



NCDHHS COVID-19 Data & Dashboards Strategy Overview

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NCDHHS's COVID-19 response emphasizes core public health functions, focus populations, and supports from enabling functions

Pillars of COVID response:

- Prevention
- Testing
- Contact Tracing
- Wrap Around/Isolation Support Services

Focus population workgroups:

- Historically Marginalized Populations (HMP)
- Farmworkers
- Community Health Workers
- LatinX Strategy
- Rural Health
- Healthier Together
- Deaf/Hard of Hearing

Enabling functions:

- Data 
- Technology
- Communications
- Legal
- Legislative Affairs

State of North Carolina
EMERGENCY OPERATIONS CENTER



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



Early Questions to Enable Data Driven Policy

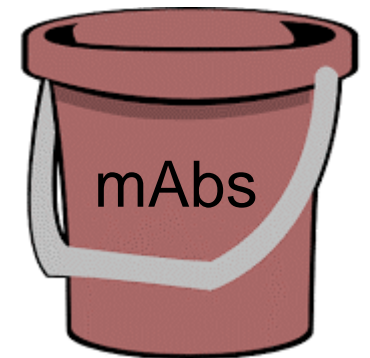
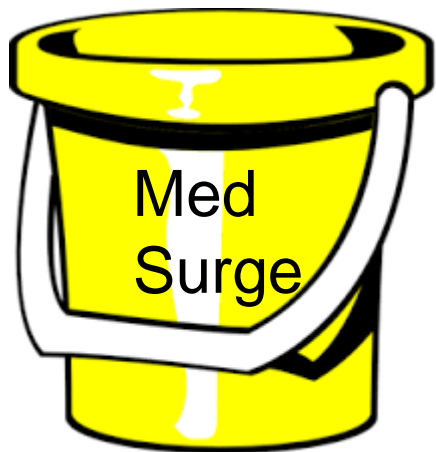
- How many cases will we see? When will our “epi curve” peak?
- How much (extra) PPE is needed, and where can we get it from?
- Will we run out of hospital beds? ICU beds? Ventilators?
- Should we shut down bars and restaurants? Schools? Businesses?
- How can we support families who are unable to work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

Data Strategy, Infrastructure, and Automation

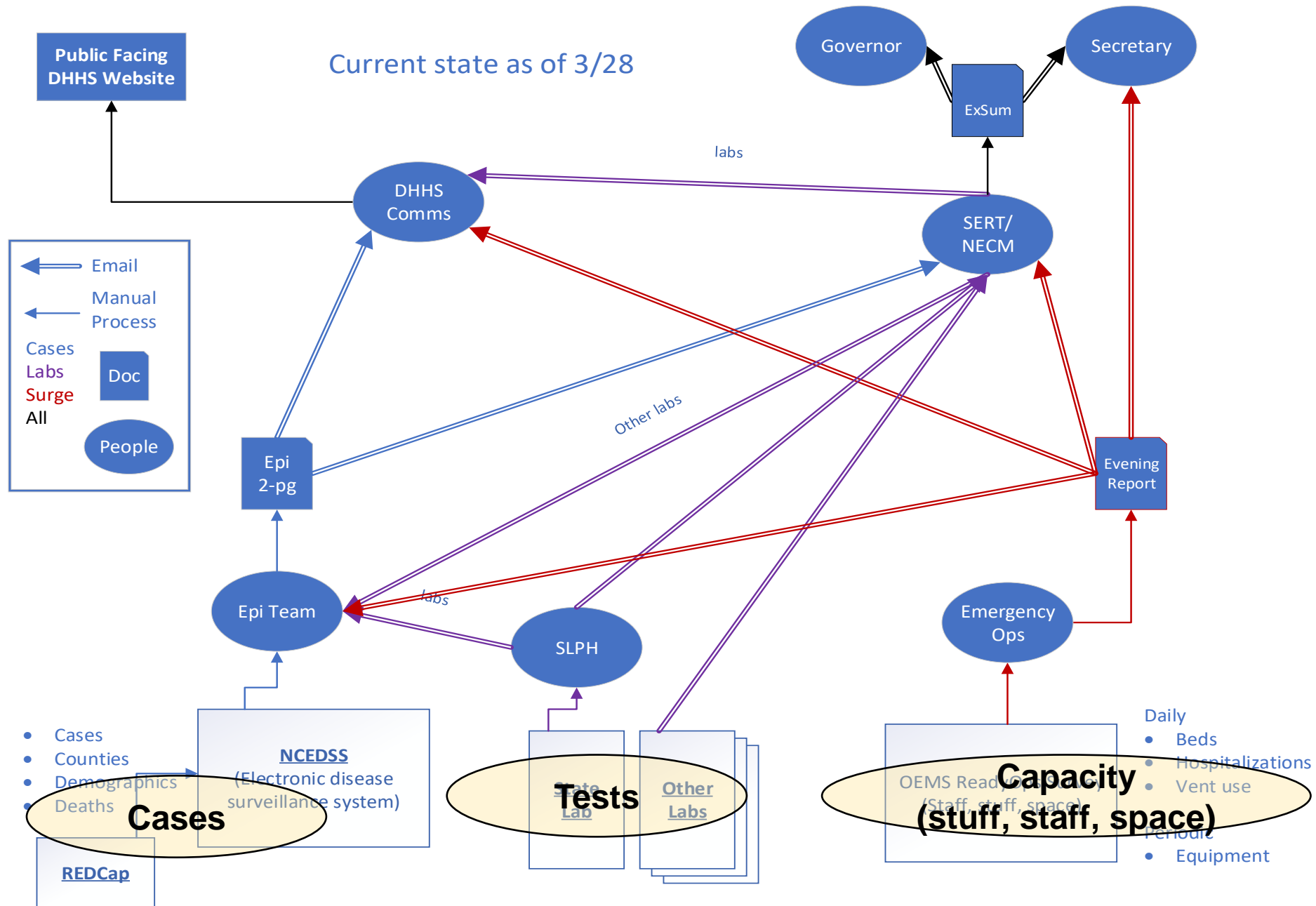
Data Strategy Challenges

- Underinvestment in public health infrastructure left agencies across the nation with outdated data systems & technologies
- Outdated systems/technologies made it difficult to keep pace with number of data-informed decisions needed to develop robust policy, public health guidance
- In some cases, new systems/technologies were needed for new data collection (for example, hospital capacity data)
- Lacking data governance processes made data sharing a challenge

Buckets of NC DHHS COVID-19 Data



Baseline Data Flow (as of March 2020)



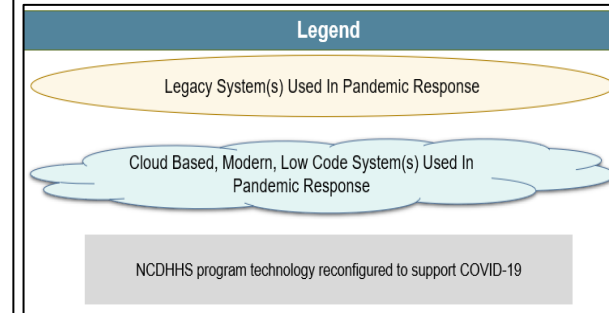
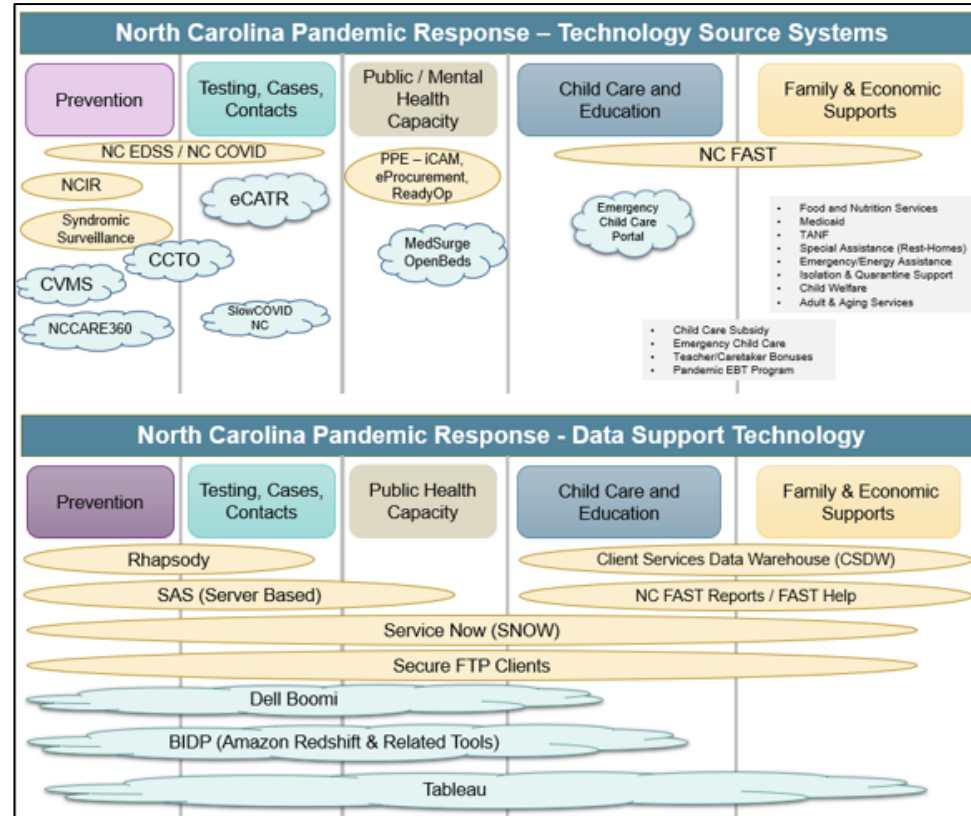
New Infrastructure & Automation

New technology source systems to improve infrastructure:

- Appriss OpenBeds Critical Resources Tracker
- Electronic COVID-19 aggregate test results platform (eCATR)
- Emergency childcare portal
- Expanded syndromic surveillance
- CCTO (contact tracing application)
- COVID-19 Vaccine Management System (CVMS)

New data support technology to improve automation for public/internal reporting:

- Business Intelligence Data Platform (BIDP)
- AWS Tableau server
- Dell Boomi (data integration platform)
- Robotics Process Automation (RPA)

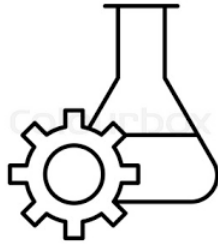


Data Workstreams During COVID Response



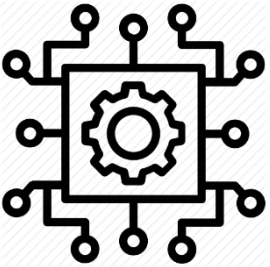
Data Governance

What data?
Who owns, protects, accesses it?
SNOW



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 Business Intelligence Data Platform (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

Today's Data Flow

Tableau Dashboards

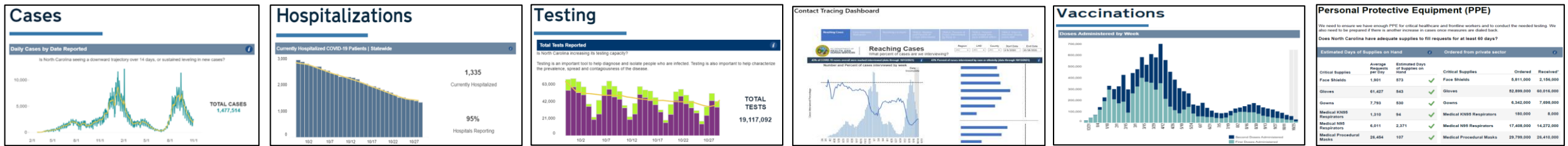
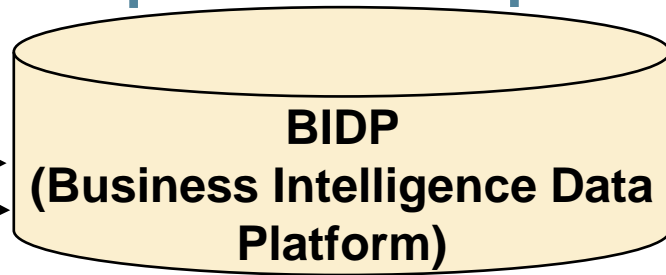


Tableau Refresh Process



Data Integration, Filtering, Transformation, Validation



Today's Data Landscape

- ✓ **Evaluate the effectiveness of our strategy and determine adjustments by monitoring key COVID-19 trends and capacity metrics:**
 1. COVID-like syndromic cases in the emergency departments.
 2. New daily cases
 3. Positive tests as a percentage of total tests
 4. Hospitalizations
 5. Vaccinations
 6. Testing
 7. Contact tracing
 8. Personal Protective Equipment (PPE)
- ✓ **Update 13 public-facing dashboards on a daily/weekly basis** using automated processes to provide data transparency, enable state and local decision-making
- ✓ **20+ automated internal dashboards that enable rapid decision-making** in NC's COVID-19 response
- ✓ **Provided structure and visibility into data that is typically difficult to access/analyze** to answer critical policy questions (PPE, Hospitalizations, Hospital bed capacity, Lab testing totals, etc.)
- ✓ **Leveraging data linkages to answer advanced policy questions:**
 - ✓ *“How many Medicaid beneficiaries have been vaccinated against COVID-19?”*
 - ✓ *“How many individuals experiencing homelessness have been vaccinated against COVID-19?”*

Demographic and Equity Data

You can't improve what you can't measure

- ✓ What is the distribution of race/ethnicity among COVID-19 cases?
- ✓ What is the distribution of race/ethnicity among COVID-19 deaths?
- ✓ What is the distribution of race/ethnicity among people tested for COVID-19?
- ✓ What is the distribution of race/ethnicity among people who are vaccinated? Boosted?

NC Equity Data Collection

Highlights:

- Top-down leadership
- Collaborate with groups working at the community level to build data strategy grounded in community perspectives
- Supplement quantitative data with qualitative insights whenever possible
- New systems can allow for new enforcement on required data collection
- Forced in User Interfaces & data exchange – continued challenge
- Tradeoffs – provider reporting burden
- Evaluate small cell suppression policies to expand transparency while continuing to protect privacy

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



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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?

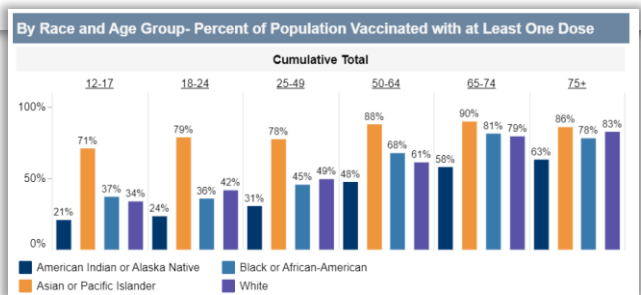
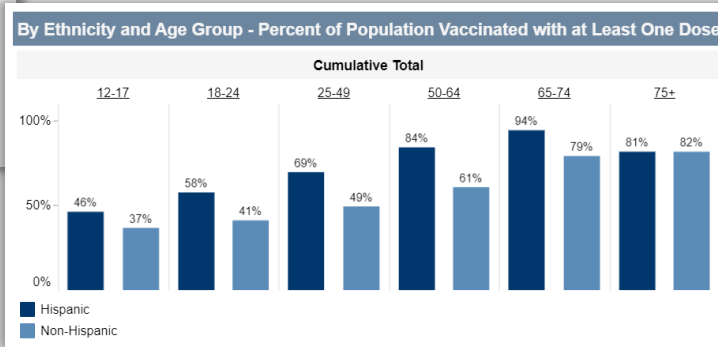
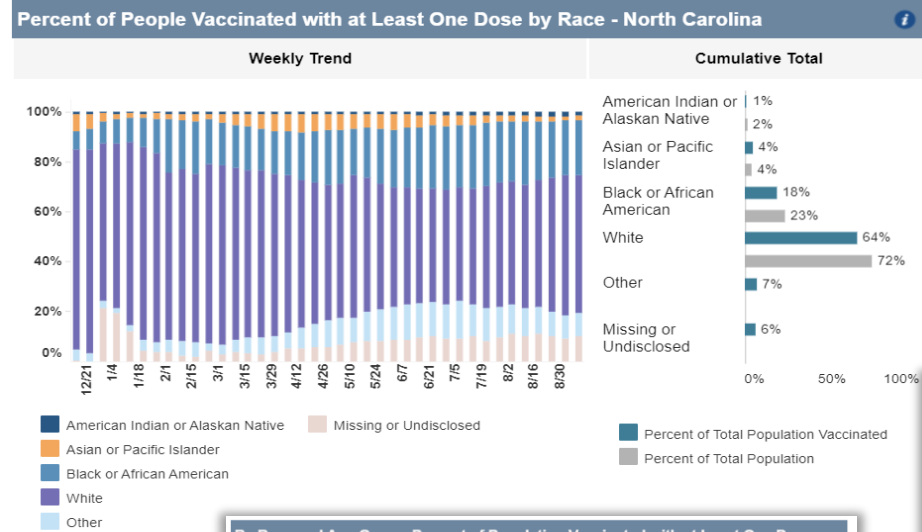
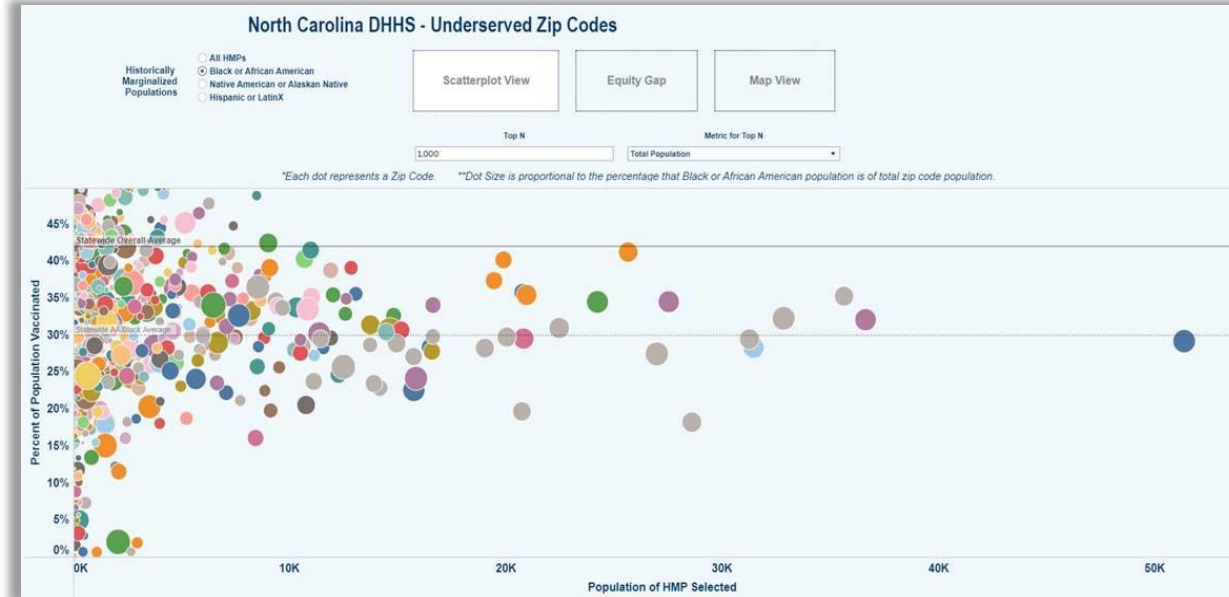
To promote equitable vaccination coverage, public health officials could consider using U.S. Census tract-level mapping to guide vaccine allocation, promote shared accountability for equitable distribution of vaccines with providers through data sharing, and facilitate community partnerships to support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

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

Dashboards, reports are used to infuse equity data insights across COVID-19 response

Provider Level Equity Analysis - Cumulative

Provider	Provider Type	VFC Pin	County of Administration	Equity Allocation Flag	American Indian or Alaska Native First Doses	AI-AN 18Po	AI-AN 18PuPop	AI-AN PoTotal	American Indian Equity Difference	Black or African American First Doses	Black 18Po	Black 18PuPop	Black PoTotal	Black Equity Difference	Hispanic First Doses	Hispanic 18 Population	Hispanic 18PuPop	Hispanic PoTotal	Hispanic Equity Difference	Asian or Pacific Islander	A-P1 18Pulator
YANCEY C.	No			No	94	0.64%	0.00%	-0.64%	1	182	1.23%	0.36%	-0.87%	13	554	3.75%	4.73%	0.98%			
CABARRI	Yes			No	1,137	0.70%	0.00%	-0.70%	80	31,265	19.30%	22.20%	-2.93%	168	14,218	8.81%	46.80%	-37.99%	5	75	
LENOR C.	No			No	303	0.70%	0.00%	-0.70%	124	17,867	41.15%	38.15%	-2.99%	15	2,676	6.19%	4.62%	-1.55%	7	4	
MECKLEN.	No			No	6,614	0.78%	0.00%	-0.78%	79	280,056	32.87%	28.32%	-4.55%	142	98,038	11.51%	50.90%	-39.39%	4	555	
CUMBERL.	No			No	1	5.047	2.00%	0.71%	-1.26%	93	101,274	40.06%	66.43%	-26.34%	7	27,451	10.87%	5.00%	-5.87%	1	9.4
WAKE CO.	No			No	7	6.484	0.76%	1.28%	0.51%	26	180,296	21.23%	4.74%	-16.49%	24	73,442	8.65%	4.38%	-4.27%	34	67.0
CATAWBA	No			No	637	0.51%	0.00%	-0.51%	12	11,109	8.91%	6.59%	-2.32%	9	9,966	8.00%	4.95%	-3.05%	2	5.0	
DAVIDSON.	No			No	2	1,013	0.77%	0.37%	-0.40%	71	13,214	10.07%	13.05%	2.99%	8	7,352	5.60%	1.47%	-4.13%	13	2.1
BUNCOMB.	No			No	1	1,176	0.55%	0.29%	-0.26%	34	13,307	6.22%	9.80%	-3.57%	21	11,483	5.37%	6.05%	0.68%	16	3.5
HEPSTAR	No			No	1	1.834	1.83%	8.83%	-1.50%	41	22,661	23.74%	22.80%	0.94%	14	11,114	11.01%	43.52%	32.52%	2	1.7



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

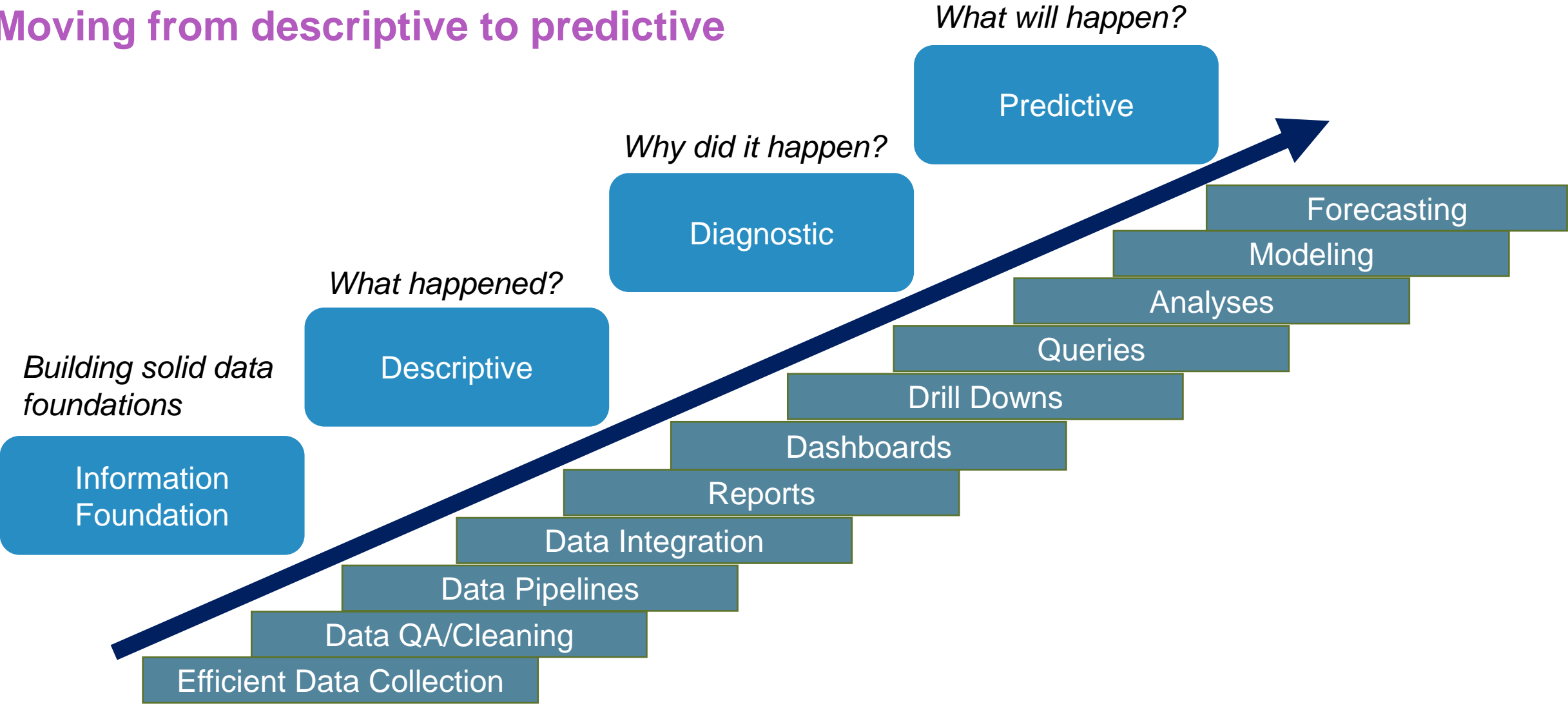
Key Takeaways & Recommendations

- COVID-19 has vastly accelerated the growth of public health informatics as a field; likewise, the field of informatics has accelerated our public health response efforts
 - Public health agencies have become more agile in their ability to leverage data to inform policy, programs, operations, and research
- Data and technology teams should work cross-functionally to be successful in data sharing, use, and in the translation of data into meaningful insights
- Public health data use should be built with local/community decision-making in mind
- The build of public health technologies and data infrastructure should be coupled with a focus on data governance, integration, automation to make data use safe and efficient
- The expanded use of data 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

Future Directions

- Continue to **synthesize findings from data work across the country** to expand the field of public health informatics
- Apply lessons learned from COVID-19 data strategy roadmap to **support broader efforts to enable whole-person centered health**
- **Create common logical data model** to enable integration across datasets
- **Build out department-wide equity data strategy** using the foundations of COVID-19 equity data work
- **Continue to expand, improve data integration capabilities** to answer today's more complex policy questions:
 - ✓ 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?

Moving from descriptive to predictive



Acknowledgments – too many to name!

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NCDHHS COVID-19 Dashboards Team
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DPH: Healthcare Preparedness Program
NCDHHS Communications Team
NCDHHS Enterprise Architecture Team
NCDHHS Information Technology Division
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