ASSESSING TELEHEALTH MODALITIES & THEIR ASSOCIATION WITH HEALTH DISPARITIES AND HEALTH ACCESS

GRAD 989 Internship Presentation

Roshan John, November 2nd, 2020

Overview

Two main deliverables worked on, an introductory literature review and data analysis of a telehealth dataset for a study manuscript.

Focused on comparing the modalities of telehealth during the months of March and April 2020 with the UNC Urgent Care system

The internship spanned the months of May through July 2020

Meaningful first exposure to working in health informatics

Professional Background and Internship Goal

- Background has been outside the healthcare industry, largely in the domain of information technology
- Interplay between people, information and systems in a field that is increasingly relying on information systems and informatics initiatives
- An initial exposure to working with information and datasets in a health informatics setting
- Understand some of the needs, concerns, and priorities of working with healthcare data
- Foundational steppingstone to enter working with health information

Project Setting: Where and Who

- Setting: UNC Urgent Care 24/7 telehealth service[1]
- Data is warehoused at UNC Health
- Key direct collaborators:
  - Dr. Saif Khairat, Assistant Professor at the UNC-Chapel Hill's School of Nursing
  - Malvika Pillai, BMHI doctoral student
- Key leaders attributed to project: Barbara Edson and Robert Gianforcaro from the Virtual Care Center at UNC Health Care

Project Setting: What was tasked

Two main activities during the internship

Performing data cleaning and assisting in data analysis

Develop an introduction for the paper manuscript, based on a literature review

Project Setting: Why it matters

- The value of telehealth has been made more evident and significant in the context of the COVID-19 pandemic
- Understanding telehealth usage patterns among patients help inform telehealth initiatives to be more accessible and improve utilization

The Big Picture

- Are phone or video telehealth modalities are used more by certain types of patients, potentially along the lines of health disparities, in COVID-19 pandemic setting?
- Is there a contrast with how previous telehealth studies have examined patterns in modality usage historically?
- This kind of assessment is being initiated in other US settings during COVID-19 too:
  - Rural Appalachia and outpatient neurology[2]
  - New York City and minority patients in oncology

Three Main Questions

1. Are there differences between patients using phone and video telehealth visits:
   - Age, Gender, Health Insurance Status, Rural-Urban divide
   - Prescriptions granted
2. Are there differences in patient wait times or visit length based on telehealth modality used?
3. What do previous telehealth studies before COVID-19 conclude about patient use of phone and video modalities?

Work Produced: Data analysis

- Dataset from UNC Urgent Care spanned from March 3rd, 2020 through May 3rd, 2020 and included over 1800 unique visit data points
- Examined variables: modality used, how long the visit was, what the wait time before the visit was, as well as medication prescriptions issued
- Outcomes of interest: how modality corresponds with age, gender, health access (urban/rural), insurance status, visit wait times, visit durations, as well as if prescriptions given to patients

Work Produced: Introductory Review

For the literature review component, there were two stages of development.

Initial review focused on studies specifically comparing both phone and video telehealth modalities in patient experience and outcomes

More general review included studies individually examining one of these modalities and was incorporated into the introduction of manuscript

Appendix A:
Percentage Statistics and Chi² values for all observed Telemedicine

Telemedicine Visits	March 3, 2020 – May 3, 2020		
	Phone	Video	Total
	Visits (%)	Visits (%)	Visits (%)
Avg. number of visits per day	22.8 (SD=9.0)	6.3 (SD=3.1)	29.1 (SD=10.7)
Total virtual visits	1414 (78.4%)	389 (21.6%)	1803 (100%)
Gender			
Female	1033 (73.0%)	245 (63.0%)	1278 (70.9%)
Male	377 (26.7%)	144 (37.0%)	521 (28.9%)
Non-Binary	4 (0.3%)	0 (0.0%)	4 (0.2%)
Age			
<18	96 (6.8%)	57 (14.7%)	153 (8.5%)
18-34	579 (40.9%)	151 (38.8%)	730 (40.5%)
35-50	486 (34.4%)	123 (31.6%)	609 (33.8%)
51-64	185 (13.1%)	44 (11.3%)	229 (12.7%)
65+	68 (4.8%)	14 (3.6%)	82 (4.5%)
Health Insurance Status			
Insured	329 (23.3%)	51 (13.1%)	380 (21.1%)
Uninsured	1085 (76.7%)	338 (86.9%)	1423 (78.9%)
Health Access (excluding Out of State residence)	**N = 1370**	**N = 381**	**N = 1751**
Rural	782 (57.1%)	189 (49.6%)	971 (55.5%)
Urban	588 (42.9%)	192 (50.4%)	780 (44.5%)
Prescriptions Per Visit			
Received	980 (69.3%)	218 (56.0%)	1198 (66.4%)
Did not receive	434 (30.7%)	171 (44.0%)	605 (33.6%)

DATA ANALYSIS FINDINGS – PERCENTAGE STATISTICS

DATA ANALYSIS FINDINGS– CHI² VALUES & WELCH'S T-TEST

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Percentage Statistics and Chi² values for all observed Telemedicine Visits

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	Visits (%)	Visits (%)	Visits (%)	
Avg. number of visits per day	22.8 (SD=9.0)	6.3 (SD=3.1)	29.1 (SD=10.7)	N/A
Total virtual visits	1414 (78.4%)	389 (21.6%)	1803 (100%)	
Gender				
Female	1033 (73.0%)	245 (63.0%)	1278 (70.9%)	0.0002
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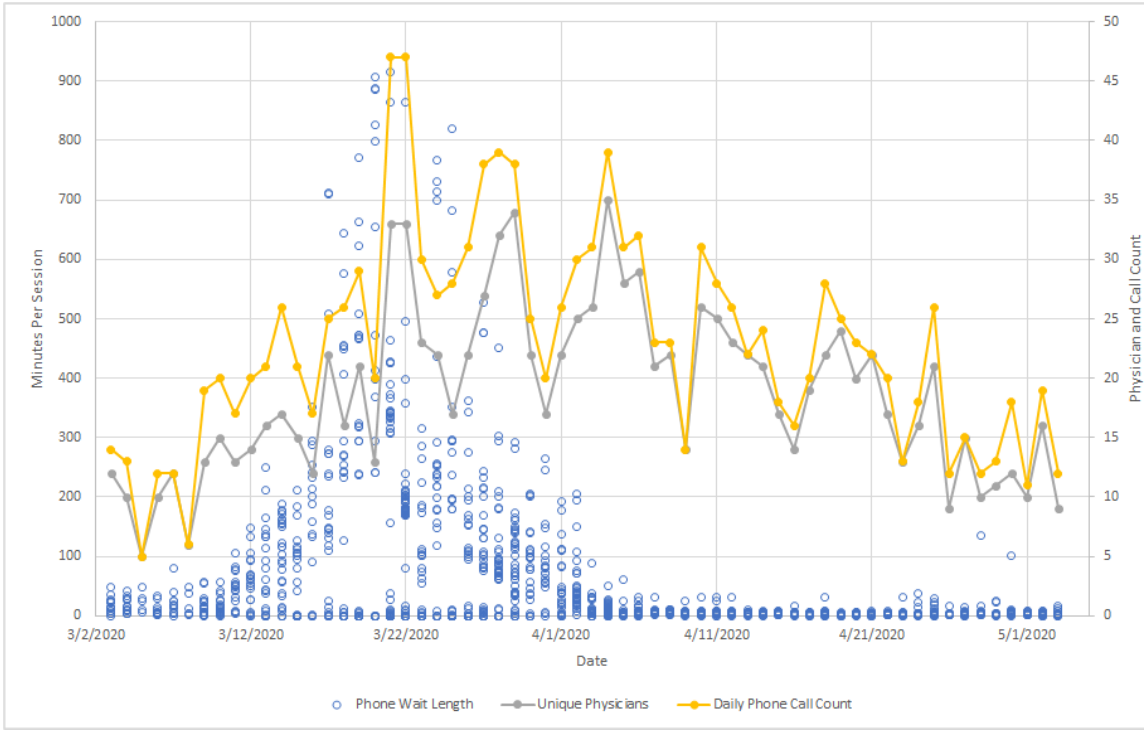
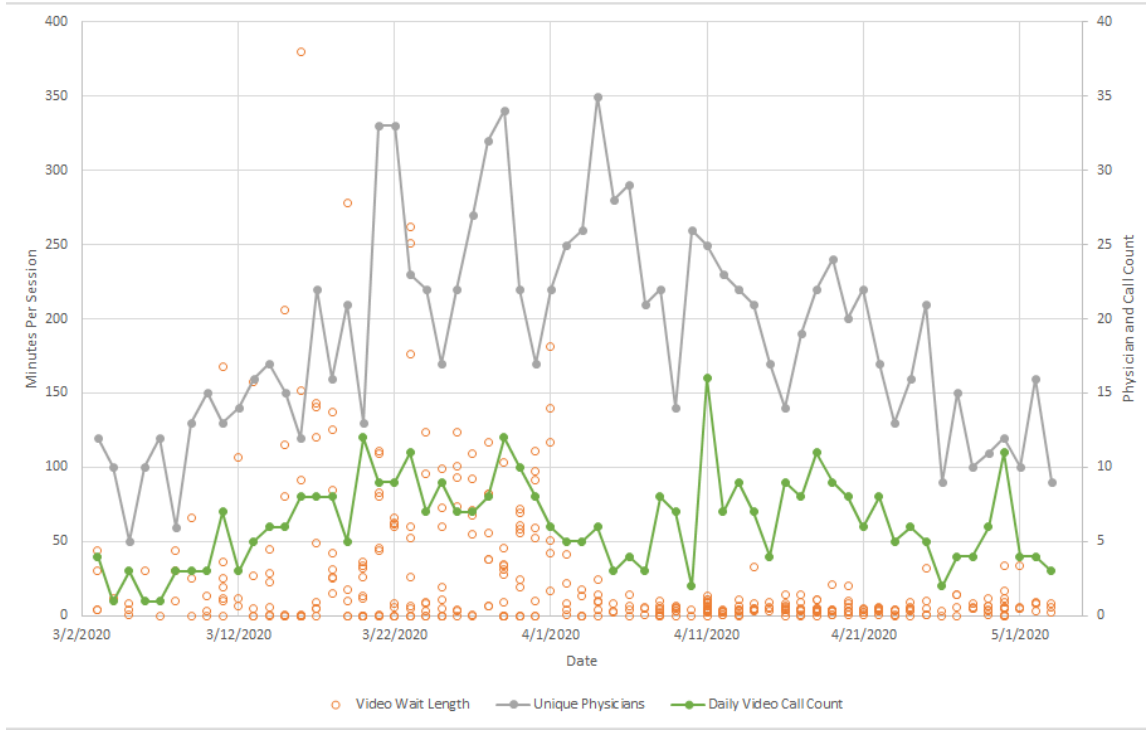
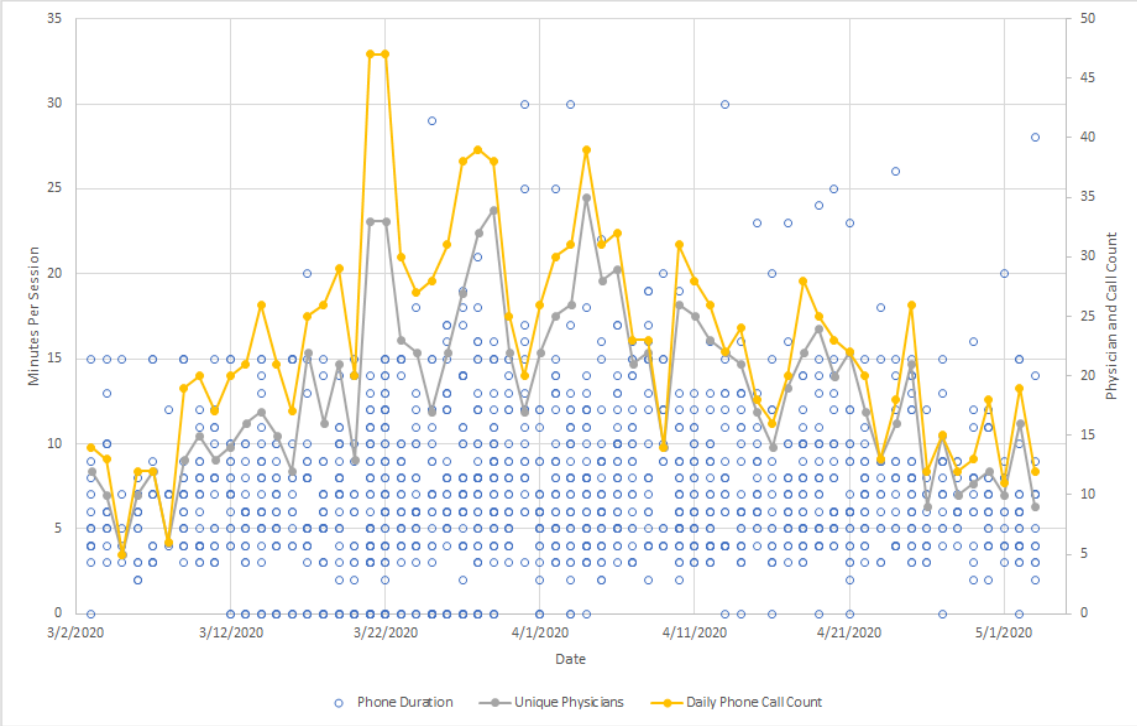
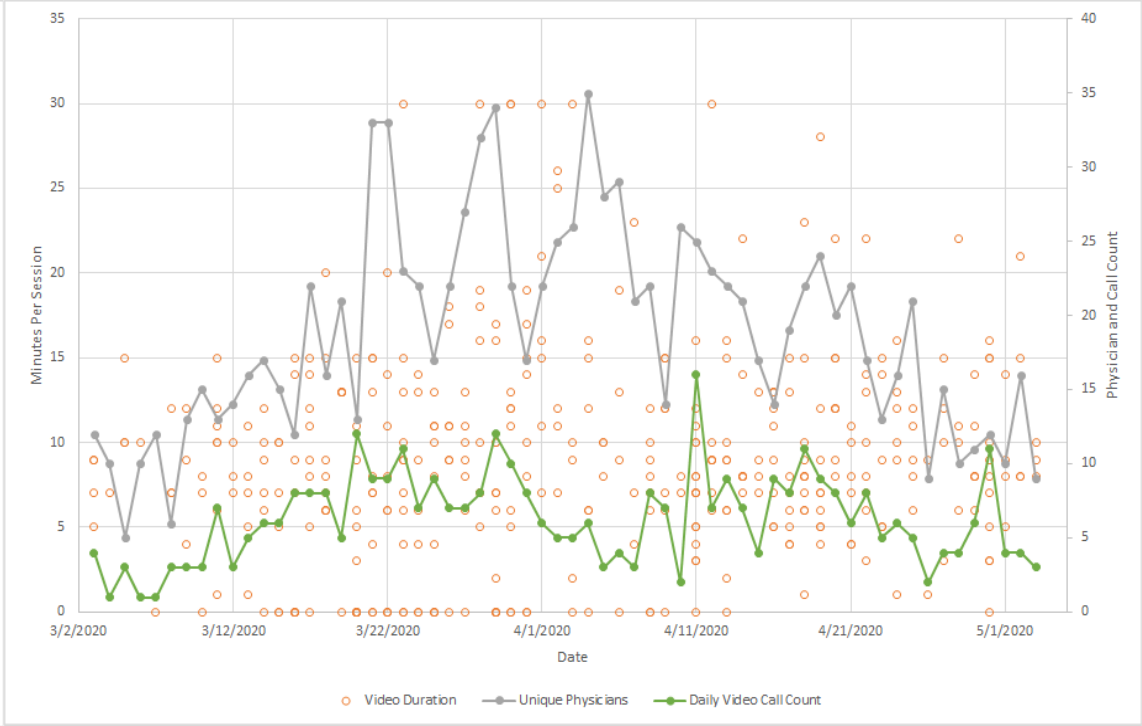
Data Analysis Findings – Wait Times
Phone (left) vs. Video (right)





Data Analysis Findings – Visit Duration Length Phone (left) vs. Video (right)





Data Analysis: Conclusions

- Male patients, patients of age <18, uninsured patients, and urban residing patients are closely associated with video utilization for telemedicine visits
- Video visits are more associated with not receiving prescriptions compared to phone visits.
- Wait Time: patients on average has a significant longer wait time for a phone visit than video.
- Visit length: video visits were on average significantly longer than phone visits.

Literature Review: Prior Studies on Telehealth Modalities

Focused on an examination of studies that directly compare both phone and video modalities in telemedicine studies prior to COVID-19

Most leaned towards finding video telehealth implementation more beneficial in improving outcomes or favorable among patients, compared to telephone

Phone medium was sometimes considered more favorable, due to its lower cost and technical complexity of implementation

Results and Findings: Contrast to Our Project

- There are some underexplored factors in existing literature on phone and video modalities, that this project's data analysis focuses on
- Limited knowledge on the comparative usage of both modalities simultaneously by patients - a serious limitation in the current context of COVID-19
- Gap in literature exists on the effectiveness of phone or video visits as it links to health access, disparities, and service outcomes
- Limited in generalizability due to selection of patients based on convenience sampling, limited/specialized scope, or strict exclusion criteria

Challenges Faced: Data Cleaning

Wrangling and the appropriate handling of raw data to make meaningful use

One example in this project was the labeling of Urban and Rural categories

Iterative process of clarifying categorization criteria based on existing definitions was helpful

Challenges Faced: Limitations of study focus

- There was not a randomization of patients
- No data capturing ethnicity or insurance type
- Possible confounding in the difference in prescription rates due to the various diagnoses that patients received

Challenges Faced – Use of Excel for analysis

Get more familiar and experiment with using programmatic tools for analysis

Excel is more laborious for data wrangling or multiple levels of stratification within a specific data category

Getting some exposure to learning how to use tools like R and Python

Challenges Faced: Working Remotely

Need for 100% remote working in a collaborative manner

Communication done either by teleconferencing, email, or online collaboration tools

Essential to communicate often and clearly

Practice and implement careful information safeguards while working with online services

Lessons Learned and Future Opportunities

- Understanding how the determinants of health can have some relation to the use of modalities of telehealth
- Increased sensitivity to the ethics and concerns that come with working with healthcare data
- Contrast how the academic research process and manuscript developing works in this context compared to deliverables or reports in previous settings
- Deeper appreciation for the possible efficiencies and capabilities of using programmatic tools
- Value of clear, effective written and verbal communication and the need to manage independent work to stay on schedule

Acknowledgements

- Dr. Saif Khairat, project sponsor
- Malvika Pillai, project collaborator
- Dr. Javed Mostafa, CHIP faculty advisor
- Mariell Ruiz, CHIP program coordinator
- Instructors and fellow students in the CHIP program

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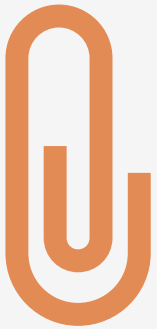
Thank You



Full Written Report & Appendix available upon request

Questions?

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