

Takeaways from Evaluating the Role of Telehealth During COVID-19

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10th Annual Telehealth Summit of SC
Thursday, November 10

Funding & Disclosure

This presentation was supported in part by the the Agency for Healthcare Research and Quality (1R01HSO28284) and HRSA National Telehealth Center of Excellence Award (U66 RH31458). The contents are those of the speakers and do not necessarily represent the official views of, nor an endorsement, by HHS or the U.S. Government.

No financial or conflicts of interest to disclose.



Leveraging Health System Telehealth and Informatics Infrastructure to Create a Continuum of Services for COVID-19 Screening, Testing, and Treatment: A Learning Health System Approach

- 2-year grant from Agency of Healthcare Research and Quality (AHRQ)
 - PIs: Kit Simpson and Jillian Harvey
- Specific Aims
 1. Describe characteristics of programmatic interventions in screening, testing, and treatment and how the urgent COVID-19 requirements modified the standard telehealth or health systems processes.
 2. Measure and compare the health system's COVID-19 adjustments with regards to: overall patient volume, service uptake, delivery learning curves, and safety/quality indicators as they changed over time, with special emphasis on differences observed for underserved and high-risk populations.
 3. Assess population health outcomes, value, and cost from the perspectives of patients and providers with special attention to changes in access to acute care, emerging gaps in preventive care, unintended consequences of COVID-19 response, differential effect on underserved and high-risk populations, and specific issues emerging in rural locations and in broadband "digital deserts."
- Partnered with PCC on dissemination of findings through Telemedicine Research & Reports webinars

Agenda

1. Utilization of MUSC's COVID Virtual Urgent Care Screening to Testing Triage
2. Patient perspectives on audio-only versus video telehealth
3. Effect of COVID-19 on Stroke and MI Admissions in SC
4. Q&A

Utilization of MUSC's COVID Virtual Urgent Care Screening to Testing Triage

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AHRQ Aim

Measure and compare the health system's adjustments to COVID with regards to: patient volume, service uptake, delivery learning curves, and quality indicators as they changed over time, with special emphasis on differences observed for underserved populations.

- › How many patients were we reaching and how are they distributed across geographic areas and risk groups?
- › What was the growth in uptake, barriers to scale up and scale out, and solutions tested and failed?

Background

- MUSC has a direct-to-patient, asynchronous virtual urgent care (VUC) platform used to provide rapid care for low-risk, common acute conditions.¹
- During the first months of COVID, it was rapidly re-engineered to support COVID screening as means to triage individuals to testing.²
- Promoted through internal communications, local media, and state officials as a public health tool for SC citizens to receive no-charge virtual screening.
- While others had similar programs, few if any have published on use of asynchronous virtual care to support COVID screening.³
- A number have published on synchronous telehealth screeners and synchronous VUC visits,^{4,5} use web-based surveys as part of synchronous triage visits,⁶ and the validity of web-based self-screeners.⁷

Methods

- VUC platform (Zipnosis) was our primary data source.
- Data were merged with EPIC data to gather payer, race, and ethnicity data for those with a previous MUSC encounter.
- Census used for county-level population statistics, and social vulnerability derived from the CDC's social vulnerability index which members of our team have recoded to the zip code level.
- General descriptive statistics on the utilization of the platform over the first 6-months of the pandemic (March – August 2020), both for the entire state and for the Tri-County Area (Charleston, Berkeley, Dorchester), given that is MUSC Charleston's primary market region.
- COVID VUC visits were categorized based on:
 - Visits with the upper respiratory infection (URI) protocol (these both included COVID specific and general URI algorithms) OR
 - Received an order for a COVID testing.
- Qualitative data (program staff memos staff and follow-up interviews) to flag mitigation efforts to address any disparities.

Results

Unique Patients with COVID VUC Screening Visits

Demographics & Utilization	SC Total Patients n = 67,292	Tri-County Patients n=43,348	Tri-County Census n=802,122
Gender			
Female	61.4%	60.2%	51.2%
Male	38.6%	39.8%	48.8%
Age			
0-19	11.4%	12.2%	24.1%
20-64	85.1%	83.4%	60.2%
65+	3.5%	4.4%	15.7%
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25-44	49.1%	50.6%	
Rurality			
Rural	13.1%	0.3%	13.1%
Non-Rural	86.9%	99.7%	86.9%
Race*			
White	75%	76.4%	70.4%
Black	18%	16.2%	26.5%
Other	7%	7.4%	3.1%
Ethnicity**			
Hispanic or Latino	2.4%	2.6%	6.0%
Non Hispanic or Latino	97.6%	97.4%	94.0%

*68% of patients statewide had race data on file in EPIC, 79% of Tri-County patients

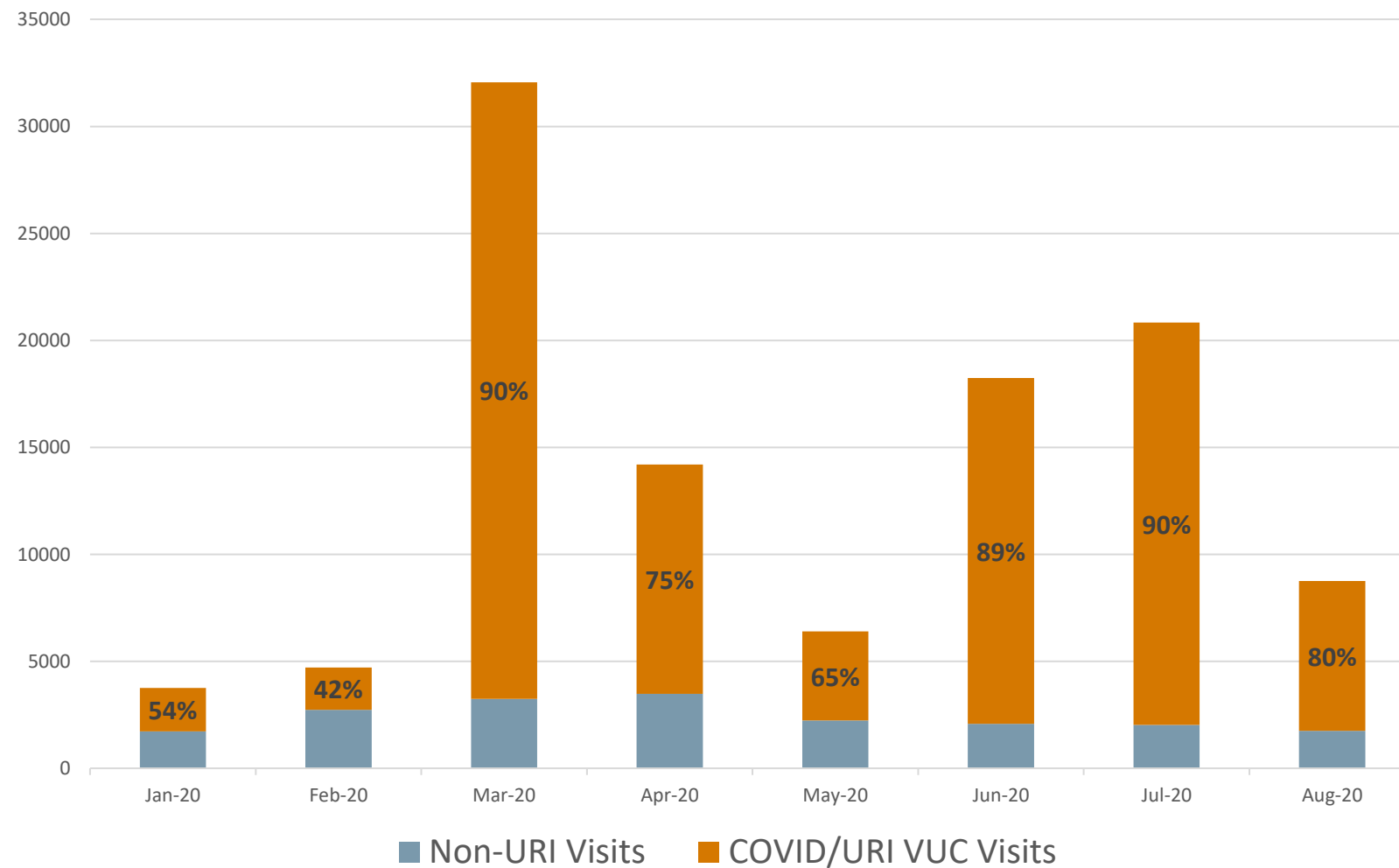
**61% of patients statewide had ethnicity data on file in EPIC, 72% of Tri-County patients

***58% of patients statewide had payer data on file in EPIC, 70% of Tri-County patients

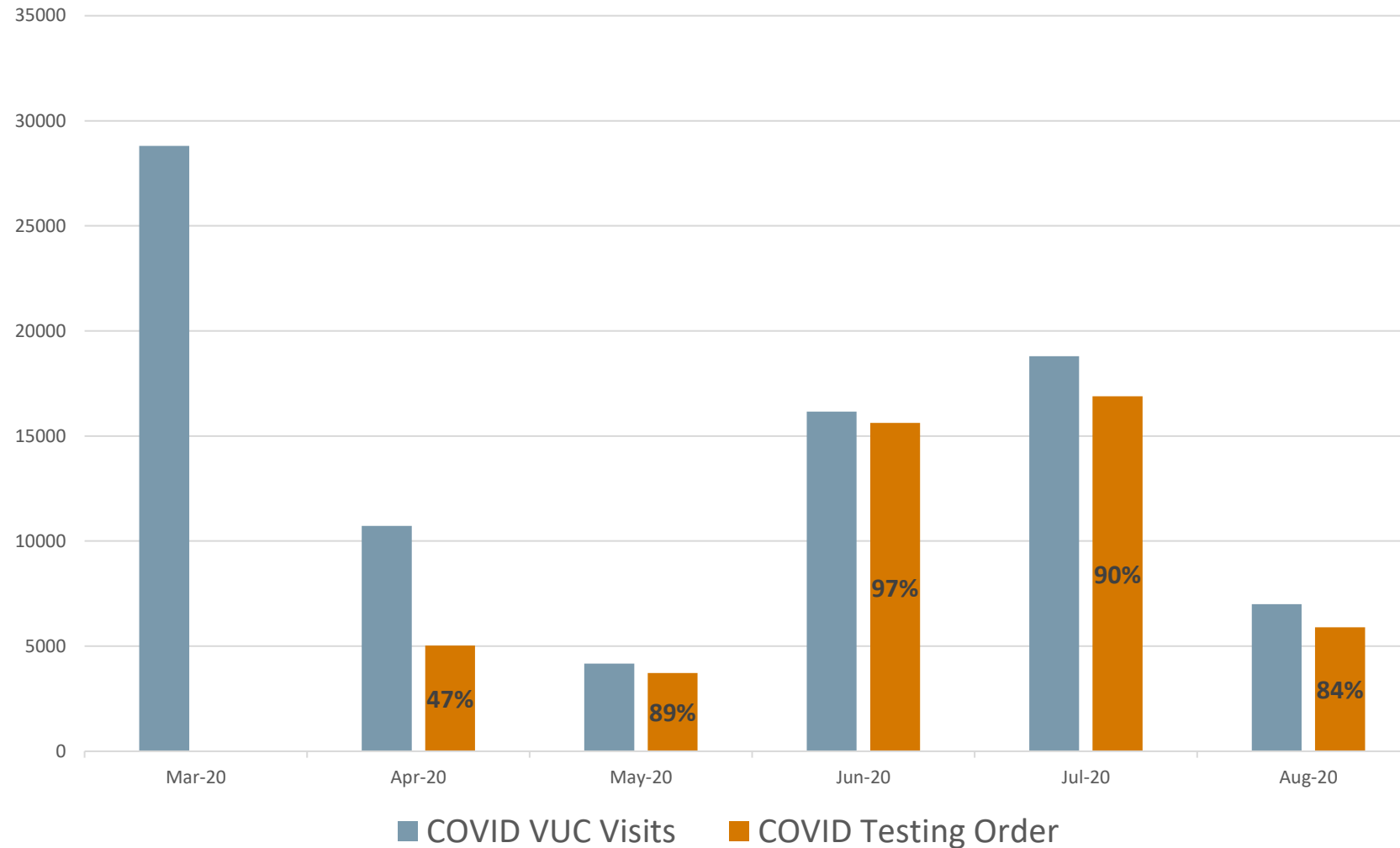
Unique Patients with COVID VUC Screening Visits

Demographics & Utilization	SC Total Patients n = 67,292	Tri-County Patients n=43,348
Social Vulnerability National Quartiles		
4 th Quartile (most vulnerable)	8.9%	3.1%
3 rd Quartile	19.9%	7.7%
2 nd Quartile	42.9%	47.6%
1 st Quartile (least vulnerable)	28.3%	41.6%
Number of COVID Visits		
1 Visit	80.1%	78.8%
2-4 Visits	19.2%	20.5%
5+ Visits	0.7%	0.7%
COVID Testing Order		
One or more COVID Orders	60.5%	69.2%

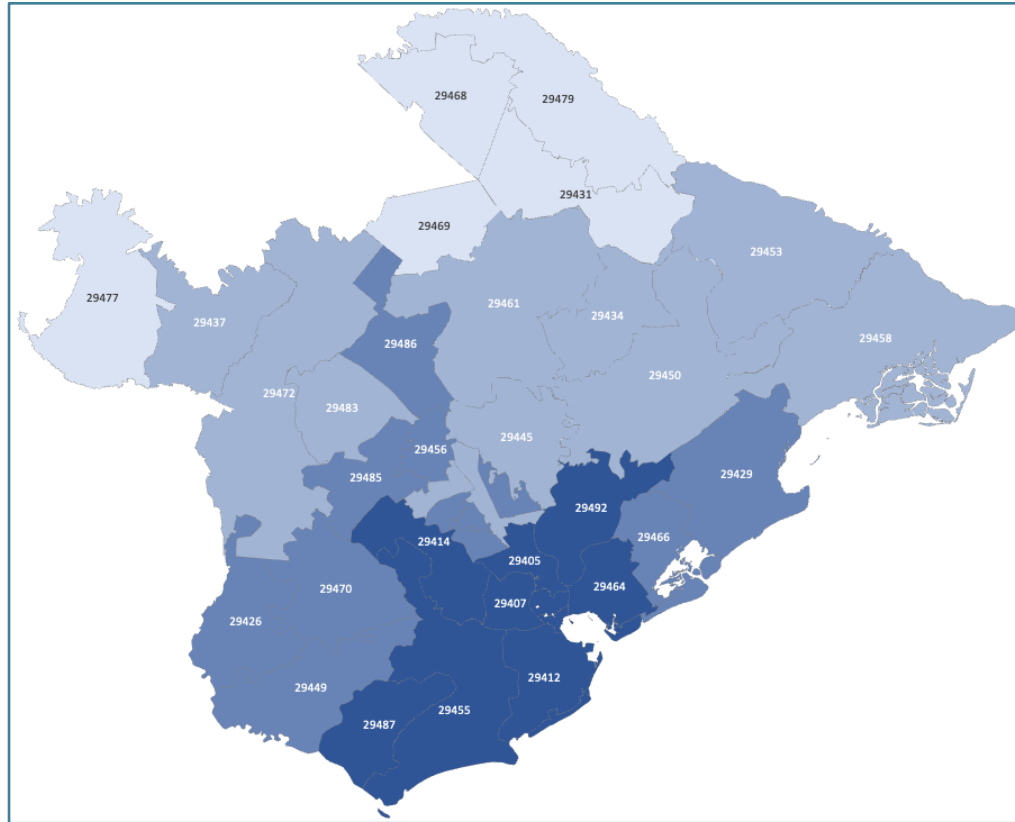
COVID VUC Visit Utilization



COVID Visits Resulting in Order

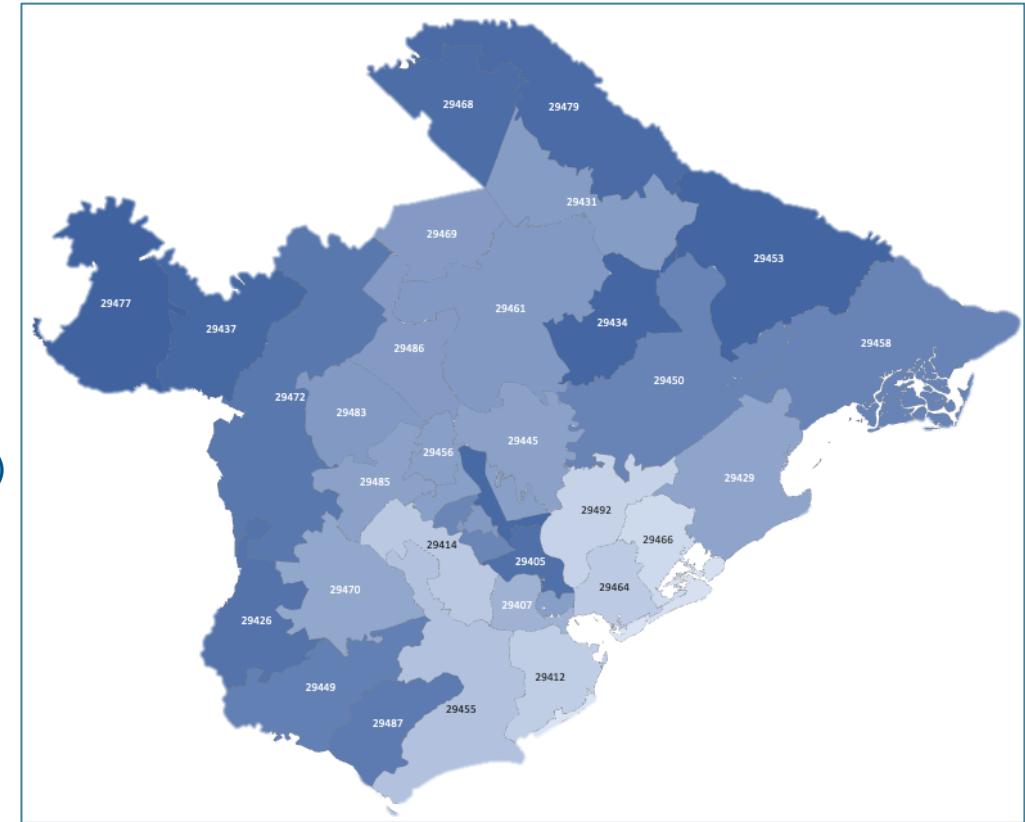
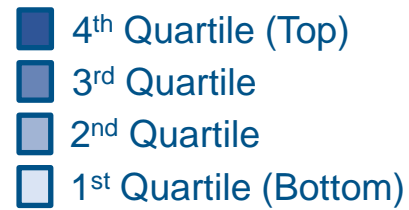


Tri-County MUSC VUC Utilization & Social Vulnerability



Tri-County Virtual Urgent Care Visits

(darker = more VUC visits)



Tri-County Social Vulnerability

(darker = higher social vulnerability communities)

Efforts to Mitigate Disparities

- Clear disparities (gender, race, ethnicity, age, payer class, social vulnerability)
- MUSC early efforts to mitigate disparities:
 - Set-up pop-up sites for VUC screening among at-risk groups, e.g. One80 Place (n=81)
 - Implement option for Spanish speaking persons
 - Phone option
 - Allow multiple entry points to testing (drive-up and walkthrough sites), including community-based locations
 - Adjust registration options for individuals (e.g., not requiring ID)

Discussion

- Program provided widespread, efficient access to COVID screening, education, and streamlined triage & testing
- Critical at a time when individuals had limited access to health care providers and seeking COVID information, healthcare workers were stretched, and testing was limited
- This free, public service was disproportionately underutilized by at-risk populations
- While disparities may in part be related to telehealth specifically, may also just be reflective of social determinants of health affecting all health care utilization.^{8,9}
- Efforts needed to make telehealth modalities more accessible to all
- However, underlying social determinants of health must also be addressed
- Future directions: further analysis to better understand nature and effect of MUSC's mitigating efforts—both in early days but also currently—as well as analysis looking at pre/during/post access among at-risk groups

References

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Patient perspectives on audio-only versus video telehealth

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Background

- Telehealth utilization surged during the COVID-19 pandemic
 - 11,000 Medicare patients used telehealth in March 2020
 - 1.3 million Medicare patients used telehealth in April 2020
- Many insurance organizations reimbursed both audio-only and video visits during COVID-19
- The impact of discontinuing audio-only coverage is unknown
- There is disagreement if audio-only visits should continue
 - Concerns with fraud, cost, and quality
 - Benefits of audio-only for those in rural areas, low-digital literacy, or lack access to equipment

Sources: Chen J, Li KY, Andino J, Hill CE, Ng S, Steppe E, Ellimoottil C. Predictors of Audio-Only Versus Video Telehealth Visits During the COVID-19 Pandemic. J Gen Intern Med. 2022 Apr;37(5):1138-1144

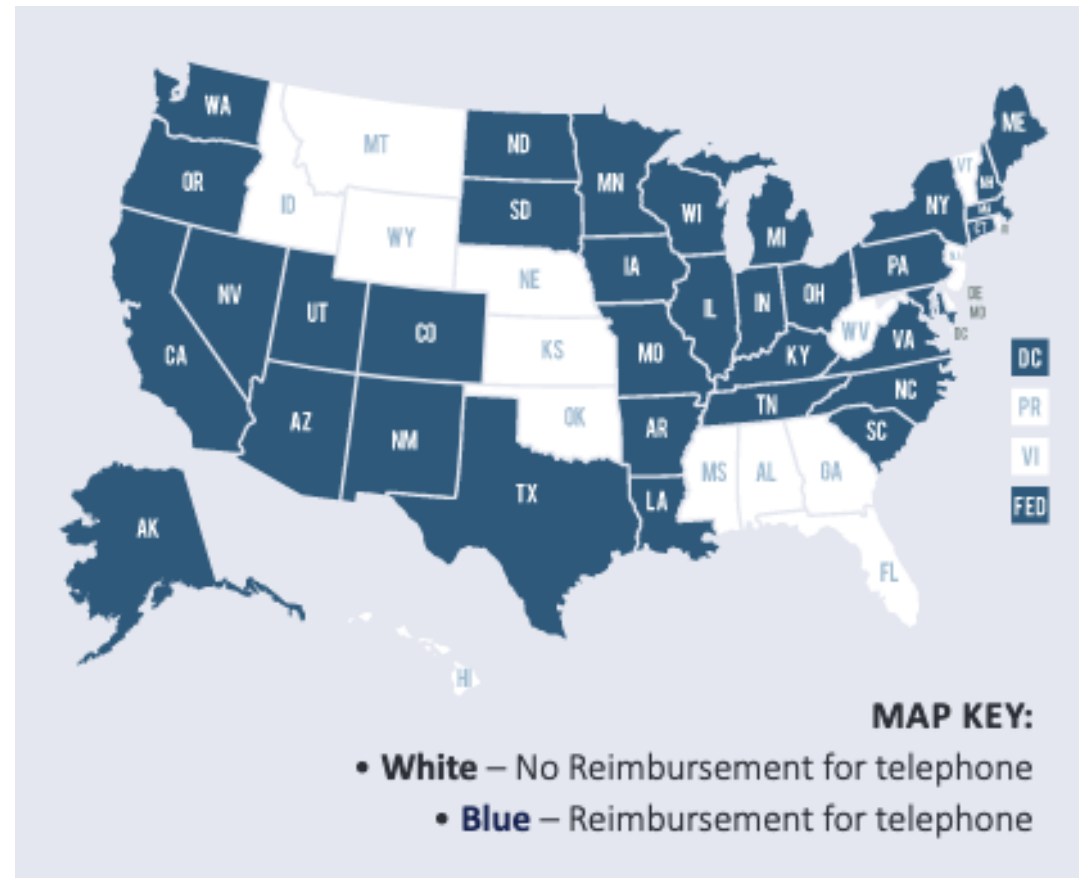
Current Policy: Medicare

- 2022: After the end of the COVID-19 public health emergency (PHE), CMS will allow audio-only interactions for:
 - counseling and therapy in cases where audio-video communication isn't available to the patient
 - including circumstances in which the patient can't/won't agree to use audio/video communication
- 2023: CMS will continue PHE services for 151 days following the end of the PHE
- CMS decided audio-only telephone evaluation and management coverage outside of behavioral health will not be extended until the end of 2023
- The final rule also stated that audio-video technology will continue to be the appropriate standard of care for Medicare telehealth services after the COVID-19 PHE and the 151-day extension period
- Audio-only virtual check-ins (G2012) can continue

Source: CMS (2022). Billing & Payment. Available at:
<https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/Opioid-Treatment-Program/billing-payment>

Current Policy: Medicaid

- Thirty-four states and DC Medicaid programs reimburse for audio-only visits in some capacity
- Audio-only visits had the largest increase in states reimbursing for it, increasing from 29 since Spring 2022.
- Limitations in some states:
 - E.g. Certain specialties
 - Mental Health
 - Case Management



Source: Center for Connected Health Policy. (2022, October).
State Telehealth Laws and Medicaid Program Policies.
Available at:
https://www.cchpca.org/2022/10/Fall2022_ExecutiveSummary8.pdf

Research Questions

How do patients perceive their experience with audio-only telehealth visits as compared to video telehealth visits?

How do patients perceive the value of audio-only telehealth visits in the context of their overall healthcare utilization?

Methods

Recruitment

- Cold-contact patient recruitment of patients who have participated in both an audio-only and a video telehealth visit
- 290 patients had both audio-only and video visits in last 6 months
- 100 patients were contacted
- Participants received \$20 Amazon gift cards

Interviews

- Interview topics: Healthcare use, reason for telehealth visit, Video and Audio experience (likes, challenges), referral to telehealth, comparison of audio & tele (comfort, engagement, professionalism, understanding, privacy and needs met), preferences
- 14 interviews were completed between 9/15/22-11/2/22 via Teams
- Average length 18:45 minutes (range: 9.5-27)
- Interviews were recorded and professionally transcribed

Analysis

- Utilize a general inductive approach
- Memos were written to summarize content of each interview
- Utilizing open coding and categorization to develop themes and recommendations
- Nvivo software

Source: Thomas, D., A general inductive approach for qualitative data analysis. (2003). *American Journal of Evaluation*, 27(2).

Triangulation

- Interviews held with telehealth leadership, health system compliance and finance leaders, and telehealth providers to assess the changes that took place during COVID.

Results

Patients want choices (and convenience) with their healthcare

- Nearly all agreed that telehealth was positive and hoped it was here to stay.
- Convenience was noted primarily as the benefit of both types of telehealth—specifically less travel time, less wait time, and do not need to miss work.
 - *It's the fact that I don't have to drive all the way into his office. -Patient*
- A handful of patients also brought up limiting exposure to illness (e.g., COVID) as a reason for telehealth.
- Some patients also brought up feeling like providers seemed less rushed in telehealth as opposed to in-person visits.

While patients were divided and nuanced in terms of their preferences for video vs. audio, nearly all agreed that there were benefits to having both available

If it was a doctor I liked and felt like I was going to have a long-term relationship with, I would want to see in person. But, you know, with the complexity of my case, I got thrown off in the crazy departments like Oncology, Neurooncology, neurooncology surgery, so if I was just having these as a one-off then I was fine doing the audio visit...If it was somebody that I felt was going to be responsible for my care for a long time, I wanna have a personal relationship with them. I want them to know me and want them to see me and see my wife and then that way they would remember. Hopefully, they will remember me if I ever had another emergency. –Patient

I think we really would love to focus on targeting the most efficient and effective use of virtual care along the care continuum. –Leader/Provider

Patient Preference for Audio-Only Option

Convenience when busy at work or home.

- *They're [audio-only] just as convenient. I mean, especially because some of my visits are in the car. I probably shouldn't be doing that. But you know, I'm, I'm a very busy person and you know, so I can chit chat and you don't have to see me.-Patient*
- *I have had a couple of patients who are like, "I don't have a smartphone but I want to do a telephone visit." I was like, "Sure. I don't have a problem with that. –Leader/Provider*

Provider preference for certain types of visits

Concerns with privacy or providers seeing inside the home

- *With audio only, I think I felt like I was less on the spot. I didn't have to worry about anything in the background being visible that I didn't want visible. I didn't have to worry about taking a drink of my drink. -Patient*

At least half of the patients indicated that their initial audio-only call resulted from a technical issue with a video call.

We have two platforms. We had too many platforms...But we're bringing on one...that caters to the patient better than before. So we are adopting technology that is a better video experience, better audio experience, that we knew were problems. –Leader/Provider

But on the other hand, getting set up, all that stuff, and then you can't connect. You don't have a nurse to just tell you where the patient is and vice versa. All that coordination of the workflow is harder when two people are at a distance from each other and your staff is at a distance from each other. And so, it's got to be a really well-oiled machine. –Leader/Provider

Patient Preferences for Video Visits

Some patients experienced a stronger connection with their provider during video visits

- *To me, it [video visit] just made me feel more secure, I feel. I love doing it that way because you're interacting. You see the person. I don't know what it is, it's just—you just feel better. Just seeing that person—that person is in your presence. That's how I feel when I'm doing a video visit. I get excited. –Patient*
- *But they continue to struggle sometimes trying to connect with our physicians and then they feel like, at least some of them may feel like that it's not quite as personal when they're on the telephone or on the video than they would be in clinic. –Leader/Provider*

Policy & Workflow Concerns

So unless I had a block of videos of Doxy patients, it was very difficult to switch from a patient who was being seen in clinic and then switch over to a telephone, call them, set that up, and then switch back to another patient who was sitting in the waiting room -Provider

*I'm sure everybody in the country would say this – the minute that reimbursements get removed or slashed, it will evaporate to zero because that was the primary barrier on the front end.
–Leader/Provider*

Sort of immutable facts about health care, so billing reimbursement will impact whether the innovation is sustained. –Leader/Provider

Conclusions & Recommendations

	Audio-Only	Video
Pros	<ul style="list-style-type: none">• Waiting for an audio-only call (a telephone call) was much less stressful than navigating a telehealth platform• More convenient for patients• Potential efficiencies for providers• Useful when getting results back on labs or a procedures• Fewer technical problems (even those who preferred video, noted appreciated that this was available as a back-up)	<ul style="list-style-type: none">• Greater connection between patient and provider• Non-verbal communication in video visit• Ability to demonstrate something to the provider
Cons	<ul style="list-style-type: none">• Less relational and less able to perceive non-verbal communication• Limited in what can be addressed• Uncertain billing	<ul style="list-style-type: none">• Technical• Variations in how video visits are scheduled and how to access the platform• Discomfort with providers seeing

- Patients and providers find value, efficiencies and conveniences of both options.
- Policy, practice, and payment must align to support innovation and the most cost-effective way to provide access to services

Effect of COVID-19 on Stroke and MI Admissions in SC

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Background

- COVID-19 pandemic disrupted health care systems across the world
- This disruption affected both health system and patient behaviors
- Our AHRQ grant:
 - **Leveraging Health System Telehealth and Informatics Infrastructure to Create a Continuum of Services for COVID-19 Screening, Testing, and Treatment: A Learning Health System Approach** supported our examinations of both systems and patient responses
- One objective was to examine access and utilization for vulnerable disease groups:
 - **Stroke**
 - **MI**
 - Sickle cell disease
 - Diabetes
 - Alzheimer's disease and other dementias
 - Patients admitted from skilled nursing facilities

Background: Patient Avoidance of Medical Care when Seriously Ill

- Delays in seeking medical care for stroke or MI have serious health consequences because curative treatment is time sensitive
- More than 50% of US survey respondents who stated that they needed care for a new severe medical issue reported to having foregone care during the March through mid-July 2020.
 - 29% forewent care due to fear of COVID-19
 - 7% forewent care due to financial issues associated with the pandemic

Source: Anderson KE, McGinty EE, Presskreicher R, Barry CL. Reports of foregone medical care among US adults during the initial phase of the COVID-19 pandemic. JAMA Open 2021; 4(1).

Background: Avoiding Care During COVID

- An online survey that examined when and why patients would decide not to seek emergency care for care unrelated to COVID-19.
 - 16% of respondents would prioritize avoiding COVID-19 in an ED even if they had a heart attack
 - 25.5% would avoid an ED with symptoms of acute appendicitis .
- This intent to avoid an ED visit due to COVID-19 infection risk was shown to be real
 - Voluntary refusals of ambulance transport to EDs in Detroit during the early phase of the pandemic an increased from 15% in 2019 to 25% in 2020

Sources: Gale R, Eberlein S, Fuller G et al. Public perspective on decisions about emergency care seeking for care unrelated to COVID-19 during the COVID-19 pandemic. JAMA Open 2021 4(8).

Harrisin NE, Ehrman RR, Curtin A et al. Factors associated with voluntary refusal of emergency medical system transport for emergency care in Detroit during the early phase of the COVID-19 pandemic. JAMA Open 2021 4(8).

Reports from the SC Tele-stroke Program

- The SC Tele-stroke Program has been shown to improve access to timely treatment and improve outcomes for patients in rural and remote areas.
- We explored the utilization of tele-stroke services and processes of care measures during the 2020 COVID-19 pandemic compared to the same time period in 2019.
- Using registry data, we identified 4,538 patients who received a tele-stroke consultations from Q2-Q3 2019 and Q2-Q3 2020.
- **There was a significant decline in the number of completed tele-stroke consultations during COVID-19 (2657 vs.1,881).**
- There was no difference in average age, sex, the percentage of patients transferred away from the community hospital, or stroke severity (NIHSS on admission) across years, but for stroke patients eligible for tPA, the time from symptom onset to ED arrival increased significantly from 83 minutes in 2019 to 121 minutes in 2020 ($p<0.05$).

Research Questions:

- Was the decrease in our observed telestroke use a health systems response? or was it a patient response?
 - Did admissions for acute ischemic strokes change during COVID?
 - Did we observe similar changes for myocardial infarctions (MI)?

METHODS and Data Source

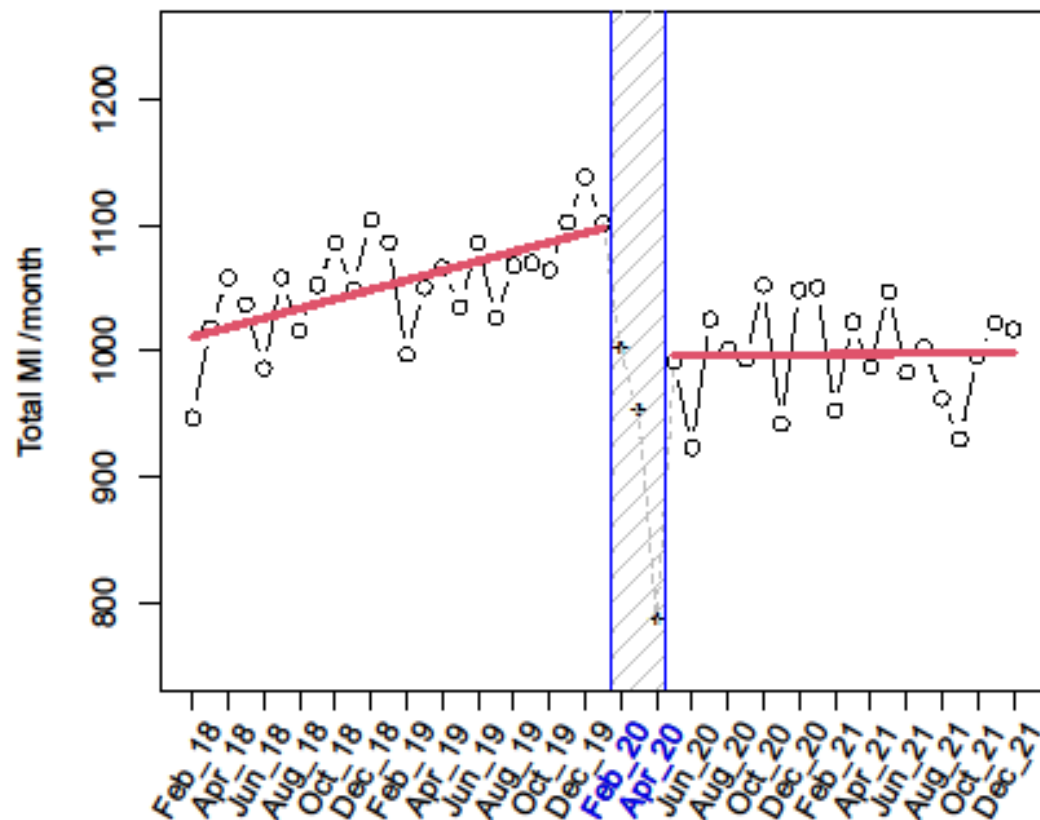
Methods

- Retrospective analysis of archival SC billing data
- All SC hospital admissions for AIS and MI identified using previously validate ICD-10 phenotypes for the events
- SC All-payer billing data for inpatient admissions from 2018 through 2021
- Interrupted time series analysis using monthly aggregates of events
- Examination of subgroups defined by minority race or rural residence
- Exploration of death rates using expected values based on seasonal trends observed during 2018 and 2019

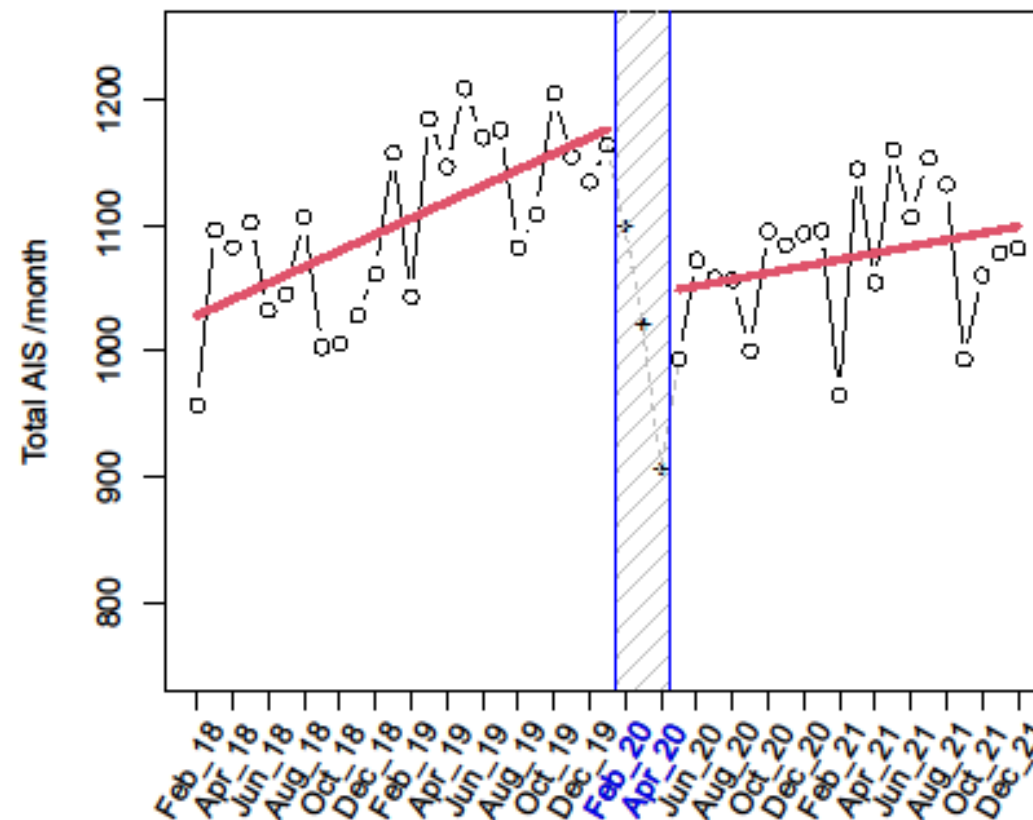
Results

Total MI and AIS per month in SC (2018-2021)

SC Myocardial Infarction



SC Acute Ischemic Stroke

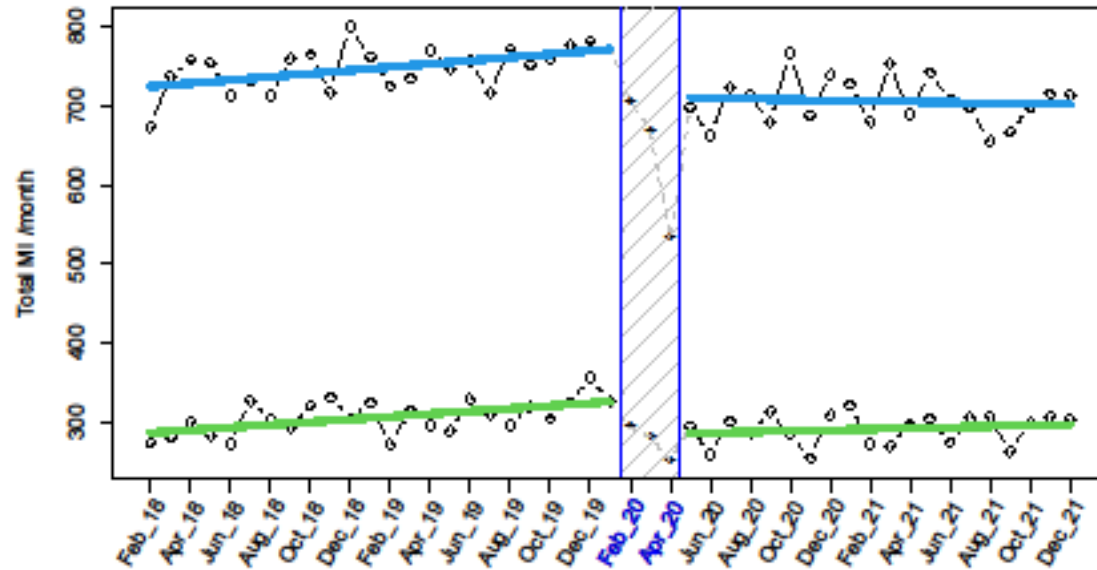


MI	Estimate	StdErr	prob	CI_LL	CI_UL
baseline rate	1007.21	15.6432	<.0001	976.549	1037.87
pre-COVID slope	3.756522	1.0948	0.0014	1.611	5.9
transition change	-101.546	22.658	<.0001	-145.955	-57.14
post-COVID slope change	-3.60615	1.8087	0.053	-7.151	-0.06
post-COVID slope	0.150376	1.4397	0.9168	-2.671	2.97

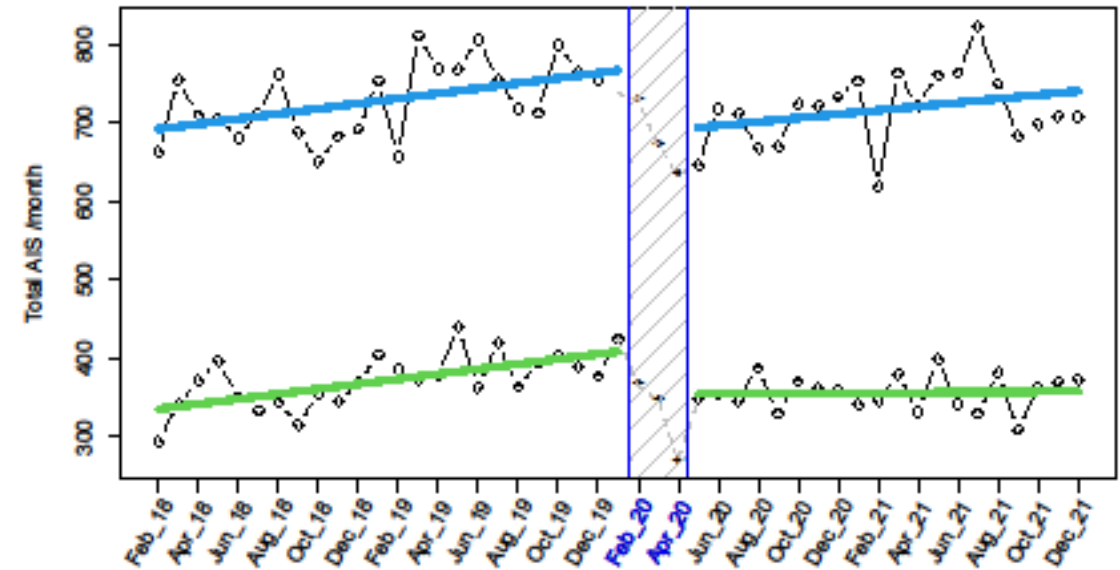
Stroke	Estimate	StdErr	prob	CI_LL	CI_UL
baseline rate	1021.598	22.5078	<.0001	977.483	1065.71
pre-COVID slope	6.422174	1.5752	0.0002	3.335	9.51
transition change	-129.593	32.6007	0.0003	-193.491	-65.7
post-COVID slope change	-3.80187	2.6024	0.1518	-8.903	1.3
post-COVID slope	2.620301	2.0715	0.2059	-1.44	6.68

AIS and MI by Minority Status

SC Myocardial Infarction



SC Acute Ischemic Stroke

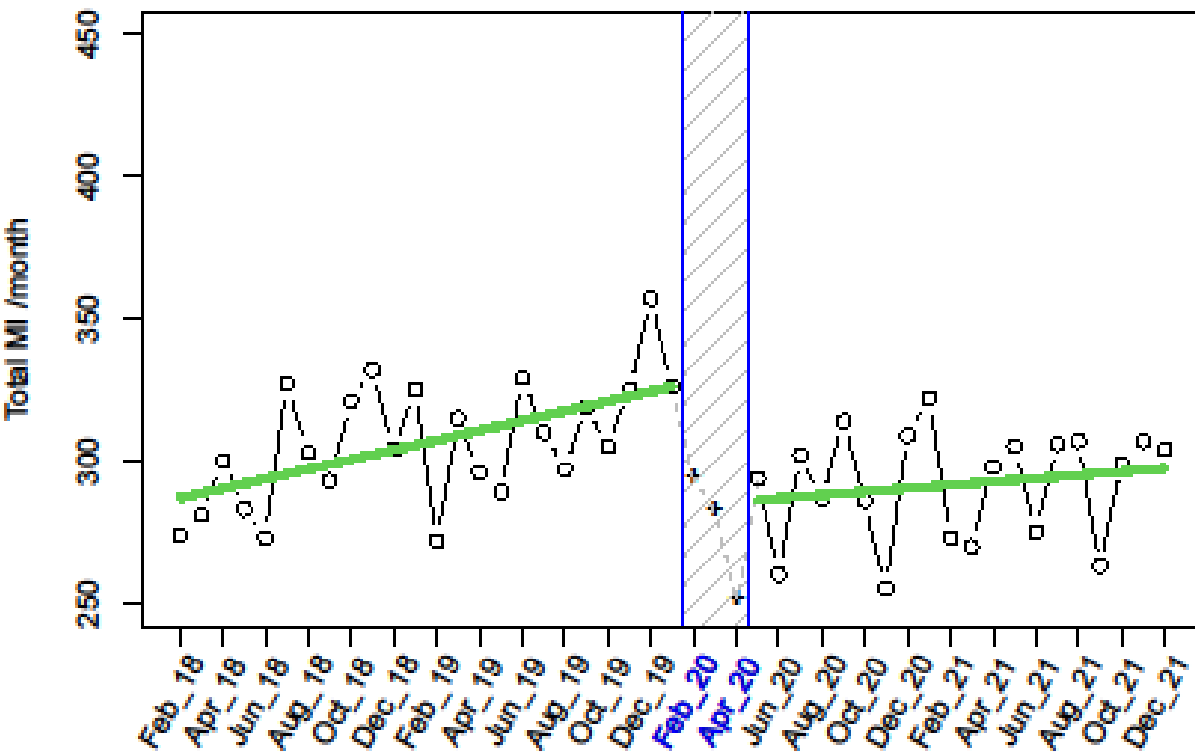


— Minority Group — Non-Minority

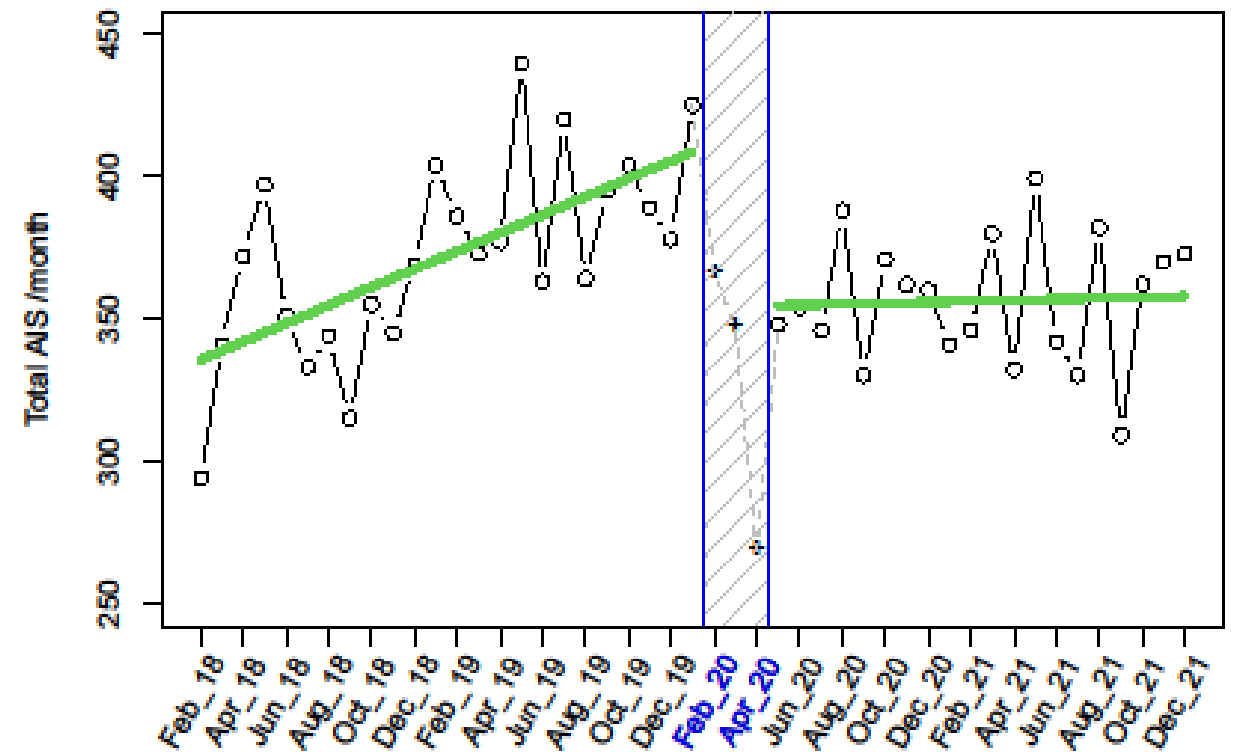
MI minority vs non-minority	Estimate	StdErr	Probt	CI_LL	CI_UL			Stroke minority vs non-minority	Estimate	StdErr	Probt	CI_LL	CI_UL
baseline rate non minority group	722.0036	10.0572	<.0001	702.292	741.716			baseline rate non minority group	689.087	15.0179	<.0001	659.652	718.522
pre-COVID slope non-minority	2.053043	0.7039	0.0046	0.673	3.433			pre-COVID slope non-minority	3.243043	1.051	0.0028	1.183	5.303
transition change non-minority	-61.0977	14.567	<.0001	-89.649	-32.546			transition change non-minority	-75.2568	21.7523	0.0009	-117.891	-32.622
post-COVID slope change non-minority	-2.48913	1.1628	0.0354	-4.768	-0.21			post-COVID slope change non-minority	-0.79192	1.7364	0.6496	-4.195	2.611
difference in baseline rate (minority-non-minority)	-436.797	14.223	<.0001	-464.674	-408.92			difference in baseline rate (minority-non-minority)	-356.576	21.2386	<.0001	-398.204	-314.948
pre-COVID slope difference (minority-non-minority)	-0.34957	0.9954	0.7264	-2.301	1.601			pre-COVID slope difference (minority-non-minority)	-0.06391	1.4864	0.9658	-2.977	2.849
transition change difference (minority-non-minority)	20.64982	20.6008	0.3192	-19.728	61.027			transition change difference (minority-non-minority)	20.92053	30.7624	0.4984	-39.374	81.215
post-COVID slope difference (minority-non-minority)	1.372122	1.6445	0.4065	-1.851	4.595			post-COVID slope difference (minority-non-minority)	-2.21804	2.4556	0.3691	-7.031	2.595

AIS and MI within Minority Groups

SC Myocardial Infarction

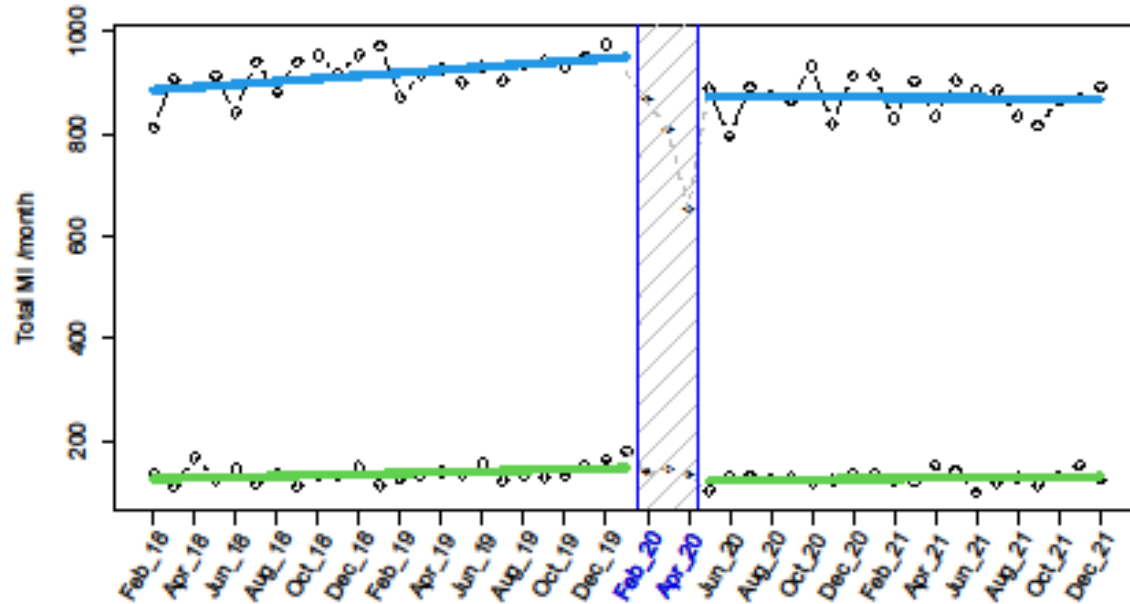


SC Acute Ischemic Stroke

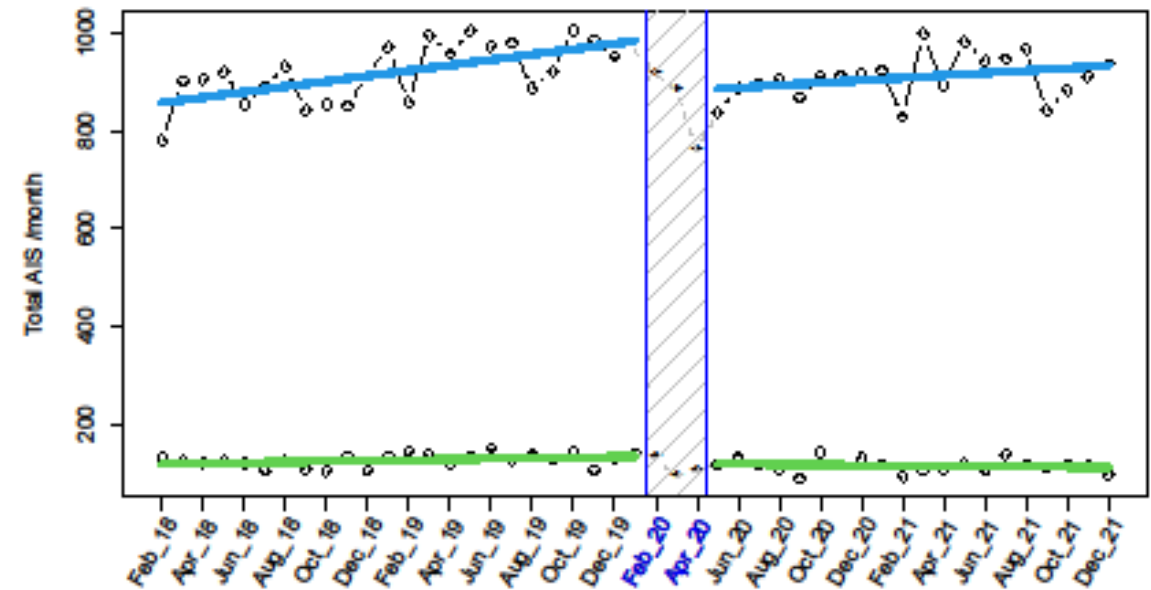


AIS and MI by Rurality

SC Myocardial Infarction



SC Acute Ischemic Stroke



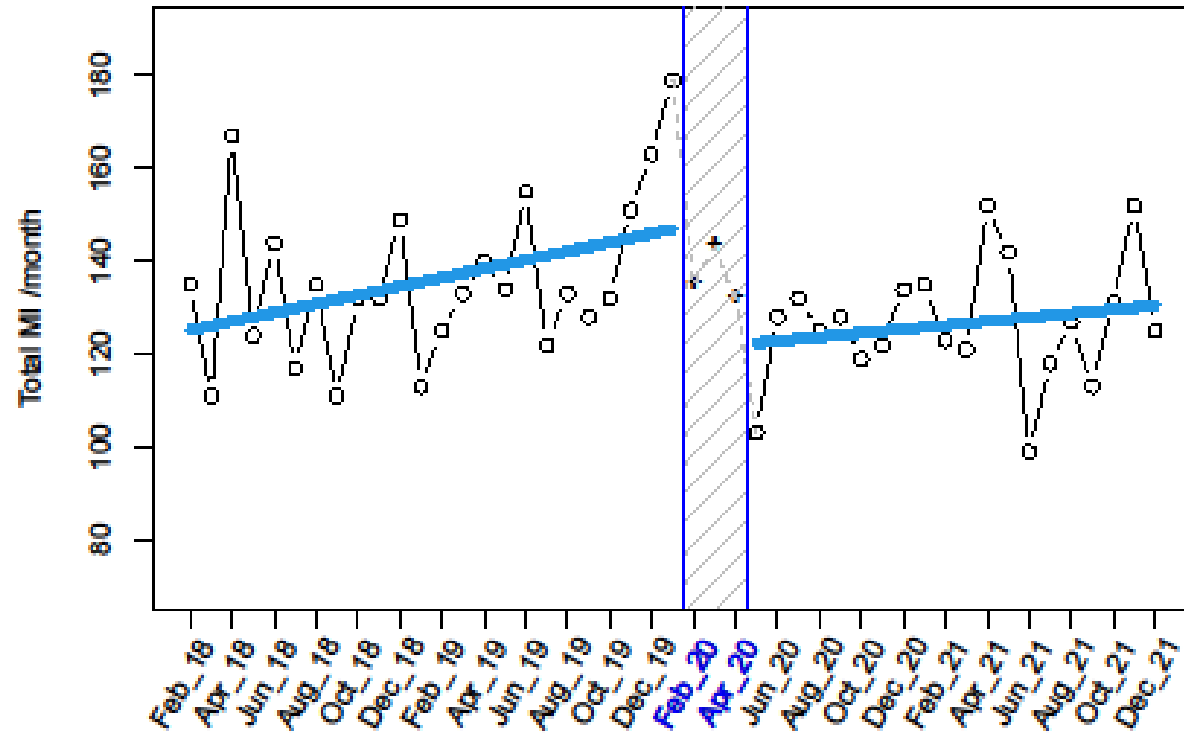
— Rural location — Urban

Rural vs Urban MI	Estimate	StdErr	Probt	CI_LL	CI_UL
baseline rate urban group	882.9891	11.6808	<.0001	860.095	905.884
pre-COVID slope urban	2.81087	0.8175	0.0009	1.209	4.413
transition change urban	-76.6342	16.9187	<.0001	-109.795	-43.474
post-COVID slope change urban	-3.0838	1.3505	0.0251	-5.731	-0.437
difference in baseline rate (rural-urban)	-758.768	16.5192	<.0001	-791.146	-726.391
pre-COVID slope difference (rural-urban)	-1.86522	1.1561	0.1106	-4.131	0.401
transition change difference (rural-urban)	51.72281	23.9267	0.0336	4.827	98.619
post-COVID slope difference (rural-urban)	2.561458	1.91	0.1837	-1.182	6.305

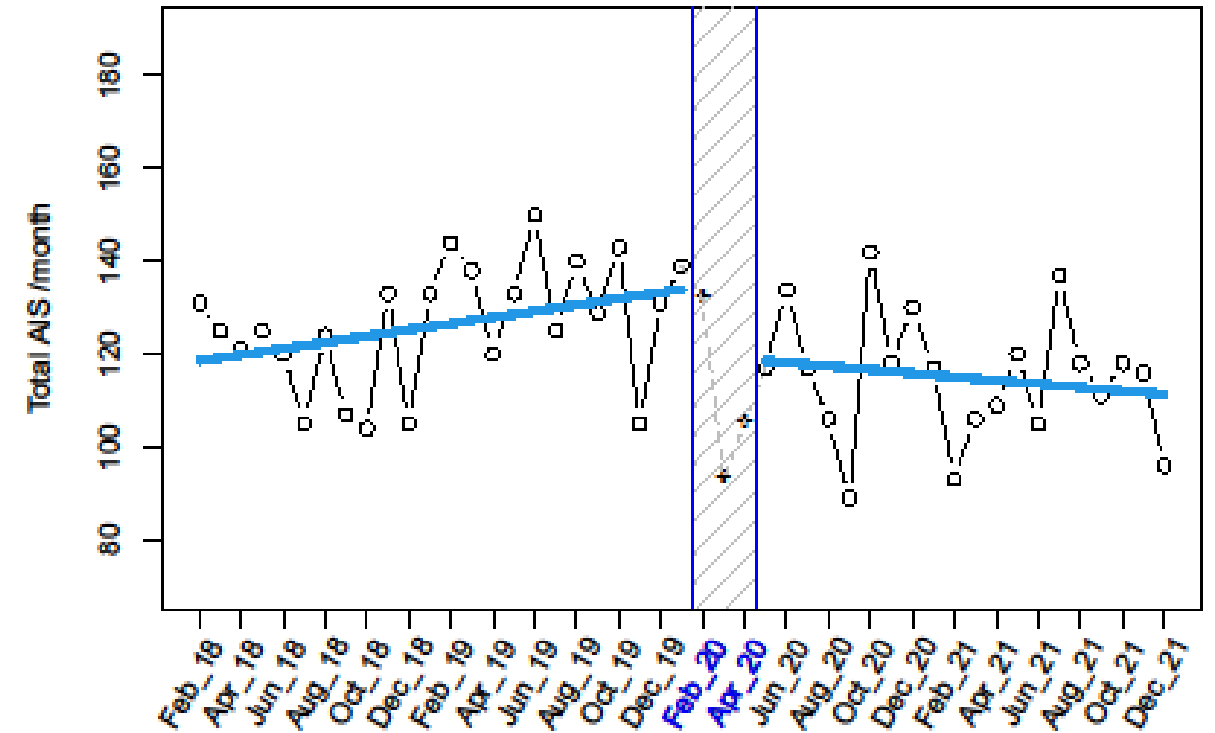
Rural vs Urban Stroke	Estimate	StdErr	Probt	CI_LL	CI_UL
baseline rate urban group	851.7428	14.2588	<.0001	823.796	879.69
pre-COVID slope urban	5.493913	0.9979	<.0001	3.538	7.45
transition change urban	-100.412	20.6527	<.0001	-140.892	-59.933
post-COVID slope change urban	-3.00669	1.6486	0.0719	-6.238	0.225
difference in baseline rate (rural-urban)	-733.906	20.1649	<.0001	-773.429	-694.383
pre-COVID slope difference (rural-urban)	-4.82087	1.4113	0.001	-7.587	-2.055
transition change difference (rural-urban)	85.34351	29.2073	0.0045	28.097	142.59
post-COVID slope difference (rural-urban)	1.955456	2.3315	0.4041	-2.614	6.525

AIS and MI within Rural Group

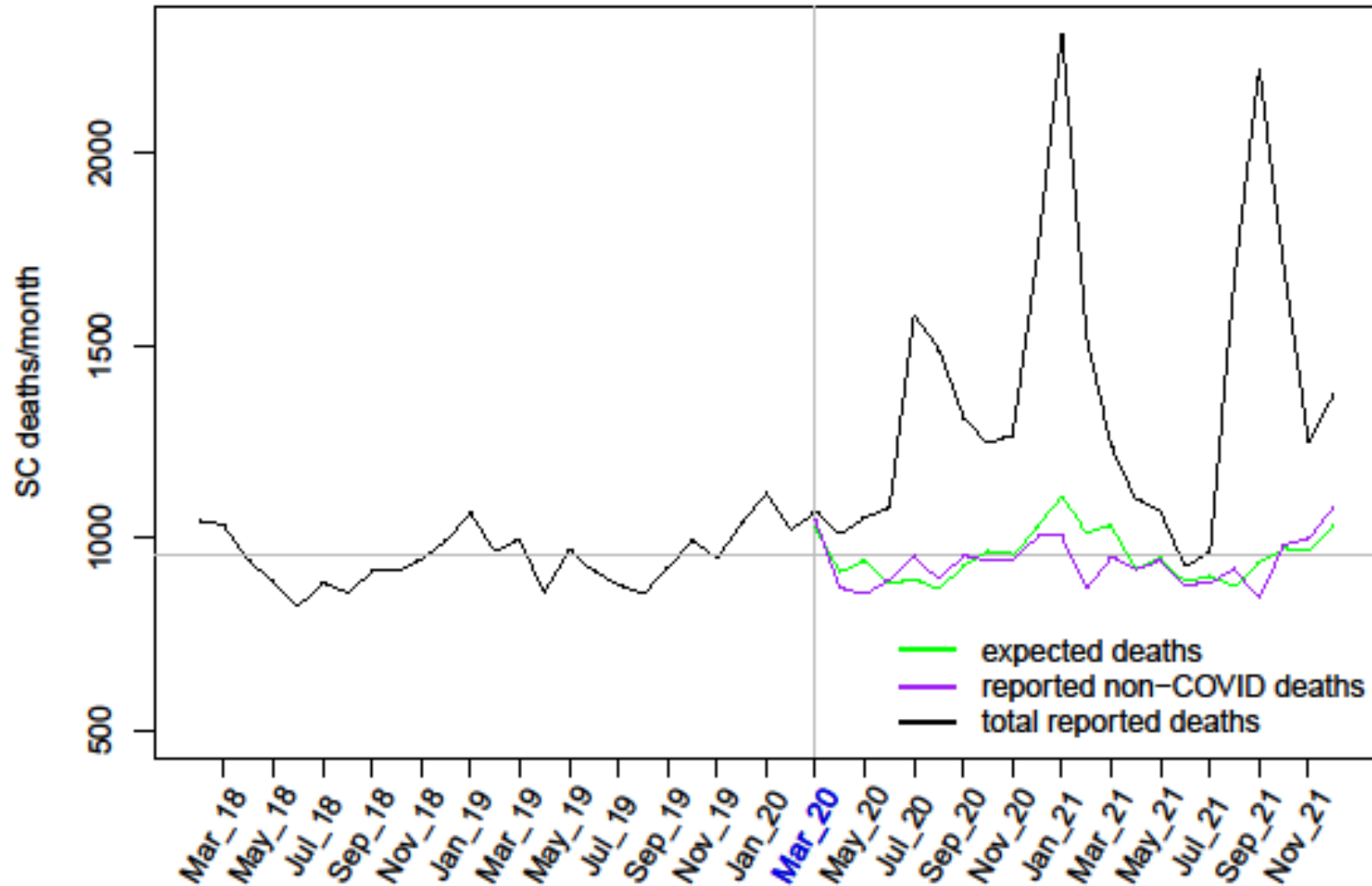
SC Myocardial Infarction



SC Acute Ischemic Stroke

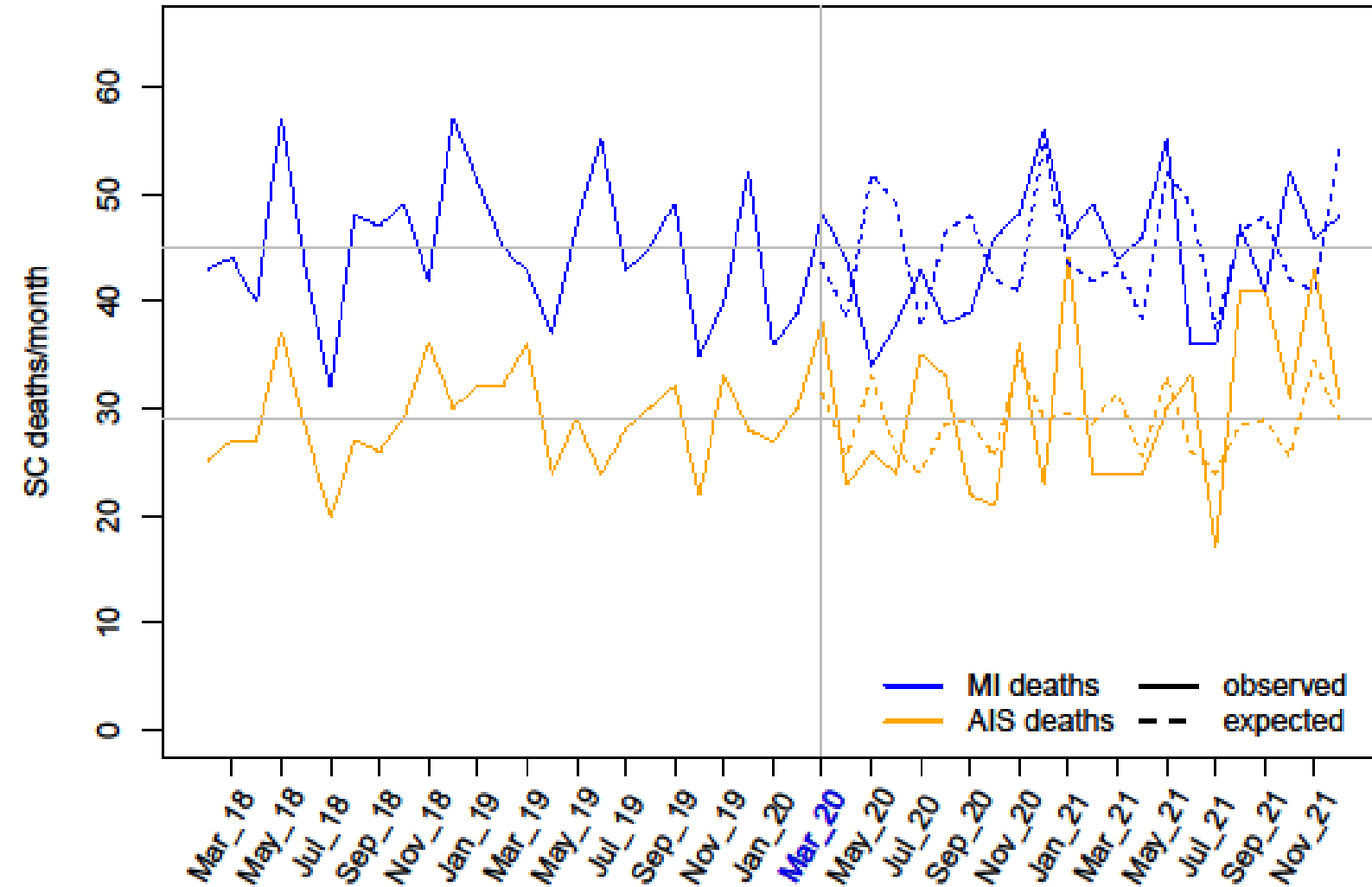


Observed vs expected deaths



- Expected deaths estimated from linear model of deaths over 26 pre-COVID months such that monthly variations were accounted for.
- Horizontal line is shown for mean deaths/month from Jan-2018 to Feb-2020.
- Expected deaths and reported non-COVID deaths are generally consistent, indicating COVID death reporting was reasonably reliable in these data
 - If non-COVID deaths had been substantially larger than expected, then COVID-related deaths would likely have been under-reported

Observed vs expected deaths MI and Stroke



- Expected AIS and MI deaths estimated from linear model over 26 pre-COVID months such that monthly variations were accounted for.
- Horizontal lines shown for mean deaths/month from Jan-2018 to Feb-2020.
- Reported vs expected deaths from MI and AIS do not appear to be substantially different

All-cause mortality Odds Ratios					
Effect	Level	Odds Ratio Estimate	95% Wald Confidence Limits		p-value
MI during COVID era	Y vs N	1.158	1.056	1.271	0.002
Race and ethnicity ref=non-Hispanic White	non-Hispanic Black	1.068	0.956	1.194	0.24
	Hispanic	0.803	0.444	1.454	0.47
	Other race and ethnici	0.942	0.738	1.202	0.63
Location	Rural vs Urban	0.733	0.665	0.807	<.0001
Sex	Female vs male	1.132	1.029	1.245	0.011
Age group	>65 vs <= 65	2.579	2.23	2.982	<.0001
Charlson Score	per additional unit	1.132	1.106	1.158	<.0001
Insurance type ref=Medicare	Medicaid	1.484	1.161	1.897	0.002
	Other insurance	1.064	0.857	1.321	0.57
	Private insurance	0.782	0.656	0.932	0.006
	Uninsured	1.387	1.12	1.717	0.003
ICU stay	Y vs N	4.007	3.636	4.416	<.0001
Intermediate ICU stay	Y vs N	0.359	0.319	0.404	<.0001

Logistic model to predict death following MI
Interactions between COVID and race/ethnicity, rurality were not significant:
i.e., these effects did not appear to differ by COVID status

Research Questions:

- Was the decrease in our observed tele-stroke use a health systems response or was it a patient response?
 - Did admissions for acute ischemic strokes change during COVID? **YES**
 - Did we observe similar changes for myocardial infarctions (MI)? **YES**
 - **The decrease was most likely a patient response because we saw the same effect across all hospitals and it was not limited to institutions served by telehealth**

Questions & Answers