Spatial Data In the Age of COVID-19

Lessons learned in managing, serving, and teaching with public health data.

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Stacy Curry-Johnson

Geospatial Librarian and Lecturer at Vanderbilt University

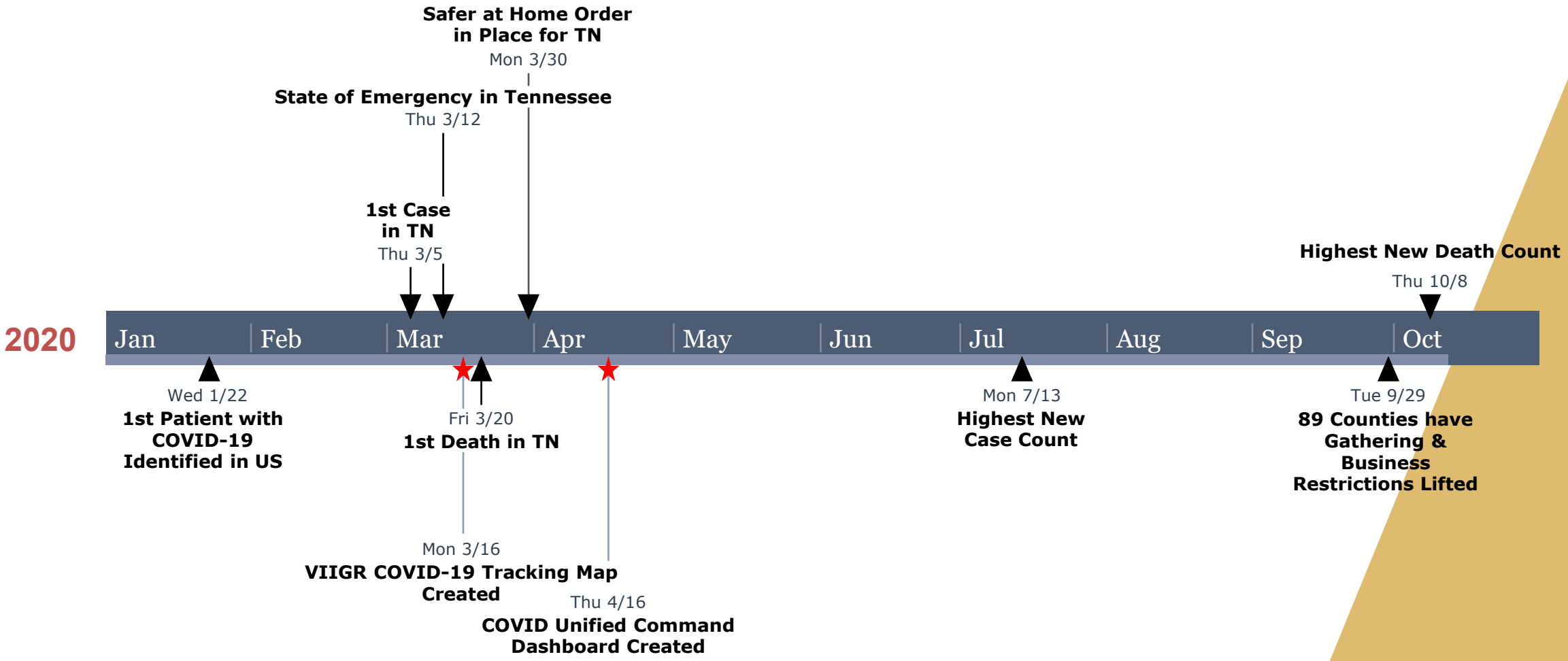
- BS in Geography from Appalachian State University
- MS in Geographic and Cartographic Science from George Mason University
- Ph.D. in Geography from UNCG
- Former USGS Remote Sensing Scientist
- Instructor for the Intro to GIS and Remote Sensing Course for the Anthropology Department
- Project consultations and Geospatial instruction at Vanderbilt
- Co- PI on the Battle of Nashville Project

Natalie Robbins

Program Manager at Vanderbilt Institute for Spatial Research

- BS in Environmental Science from University of Arizona
- TN Tech Alumna for Professional Science Master's in Environmental Informatics
- Before working at Vanderbilt she spent 6 mo. working at Oak Ridge National Lab
- Now, serves as a spatial scientist on high-level geospatial and geophysical survey projects across the university
- Co-teach GIS workshops with Stacy
- Tennessee Geographic Information Council (TNGIC) board member

TIMELINE



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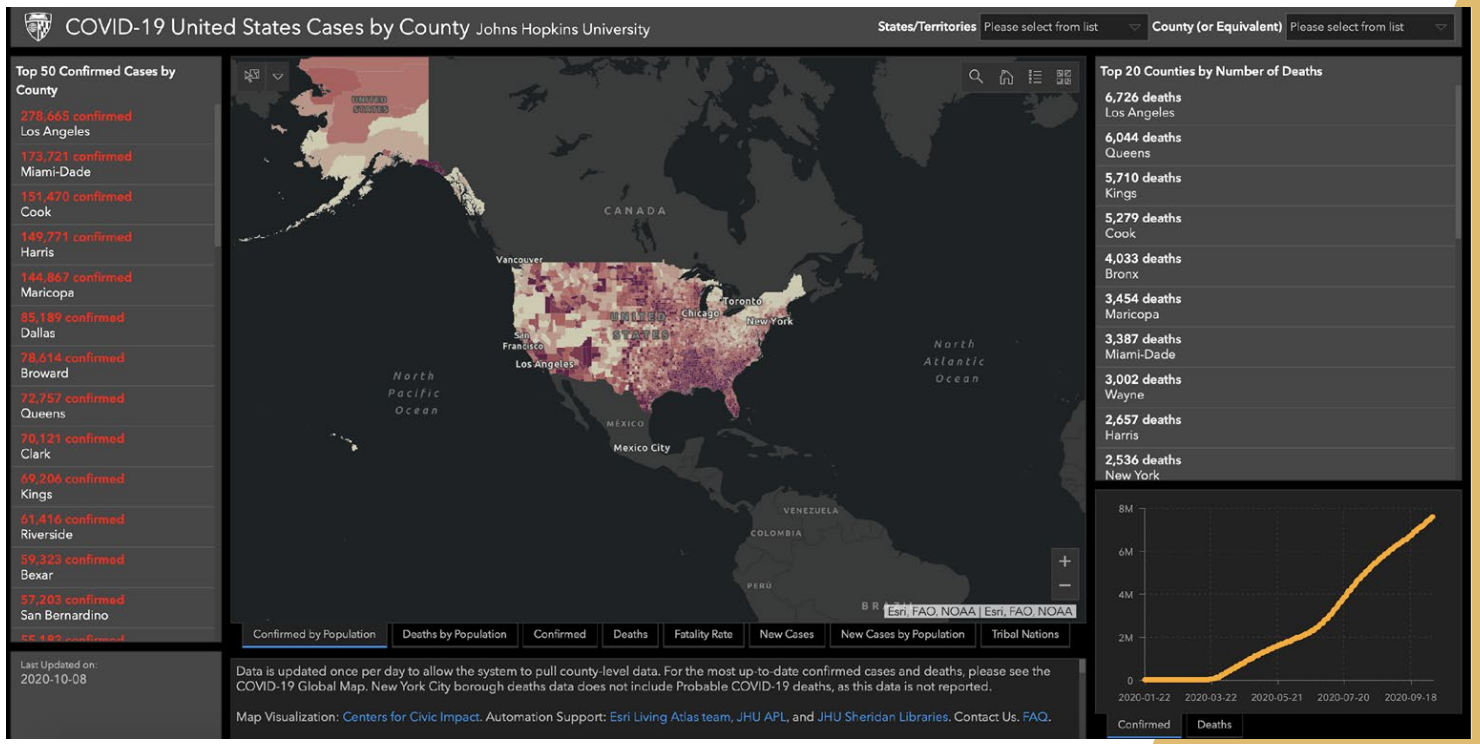
Background

- Wanted to replicated John Hopkins Dashboard for Tennessee
- Identified need for TN-specific geospatial visualization
- Understanding of spread in TN within context of rural/urban population, health care deserts



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TENNESSEE COVID-19 RESPONSE

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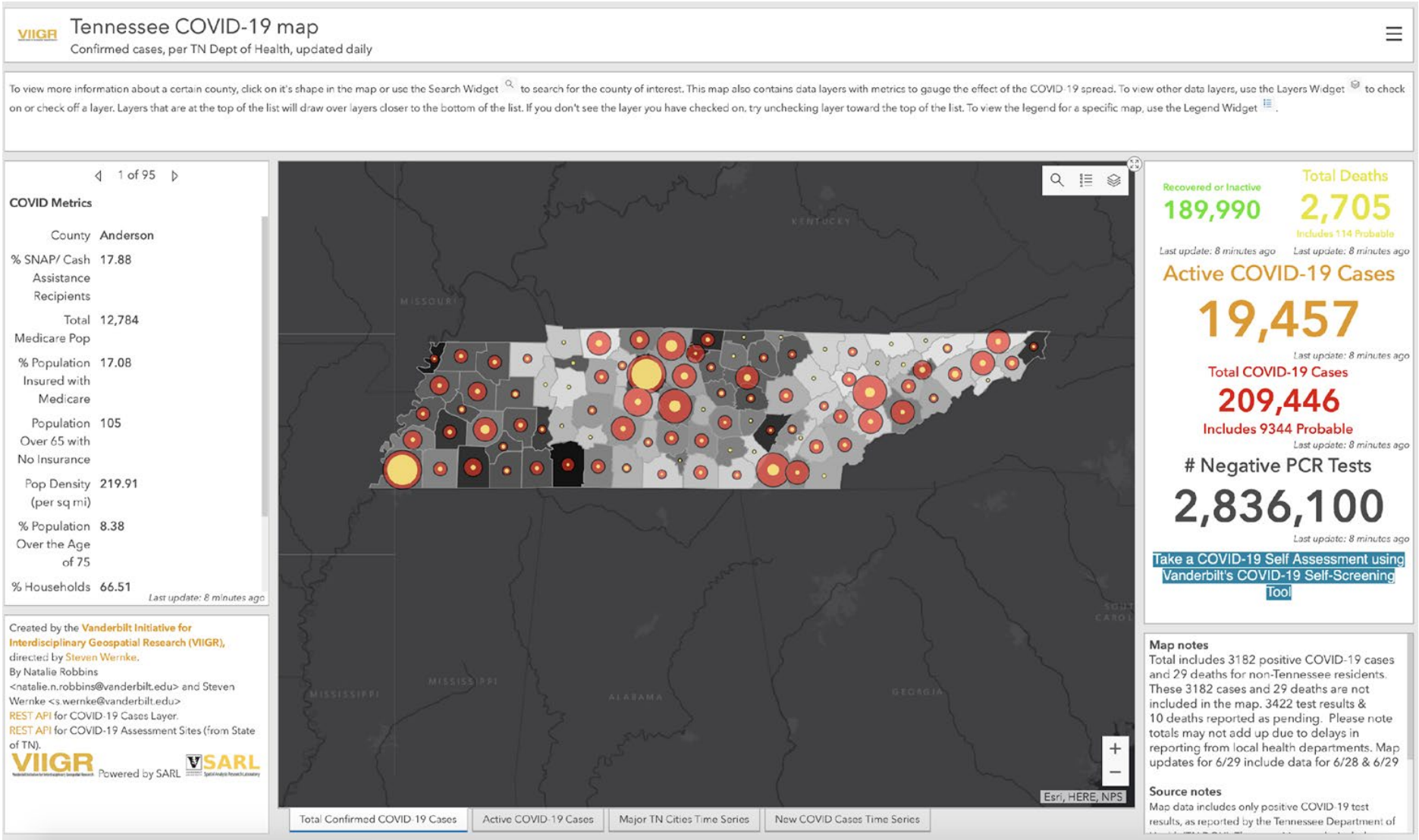
TENNESSEE COVID-19 MAP



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HOSTED CONTENT

Hosted Feature Layers

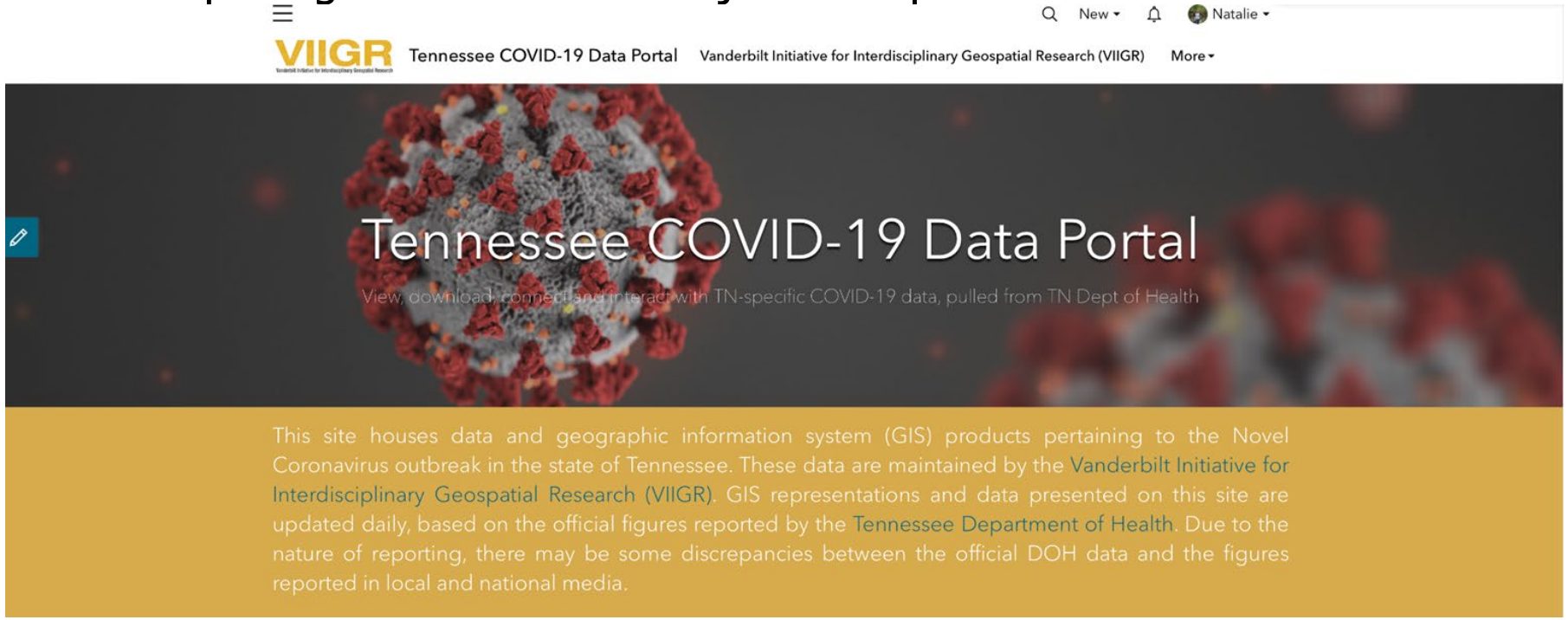
- Total Case Counts Per County
- Long Term Care Facility Case Counts
- Tennessee Department of Corrections Case Counts
- Health & demographic metrics per county based off ACS data

CSV Files

- Running Daily County Case Counts
- New Daily County Case Counts

TENNESSEE COVID-19 DATA PORTAL

- ArcGIS Hub with hosted content and maps for COVID-19 in Tennessee
- Charts depicting case counts in major metropolitan areas of TN



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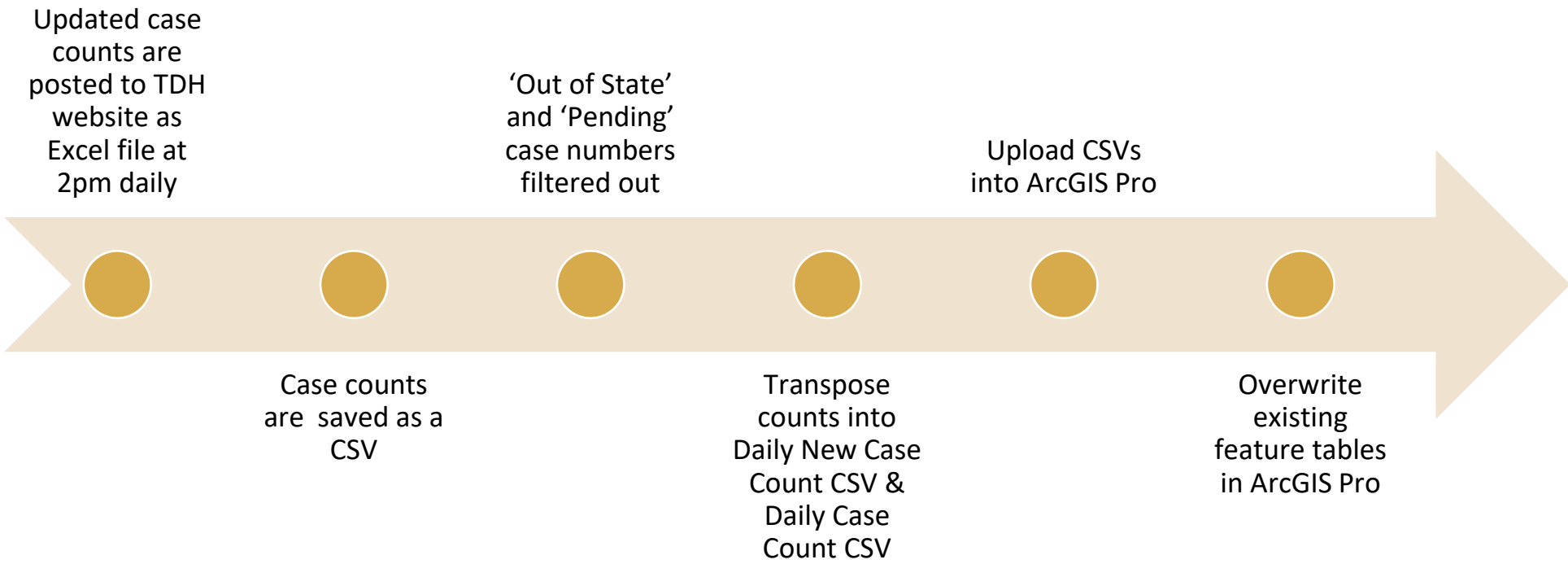
CHALLENGES

- Non-GIS friendly data disseminations
- Constantly evolving data
- Data discrepancies between local and state reporting
- Various sources for case counts
    - State, Metro, NY Times API, John Hopkins API
- TN State hosted feature classes are available but not easily accessible
    - Can access API for hosted feature classes that are in public-facing web maps using the developer tools

COVID-19 CSV TABLES



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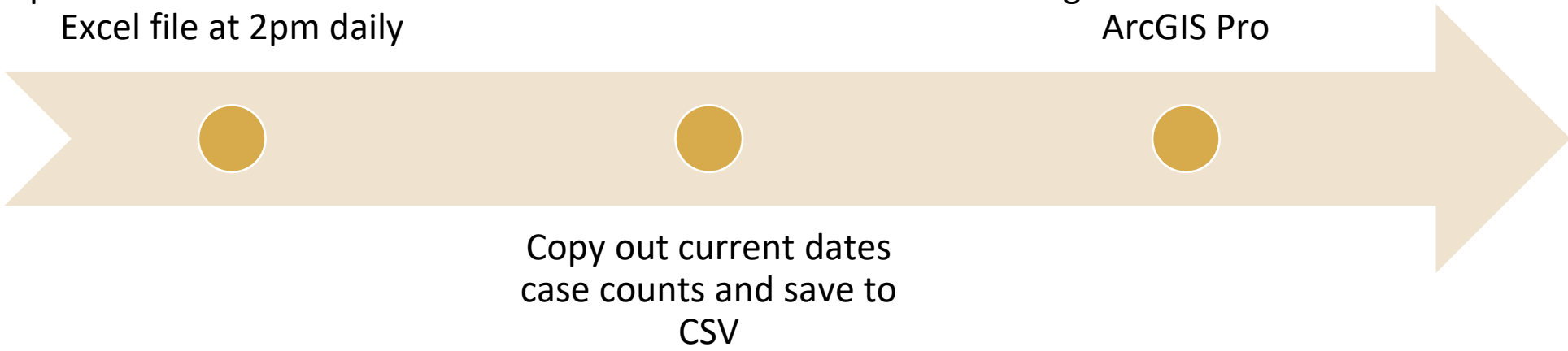
COVID-19 CASE DATA



Additional Challenges

- Many different agencies involved in reporting data, especially related to super-spreader facilities
  - TN Dept of Health handled long term care facility data while TN Dept of Corrections handled prison data
- No centralized data stream for various metrics of interest
- Ingestion into GIS was difficult because of formatting of the data
- Varying scales

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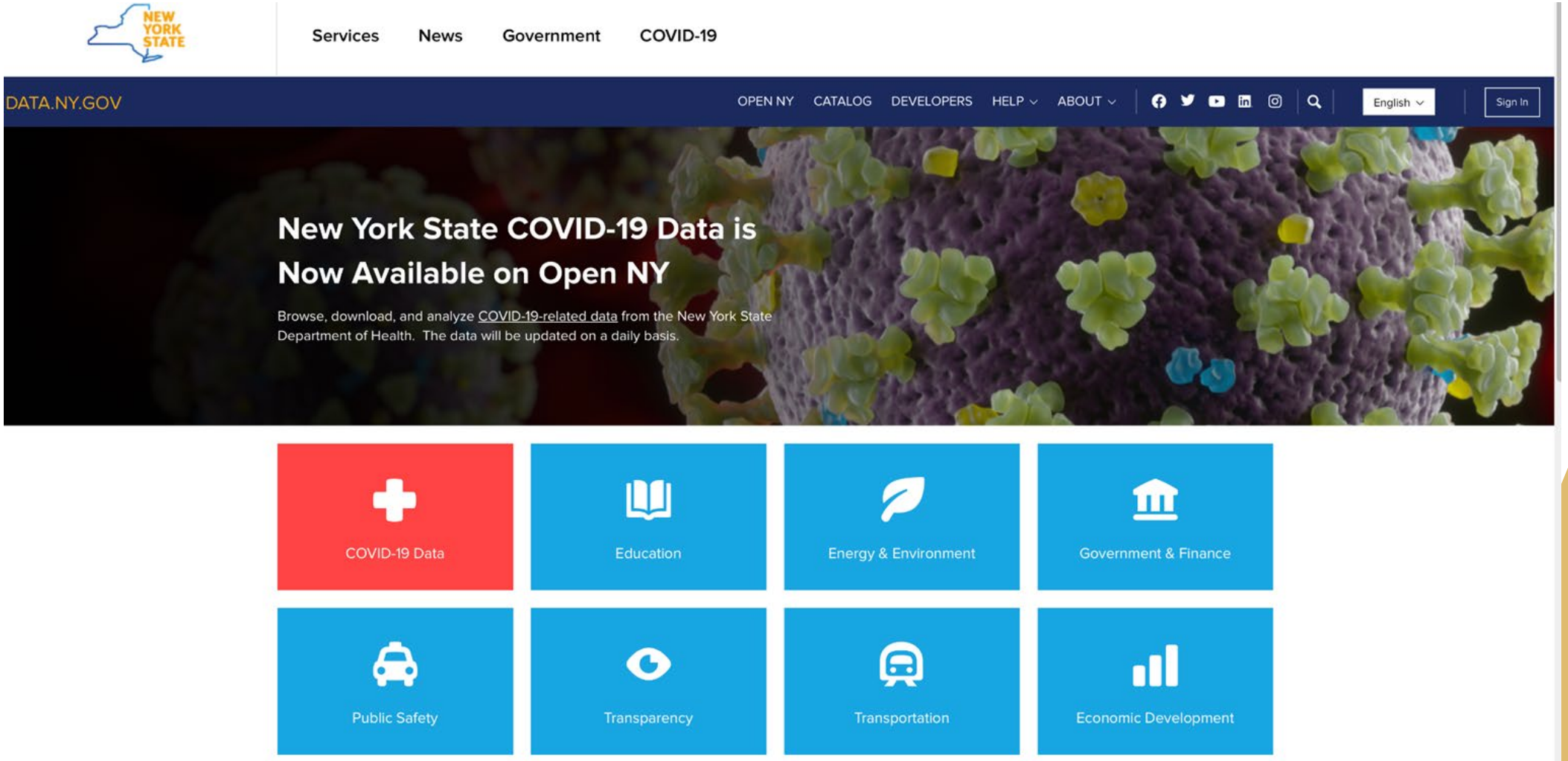
LESSONS & RECOMMENDATIONS

RECOMMENDATIONS

1. Data is disseminated in one format, preferably a CSV
2. REST API's are shared out on open data portals for GIS analysts to connect to directly
3. State and local entities have agreed upon data dissemination standards so that number match up from both

New York Open Data Portal



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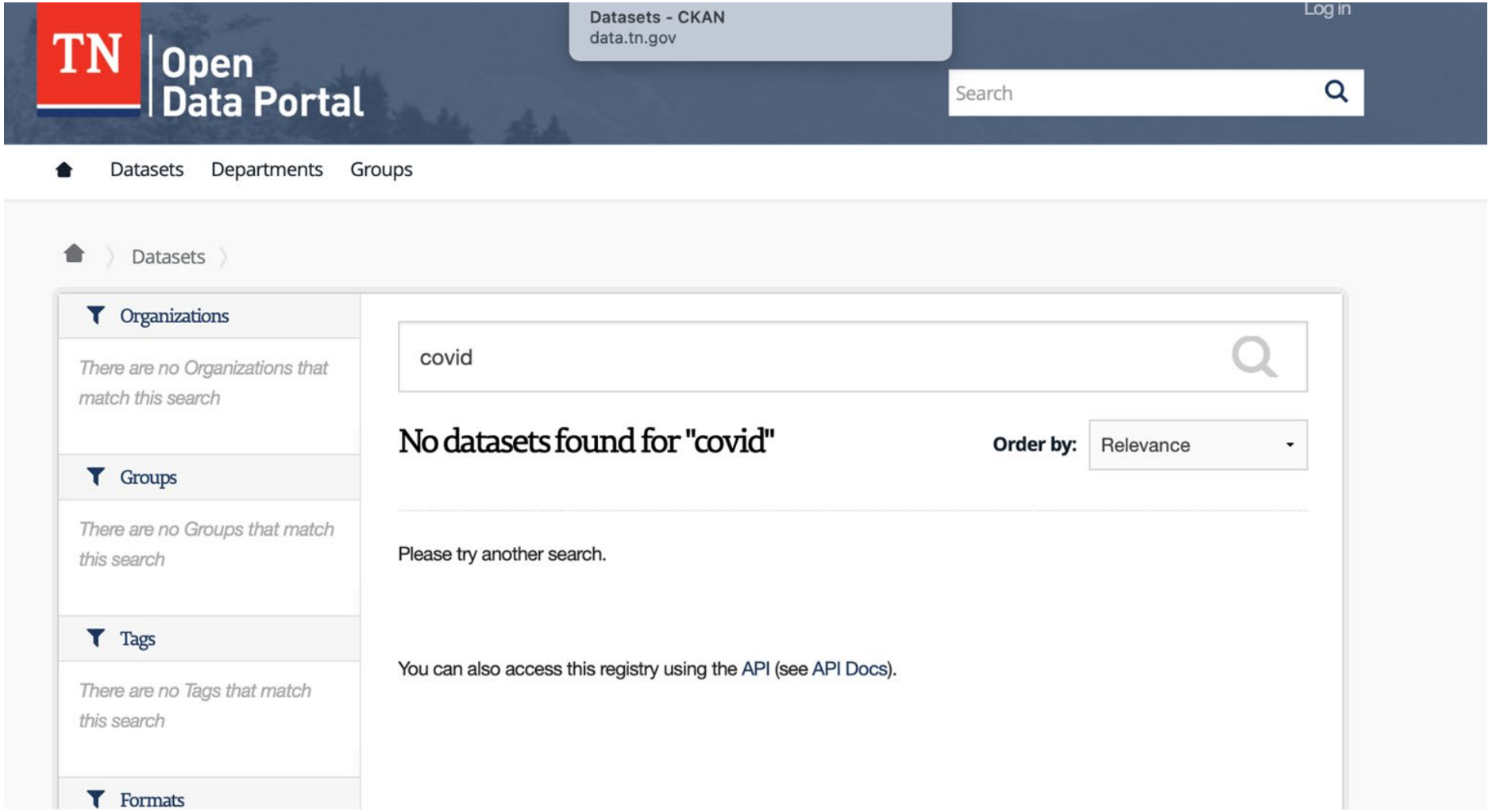
Tennessee Open Data Portal



Data Dissemination Standards

- Syncing of when data is coming in and when it is being shared with the public
- Data draws from one master dataset so there are not discrepancies between local vs state numbers

COUNTY	DATE	TOTAL_CASES	NEW_CASES	TOTAL_CONFIRMED	NEW_CONFIRMED	TOTAL_PROBABLE
Anderson	10/8/22	26036	0	15943	0	10093
Bedford	10/8/22	16998	1	12332	1	4666
Benton	10/8/22	5231	1	3063	1	2168
Bledsoe	10/8/22	5132	1	3770	1	1362
Blount	10/8/22	45701	4	36321	4	9380
Bradley	10/8/22	37217	1	26826	0	10391
Campbell	10/8/22	14625	3	5267	0	9358
Cannon	10/8/22	4896	0	3172	0	1724
Carroll	10/8/22	10609	1	5757	0	4852
Carter	10/8/22	19468	0	16279	0	3189
Cheatham	10/8/22	12321	1	8893	0	3428
Chester	10/8/22	6567	0	3896	0	2671
Claiborne	10/8/22	10358	2	5808	2	4550
Clay	10/8/22	2564	0	1594	0	970
Cocke	10/8/22	13633	2	6553	1	7080
Coffee	10/8/22	19611	3	11470	3	8141
Crockett	10/8/22	5941	1	3042	0	2899

Role of Universities & Organizations

1. Universities can partner with state entities to help develop and disseminate public health data quickly
    - Guidance from researchers on best data formats and automation
2. Organizations like TNGIC can communicate with state GIS leaders what those at metro and city governments need and coordinate data dissemination factors
    - GIS user to GIS user communication

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THE UNIVERSITY OF TENNESSEE SYSTEM

TENNESSEE GEOGRAPHIC INFORMATION COUNCIL
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Role of University Libraries

- Stewards and curators of data
- Metadata quality checks
- Distribution to multiple departments within the university
- Distribution outside the university
- Mitigate misinformation

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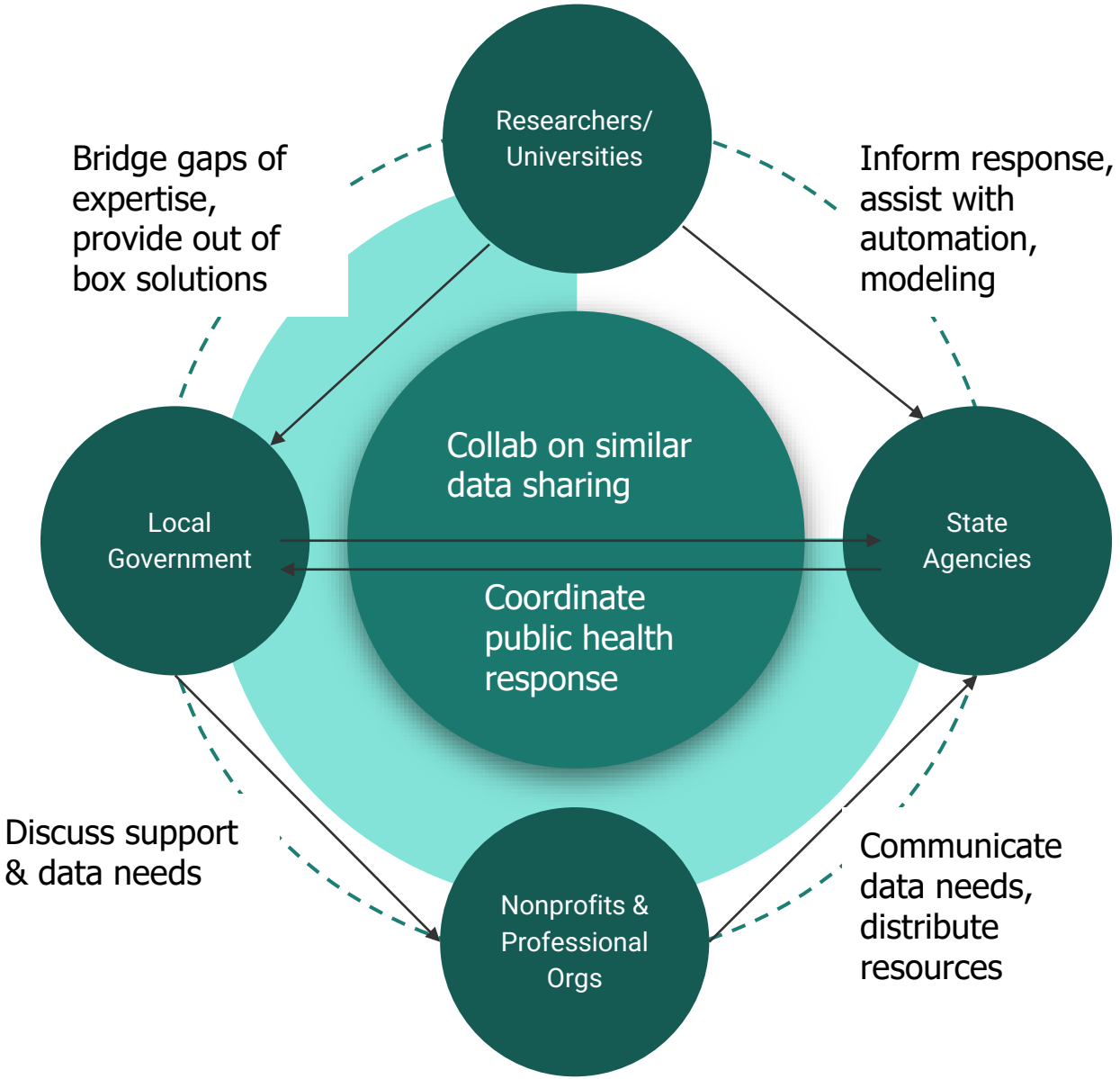
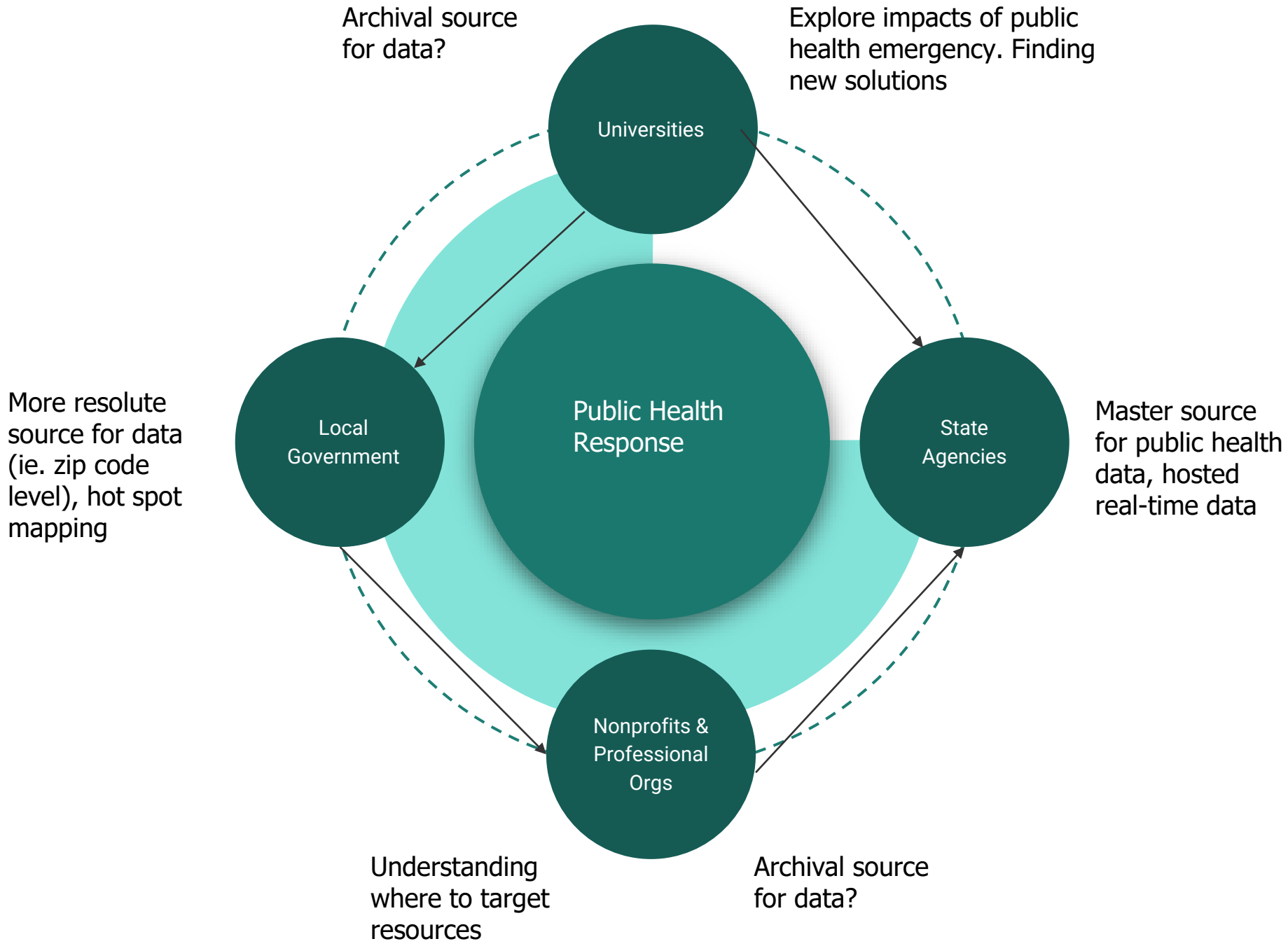
Jean *and* Alexander
Heard Libraries


Researchers/ Universities
Bridge gaps of expertise, provide out of box solutions
Inform response, assist with automation, modeling
Collab on similar data sharing
Local Government
State Agencies
Coordinate public health response
Discuss support & data needs
Nonprofits & Professional Orgs
Communicate data needs, distribute resources

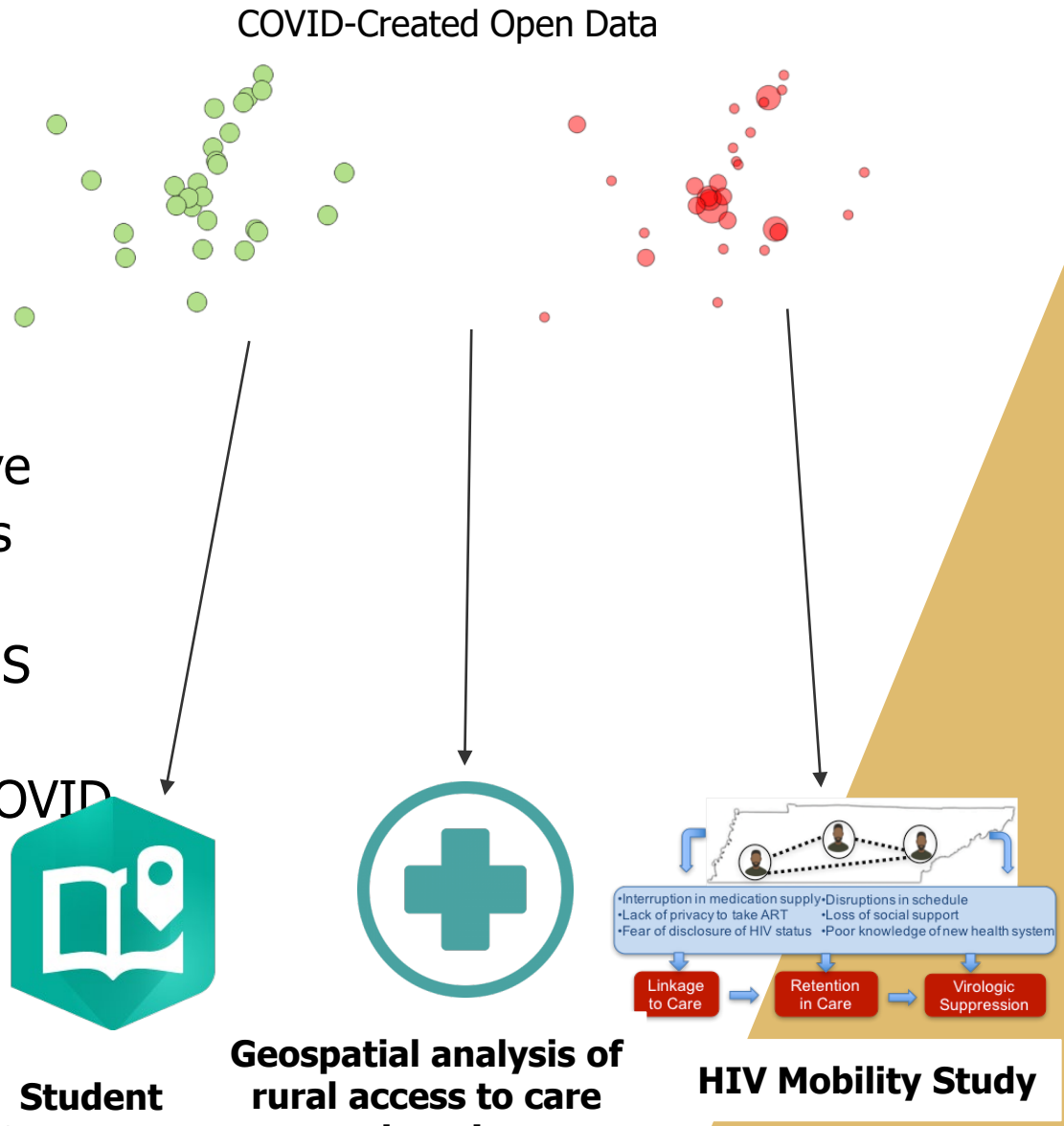

Archival source for data?
Explore impacts of public health emergency. Finding new solutions
Universities
More resolute source for data (ie. zip code level), hot spot mapping
Local Government
Public Health Response
State Agencies
Master source for public health data, hosted real-time data
Nonprofits & Professional Orgs
Understanding where to target resources
Archival source for data?

Role of the CDC

- Baseline state and county datasets that are aligned with state agency numbers
- Guidance on important public health tracking metrics
- Guidance from about how to count out of state case numbers
  - Issue for tourist cities like Nashville, TN, Austin, TN, NYC, NY
  - Numbers would sometimes be a lot higher for Nashville than shown on the state portal because of how out of state cases were counted
    - erosion of public trust
  - How to spatialize out of state cases?

Positive Outcomes

- Improved State datasets
  - updated hospital locations, health centers
- Datasets created for TN COVID-19 Portal have been applicable for a variety of other projects
  - Correctional facilities, ACS rate renderings
- Better awareness of GIS and the power of GIS
- GIS solutions for future health emergencies
- Partnerships with VUMC research involving COVID and environmental determinants of health



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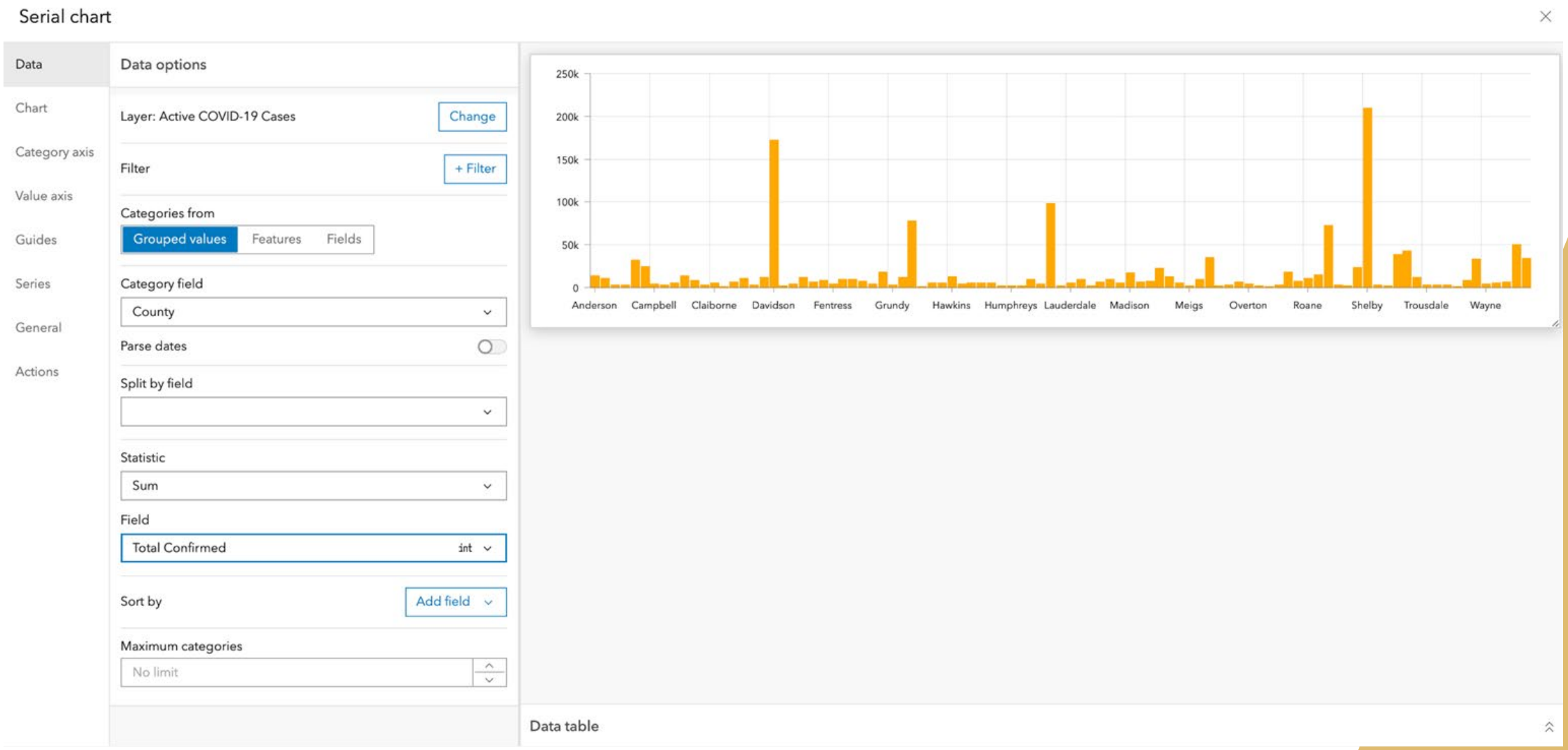
Updates to AGOL Resources



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Questions?

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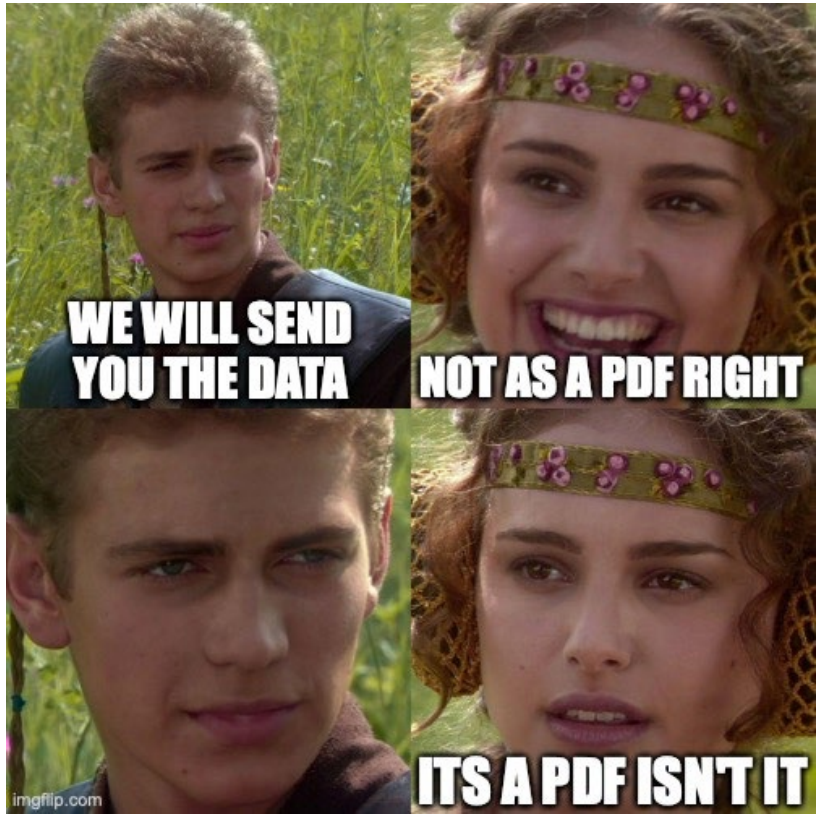

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