



COVID-19 Response in Fulton County

Supporting testing, case investigation, and epidemiologic analysis for public health action


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Noon Seminar

October 14, 2020

Outline

- Why Fulton County?
 - Testing
 - Case investigation
 - Data analysis
 - What's next?
- 

Why Fulton County?



Why Fulton County?

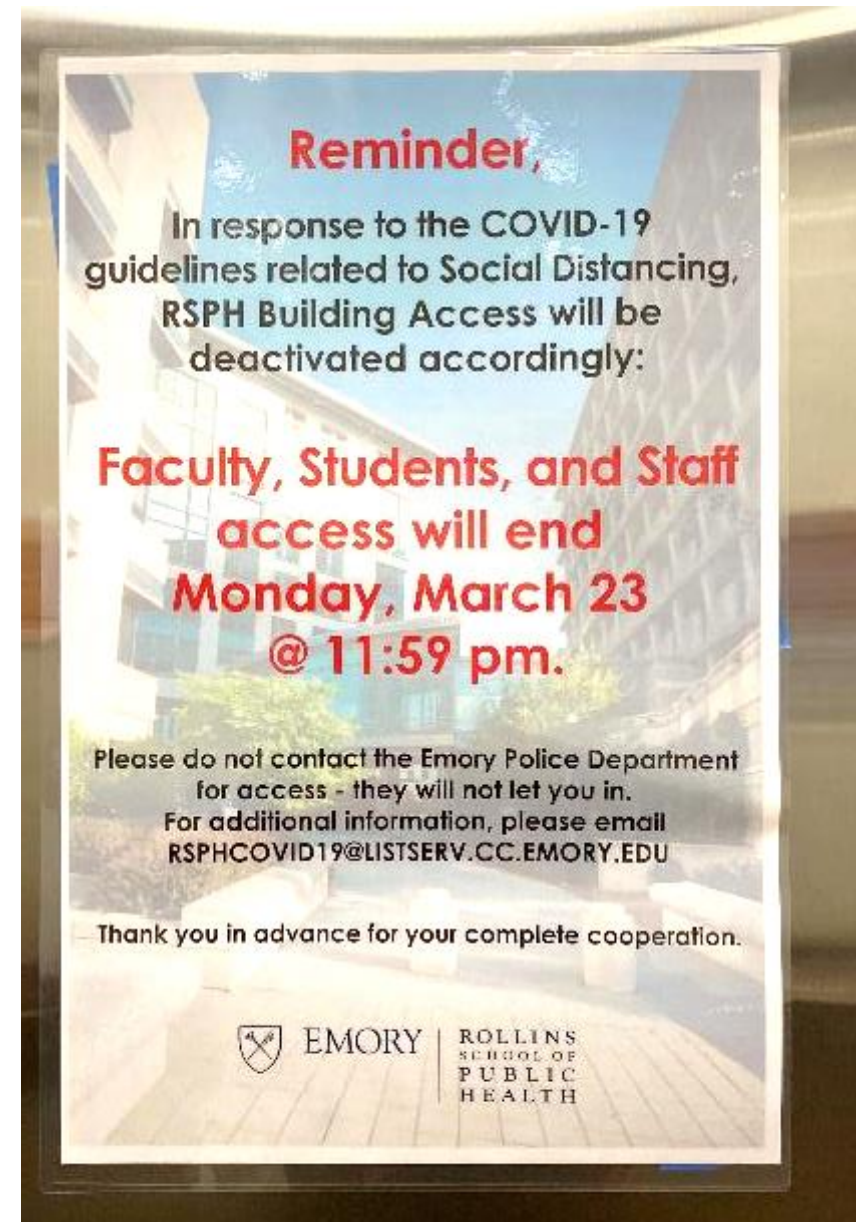


Primary health center, Nasarawa province, Nigeria (Jan 2020)

Why is a global health TB/HIV researcher working on COVID in Fulton County?



Started as faculty in HDGH on March 1

A vertical sign with a background image of a modern building courtyard. The sign contains the following text:


Reminder,

In response to the COVID-19 guidelines related to Social Distancing, RSPH Building Access will be deactivated accordingly:

Faculty, Students, and Staff access will end Monday, March 23 @ 11:59 pm.

Please do not contact the Emory Police Department for access - they will not let you in. For additional information, please email RSPHCOVID19@LISTSERV.CC.EMORY.EDU

Thank you in advance for your complete cooperation.

 **EMORY** | **ROLLINS SCHOOL OF PUBLIC HEALTH**



Why Fulton County?

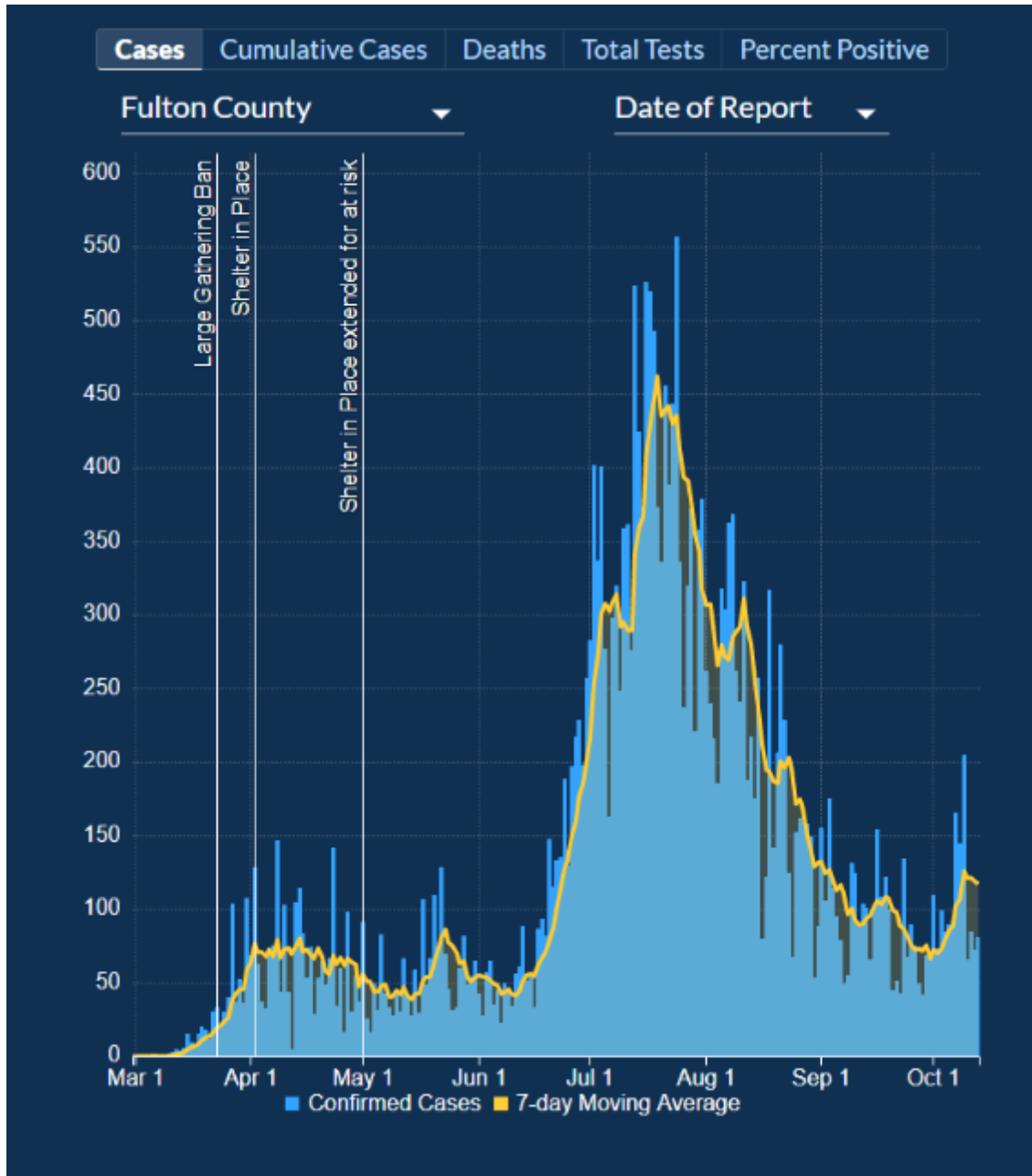


How can a global health TB/HIV researcher get involved with COVID in Fulton County?

Emory–Fulton County Partnership

- Long-standing clinical and epidemiologic collaboration
 - Allison Chamberlain (RSPH/Epi)
 - David Holland (SOM/DOM/ID)
- Public health–academic partnership:
<https://jphmpdirect.com/2019/01/29/my-life-as-a-pracademic/>
- Foundation for rapidly expanding for COVID response
 - Additional Faculty: Neel Gandhi (RSPH/Epi)
 - Current and former Rollins students (MPH, PhD, MD/PhD)
 - Fulton County Office of Epidemiology
 - Fulton County government



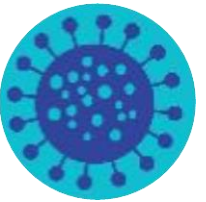


COVID-19 in Fulton County

- **Popn: 1.1 million**
- **29,274 cases**
 - 8.8% all GA cases (333K)
 - Peak: 417 cases/day
 - Current: 105 cases/day
- **8.6% hospitalized** (GA: 8.9%)
- **2.0% died** (GA: 2.2%)
- **3.5% PCR test positivity currently** (GA: 5.8%)



COVID-19 Testing



Testing initiatives

- Initial guidance limited testing to high-risk “persons under investigation”
 - Older age, medical conditions, symptoms
 - Drive-through site established
 - Low uptake, in part due to testing policy
- Fulton County mobilization to make testing available to **anyone who wants a test**, regardless of symptoms or risk factors
 - Together with state / national shifts in testing, uptake increased through June-Aug
 - Peak of **~21,000 tests** week after July 4 (we’ll come back to this...)



Anyone can get fast, easy testing at Fulton sites!

- Any age (testing kids of all ages!)
- Any county residence
- No referral needed
- No appointment needed (walk up!)
- No symptoms needed
- No lines
- Results in 24 hours (PCR)
- Friendly staff!



Jane Yoon (SOM/ID PGY5), David Holland, Alfonso Hernandez (SOM/ID PGY5)

Testing in the community:

Long-term care facilities (LTCF)

- First LTCF Outbreak: March 31, 2020
- Case Management and Investigation
 - Mass testing of LTCFs
 - Contact tracing
- Infection Prevention and Control evaluation
 - Site visits and training in key IPC domains: hand hygiene, disinfection, social distancing, PPE, screening
 - Preprint: <https://www.medrxiv.org/content/10.1101/2020.08.13.20174466v1>
(Telford CT, Bystrom C, Fox T, et al.)



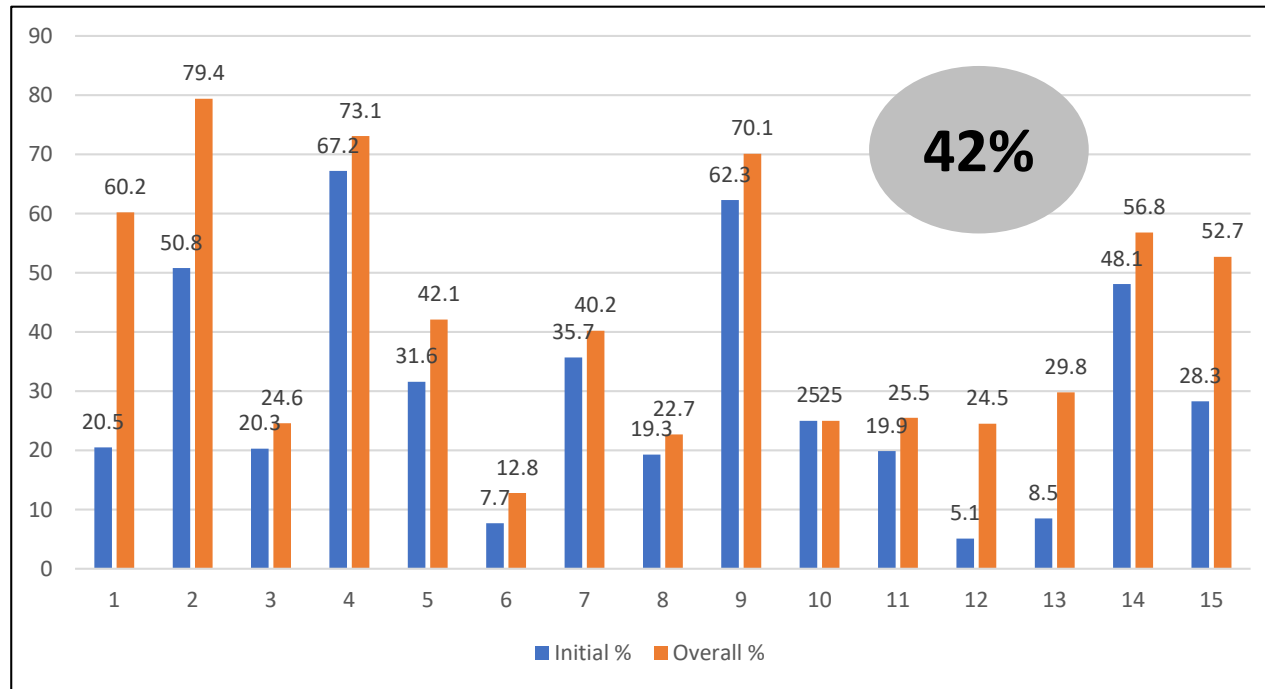
Carson Telford, 2nd year
GLEPI MPH student

Mass testing initiative in LTCFs

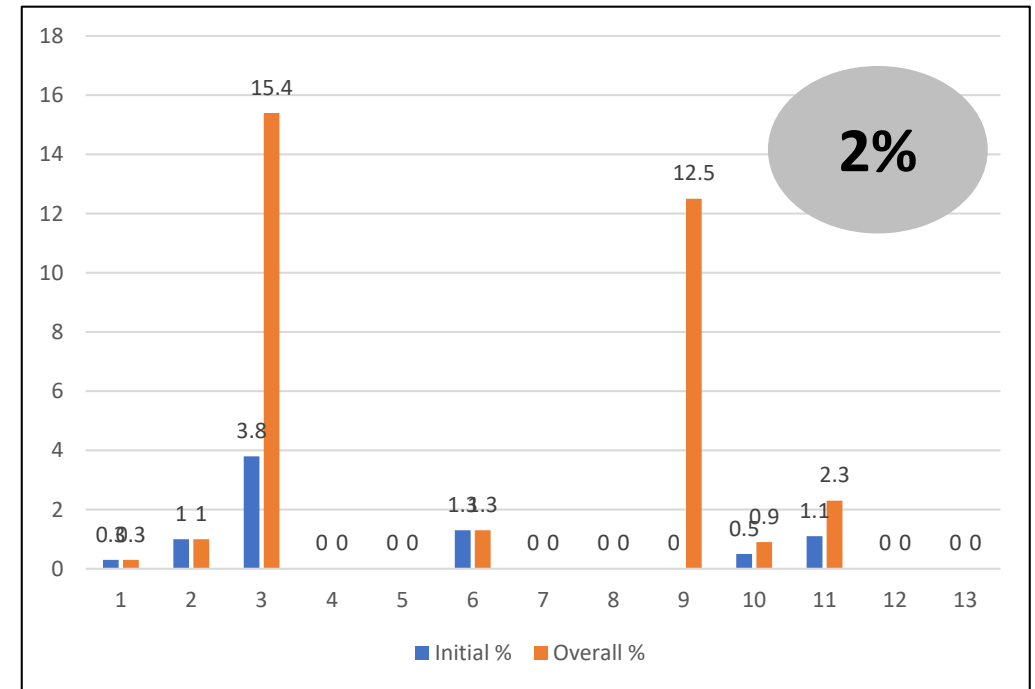
- Implemented mass testing of all staff and residents in 28 facilities starting 3/31–5/14/2020
 - **15 LTCFs** initiated testing **after the first infection was identified** through symptom based screening
 - **13 LTCFs** initiated testing **preemptively, before a known case** was identified
- All samples tested using SARS-CoV-2 PCR
- Staff and residents followed-up for 4 weeks for additional cases, hospitalization, and death

Residents in response group had higher positivity than residents in preventive group

SARS-CoV-2 Test positivity (%) in Response Group

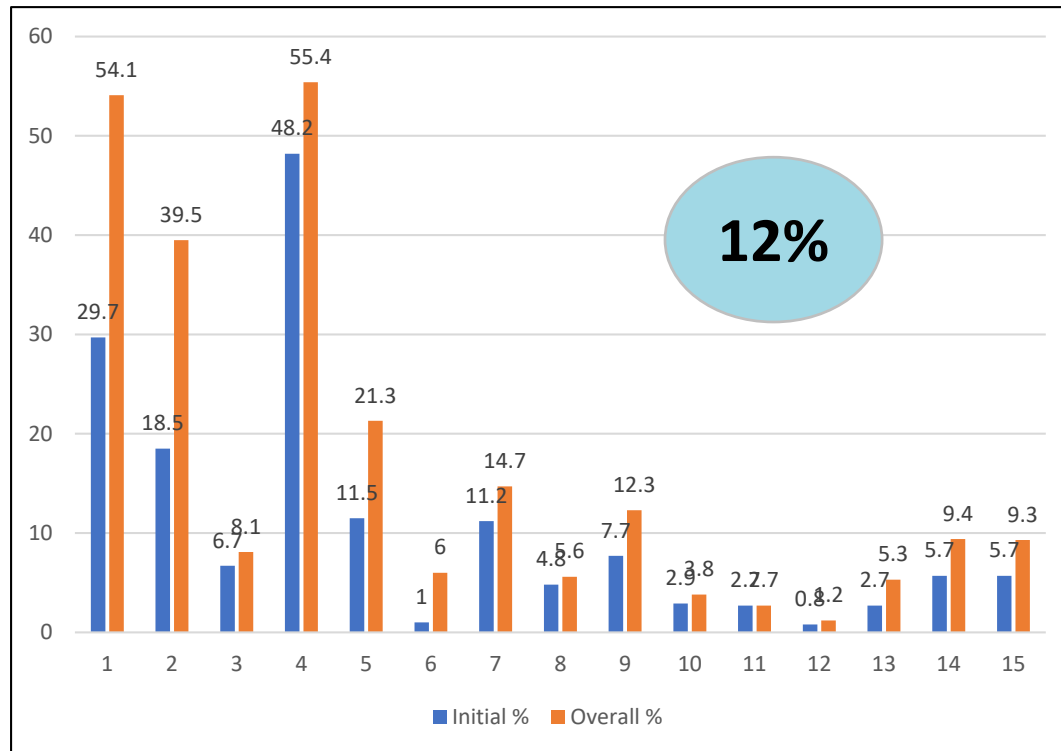


SARS-CoV-2 Test positivity (%) in Preventive Group

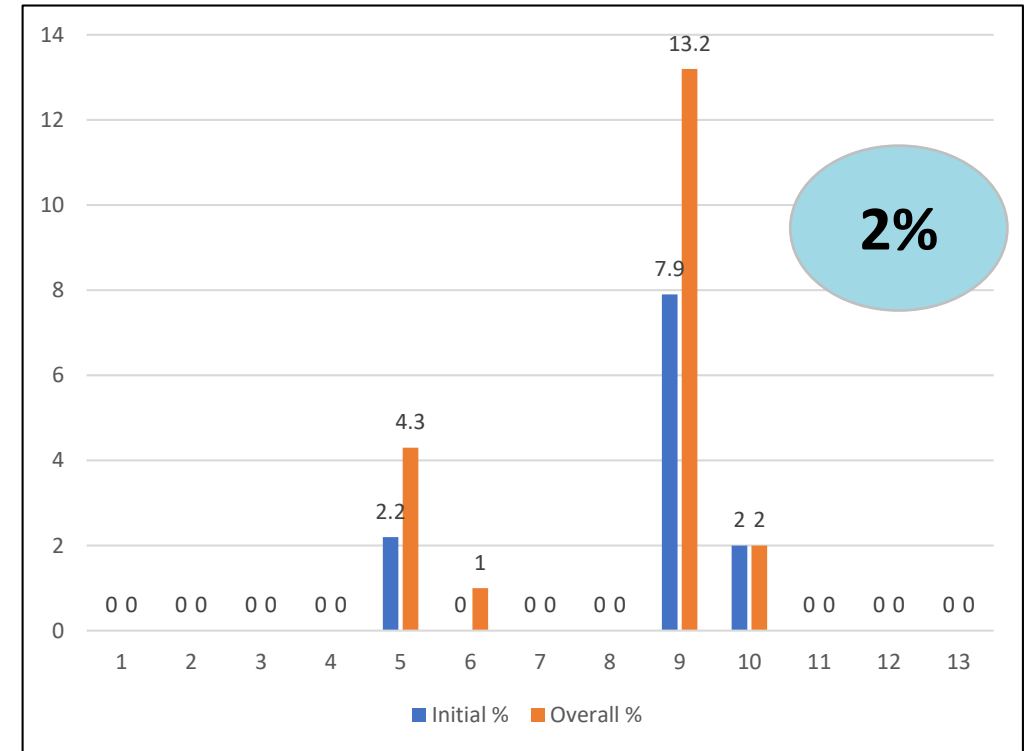


Staff in response group had higher positivity than residents in preventive group

SARS-CoV-2 Test positivity (%) in **Response** Group



SARS-CoV-2 Test positivity (%) in **Preventive** Group



Testing residents and staff before a symptomatic case was identified helped prevent COVID-19 outbreaks in Georgia long-term care facilities

PERCENTAGE OF RESIDENTS AND STAFF WHO TESTED POSITIVE FOR COVID-19*

Facilities testing

AFTER

someone showed symptoms

42%
RESIDENTS

12%
STAFF

Facilities testing

BEFORE

someone showed symptoms

2%
RESIDENTS

2%
STAFF

Testing residents and staff before a case is identified can

- ✓ **RECOGNIZE** cases early
- ✓ **GUIDE** infection prevention and control practices
- ✓ **PREVENT** outbreaks

*During March-May 2020, based on testing and 4 weeks of follow-up screening conducted among 28 LTCFs in Fulton County, Georgia

Testing in the community:

Persons experiencing homelessness

- Several outbreaks reported in other U.S. cities
- FCBOH initiated testing for all PEH and staff from 4/7–5/6/2020
 - Included PEH living in shelters and those who were unsheltered
- Assessed shelters for infection prevention and control measures
- All samples tested using SARS-CoV-2 PCR
- Collaborative effort with CDC, Mercy Care, Partners for HOME



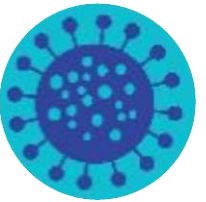
Mass testing of persons experiencing homelessness

- Tested 2,875 PEH from 24 shelters and 9 outreach events
- Prevalence:
 - **2.1% among sheltered**
 - 0.5% among unsheltered
 - 1.3% among staff
- Evaluation of COVID-19 testing criteria at that time:
 - Only 7% were over age 65
 - Only ½ reported an underlying medical conditions
 - 76% of positive cases reported no symptoms



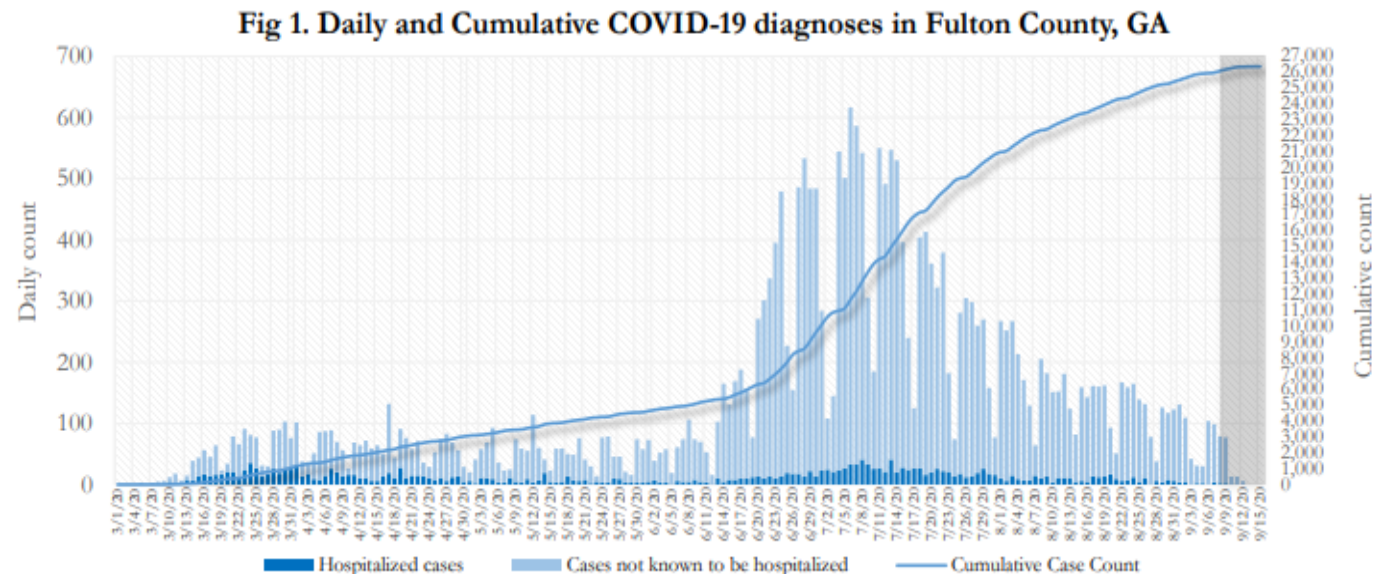


Case Investigations



Why case investigations?

- Very limited information through lab report (e.g., age, gender, address)
- Gaps in critical variables needed for understanding epidemic
 - Race, ethnicity, underlying medical conditions, exposure, occupation, symptoms, disease severity
- Insufficient public health staff to contact all newly diagnosed cases




Case Investigation Team



- Eliot England
- Dylan Fink
- Caitlyn Fong
- Sarah Hamid
- Kristin Harrington
- Pauline Harrington
- Kennedy Houck
- Carol Liu
- Maret Maliniak
- Dallas Rohraff
- Meagan Stephenson
- Daniel Thomas

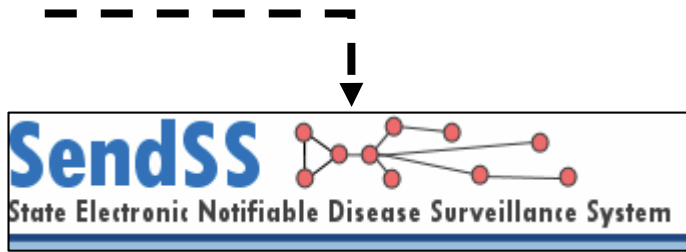
Training and support

- **Orientation** on expectations, working with sensitive data, state electronic notifiable disease surveillance system (SendSS)
 - **Online training** through Johns Hopkins contact tracing course & CITI training on Human Subjects Protection
 - **Shadowing** case investigator on making calls
 - **Support** from faculty mentors, project coordinator, peer mentors
 - **Sharing experiences** on weekly team calls about challenges, new scientific information, how to improve process
- 

Case Investigation Cascade



COVID+ Test



PUI added



Contact PUI



Collect data

PUI = Patient Under Investigation

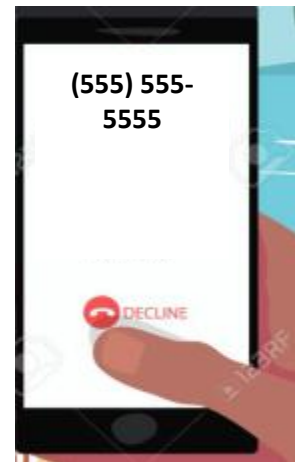
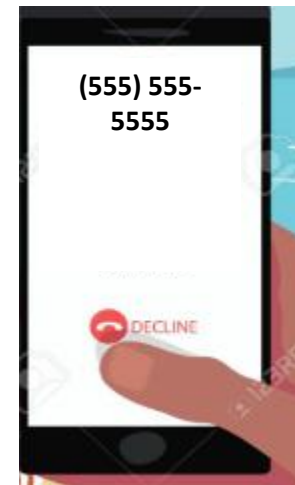
Slide courtesy of Maret Maliniak

Contacting PUIs

Ideal



Reality

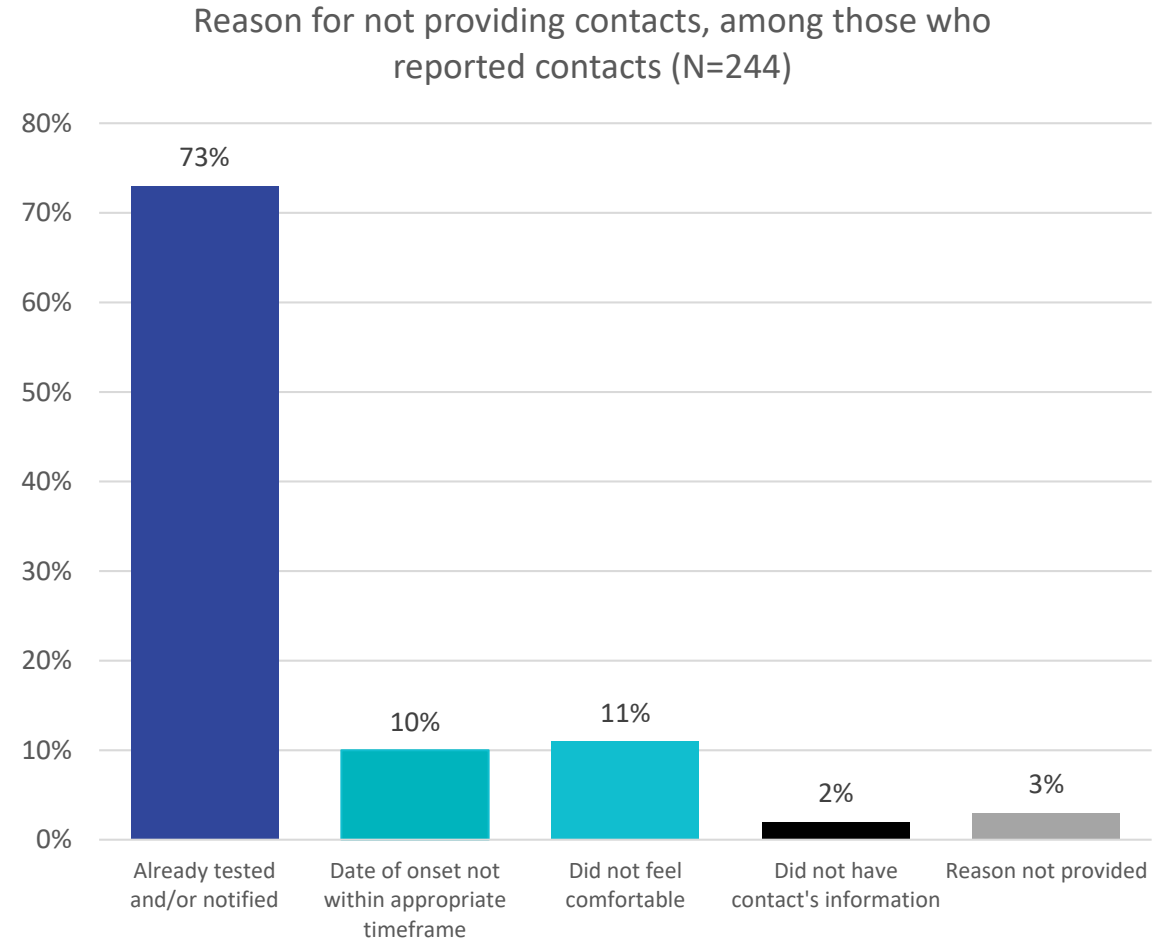


Real life experience with collecting surveillance data

- 2,740 PUIs assigned from 5/5–9/25/20
 - 1,136 (41%) not investigated for various reasons (e.g., no phone number, not Fulton resident, LTCF resident, incarcerated, hospitalized)
 - 1,604 were investigated
 - 744 (46%) no answer after 2 call attempts on 2 separate days
 - 58 (7%) refused interview
 - 42 (5%) Spanish speaking → referred back to Fulton Co. interviewers; *new Spanish-speaking Emory team member since Sept!*
- 692 interviews completed (25% of PUIs assigned; 43% of those investigated)
- Very unwilling to provide contacts for contact tracing

Contact tracing challenges

- June 22–September 25, 2020
- 2/3 of PUIs reported having a close contact
 - **only 13% provided their contacts' information** for tracing
 - Main reason cited was contact had already been notified and/or tested
- Lag in testing -> SendSS -> case investigation



Lessons learned



- I have learned the significance of being **flexible, adaptable, and inquisitive** as a public health student and future professional. (Dallas Rohraff, GLEPI 2nd year MPH)



- While COVID-19 has been devastating for so many and the case interviews can be difficult at times, I really enjoy doing them and being part of this process. They give you an **insight into people's experiences that you just can't get from looking at data alone**. (Maret Maliniak, 3rd year PhD student)



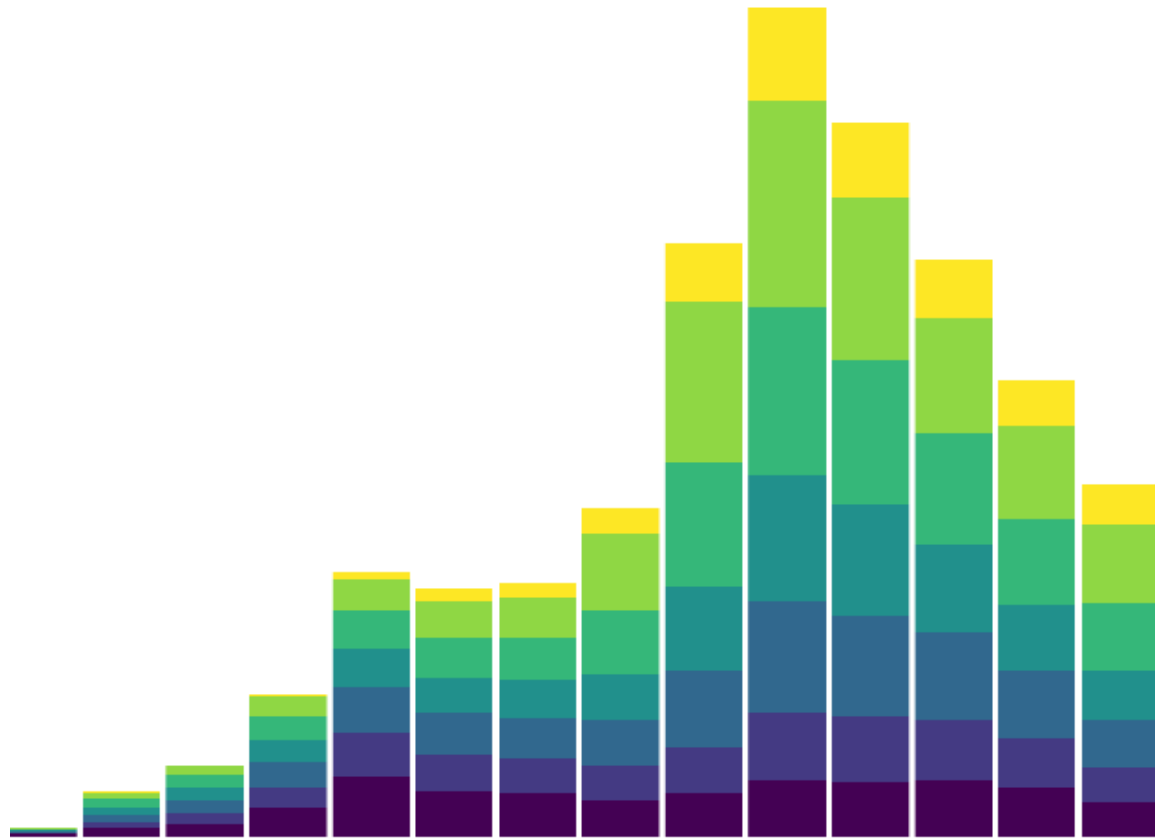
- Doing case investigations gives you an appreciation for **how surveillance data are generated and the limitations of various data points**, which is important to understand when analyzing the data. (Sarah Hamid, 4th year PhD student)



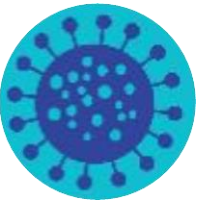
- Calling PUIs and speaking to individuals who have been personally affected by the epidemic has **placed a face and humanity to the numbers** I'm often tasked to crunch. (Carol Liu, 2nd year PhD student)



- The enormous range of responses from the community to the pandemic have been fascinating to witness. By speaking with all of these individuals, I have been fortunate to get a glimpse into **understanding the struggles people are going through**. Many of the calls I have made have been incredibly draining and taken an emotional toll. However, the strength with which individuals face these challenges has been equally moving." (Daniel Thomas, Epi 2nd year MPH)



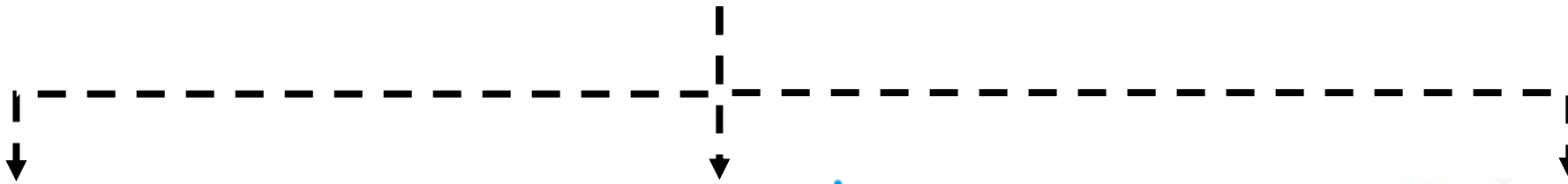
Data Analysis



Several types of analyses for different purposes



Data



**Monitor
epidemiological trends**



**Monitor process
indicators**



In-depth analysis

Monitor local epidemiological trends

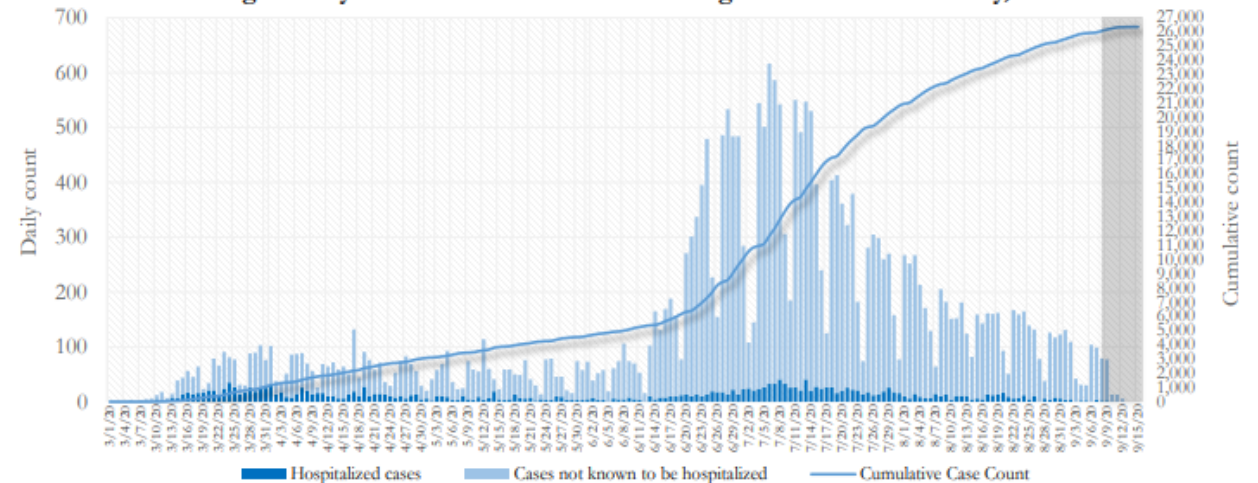


- Routine reports (2-3x/week)
- Near real-time information
- Detailed descriptions of cases and testing by **age**, **gender**, **race**, **location**, **LTCF**
- Time trends
- Comparison to neighboring districts and GA state

SUMMARY

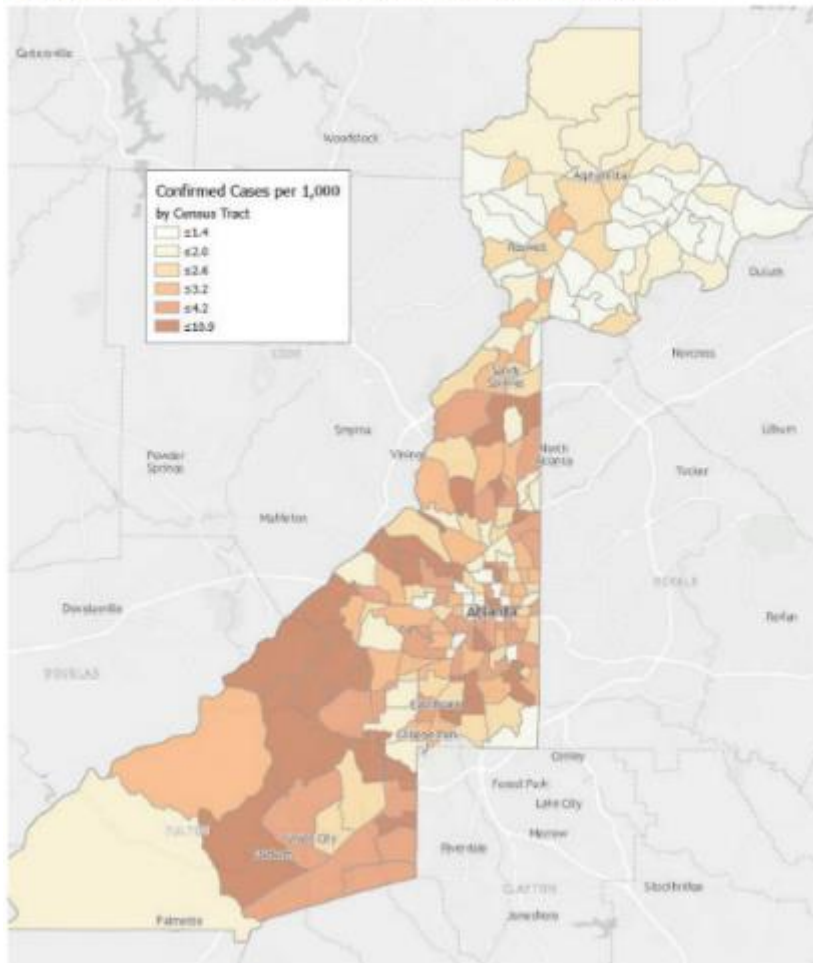
- As of September 15, 2020, Fulton County has recorded 26,351 cases of the 2019 novel coronavirus (COVID-19) and 556 deaths.
- Of 1,511 new diagnoses made between August 25 and September 8, the central portion of the county (Atlanta metro) accounted for 37% while the northern and southern parts accounted for 43% and 13% respectively.
- By city, new COVID-19 case rates range from 64.9 per 100,000 persons (College Park) to 210.1 per 100,000 persons (Roswell). [Fulton County Diagnoses Rates (per 100,000 persons): Cumulative – 2476.7; Incidence –142.0]. See map showing incident case rate by ZIP code on Pg.17.
- Among all persons diagnosed with COVID-19 in Fulton County since May 1, 6.5% required hospitalization and 1.7% died.
- Of all testing done in Fulton County between August 31 and September 13, the percent positivity rate was 5%.

Fig 1. Daily and Cumulative COVID-19 diagnoses in Fulton County, GA

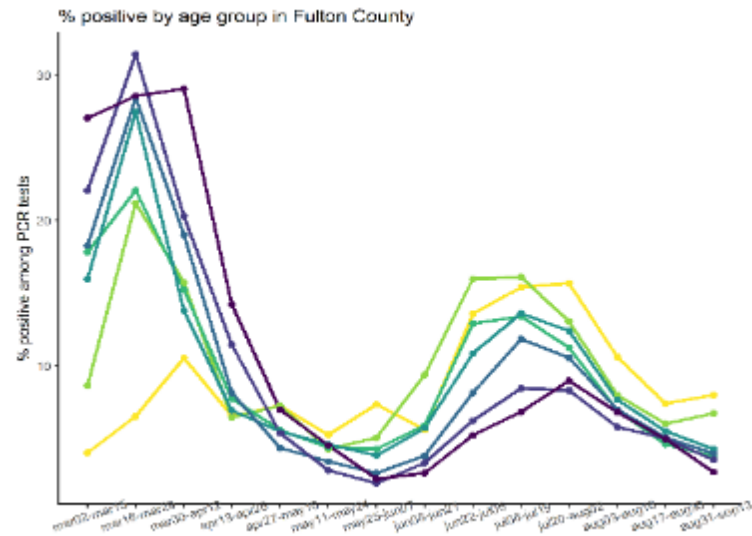
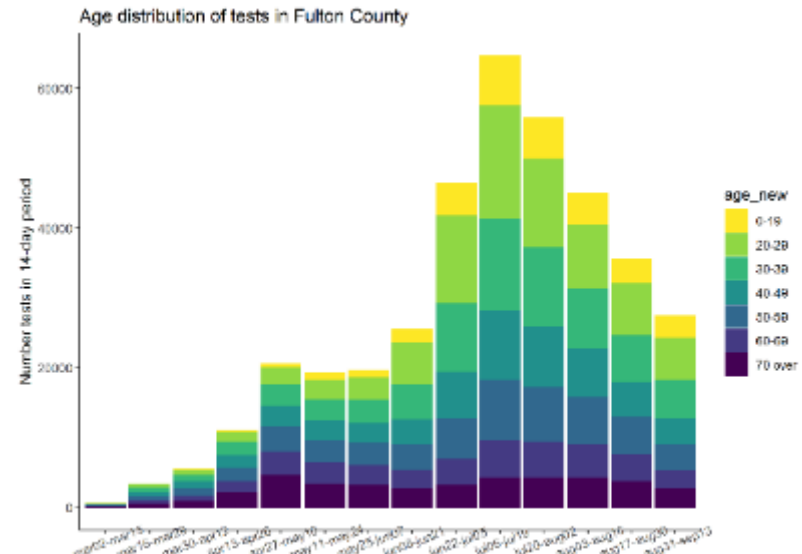


Monitor local epidemiological trends

Figure 5. COVID19 Diagnosis Rates in Fulton County by Census Tract (5/18/2020)



Geographic distribution of cases



Testing and positivity by age



Carol Liu, 2nd year
Epi PhD candidate

Applying epi methods to fill gaps

- Several reports of disproportionate disease burden and severity among Hispanic, Black, and American Indian/Alaskan Native persons
- Race and ethnicity **missing for 35-40%** of COVID-19 cases in Fulton
- Used **imputation and bias-adjustment** to estimate racial and ethnic disparities in infection, hospitalization, and death
- After adjustment, **increase in disparity by 1.3–1.6 times**

Table 3: Relative difference (RD) of SARS-CoV-2 infection rates among minority groups compared with non-Hispanic White persons among cases with complete information and after accounting for missing race/ethnicity among 4004 SARS-CoV-2 infected persons reported to Fulton County before 20 May 2020.

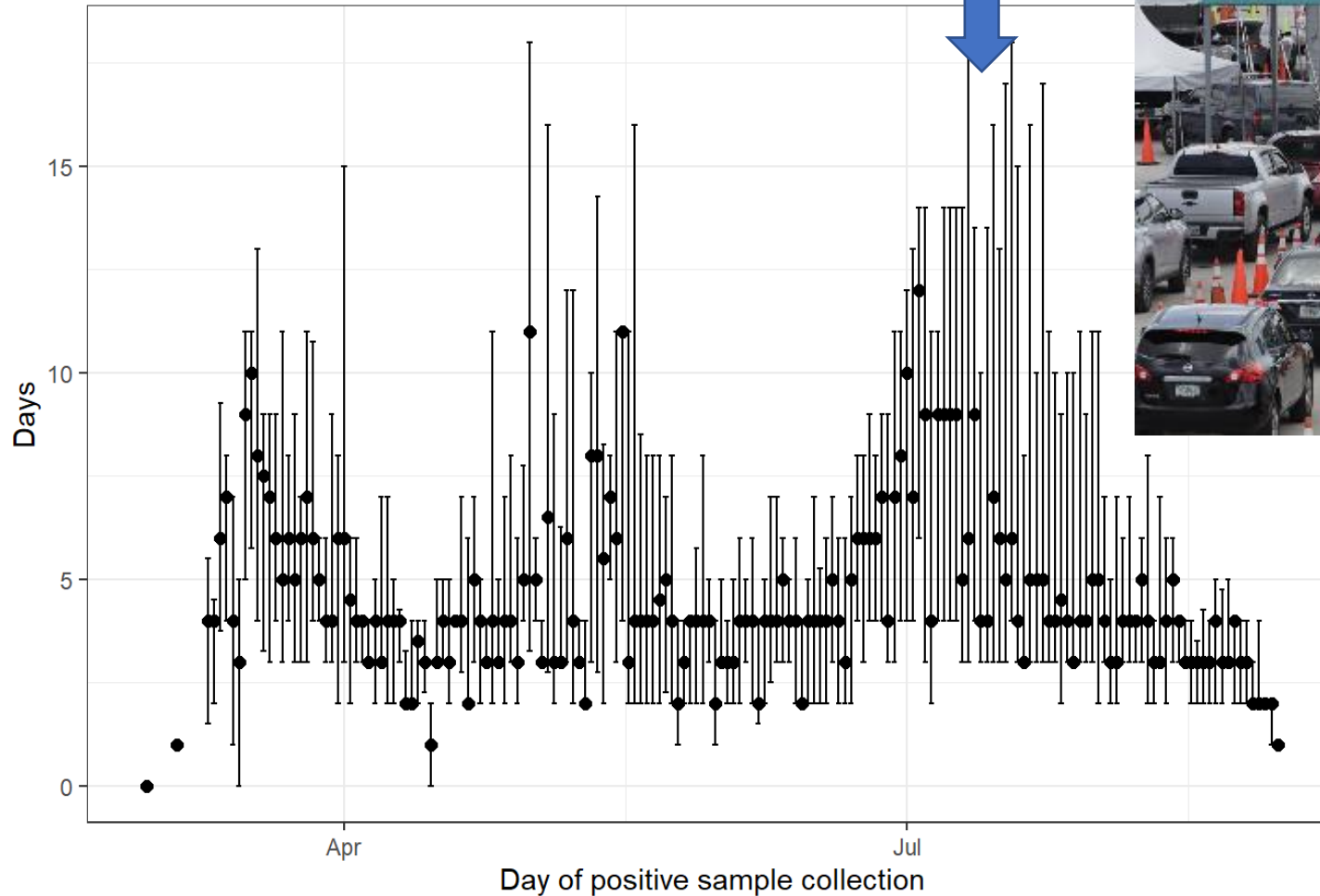
Race/ Ethnicity	Complete Case		Bias-Adjusted		Relative change in magnitude of disparity
	Infection rate per 1,000 (95%CI)*	RD per 1,000 (95%CI)	Infection rate per 1,000 (95%SI)	RD per 1,000 (95%SI)	
Asian	3.7 (3.3, 4.2)	-4.0 (-4.6, -3.5)	6.5 (5.9, 7.2)	-6.5 (-6.8, -6.2)	0.6
Hispanic	22 (21, 23)	14 (13, 15)	36 (35, 38)	23 (23, 23)	1.6
Black	16 (15, 16)	7.9 (7.4, 8.3)	23 (23, 24)	10 (10, 11)	1.3
White	7.7 (7.4, 7.8)	Reference	13 (13, 13)	Reference	
Other	85 (78, 92)	77 (70, 84)	138 (128, 148)	125 (121, 130)	1.6



Process measures: Testing turnaround time



Days between positive sample collection and report creation over time



Carol Liu, 2nd year
Epi PhD candidate

Ad-hoc in-depth analysis

- Responsive to needs of local constituents and policy makers
- Analytic questions from Fulton and Emory epis

Examples



Pediatric report in response to school-reopening



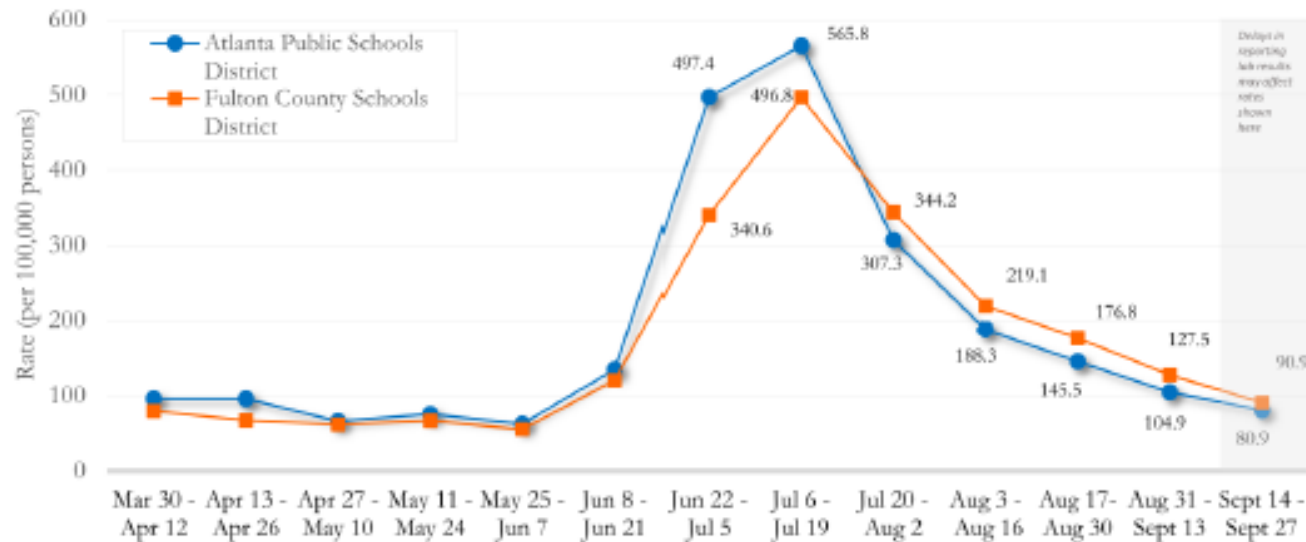
Household clustering analysis



Severe disease risk factors

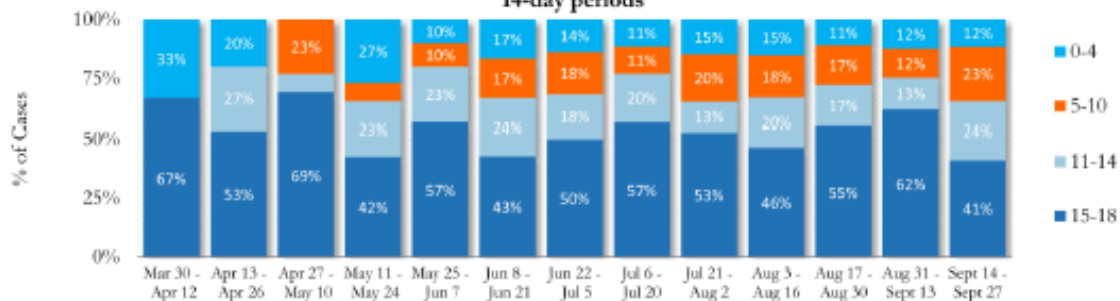
Pediatric COVID weekly report

Fig. 3. 14-day Trends in COVID-19 Diagnoses Rate in Fulton County School (FCS) District vs. Atlanta Public School (APS) District

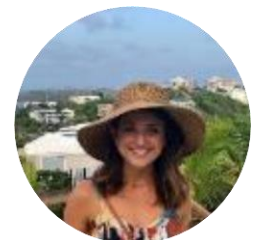
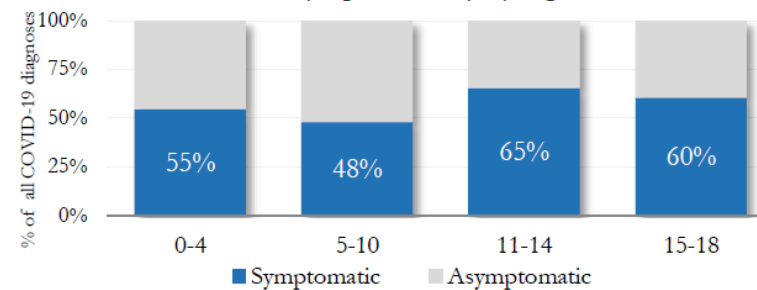


- Case rates by school district over time
- Age distribution of cases over time
- Symptoms by age group

Fig. 11. Age Distribution of COVID-19 Pediatric Cases in Fulton County School District by 14-day periods



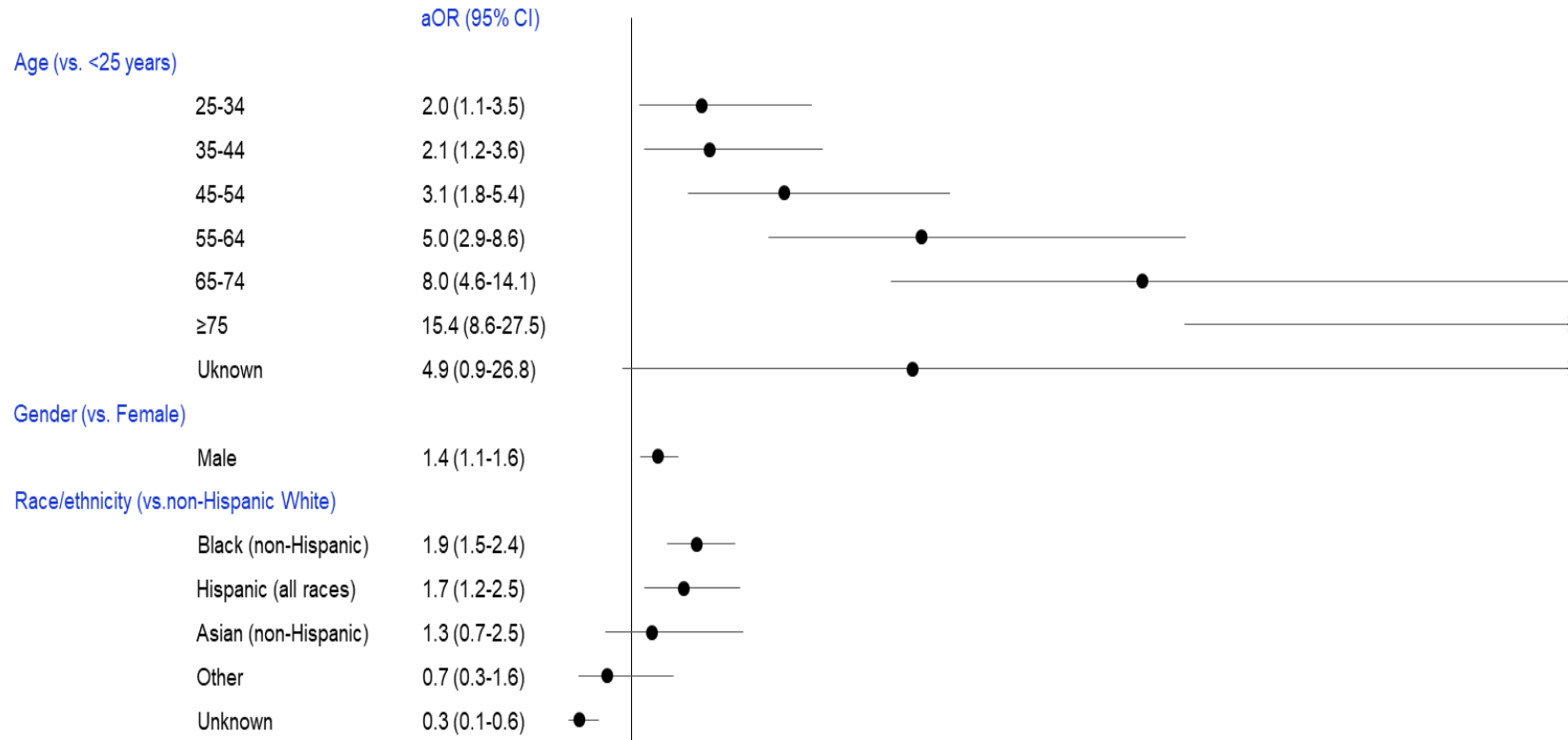
b. Symptomaticity by Age



Chloe Barrera, 2nd year Epi PhD candidate

Risk factors for severe disease

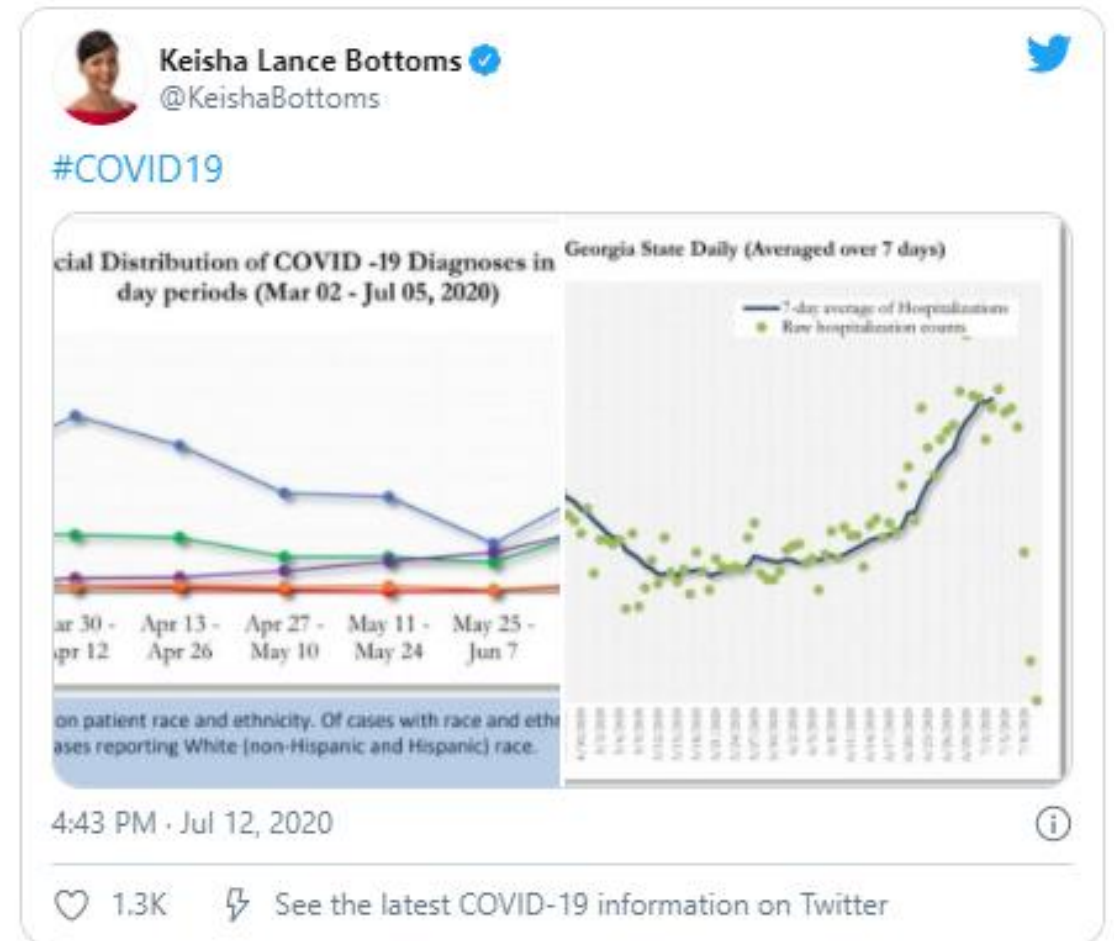
d. Severe COVID-19 Disease Model



- N=2,820 hospitalized
- 3/2–5/31/2020
- **Severe disease = hospitalization, ICU, or death**
- Logistic regression with random effects analysis
- Model included demographic and chronic medical conditions
- **Older age, male, black and Hispanic individuals at higher risk**

Public reception and data usage

- Routine epidemiology report website has 30K hits per month
- Nursing homes use county-wide % positivity to guide screening strategy (per CMS guidance)
- Pediatrics report reviewed by superintendents and leadership to guide school planning



Data analysis & visualization team

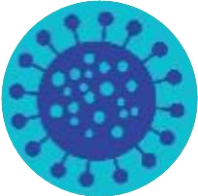


Without pictures:

- Dr. Fazle Khan (FCBOH)
- Mallory Hazle (FCBOH)
- Shamim Khan (FCBOH)
- Nathaniel Chishinga (FCBOH)



What's Next?



Doing more at testing sites



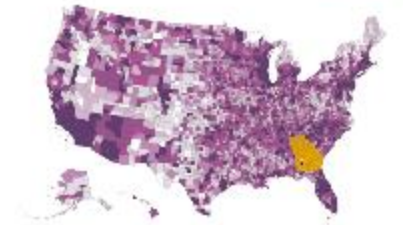
- Eliciting contacts at time of testing with goal of:
 - More rapidly and more completely identify close contacts
 - Reach close contacts faster
 - Pilot underway at central SPOC testing site
- Case-control study of who provides contacts vs. who does not
- Flu vaccination with COVID testing *started this week!*
- COVID vaccination at testing sites?

Beyond Fulton County

- Georgia Health Equity Dashboard (Shivani Patel, Laura Edison)
 - <https://covid19.emory.edu/>
- RADx-UP testing program for persons with or at risk of diabetes (GA Center for Diabetes Translation Research; Venkat Narayan)
- Emory University Midtown Hospital serosurvey (Neel Gandhi, John Roback)
- Impact of COVID on HIV continuity of care (Karla Galaviz, Jonathan Colasanti, Vince Marconi)
 - Ponce Center Infectious Diseases Program telehealth survey
 - NA-ACCORD observational clinical cohorts



Average Daily COVID-19 Cases



North American AIDS Cohort
Collaboration on Research and Design

Acknowledgements

- **Emory RSPH/SOM**

- Allison Chamberlain
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- David Holland
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- Pauline Harrington
- Meghan Franczek
- Megan Coe
- Meagan Stephenson
- Tim Lash
- Jane Yoon
- Alfonso Hernandez
- Chloe Barrera
- Lindsay Collin
- Eliot England
- Dylan Fink
- Caitlyn Fong
- Sarah Hamid

- **Emory RSPH (cont.)**

- Kristin Harrington
- Kennedy Houck
- Katie Labgold
- Carol Liu
- Maret Maliniak
- Dallas Rohraff
- Daniel Thomas
- Shivani Patel

- **Fulton County Board of Health**

- Fazle Khan
- Shamim Khan
- Kim Turner
- Udodirim Onwubiko (also RSPH)
- Nathaniel Chishinga
- Mallory Hazell
- Juliana Prieto
- Sasha Smith
- Carson Telford (also RSPH)

- **Fulton County government**

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- Hyun-Hee Kwak
- Irina Kroeger

- **Georgia Department of Public Health**

- Laura Edison
- Michael Thomas

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- Emory COVID Response Collaborative (PI: Chamberlain)
- NIH/NIDDK RADx-UP award (P30DK111024-05S1, PI: Narayan)
- NIH/NIAID K24AI114444 (PI: Gandhi)
- Woodruff Health Sciences COVID-19 CURE award (PI: Gandhi/Roback)

