

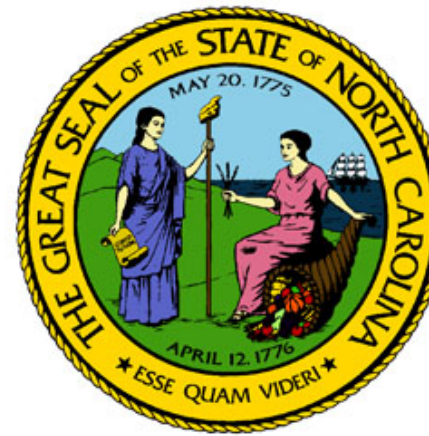
NC's Data Driven Response to COVID-19- Tales from the Trenches

**Jessie Tenenbaum, PhD
Chief Data Officer
NC DHHS**

November 29, 2021

NC Dept. of Health and Human Services

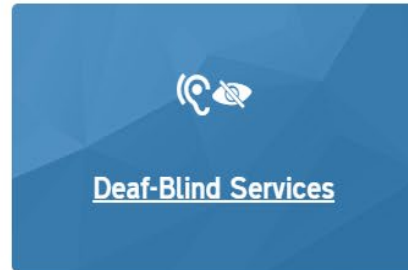
<https://www.ncdhhs.gov/>



Sec. Mandy Cohen, MD



Children's Services



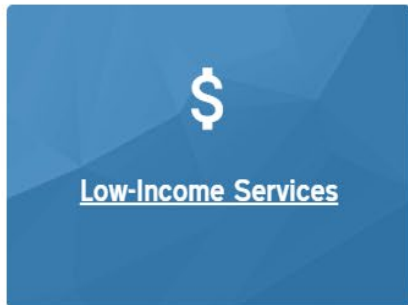
Deaf-Blind Services



Disability Services



Vital Records



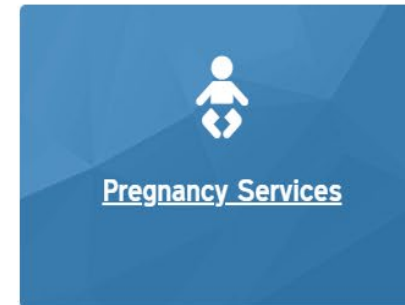
Low-Income Services



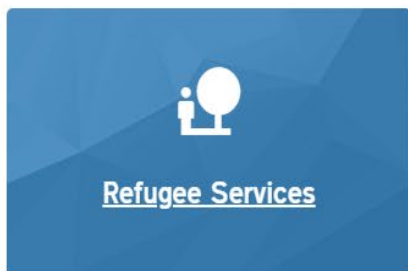
Medicaid



Mental Health and
Substance Abuse



Pregnancy Services



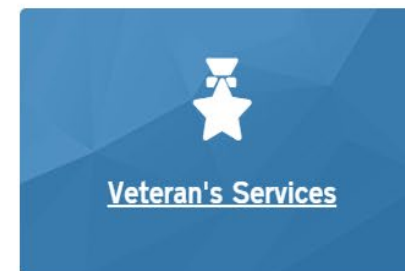
Refugee Services



Aging and Adult Services



Guardianship



Veteran's Services

- Led by Secretary Mandy K. Cohen, MD
- 2nd largest state agency in NC, employs over 16,000
- 30 divisions and offices
- Budget of \$20.5 billion
 - 90% of expenditures go toward aid and public assistance for beneficiaries of programs such as Medicaid and food stamps

State of North Carolina
EMERGENCY OPERATIONS CENTER



**Declaration of State of
Emergency**
March 10, 2020



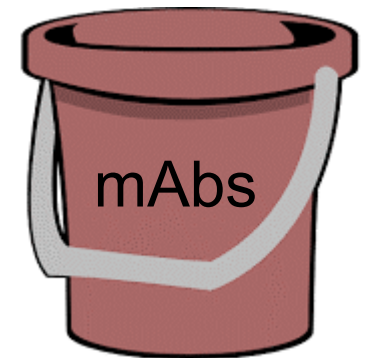
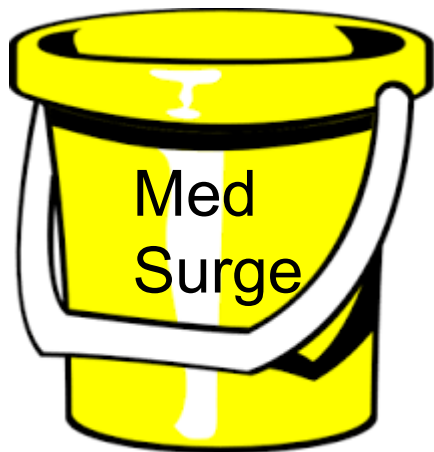
“Fast paced environment”

- Thinking long term- like 2 days...
- PUI forms example- “Person Under Investigation”
 - Paper form faxed to LHD, hand entered
 - Design app to facilitate digital entry
 - 2 days later, minority of tests using PUI form
- Constant phone calls and meetings, all hours (weekends included)

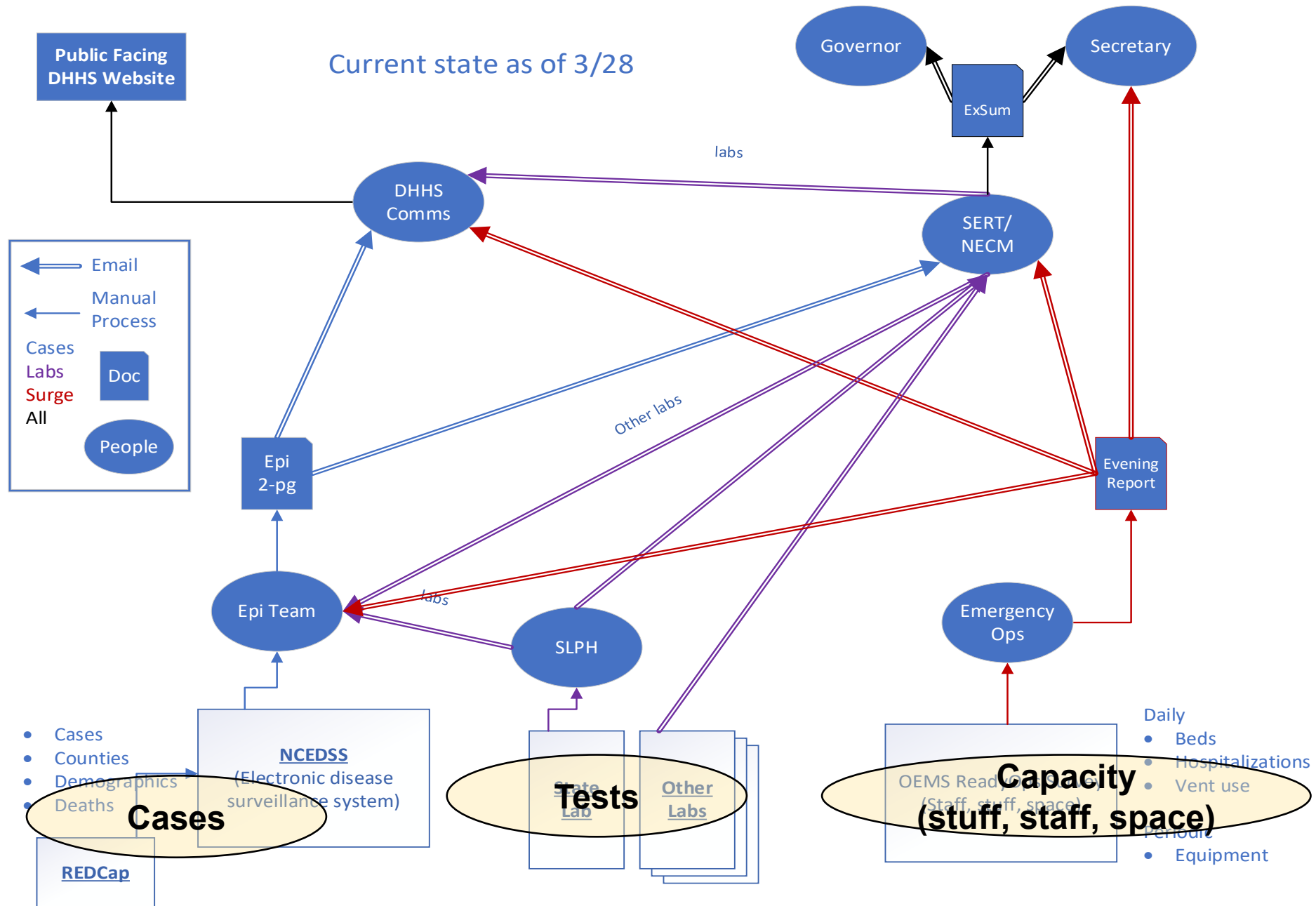
Early Questions to Enable Data Driven Policy

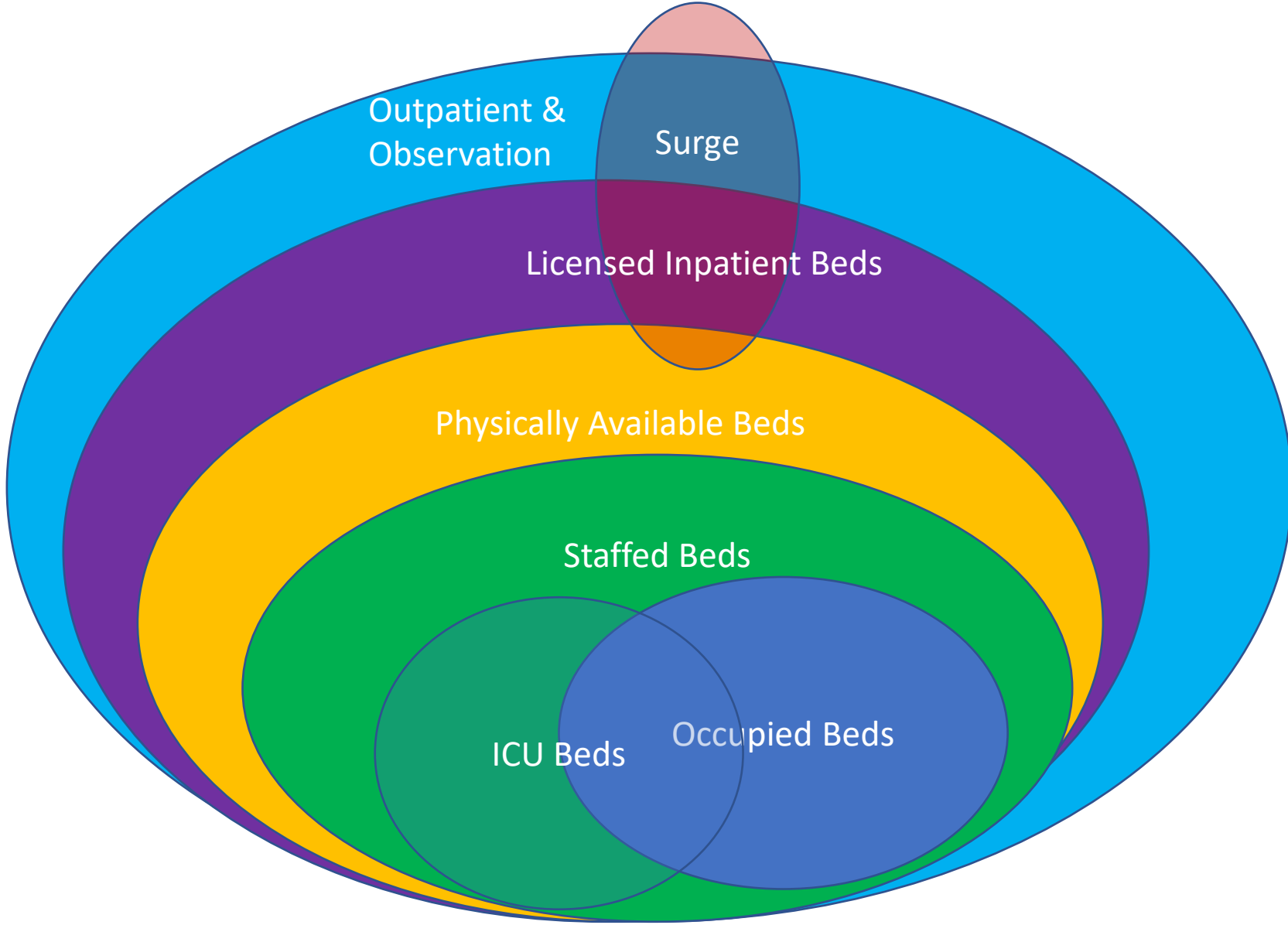
- How many cases will we see? When will our “epi curve” peak?
- How much (extra) PPE is needed, and where can we get it from?
- Will we run out of hospital beds? ICU beds? Ventilators?
- Should we shut down bars and restaurants? Schools? Businesses?
- How can we support families who are unable to work (either because workplace is shut down, or childcare is unavailable)?

Buckets of NC DHHS COVID-19 Data

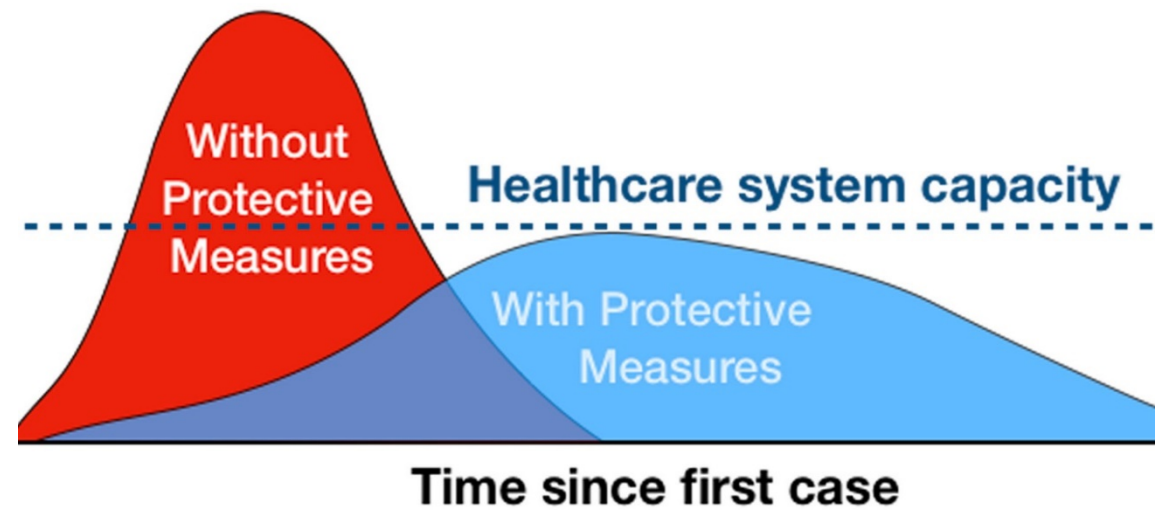


Baseline Data Flow (as of March 2020)

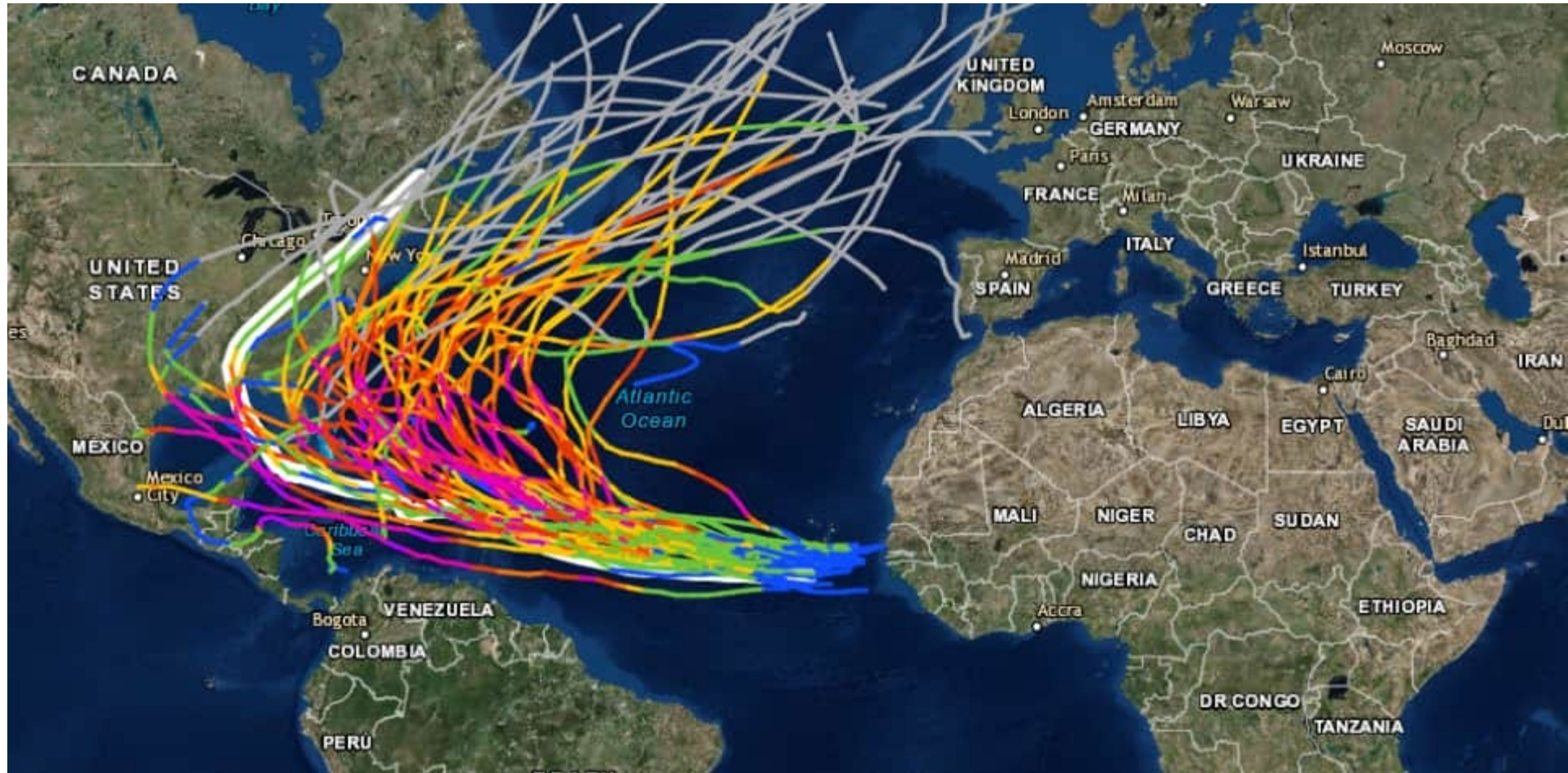




Data
Modeling:
Team science
at work



Adapted from CDC / The Economist

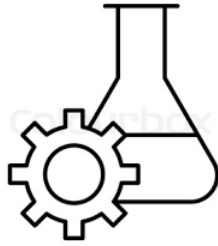


Data Workstreams During COVID Response



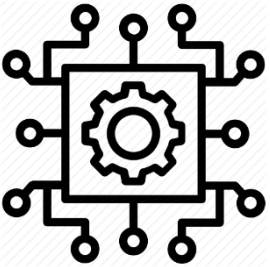
Data Governance

What data?
Who owns, protects, accesses it?



Lab Automation/SWAT

Collecting positive and negative **test data** at local level



Data Automation

Automate data flow into BIDP and out to feed dashboards



Dashboards

Build dashboards to pull from BIDP (not from spreadsheets)



Data Flow & Infrastructure

Analyze existing infrastructure and flow for collecting & creating data



Data Sharing

Playbook for how to request data, grant access, share

Significant overlap between streams

Universal Unique ID's

- Master Patient Index, Entity Resolution, Record Linkage (oh my!)
- Is Jessica, seen at Duke, the same as Jessie, seen at UNC?

COVID Cases



ID: 123456
Name: Waldo



COVID
vaccinations

- DHHS has one identifier for Medicaid, many social services
- NCHealthConnex (NC's HIE) has expertise in record linkage, and its own Master Patient Index (MPI)
- We will never have one ID to rule them all- instead we map them- "eHub" table

Today's Data Flow

Tableau Dashboards

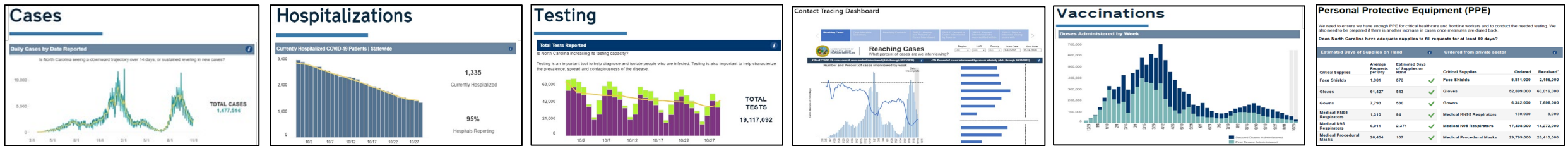
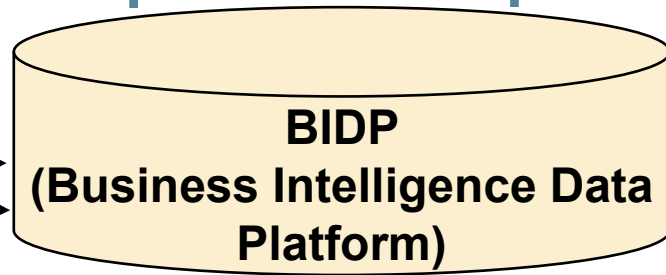


Tableau Refresh Process



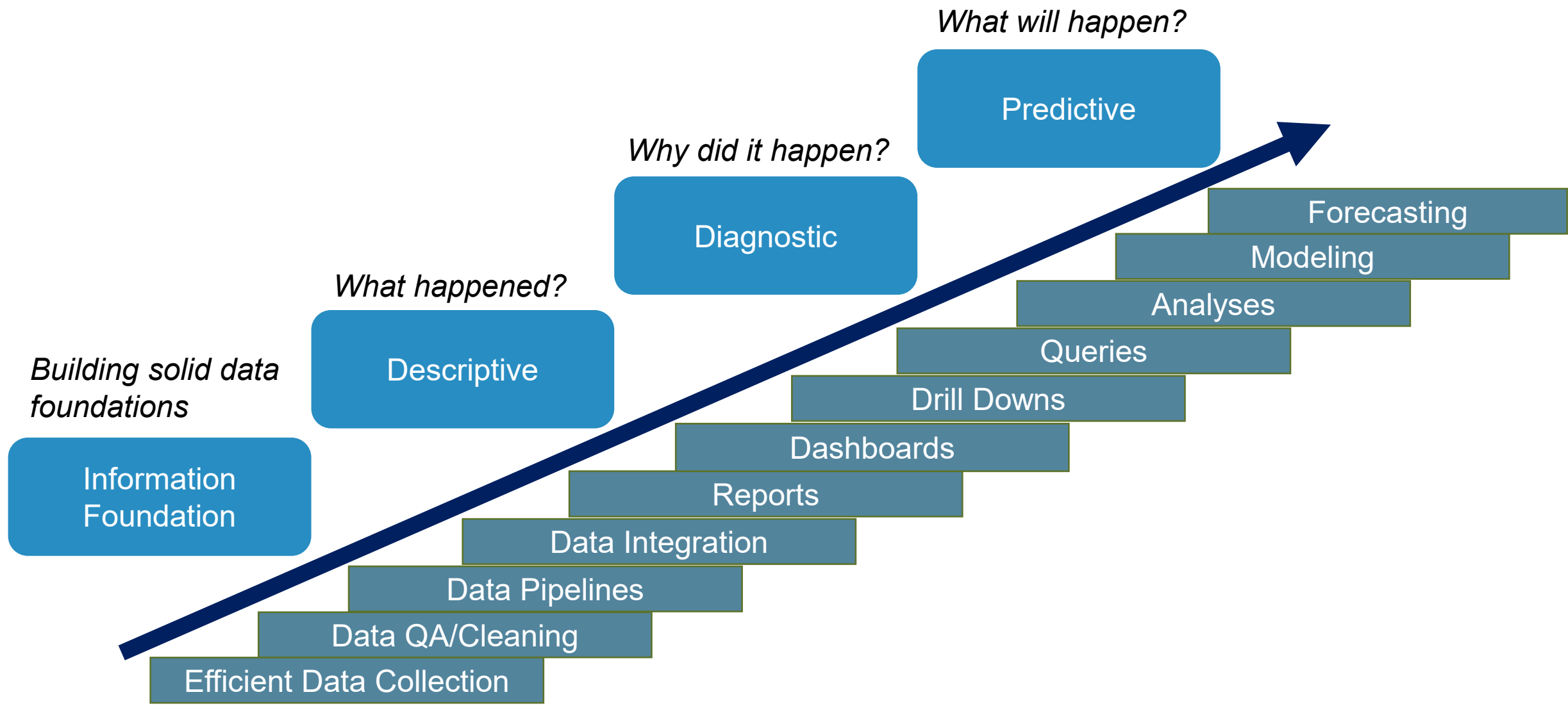
Data Integration, Filtering, Transformation, Validation



Today's More Advanced Questions to Enable Data Driven Policy

- How many Medicaid beneficiaries have been vaccinated?
- How many individuals experiencing homelessness have been vaccinated?
- What is the distribution of vaccination status among COVID-19 cases?
- What is the distribution of vaccination status among individuals hospitalized with/for COVID-19?

What's next? Moving from descriptive to predictive



Demographic and Equity Data

You can't improve what you can't measure

- What is the distribution of race/ethnicity among
 - COVID-19 cases?
 - COVID-19 deaths?
 - people tested for COVID-19?
 - people vaccinated against COVID-19?

NC Leads the Country in Collecting Equity Data

- **Highlights:**
 - Top-down leadership
 - Forced in UI – continued challenge
 - Tradeoffs – provider reporting burden
- **Data tools built to infuse equity data insights across entire vaccine operation**
 - HMP zip code data
 - Provider equity reports
 - Monthly equity policy brief
 - Public dashboard containing state & county-level demographic data


Bloomberg

Prognosis

One U.S. State's Laser Focus on Data Helps Shrink Racial Vaccine Gap

North Carolina has racial data for 99.6% of people who got a shot in the state

By [Angelica LaVito](#)
March 6, 2021, 8:30 AM EST



LIVE ON BLOOMBERG
Watch Live TV >
Listen to Live Radio >

IG
Open an account and start trading in minutes
Trade now >
Forex trading involves risk. Losses can exceed deposits.

COVID-19 Vaccine Administration, by Race and Ethnicity — North Carolina, December 14, 2020–April 6, 2021

Weekly / July 16, 2021 / 70(28):991–996

Charlene A. Wong, MD¹; Shannon Dowler, MD¹; Amanda Fuller Moore, PharmD¹; Erin Fry Sosne, MPH¹; Hayley Young, MPH¹; Jessica D. Tenenbaum, PhD¹; Cardra E. Burns, DBA¹; Sydney Jones, PhD²; Marina Smelyanskaya, MPH³; Kody H. Kinsley, MPP¹ ([View author affiliations](#))

[View suggested citation](#)

Summary

What is already known about this topic?

COVID-19 has disproportionately affected Black or African American and Hispanic communities.

What is added by this report?

Among persons vaccinated during March 29–April 6, 2021, compared with December 14, 2020–January 3, 2021, in North Carolina, the proportion who were Black nearly doubled, and the share of vaccine doses administered to Hispanic persons doubled during this period, approaching the proportion of the state population for these groups aged ≥16 years.

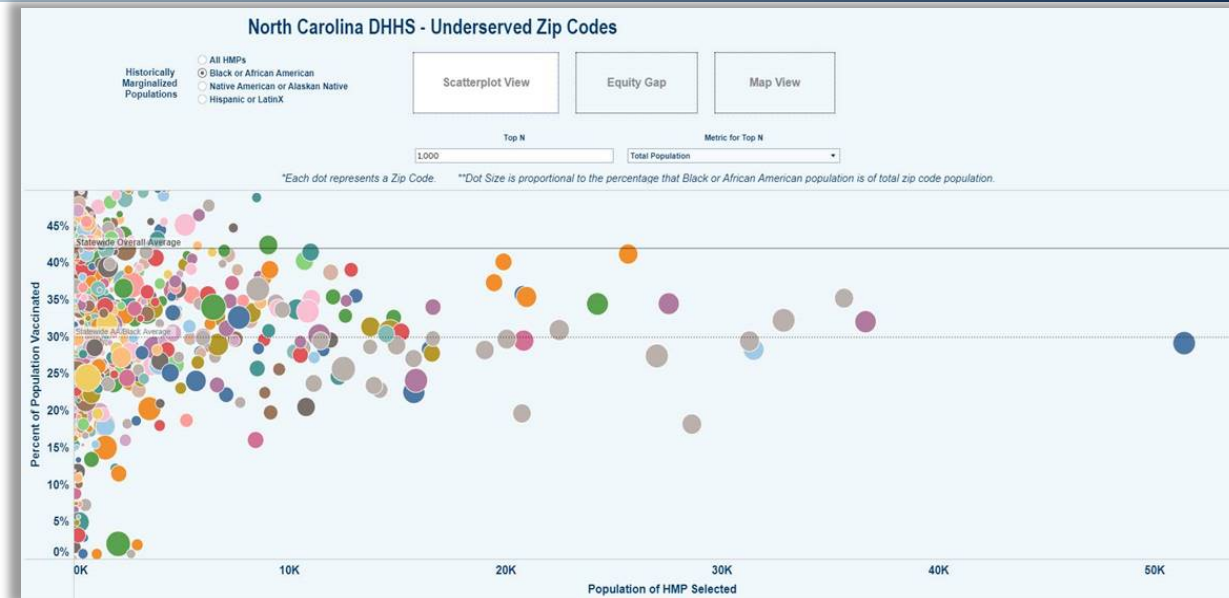
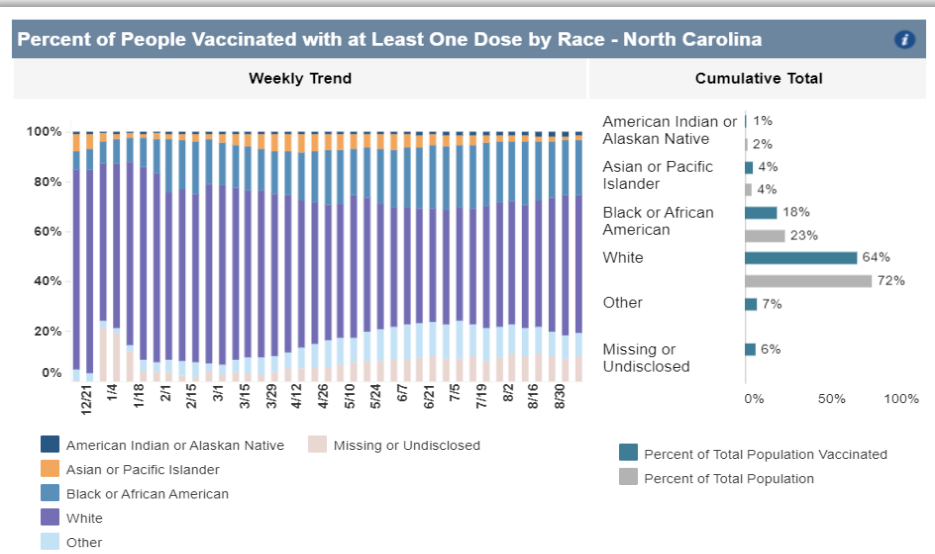
What are the implications for public health practice?

To promote equitable vaccination coverage, public health officials could consider using U.S. Census tract-level mapping to guide vaccine allocation, promote shared accountability for equitable distribution of vaccines with providers through data sharing, and facilitate community partnerships to support vaccine access.

<https://www.cdc.gov/mmwr/volumes/70/wr/mm7028a2.htm>

NC Leads the Country in Collecting Equity Data

- Data tools built to infuse equity data insights across entire vaccine operation



YOU HAVE A SPOT. TAKE YOUR SHOT.

Promoting COVID-19 Vaccine Equity in North Carolina

DATA AS OF SEPTEMBER 9, 2021

Longstanding racial and ethnic injustices contribute to disparities in vaccination rates among historically marginalized populations. We are building equity into every aspect of vaccine distribution in order to **close the vaccination gap** between white populations and Black/African American, Hispanic/Latinx, and American Indian populations in North Carolina.

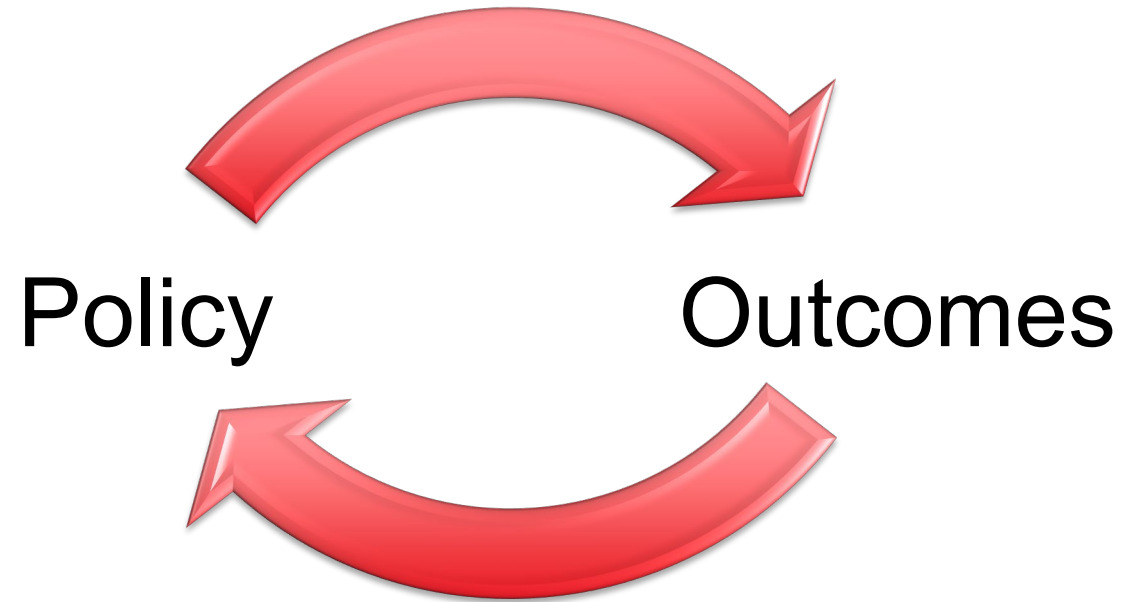
| Equity Data Highlights: | Share of Vaccinations in the Past 4 Weeks | Share of Total NC Vaccinations to Date | Share of Overall NC Population |
|-------------------------------------|---|--|--------------------------------|
| Black/African American vaccinations | 22.8% | 18.2% | 23.1% |
| Hispanic/Latinx vaccinations | 12.4% | 8.5% | 9.8% |
| American Indian vaccinations | 1.6% | 0.9% | 1.7% |

Key Takeaways & Future Directions

Key Takeaways

- COVID-19 has vastly accelerated the growth of public health informatics through investments in modernized data infrastructure, systems, and technologies
- The build of new data technologies and infrastructure should include a focus on data governance, integration, automation
- Public health agencies have become more agile in their ability to leverage data to inform policy, programs, operations, and research
- This more agile use of data assets has allowed agencies to develop new tools for improving health outcomes in the space of COVID-19 and beyond
 - Use of COVID-19 demographic data can be used as a blueprint to address other health disparities/inequities

Policy impacts outcomes



Outcomes inform policy

Acknowledgments

Dr. Mandy Cohen
Hayley Young
Charles Carter
Tracy Zimmerman
Kody Kinsley
Babita Savitsky
Dr. Zack Moore
Dr. Kelly Kimple
Kimberly Clement
Karen Burkes
Erika Samoff
Ryan Jury
Amanda Fuller-Moore
Sam Gibbs
Angela Taylor

Jean Chiang
Jennifer Braley
Dianne Enright
Rob Morrell
Elyse Powell
Ajit Rajavat
Jon Ament
Colleen Tapen
Andrew Szambelan
Anurag Saraf
Angela Wong
Ashish Sijapati
Susan Gale Perry

NCDHHS COVID-19
Response Team
NCDHHS Data Office
COVID-19 Dashboards
Team
DPH: Epidemiology &
Outbreaks Data Teams
NCDHHS Information
Technology Division
NCDHHS Communications
Team
Accenture NC COVID-19
Support Team
Ernst & Young NC COVID-
19 Support Team