:** shows who is affected by a health problem
 - Can describe how much of a population currently has a disease
 - Can indicate how many deaths in a community were caused by a disease
- **Rates:** shows who is affected by a health problem and how rapidly it is occurring in a population
 - Standard way to compare characteristics between populations of different compositions

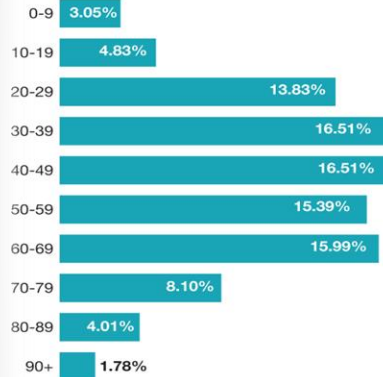
With all this data.
How do we present it?



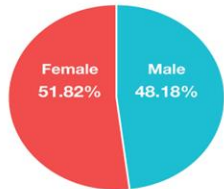
How to Present Data Visually

NEW DATA SHEDS LIGHT ON DISTRIBUTION OF NEW MEXICO COVID-19 CASES

Statewide age breakdown

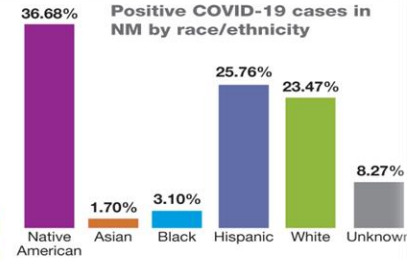


Positive cases by gender

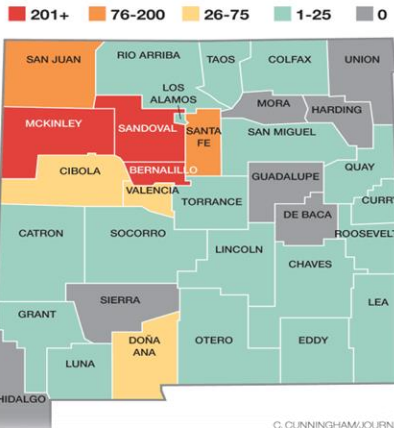


SOURCE: NM Department of Health
cv.nmhealth.org/dashboard

Positive COVID-19 cases in NM by race/ethnicity



Cases by county



C. CUNNINGHAM/JOURNAL

- Keep it simple!
 - Popular types of data visualization include tables, graphs, charts, maps, dashboards, and infographics
- REMEMBER:** A simple clean display is better than something cluttered.



When to Use a Table

Use a TABLE to:

- Look up specific values
- Compare specific values
- Display precise values
- Communicate more than one unit of measure

COVID-19 Vaccine Distribution and Administration by IHS Area

As of November 27, 2022, the IHS is distributing all COVID-19 vaccines currently authorized or approved in the U.S., including Pfizer-BioNTech, Moderna, Janssen/Johnson & Johnson and Novavax. The table below shows the total number of vaccine doses distributed and administered to date, per IHS Area, for facilities that chose to receive vaccine through the IHS jurisdiction. The data includes COVID-19 vaccinations administered to all ages and specialty groups authorized for emergency use or fully licensed by the Food and Drug Administration (FDA).

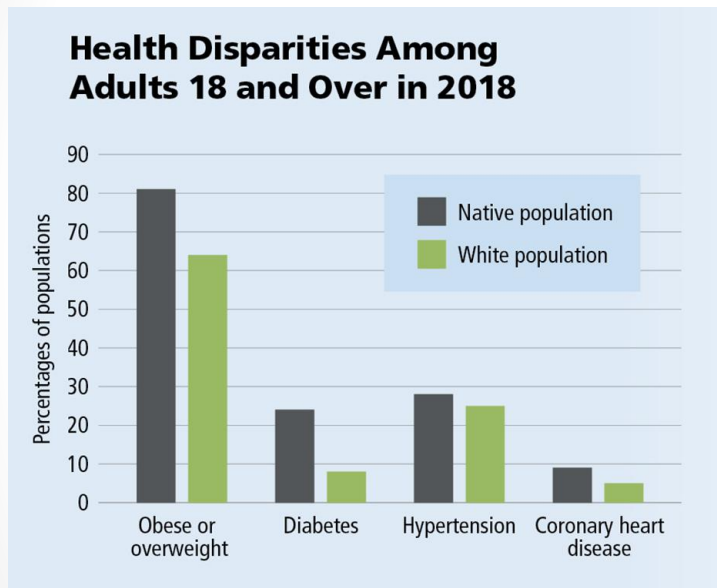
Area	Total Doses Distributed*	Total Doses Administered**
Albuquerque	264,190	199,244
Bemidji	314,670	185,019
Billings	183,820	86,948
California	460,130	233,658
Great Plains	311,290	181,268
Nashville	202,140	115,325
Navajo	621,820	420,503
Oklahoma City	838,965	528,904
Phoenix	437,555	263,403
Portland	207,500	113,297
Tucson	20,190	14,254
Grand Total	3,862,270	2,341,823

*Distributed Data Source: IHS National Supply Service Center, includes total doses ordered and delivered by November 25, 2022, to facilities that chose the IHS jurisdiction for vaccine distribution.

**Administered Data Source: Data is reported from the Vaccine Administration Management System (VAMS) and IHS Central Aggregator Service (CAS). Data may be different than data on the CDC COVID-19 Vaccine Tracker due to lags and ongoing quality review of data, including resolving data errors.



When to Use a Graph



Use a GRAPH to:

- Show patterns
- Show trends
- Show exceptions
- Reveal relationships among multiple values



When to Use a Line Chart

- Line charts are best for showing changes over time.
- The vertical axis can represent any kind of value. The horizontal axis should represent time.
- Line charts are used to detect trends and patterns, not to give exact quantitative readings.



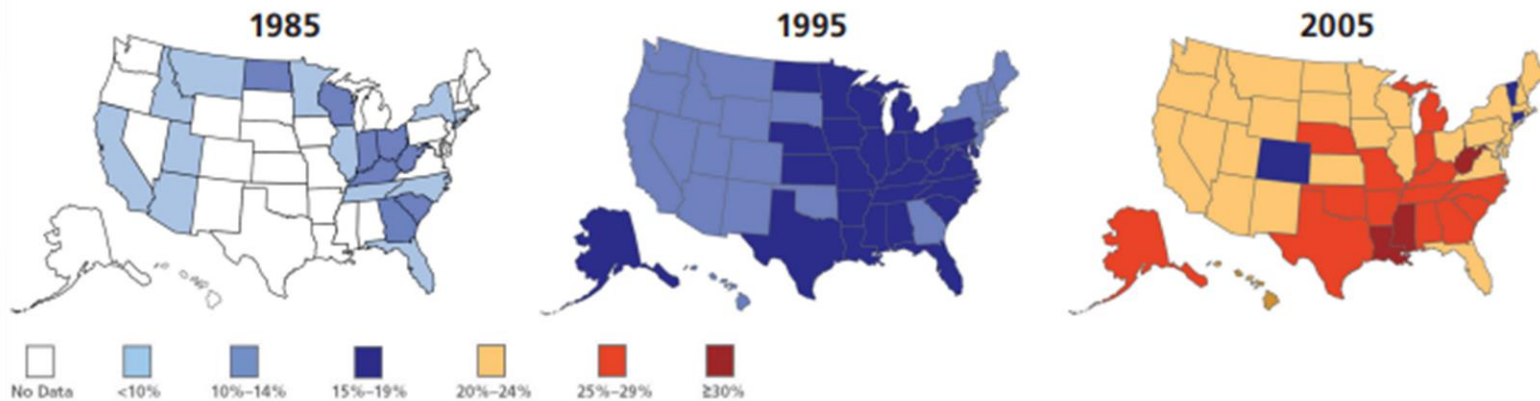
Source: CDC



Heat Maps

Example of visualizing patterns and details using heat maps.

Obesity Trends Among U.S. Adults*



* Data collected from the Centers for Disease Control and Prevention Behavioral Risk Factor Surveillance System. Obesity defined as having a body mass index (BMI) of ≥ 30 , or ~ 30 pounds overweight for a 5' 4" person.

COVID-19 AMONG AMERICAN INDIAN / ALASKA NATIVES

The total proportion of state cases reported to the CDC on a given day varies on a state-by-state and day-by-day basis. We recommend caution when comparing information across states and across times as numbers in this dashboard are highly dependent on this changing proportion of available data. Click on tiles below to change data visualized in the map and trend chart. Please use the racial data availability percentage as a measure of the overall completeness of racial data available for the selected counties.



**RACIAL DATA
AVAILABILITY**

40.4%

Nationwide
Cases

TOTAL COUNT

491,988

TOTAL RATE PER 100K

20,205.6

PAST 4 WEEKS COUNT

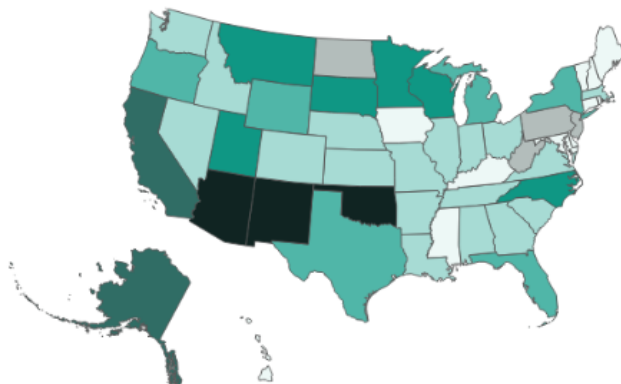
4,787

PAST 4 WEEKS PER 100K

196.6

Nationwide All Counties: Total Count of AI/AN Cases

Select a state to filter:



Legend: Suppressed 10-1,000 1,001-5,000 5,001-10,000 10,001-20,000 20,001-50,000 >50,000

Nationwide Cases Demographic Comparison - All Time

		American Indian / Alaska Native		Non-Hispanic White	
		Counts	Rate per 100K	Counts	Rate per 100K
Sex	All	491,988	20,205.6	24,090,505	12,209.5
	Female	274,757	22,219.9	12,975,172	12,975.6
	Male	217,231	18,127.2	11,115,333	11,422.2
Age Group	0-19 years	120,469	17,493.4	4,058,781	9,849.6
	20-54 years	271,251	23,656.1	12,320,901	14,419.1
	55+ years	100,268	16,722.2	7,710,823	10,913.5

*Values between 0-9 are suppressed

Data Last Updated: 11/30/22

Source:
Urban Indian
Health
Institute

National Indian
Health Board





Total Confirmed

2,072,228

Confirmed Cases by
Country/Region/Sovereignty

639,664	US
180,659	Spain
165,155	Italy
134,753	Germany
134,582	France
99,516	United Kingdom
83,402	China
76,389	Iran
69,392	Turkey
34,809	Belgium
28,912	Brazil
28,316	Netherlands
28,253	Canada
27,938	Russia

Admin

Last Updated at (M/D/YYYY)
4/16/2020, 10:33:10 AM



185

countries/regions

Lancet Inf Dis Article: [Here](#). Mobile Version: [Here](#).
Lead by JHU CSSE, Automation Support: [Exri Living Atlas team](#) and JHU
APL. Contact US. FAQ.

Total Deaths

137,666

21,645 deaths
Italy

18,812 deaths
Spain

17,167 deaths
France

12,868 deaths
United Kingdom

10,899 deaths
New York City **New**
York US

4,857 deaths
Belgium

Deaths

Recovered

JHU CSSE

Mobile Version

Modeling COVID-19

JHU COVID-19

215,400 ter
California US

205,322 ter
Florida US

146,467 ter
Texas US

139,774 ter
New Jersey

133,631 ter
Pennsylvania

126,551 ter
Massachusetts

US

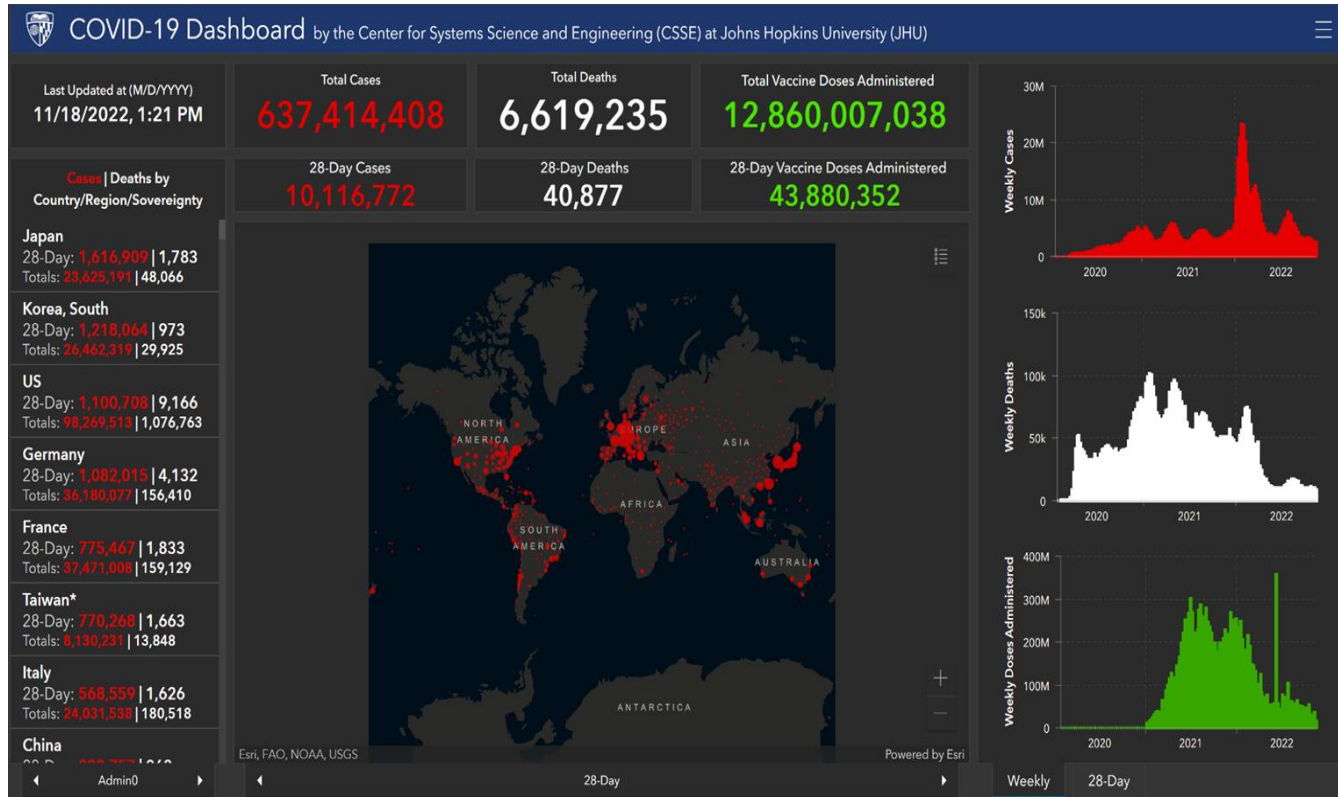


Confirmed

Logarithmic

Daily Cases

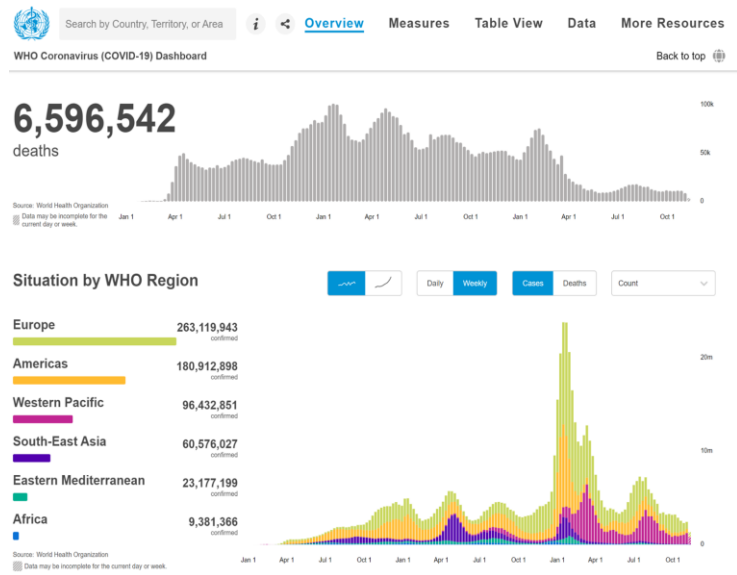
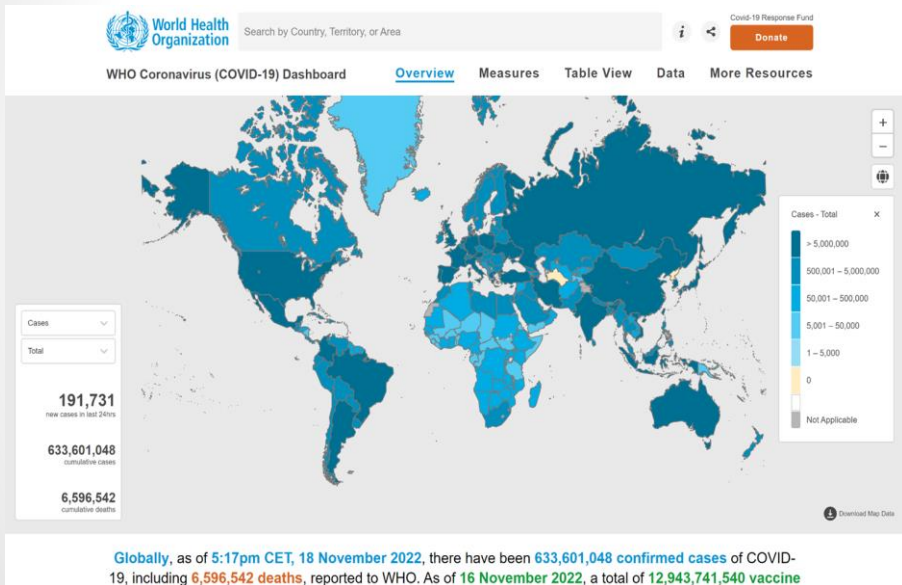
What is a Data Dashboard?



Credit: John Hopkins University



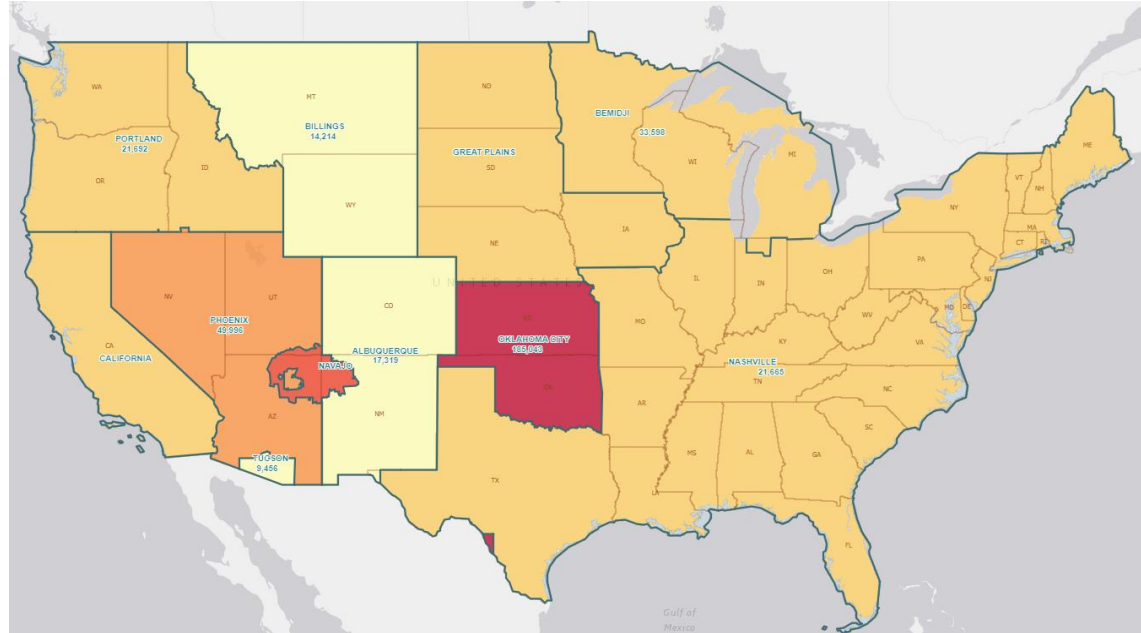
World Health Organization's COVID-19 Dashboard



Indian Health Service COVID-19 Dashboard

COVID-19 Positive Cases by IHS Area (Nov, 2022)

- Updated every Mondays and Thursdays
- Reported by the IHS, Tribal, and Indian organization entities
- Available for public viewing



IHS Headquarters, Indian Health Service,
5600 Fishers Lane, Rockville, MD 20857



Infographics

Disproportionate Rates of COVID-19 Cases, Hospitalizations, and Mortality Among AI/ANs

Cases

3.5x

AI/AN were 3.5x more likely to test positive for COVID-19 at the height of the pandemic.²

Hospitalization

3.2x

AI/AN are 3.2 times more likely to be hospitalized for the virus.³

Death

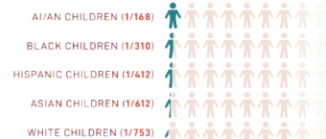
2.2x

AI/AN are 2.2x more likely to die from COVID-19.³

American Indians and Alaska Natives have infection rates over 3.5 times higher than non-Hispanic whites, are over 3.2 times more likely to be hospitalized as a result of COVID-19 and have higher rates of mortality at younger ages than non-Hispanic whites.

AI/AN Children and Orphanhood Due to COVID-19

AI/AN children who lost a parent/caregiver to COVID-19⁴



Compared to white children, **American Indian/Alaska Native children were 4.5 times more likely to lose a parent or grandparent caregiver.** Black children were 2.4 times more likely, and Hispanic children were nearly 2 times (1.8) more likely.

1 of every 168 AI/AN children experienced orphanhood or death of caregivers due to the pandemic, and AI/AN children were 4.5 times more likely than white children to lose a parent or grandparent caregiver.

Infographics come in many forms:

- Static or interactive
- Long form
- Digital postcards
- Illustrations, photos or icons

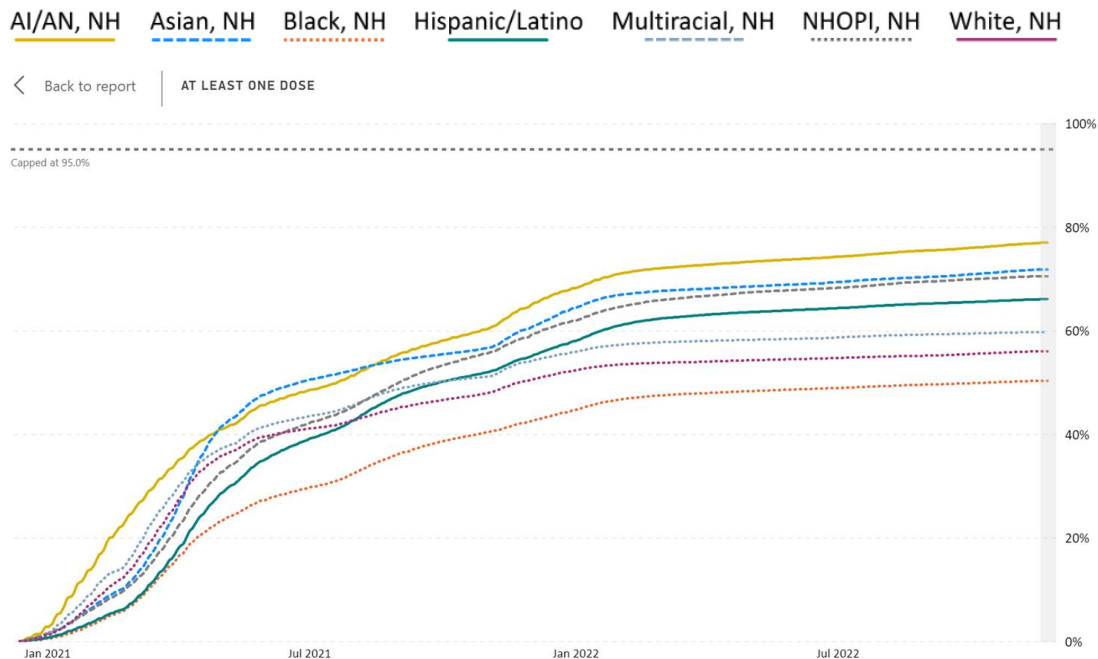
Source: National Council of Urban Indian Health



Create Your Own Table

5 Minute Activity:

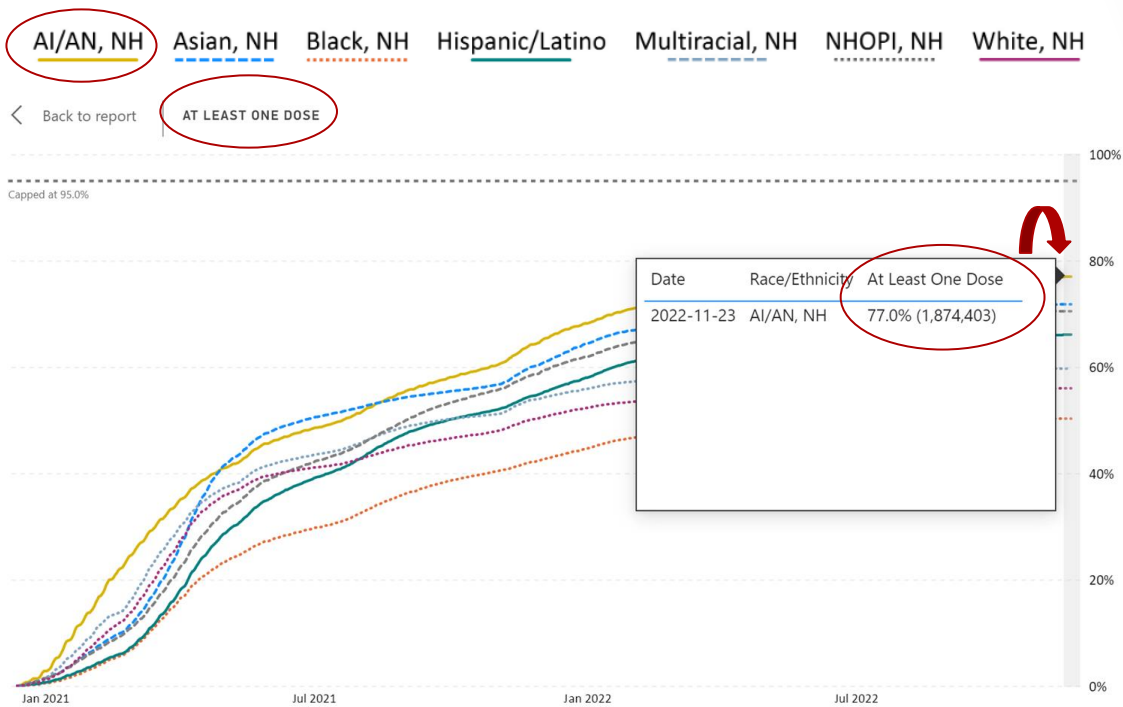
Let's create a table that demonstrates the approximate current percentage of American Indian/Alaskan Natives (AI/AN) who have received at least one dose of the COVID-19 vaccine.



Create Your Own Table

Answer:

	American Indian/Alaska Native
At Least One Dose	77.0%





That's all Folks!

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Acknowledgements

University at Buffalo

Mr. Nicholas Blatto

Mr. Felix Liao

Mr. Mathew Yonks

Mr. Chen Hong Wang

