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Patient Access and Attitudes Toward Telehealth for Perinatal Care During and After the COVID-19 Pandemic in Georgia: An Exploratory Study

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ABSTRACT

Patient Access and Attitudes Toward Telehealth for Perinatal Care During and After the COVID-19 Pandemic in Georgia: An Exploratory Study

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ABSTRACT

Georgia has one of the highest maternal mortality ratios out of all the states in the United States of America. Maternal mortality is attributed to the quality of perinatal care and is exacerbated in rural populations. Literature on telehealth perinatal care access and satisfaction in Georgia is scarce, but there are even less resources applicable to pregnancy care during and after the COVID-19 pandemic. This thesis addresses gaps in knowledge on the access and attitudes of patients on their experiences with perinatal telehealth appointments, especially within different geographical locations within Georgia, U.S.A. To address this gap in knowledge, we screened 217 persons who were pregnant or gave birth during the 2020 COVID-19 pandemic in Georgia. The respondents answered 22 demographic, pregnancy care, and telehealth experience related questions. These questions were also used to ensure the respondents qualified as perinatal, whether present or past patients during the COVID-19 pandemic in Georgia to be interviewed. Then, 17 of these persons were interviewed in-depth using semi-structured mixed-method interviews. From the survey and interviews, the respondent care and residence locations were determined and analyzed. Rural patients receive more care in urban locations than rural locations. Generally, the interview respondents were both satisfied with their telehealth maternal care and willing to use telehealth appointments in the future, with no significant difference between rural and urban populations. Interview respondents reported satisfaction with their telehealth perinatal care because it reduced stressors, reduced indirect costs, and was easy to use in comparison to in-person appointments. Interview respondents also mentioned desired improvements to telehealth services including telehealth providers and locations supplying educational materials, strengthening the structuring of appointments, supplying at-home monitoring equipment, increasing visualization capacity within appointments, providing online perinatal support and education classes, and providing technology support. Based on these results, maternal care providers and perinatal legislation should account for what telehealth patients request to increase their satisfaction and access to telehealth services. However, due to the everchanging pandemic landscape, additional research is needed to further improve the understanding and suggestions of telehealth perinatal care at this scope.

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TABLE OF CONTENTS

I. INTRODUCTION **1**

1.1 Introduction and Rationale 1
1.2 Problem Statement 2
1.3 Purpose Statement 2
1.4 Research Questions 2
1.5 Significance Statement 2
1.6 Definition of Terms 3
1.7 Acronyms 5

II. LITERATURE REVIEW **6**

2.1 Maternal Mortality Overview 6
2.2 COVID-19 Background 9
2.3 Implications of COVID-19 on Pregnant Women 10
Figure 1. COVID-19 cases by date of report in Georgia (Mar-Dec 2020) 11
2.4 Georgia Maternal Inequities 11
2.5 Exacerbations in Rural Populations 13
Figure 2. Available obstetrics provider services by Primary Care Service Area (PCSA) in Georgia in 2011 ..... *15*
2.6 Telehealth Background 16

III. MATERIALS AND METHODS **18**

3.1 Introduction 18
3.2 Population, Sample, and Setting 19
3.3 Research Design and Procedures 20
3.4 Research Instruments 21
3.5 Data Analysis Plan 22
3.6 Ethical Considerations 23
3.7 Limitations and Delimitations 23

IV. RESULTS **25**

4.1 Introduction 25
4.2 Study Findings 25
4.2.1 Findings: Access to Care *26*
Figure 3. Study Respondent Residence and Care Locations in Georgia *26*
Table 1. The total number of screener respondent and care classifications for those who provided location information. *27*
4.2.2 Findings: Patient Perinatal Care Satisfaction and Willingness *27*
Table 2. The willingness of interview respondents to use telehealth in the future *28*
Table 3. The satisfaction of interview respondents with their perinatal care experience. *28*
4.2.3 Findings: Major Themes from the Qualitative Analysis *29*
Table 4. The most mentioned telehealth improvements that would make respondents more willing to use and satisfied with telehealth services for perinatal care. *31*

V. DISCUSSION AND CONCLUSIONS **33**

VI. IMPLICATIONS, RECOMMENDATIONS, AND FUTURE DIRECTIONS **36**

REFERENCES **39**

I. INTRODUCTION

1.1 Introduction and Rationale

In 2019, Georgia had the highest maternal mortality ratio out of all the states in the country (Maternal Health in Georgia, 2019). Maternal mortality is directly attributed to the quality of perinatal care available to patients. A recent study found that rural residents have a nine percent greater probability of severe maternal morbidity and mortality when compared to urban residents (Kozhimannil, Interrante, Henning-Smith, & Admon, 2019). Clinical and social determinants of health factors such as workforce shortages, patient volume, closures of facilities, and access to specialty care have been found to affect pregnant persons living in rural locations (*Improving Access to Maternal Health Care in Rural Communities*, 2019a; Jean-Francois et al., 2020; Jolles et al., 2020; Kozhimannil et al., 2019). COVID-19 disproportionately affects rural and underserved populations and create additional obstacles to quality perinatal care (Weigel, Frederiksen, & Ranji, 2020). These social determinants of health lead to greater risks of death, depression and stress, poor nutrition, substance abuse, preterm birth, and morbidities among rural residents when compared to their urban counterparts (Baudry, Gusman, Strang, Thomas, & Villarreal, 2019). Telehealth is a potential way to mitigate some of these factors that negatively affect women in rural locations of the United States (Weigel et al., 2020). Additionally, telehealth is an option to increase the quality of perinatal care in not only rural Georgia, but all of Georgia and nationally. However, a focus on telehealth satisfaction in rural Georgia addresses an especially vulnerable pregnancy care patient population.

1.2 Problem Statement

There is little literature on telehealth perinatal care in Georgia, but even less literature that is directly applicable to telehealth pregnancy care during and after the COVID-19 pandemic.

1.3 Purpose Statement

This thesis will address the gap in knowledge on access and attitudes of patients on their experiences with perinatal telehealth appointments, especially within different geographical locations within Georgia, U.S.A.

1.4 Research Questions

1. How does geography affect access of telehealth for perinatal patients in GA during and after the COVID-19 pandemic?
2. What is the perceived satisfaction of patients receiving perinatal telehealth in Georgia during the COVID-19 pandemic and does it differ based on geographic location?
3. How does willingness of perinatal patients towards telehealth differ in rural and urban GA populations during and after the COVID-19 pandemic?

1.5 Significance Statement

The interdisciplinary approach of this study is critical to a patient's experience during and after labor is affected by the telehealth services offered by various members of the healthcare workforce during the pandemic. Additionally, the study approach, including screening and in-depth interview questionnaires, can be applied to future studies. This study will provide data and information to help in the assessment of if telehealth can

improve pregnant persons' access to care and their satisfaction of care. Research findings will furthermore strengthen information on patient attitudes towards telehealth and how they differ across locations in Georgia to improve telehealth services offered by providers of perinatal care in Georgia.

1.6 Definition of Terms

Term	**Definition**
American Community Survey	The American Community Survey (ACS) "helps local officials, community leaders, and businesses understand the changes taking place in their communities. It is the premier source for detailed population and housing information about our nation."
COVID-19 Pandemic	The pandemic caused by the virus SARS-CoV-2.
Evidence-Based Practices	For the purposes of this thesis, Evidence-Based Practices refers to the ways that maternity care practices are and are recommended to be based on previous literature as well as this thesis.
Health Resources and Services Administration	The Health Resources and Services Administration (HRSA), is an agency within the U.S. Department of Health and Human Services that is the "primary federal agency for improving health care to people who are geographically isolated, economically or medically vulnerable."
Income Classification	Since July 1st, 2019, "low-income economies are defined as those with a GNI per capita, calculated using the World Bank Atlas method, of $1,025 or less in 2018; lower middle-income economies are those with a GNI per capita between $1,026 and $3,995; upper middle-income economies are those between $3,996 and $12,375; high-income economies are those with a GNI per capita of $12,376 or more" (Prydz & Wadhwa, 2019).
Maternal Death	A "maternal death" is the death of a woman while pregnant or within one year of the end of pregnancy ("Maternal Mortality Prevention – Healthy Start EPIC Center"). Maternal death is considered in this document as pregnancy-associated and pregnancy-related. "Pregnancy-associated are deaths due to a cause unrelated to pregnancy, and pregnancy-related deaths are deaths due to any cause related to or aggravated by pregnancy and maternity care" ("House of Representatives Study Committee on Maternal Mortality").

Maternal Mortality Ratio	The maternal mortality ratio, also known as the maternal mortality rate, is the number of maternal deaths per 100,000 live births. This ratio is often compared internationally and used as an indicator of the development and quality of health care of a nation (Reducing US Maternal Mortality as a Human Right, 2011).
Perinatal, pregnancy care, peripartum, maternal continuum, or maternity care	For the purposes of this paper, these terms refer to the care someone bearing a fetus receives in the months before, during, and after giving birth.
Pregnancy care providers or maternity care providers	For the purposes of this paper, Pregnancy or maternity care providers refers to Obstetricians and Gynecologists, Certified Nurse Midwives, and General Practitioners and Nurse Practitioners that provide maternity care and deliver babies.
Quality Improvement Initiatives	The Center for Medicaid and CHIP Services (CMCS) Quality Improvement (QI) Program allows "state Medicaid and CHIP agencies and their quality improvement partners with the information, tools, and expert support they need to improve care and health outcomes, as demonstrated by performance on Medicaid and CHIP Child and Adult Core Set measures". One important area of focus is the Maternal and Infant Health Initiative.
Social Determinants of Health	The context in which people exist including their environment and social conditions in which they live all aspects of their lives.
Telehealth	The delivery of health in the form of care, information, support, and education health education using remote technologies. It is often used interchangeably with telemedicine but is a broader term that involves more than the medicine aspect of telemedicine including health administration and education.
Telemedicine	The use of medical information exchange using electronic communication to improve a patient's clinical health.
World Health Organization	The purpose of the World Health Organization is to "direct international health within the United Nations' system and to lead partners in global health responses.”

1.7 Acronyms

Acronym	**Full Title**
ACOG	The American College of Obstetricians and Gynecologists
ACS	American Community Survey
AIM	Alliance for Innovation in Maternal Health
CDC	Center for Disease Control
CDS	Clinical Decision Support
CNM	Certified Nurse Midwife
COVID-19	coronavirus disease 2019
CVIOG	Carl Vinson Institute of Government (University of Georgia)
DPH	Department of Public Health
EBP	Evidence-Based Practices
EHRs	Electronic Health Records
GP	General Practitioner
health IT	health Information Technology
HHS	The U.S. Department of Health and Human Services
HRSA	Health Resources and Services Administration
IPC	Infection Prevention and Control
MMM	Maternal Morbidity and Mortality
NP	Nurse Practitioner
OBGYN	Obstetrician-Gynecologist
PCSA	Primary Care Service Area
QI	Quality Improvement
RDC	House Rural Development Council
SDoH	Social Determinants of Health
WHO	World Health Organization

II. LITERATURE REVIEW

2.1 Maternal Mortality Overview

The United States spends more on pregnancy care than any other country, but is the only country considered “wealthy” in which maternal mortality has increased in the past 25 years, especially in minorities including African Americans and American Indians (Morton & Simkin, 2019). Maternal morbidity and mortality (MMM) is considered a main indicator for the health, development, and quality of health care of a nation and subsequently the states within these nations (Reducing US Maternal Mortality as a Human Right, 2011). Pregnant people within the United States have many options for birth settings and providers of pregnancy care, but laws, policies and financing options restrict these choices. State laws and regulations vary widely in providing insurance coverage, what providers and settings can legally provide pregnancy care, licensing of providers, scope of provider practice, and regulations on Medicaid eligibility and coverage (National Academies of Sciences, Engineering, & Medicine, 2020). Maternal care across the United States is unevenly available, with some pregnant persons, disproportionately minorities, without suitable access to providers and resources (National Academies of Sciences, Engineering, & Medicine, 2020).

Medical costs in the United States are extremely high and so insurance is an important part of determining maternal health access. Countries considered “high income” by World Development Indicators tend to have higher average health spending, however, the United States spends more per person on health care and related expenses than other high-income countries (Prydz & Wadhwa, 2019; Rabah Kamal, Giorlando Ramirez, & Cox, 2020). The United States spends 42% more per person for health than the next

highest per capita in health spending country, Switzerland (Rabah Kamal et al., 2020). Furthermore, insurance costs and poverty rates are extremely high in rural populations making it difficult for rural populations to cover insurance costs (Baudry et al., 2019). Georgia has the second highest uninsured rate in the United States out of all fifty states (Baudry et al., 2019). Poverty is higher in rural Georgia than in the rest of Georgia as well as the rest of the country ("Georgia," 2021; "Rural Health State Guide Georgia," 2021).

In 2019, over 1,000 U.S. women participated in a survey for ages 18-50 who had given birth recently and nearly 20% of respondents "felt neglected at some point during their birth experience." Women in this study also reported problems with staff competence and performance, neglect, communication problems, lack of respect for women's desires, perceived discrimination, and pregnancy complication (Diaz-Tello, 2016). However, there is little research on the differences in rural and urban perinatal quality care, especially specifically regarding telehealth satisfaction. More than one in five adult women in the United States live in a rural county which makes the rural health disparity an especially pressing issue (Jolles et al., 2020). Poor maternal health outcomes in the United States are still more prevalent in rural women of color even after controlling for poverty, education and unemployment, so maternal health disparities need to be further researched (Baudry et al., 2019).

At the end of 2017, the Department of Public Health joined the Alliance for Innovation on Maternal Health (AIM) which is a national quality improvement program that provides hospitals with free resources and consultations to advance obstetrics care (Baudry et al., 2019; Boockholdt et al., 2019; Peterson et al., 2019). However, AIM does

not include specific telehealth bundles nor an emphasis on integrating telehealth with different aspects of maternal care within the AIM bundles to date. Then, at the end of 2020, the U.S. Department of Health and Human Services (HHS) announced a Maternal Health Initiative, which is a crucial step in improving peripartum care and decreasing MMM throughout the nation (Chappel et al., 2020). The initiative provides block grants for states to "Expand [the] use of telehealth programs for e-Care and remote monitoring of chronic conditions" (Chappel et al., 2020). The initiative does little to directly address and provide actionable steps for telehealth and perinatal care, so the effectiveness of this new initiative needs to be evaluated. On the other hand, it is a step in the right direction for the Maternal Health Initiative to dedicate funds to the use of telehealth and underlines the importance of understanding access and satisfaction with telehealth to understand the potential effectiveness of these block grants and initiatives.

Maternal care inequities persist in the United States, in part, because of structural and institutional sexism and racism (Morton & Simkin 2019). The United States health system has done little to address quality care improvements to achieve the global goals of the United Nations' Millennium Development Goals that expired in 2015, as well as the Sustainable Development Goals which focus on global health interventions, especially reduction in maternal mortality (Miller & Lalonde 2015).

In response to increasing evidence of preventable unsatisfactory pregnancy care around the world, leading health organizations, such as the World Health Organization (WHO), White Ribbon Alliance, and United Nations Population Fund created the Maternity Care Charter: the universal right to childbearing (Miller & Lalonde 2015). In addition, the International Federation of Gynecology and Obstetrics (FIGO), created the Guidelines for

Mother- Baby Friendly Birth Facilities. Both are international guidelines that “women’s basic rights, including respect for women’s autonomy, dignity, feelings, choices, and preferences” should be upheld by all health care providers (Miller & Lalonde 2015). However, many of these guidelines are not specific enough nor mention telehealth or directly oppose the Infection and Prevention Control (IPC) protocols suggested during the COVID-19 pandemic.

2.2 COVID-19 Background

The COVID-19 pandemic is a public health emergency that exacerbates current inequities in obstetrics care across the United States that already exist in socially vulnerable groups. COVID-19 is an acute infectious respiratory disease caused by a coronavirus that is little known ("Coronavirus disease 2019 (COVID-19) - Symptoms, diagnosis and treatment," 2020). The disease has spread around the world rapidly since December 2019, when the World Health Organization (WHO) was informed of an unknown microbe causing pneumonia in Wuhan City, Hubei Province, China later announced to be a novel coronavirus ("Coronavirus disease 2019 (COVID-19) - Symptoms, diagnosis and treatment," 2020). Coronavirus is a global pandemic with over 80 million cases worldwide and the highest number of cases at close to 20 million and deaths at over 300 thousand in the United States of America (Chappel et al., 2020).

Beginning in March 2019, many hospitals and birthing centers in Georgia started implementing telehealth policies with the worsening Coronavirus disease 2019 (COVID-19) pandemic risks within Georgia. The CDC and medical professional organizations recommended the use of telehealth amidst the pandemic (Chappel et al., 2020; Fryer, Delgado, Foti, Reid, & Marshall, 2020; Perrine et al., 2020).

2.3 Implications of COVID-19 on Pregnant Women

Inequities for socially vulnerable groups during the COVID-19 pandemic include higher prevalence of chronic conditions, limitations to following safety precautions (i.e. difficulty in practicing physical distancing), as well as a decreased access to medical care and insurance (Bhandari & Dangal, 2020; Fryer et al., 2020; Onwuzurike, Meadows, & Nour, 2020). Several reasons vulnerable groups cannot take as many pandemic physical distance precautions include but are not limited to reliance on public transportation, not being able to take time off from caretaking, and jobs that cannot be made remote (Fryer et al., 2020).

COVID-19 does not seem to present a major risk of vertical transmission because it has only been found intrauterine or transplacental in 3.2% of pregnant persons checked ("Coronavirus disease 2019 (COVID-19) - Symptoms, diagnosis and treatment," 2020). The rate of vertical transmission has not been found to occur more with vaginal birth, breastfeeding, or from physical contact with a mother ("Coronavirus disease 2019 (COVID-19) - Symptoms, diagnosis and treatment," 2020). A study found that no neonates tested positive for COVID-19 at 7 days or 14 days when rooming with and breastfed from COVID-19 positive mothers ("Coronavirus disease 2019 (COVID-19) - Symptoms, diagnosis and treatment," 2020).

However, pregnant persons are considered a vulnerable population for COVID-19 and long-term effects of the virus on mothers and fetuses are unknown (Fryer et al., 2020). Pregnant persons are already considered a vulnerable population for infections and the current pandemic intensifies the vulnerabilities and barriers to care women face

("Coronavirus disease 2019 (COVID-19) - Symptoms, diagnosis and treatment," 2020; Fryer et al., 2020).

Nationally, an integrated telehealth program was the recommended prevention control strategy to maintain access to many types of health care during the COVID-19 pandemic ("COVID-19: AMA's recent and ongoing advocacy efforts," 2021; "Using Telehealth Services," 2020). Many hospitals around the country and in Georgia have been implementing practices to attempt to balance both evidence-based maternity care and COVID-19 IPC starting in early to mid-2020 (Perrine et al., 2020). Many areas of the country, especially Georgia experienced case numbers increasing during the spring of 2020 and reaching daily rates of thousands of confirmed cases throughout the summer (*Maternal Health in Georgia*, 2019).

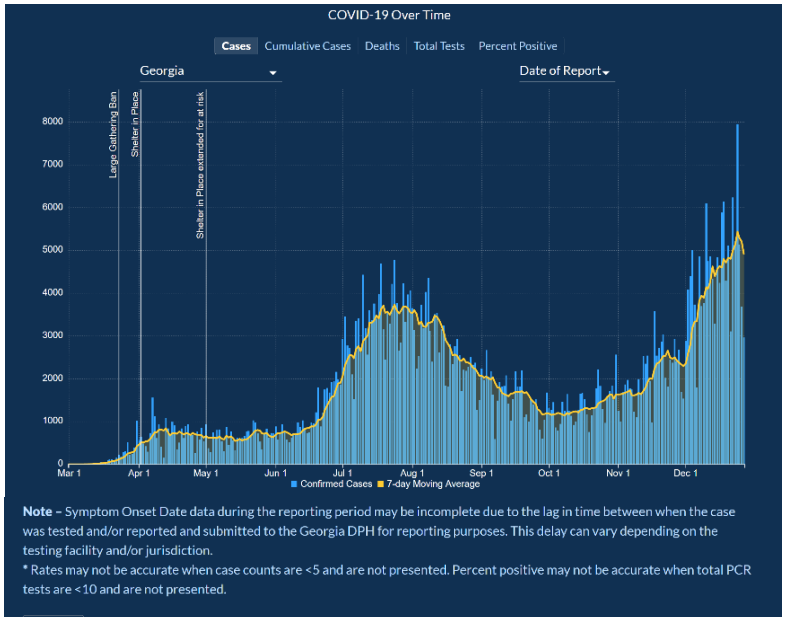

Figure 1. COVID-19 Cases by Date of Report in Georgia (March-December 2020) (Jean-Francois et al., 2020)

2.4 Georgia Maternal Inequities

Georgia has among the highest maternal mortality rate in the United States, typically ranking first as the highest maternal mortality rate in the country, but currently ranking second. The MMR of Georgia is over double the national average at a rate of 66.3 deaths per 100,000 births. The Georgia Maternal Mortality Review Committee (MMRC) found

that 60% of these deaths are preventable (Boockholdt et al., 2019). Stark disparities in maternal health outcomes exist within Georgia between different racial and geographical demographic groups (Boockholdt et al., 2019; Maternal Health in Georgia, 2019; Salgado, Peart, & Akbarali, 2018).

In Georgia, the four main options for women of reproductive age for insurance are employer plans, military, private purchase plans, or government-sponsored plans (Baudry et al., 2019). The Georgia FY (Fiscal Year) 2019 budget included $500,000 to increase sustainability of Evidence-based practices (EBP) that increases Medicaid reimbursement for prenatal care service to improve prenatal care (Peterson et al., 2019). The DPH can designate the level of maternal health care provided at hospitals that provide birthing services in Georgia to help enhance perinatal care (Peterson et al., 2019). Additionally, the Fiscal 2020 budget gives additional funding to the MMRC to help reduce the MMR (Peterson et al., 2019). However, it is important to understand how pregnant persons in Georgia perceive their perinatal care to continue to enhance it in Georgia.

AIM bundles have been implemented in Georgia starting in 2017 when the state was funded by the CDC (Boockholdt et al., 2019). For example, the Georgia

Perinatal Quality Collaborative (GaPQC) in partnership with DPH to implement EBP perinatal care (Boockholdt et al., 2019). The Georgia General Assembly provided funding to the GaPQC to implement the Rural Hospital Initiative to help rural hospitals implement the AIM bundles (Boockholdt et al., 2019). Additionally, there are university and provider-based programs working to improve pregnancy care, however these are not uniform in improving across Georgia (Baudry et al., 2019; Boockholdt et al., 2019).

2.5 Exacerbations in Rural Populations

In Georgia, counties are considered rural if they have a county population of less than 50,000 or are designated rural based on the military installation exclusion clause (O.C.G.A. § 31-7-94.1(c)(2) according to the Carl Vinson Institute of Georgia University of Georgia (CVIOG) indicators prepared for the House Rural Development Council (RDC). Based off the 2010 US census, and with more recent updates according to the Georgia House Rural Development Committee (RDC), out of 159 counties, 124 are considered rural, which is nearly 78% of the counties in Georgia (Boockholdt et al., 2019; Salgado et al., 2018). The high rate of rural counties in Georgia negatively affects perinatal care due to a variety of factors.

Of these rural counties, 93 do not have a hospital with a labor and delivery unit (Salgado et al., 2018; Spelke et al., 2016). Moreover, 70 out of the 159 Georgia counties do not have any maternal health provider in the respective counties (Boockholdt et al., 2019). There are 100 rural health clinics and 45 rural short-term hospitals within Georgia as of January 2021, but this is lacking when Georgia covers such a large geographical area. Additionally, these health clinics and hospitals do not all have birthing centers, nor all provide perinatal support, so rural Georgians seeking perinatal care may have to look elsewhere. Women who reside in areas with no maternity care providers have more limited or nonexistent use of perinatal care (*Improving Access to Maternal Health Care in Rural Communities*, 2019b).

Georgia has poor social determinants of health that are important when considering the access to care rural persons have. Within Georgia, over 13% of residence are below the poverty line. Based on 2019 ACS data, the poverty rate in rural Georgia is 19.4%, which

is must higher than the 12.4% in urban locations of the state ("Rural Health State Guide Georgia," 2021; "United States Census Bureau Georgia QuickFacts," 2019). Additionally, the unemployment rate, although lower than for the total country rate, is slightly higher in rural Georgia at 3.8% when compared to urban Georgia at 3.4% ("Rural Health State Guide Georgia," 2021; "United States Census Bureau Georgia QuickFacts," 2019).

Many barriers to access are compounded in rural populations, such as travel costs, losing income from time off work, and dependence on caregivers for childcare or to provide time and transportation (Baudry et al., 2019; Orlando, Beard, & Kumar, 2019). Therefore, the lack of perinatal care locations and additional barriers rural populations face have a negative impact on perinatal care (Baudry et al., 2019; Orlando et al., 2019; Salgado et al., 2018). With a shortage of providers and changing of pregnancy care location availability, the pandemic has made access to pregnancy care even more difficult for rural populations (Fryer et al., 2020).

In the United States overall, all races of women with rural residence have a maternal mortality rate double the rate for urban woman, and even within rural women, black women have double the risk of dying in childbirth compared to white women. Risks for MMR are unevenly distributed, with the highest risks being for black women, low-income individuals, and rural residents (Boockholdt et al., 2019; Kozhimannil et al., 2019). Vulnerable groups are placed under additional adversity; this includes people from low socioeconomic backgrounds, indigenous communities, people with disabilities, and people with several co-morbidities (Orlando et al., 2019). Rural populations are more likely to have multiple co-morbidities than their urban counterparts (Kozhimannil et al.,

2019; Meyer et al., 2016). Nearly a third of the Georgia population is African American and Georgia has the fifth highest state poverty rate in the nation and these factors can compound the effect of poor perinatal health on the rural population of Georgia (Boockholdt et al., 2019).

In Georgia, most rural births, at 70%, occur outside of the county the mother resides in. Georgians drive an average of 45 minutes to access perinatal care. Additionally, even though Georgia has over 50,000 square miles, the only two birth centers in the entire state are in the major urban locations of Savannah and Atlanta (Baudry et al., 2019; Jolles et al., 2020). There are low rates of pregnancy care settings within Georgia, as shown to the right in *Figure 2*, with locations with at-risk, deficit, and inadequate OB services in progressively darker green, especially among more rural locations (Jolles et al., 2020; Spelke et al., 2016). These obstacles to quality perinatal care are exacerbated by COVID-19 hospital closures, the reduction of public transportation, and stay at home orders which are often unpredictable and can have affect pregnancy outcomes (Boockholdt et al., 2019;

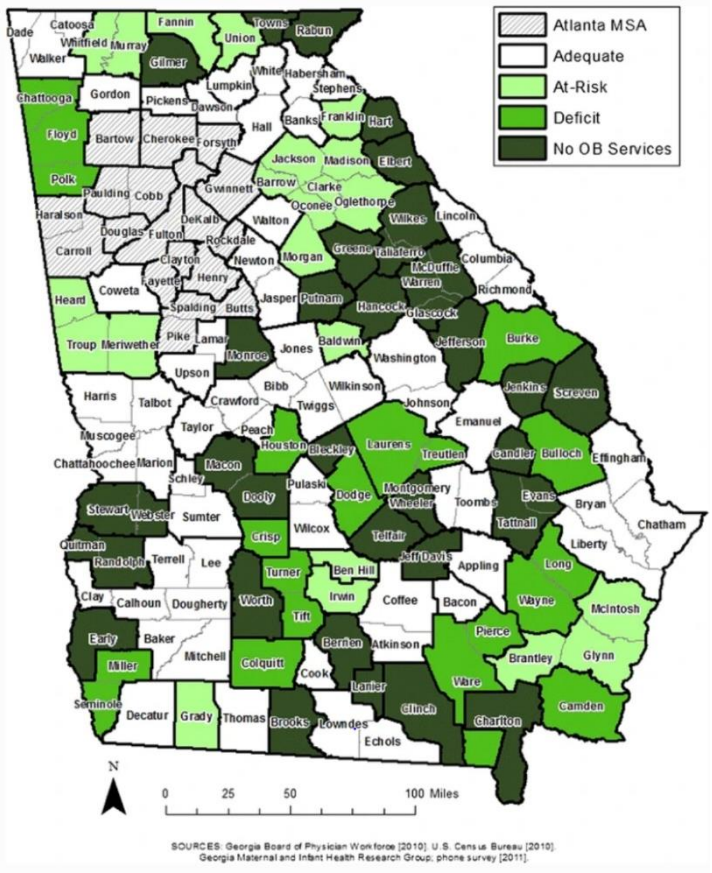

Figure 2. Available obstetrics provider services by Primary Care Service Area (PCSA) in Georgia in 2011. Darker choropleth represents a lack of OB services (Spelke, Zertuche, & Rochat, 2016)

"COVID-19: AMA's recent and ongoing advocacy efforts," 2021; Fryer et al., 2020; Ukoha et al., 2021).

2.6 Telehealth Background

Over 20 years ago, Georgia started to increase telehealth within the state to decrease the high rates of MMM in the state (Salgado et al., 2018). The Georgia Department of Public Health's Office of Telehealth and Telemedicine has worked with counties to create a telehealth system integrated into all the counties in the state health departments to successfully implement a telehealth network in all 159 counties in the state (Salgado et al., 2018). Telehealth and telemedicine programs were made to improve access to pregnancy care statewide and reduce health disparities throughout the state (Salgado et al., 2018). GDPH's telehealth efforts have helped increase access to care, decreased in-clinic waits, decreased online wait times, decreased the number of missed appointments, decreased transportation barriers, and decreased some healthcare costs for perinatal patients in Georgia (Salgado et al., 2018). As GDPH expands its telehealth network with more services and sites it is important to know what pregnant persons in Georgia think about current perinatal telehealth services as well as how they can be improved based on the attitudes of these persons (Salgado et al., 2018)

Americans that live in rural and remote areas travel longer distances on average to access healthcare than their urban counterparts. Telehealth has been integrated into maternity care healthcare models to improve access of people in rural locations, however it can be implemented more widespread within rural communities of Georgia (Orlando et al., 2019). Research has illustrated that most rural women will continue to give birth in rural areas, so understanding their perceptions of telehealth can help bolster how telehealth can

be used to supplement rural perinatal care and impact their indirect costs to accessing care (Jolles et al., 2020).

The American College of Obstetricians and Gynecologists (ACOG) has endorsed the use of telehealth to improve MMR as well as address disparities in maternal health care (Boockholdt et al., 2019; Weigel et al., 2020). Telehealth has been used to offer services such as monitoring for pregnancy-related conditions at-home, video consultations with specialists, and increasing communications with the patients' providers (Weigel et al., 2020). Telehealth helps equalize inequities in health services offered across a state and even within individual counties (Orlando et al., 2019; Weigel et al., 2020). However, technological systems must be in place within a state to allow effective telehealth communication between healthcare locations and between patients and providers (Fryer et al., 2020; Orlando et al., 2019).

In 2019, Orlando, Beard, and Kumar conducted a systematic search of six databases for studies on telehealth satisfaction. The analyses of 36 studies completed in seven countries found that telehealth is overall a positive experience for patients (Orlando et al., 2019). Previous studies and systematic reviews by Kruse in 2017 and Hilgart in 2012 have found patient satisfaction with telehealth stemming from information provided, communication, avoidance of travel, low cost, and increase in access to preference in providers and other services (Kruse et al., 2017; Orlando et al., 2019). Satisfaction is an important aspect of quality perinatal care and is associated with improved patient relationships with providers and care outcomes (Fryer et al., 2020; Orlando et al., 2019). Even so, there is a need to understand willingness and attitudes towards telehealth at a more local level in Georgia

during the context of a major pandemic that has quickly affected the implementation of perinatal care and the utilization of telehealth.

In June of 2020, a few months into the COVID-19 pandemic, Fryer, et al. published an article on the impact COVID-19 has on the prenatal framework and the need for a transition to telehealth. Fryer, et al. found satisfaction of prenatal care telehealth services from previous studies, but the article focus was a study in Florida and previous studies outside of the context of the COVID-19 pandemic and without an emphasis on the satisfaction and attitudes of patients (Fryer et al., 2020). However, the study does highlight the fact that prenatal care models do need to be updated for the current context and future as well as applied to the most at-risk patients (Fryer et al., 2020). Better understanding of patient attitudes and satisfaction in Georgia can be applied to the context within Georgia and improve prenatal telehealth interventions to be specific to the needs of the population receiving perinatal care during a pandemic and beyond.

III. MATERIALS AND METHODS

3.1 Introduction

To address the gap in knowledge on patient attitudes on their experiences with perinatal telehealth appointments, data was collected using a cross-sectional mixed method approach with post and intrapartum people aged between 18-45 who received perinatal care in Georgia, U.S.A. via telehealth during the COVID-19 pandemic. Quantitative and qualitative data were collected virtually and analyzed using interview coding, data coding, and data visualization software. The research team that carried out all steps of these Materials and Methods include one of the Principal Investigators (PI) for this project, Morgan Clark-Youngblood, from Emory University's Nell Hodgson Woodruff

School of Nursing and two graduate research assistants, Cindy Rosales and I, from Emory University's Rollins School of Public Health. The research was carried out under the other PI for this project, Dr. Priscilla Hall, and Dr. Helen Baker from Emory University's Nell Hodgson Woodruff School of Nursing. This thesis uses a portion of data collected from this larger project, *Examining perceived feasibility, acceptability, and effectiveness of perinatal care via telehealth services during and after the COVID-19 pandemic among patients in Georgia* (Baker, Clark-Youngblood, Hall, Ngo, & Rosales, 2020)

3.2 Population, Sample, and Setting

The population included people 18-45 years old who received intrapartum and/or postpartum care in Georgia during the COVID-19 pandemic. Inclusion criteria included those that had at least one telehealth appointment as a part of their perinatal care and received both their perinatal care and resided in Georgia. For this thesis, those who did not meet the residence, care location, and care type criteria were excluded from the sample. Subgroups chosen for comparison within this thesis are those participants who accessed perinatal care via telehealth during the COVID-19 pandemic that reside and who sought care in rural and urban geographical locations in Georgia.

With the purpose of verifying that potential participants met the criteria for the study, the other graduate research assistant and I created a quantitative screener. With quantitative screener data, I could specifically check where participants said they resided and received care to determine if their residence and/or care location was urban or rural.

We screened 217 people and purposefully chose 17 who were pregnant or recently gave birth; this number sufficed to meet code and meaning saturation until code and meaning

saturation based on the theory of Hennink and SAGE Research Methods (Hennink, Kaiser, & Marconi, 2017; "The SAGE Handbook of Current Developments in Grounded Theory," 2019). Saturation was believed to be found when sampling and the data from the sampling does not find any added information, which was estimated to be at about 10-12 patients, or 5-6 patients in each subgroup (Hennink et al., 2017). Meaning saturation was determined once the issues within the codes were understood with no further insights being found (Meyer et al., 2016; "The SAGE Handbook of Current Developments in Grounded Theory," 2019).

3.3 Research Design and Procedures

The purpose of this thesis is to understand the access and satisfaction of pregnant persons with the telehealth perinatal services they received in Georgia during the COVID-19 pandemic, and if this differed based on rural or urban location. The thesis also aims to understand if perceived willingness to use telehealth services in the future differs between rural and urban Georgia perinatal care patients during the pandemic. Lastly, it aims to explore if there are any themes around the differing perceived satisfaction and future willingness of telehealth care in this population.

The other graduate research assistant and I created the quantitative screener mentioned above. Then, we created a consent form as well as in-depth interview guides. The in-depth interviews included quantitative scale questions at the end, which allow me to determine the scale to which the interview participants are satisfied and willing to use telehealth in the future. Additionally, the qualitative narrative questions allow me to see if there are any themes that emerge in the difference in satisfaction and willingness with telehealth that could be attributed to geographical location. The screener and in-depth

interview guides collect data on the patients to understand robustly their willingness and satisfaction both described as well as quantified. All the data collection tools were approved by Emory Institutional Review Board (IRB) for the study.

3.4 Research Instruments

The research team created study flyers that included a link to the confidential electronic and were approved by Emory IRB. The flyer and link to the quantitative screener were distributed through Georgia maternal health professional organizations, healthcare networks, academic institutions with nursing and medical programs as well as maternal and infant health programs and coalitions. Due to a poor response rate from distributing the advertisement flyer and screener advertisement, a Facebook and Instagram ad paid for by the Emory Global Health Institute was used to disseminate the survey more directly to the specific population. The survey was kept open for two months before being closed due to a high response rate. These screeners were then self-administered using a link to Emory REDCap, a secure, internally hosted, browser-based research data management system that held this confidential information. The confidential screener began with a question to gain consent to participate in the study and then had 22 demographic, pregnancy, and telehealth use related questions that took about 5-10 minutes for the survey respondent to complete.

Using REDCap and Excel, respondents to the screener survey who met the eligibility criteria were chosen by the research team and then contacted through phone for a follow-up in-depth interview. The interviewers went through a training on data collection for in-depth interviews with participants semi-structured completed over Zoom. Zoom was the

chosen platform to record the interviews as well as mitigate any COVID-19 risks to participants or interviewers by partaking in the study.

First, the interviewer received verbal consent using the consent forms already approved by IRB, that were then stored in the project EmoryBox folder, which holds sensitive data securely. The patients were interviewed for a duration of 30 minutes to 1.5 hours. The interviews were conducted over a six-month interval by the research team with the majority conducted in August and September 2020 (82% within these two months), two interviews conducted in October, and one interview conducted in January 2021.

After each interview, a memo was created on the interview by the interviewer, the audio-recording was uploaded, and interview notes were uploaded to the password protected project EmoryBox Folder.

3.4 Data Analysis Plan

With the recordings secured the research team then uploaded the transcripts to Otter.ai for the research team to transcribe all the interviews. The research team created a qualitative codebook based on the goals of our overall study which included patient satisfaction and willingness to use telehealth in the future. The transcripts were uploaded into MAXQDA to test the qualitative codebook we created. We then made optimized our codebook and made sure to reach over 80% within MAXQDA among the research team. The results from the screener survey were analyzed for descriptive statistics on the patients such as their location, age, pregnancy history, insurance, and telehealth experience in Excel, SPSS, and Power BI. Then I used this information to create map visuals in ArcMap and other data visualizations in Power BI for this thesis. I am using STATA to run logistic regression on the screener data of urban and rural differences in the use of telehealth as

well as to stratify by potentially confounding variables that were found to be significant at the 5% significance level.

3.5 Ethical Considerations

This study and all associated research instruments were submitted to and received approval by Institutional Review Board (IRB) of Emory University in the United States because it included human subjects. We did not access any personal health information (PHI) from any covered entity and received a HIPAA Waiver because it did not apply to our records. The study (ID: STUDY00000869) received IRB expedited approval on June 18th, 2020 and was last updated on August 17th, 2020.

3.6 Limitations and Delimitations

Due to the ongoing COVID-19 pandemic, we were not able to recruit, nor perform interviews in person. Additionally, during the pandemic it was difficult to get respondents during the study recruitment period. Due to the limitations on recruiting in person and low response rate through emailing organizations, social media was the primary recruitment method. A meta-analysis on the use of social media for recruiting participants into studies found evidence that it can be the best recruitment method for observational studies and for individuals within specific groups and with specific conditions (Topolovec-Vranic & Natarajan, 2016). We also found using Facebook and Instagram ads was an effective recruitment strategy for our specific population and age group (Topolovec-Vranic & Natarajan, 2016).

There may be limitations to the results since the population sampled from mainly consisted of users of Facebook and Instagram. The people selected were known to have internet use, since they were using some form of social media, there may be skewed

telehealth connectivity results. Due to the retrospective nature of the data gather, there may be potential recall bias. There is always a possibility that participants willing to participate are different than the general population, but this is hard for researchers to mitigate. The risk level of COVID-19 may differ among patients, however, from what was gathered from the respondents, they all had the same basic COVID-19 safety protocols implemented within their care locations. We were limited to using Zoom for our interviews because of the pandemic, which may have altered the interactions between interviewer and interviewee, but also may have made the interviews more accessible for participants.

We did not accurately access ethnicity since we paired it with race and respondents mainly chose their race without choosing the ethnicity, so only race can be compared but not ethnicities within the results and conclusion.

The study did not have the ability or resources to create the online consent, screener, or interviews in languages other than English, so this non-English speaking population is omitted from the study and language proficiency is not a consideration for this study in the satisfaction of perinatal telehealth services.

The study aimed to have equal number of rural and urban in-depth interview participants, but by using the Atlanta Regional Commission definition of what classifies a county as urban and rural, our interviewees ended up being mostly urban classified. This may have been due to the definition used for an urban resident, recruitment, the likelihood of respondence.

IV. RESULTS

4.1 Introduction

In this study, information was gathered on where pregnant persons live and reside to better understand their access to perinatal care during the COVID-19 pandemic through 189 pregnant persons fully completing the screener surveys. Screener data also provided information on the demographics, current and past pregnancy care, and telehealth use of the patients. Screener data was collected to see if eligibility criteria were met and to ensure geographic residence representation was evenly divided across the state. Then, information was collected on how these patients selected for interview felt about their access to perinatal care, with an emphasis on telehealth, through 17 in-depth interviews. By matching respondent residence and care location from the screener surveys with information on patient satisfaction and willingness, location is compared to see if there are any similarities or differences in how patients responded in their attitudes toward telehealth. Using screener data, results are additionally compared to determine eligibility criteria as well as ensure geographic distribution of patients chosen for interview. Lastly, major themes are presented in the results of this thesis of what patients mention as influencing their satisfaction with their care and future willingness of using telehealth for perinatal care.

4.2 Study Findings

First, the screener quantitative data was used to understand where screener survey participants access care in relation to where they live, their residence county locations and county locations of care were asked for within the screener survey and then both analyzed and visualized. This information is visualized on the next page in *Figure 3.*

4.2.1 Findings: Access to Care

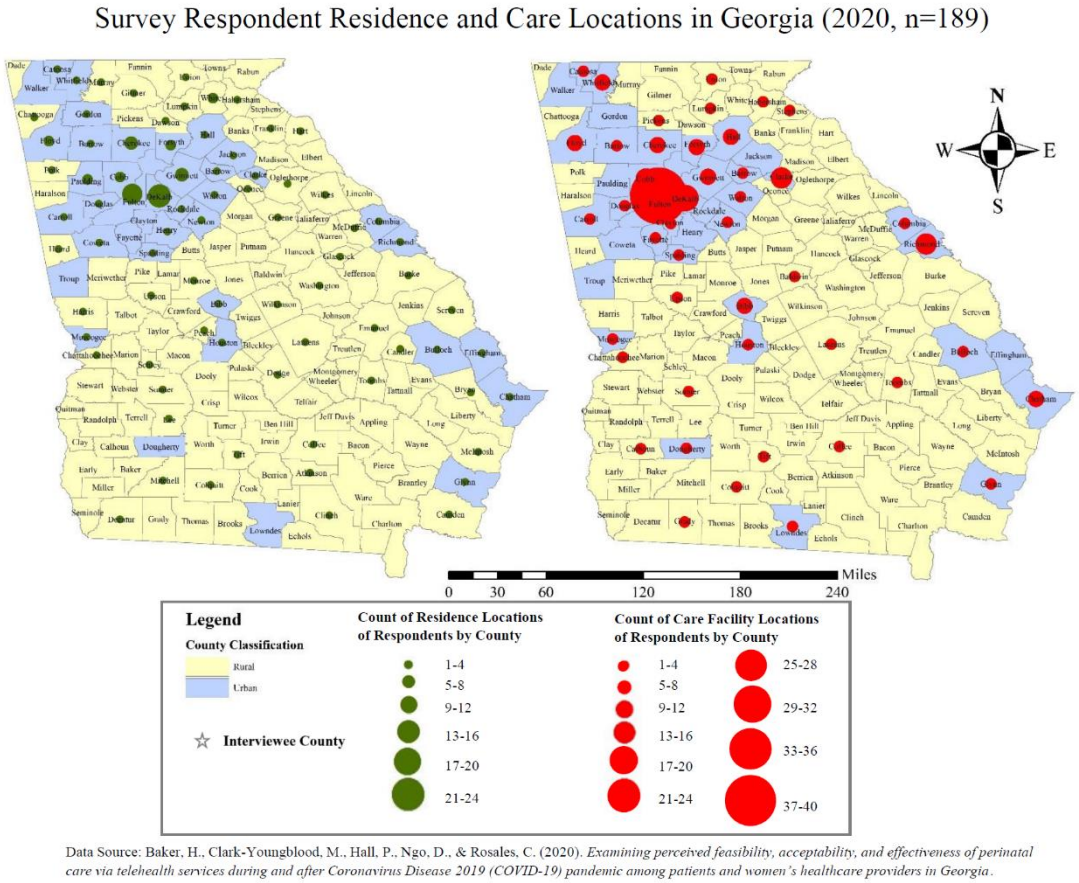

Figure 3. 2020 Points of County Residence and Care Locations of Screener Respondents by classification of the Counties as Urban or Rural.

Figure 3. includes county residence locations of those that completed the screener survey visualized as the green dot-density map (*left*) as well as the dot-density of the county care locations of respondents shown in red (*right*). The inclusion only of people who completed the screener survey and listed their counties of care and residence equated to 189 total respondents used in the screener analysis and represented on this map in *Figure 3*. The highest number of respondent residences in one county were in Dekalb County, with 24 interview participants reporting residing there. However, the county where the largest number of patients seeking care was Fulton County, with 40 interview participants

reporting seeking care there. The locations of the residence and care of the 17 interviewed persons are displayed in *Figure 3.* as grey stars. The classifications of the counties as urban or rural based on U.S. 2010 census information is presented as two differing county colors shaded yellow for rural and blue for urban, which when in black and white, the rural locations appear in a lighter grey.

The count and percentage of those surveyed on their locations for both their care and their residence are summarized below in *Table 1.*

Table 1. The total number of screener respondent and care classifications for those who provided this location information.

Classification	**Count of Respondent Residences (%)**	**Count of Respondent Care Locations (%)**
Rural	61 (32.3%)	22 (11.6%)
Urban	128 (67.7%)	167 (88.4%)
Grand Total	**189**	**189**

As shown in both *Figure 1.* and *Table 1.*, many rural respondents seek care in urban locations, as the total count of people living in rural areas is 61, which is over 32% of the respondent population surveyed, but only a third of these rurally located respondents (11.6%) were found to seek care in a rural location. This suggests that pregnant persons may seek care in urban locations more often than rural locations.

4.2.2 Findings: Patient Perinatal Care Satisfaction and Willingness

One of the questions respondents were asked is, "How willing are you to use telehealth services during prenatal care in the future?" with the answer options of: *Extremely willing, Willing, Neutral, Unwilling and Extremely unwilling*. The distribution of how in-depth interview respondents answered their willingness to use telehealth is presented below in *Table 2.*

Table 2. The willingness of interview respondents to use telehealth in the future.

Residence Classification	Extremely Willing	Willing	Neutral	Unwilling	Grand Total
Rural	0	3	1	1	5
Urban	1	7	4	0	12
Grand Total	**1**	**10**	**5**	**1**	**17**

As shown in *Table 2.*, 11 out of 17 of all survey respondents were willing or extremely willing to use telehealth beyond COVID-19, 1 out of 17 in-depth interview respondents were unwilling to use telehealth in the future, while the rest of respondents (5 out of 17) were neutral. No in-depth interview respondents chose the extremely unwilling answer option.

When asked the question *"Which best describes your current satisfaction with your pregnancy care appointments?"* with answer choice options of *Extremely satisfied, Satisfied, Neutral, Dissatisfied, and Extremely Dissatisfied, none of the respondents chose the Dissatisfied or Extremely Dissatisfied*. The answers distribution for this five-level satisfaction scale question is presented in *Table 3.*

Table 3. The satisfaction of interview respondents with their perinatal care experience

Residence Classification	Extremely Satisfied	Satisfied	Neutral	Grand Total
Rural	1	4	0	5
Urban	5	6	1	12
Grand Total	**6**	**10**	**1**	**17**

There was not a significant difference between rural and urban satisfaction and willingness to use telehealth of the 17 respondents interviewed. The only interviewee who reported being unwilling to use telehealth was a rural patient. Both rural and urban respondents were generally satisfied with their perinatal telehealth care.

The results did not show any significant difference between the satisfaction and willingness of patients to use telehealth during the COVID-19 pandemic for perinatal care based on if they were urban or rurally located within the state of Georgia. However, important themes emerged on what patients liked about their telehealth care as well as what could be improved.

4.2.3 Findings: Major Themes from the Qualitative Analysis

Each in-depth interviewee had a unique experience, but there were some common perceptions on what satisfied patients with their care, including *decreasing indirect costs, ease of access of telehealth services in comparison to in-person visits, and decreasing stressors associated with accessing care, especially among rural patients.* Furthermore, many participants reported overall satisfaction with their telehealth perinatal care experience.

a. Telehealth decreases indirect healthcare costs

To delve in, for example, one interviewee reported satisfaction with the decrease in indirect costs and ease of access: *"Um, it saves me gas money, saves me time. I'm able to do it from home, comfort of home, and I'm able to multitask. So instead of stopping studying an hour early, you know, I can stop ten minutes early and still be on time."* Most interview participants directly or indirectly expressed similar sentiments in telehealth decreasing costs such as loss of work time, driving costs, and childcare costs. For example, an interview participant mentioned: "*I don't have to drive down there. Now I don't have to drive down for my visits. And then from like, a socio-economic perspective, it benefited me in that, uh for the most part. I didn't have to request a whole or half day off work."*

b. Telehealth increases ease of accessing care

Multiple people interviewed expressed that telehealth was an easy way to get perinatal care. In another example, one interviewee reported satisfaction with their ease of access by not having to travel: *"…I think, for me, it was, it was kind of good to have the telehealth appointment because I was really sick, and I did not want to have to travel anywhere."*

Another patient interviewed expressed: *"I think that…when you need to speak with a doctor about something less urgent, and you, you know, you don't think that a whole trip to the physician is necessary, I think that telehealth is definitely advantageous in that aspect… so you don't necessarily have to waste all that time doing face to face, especially, you know, when it comes to having to take off work, and all those other things. Doing telehealth um is definitely more helpful. And I think a more better use of your time."*

c. Telehealth decreases overall stress with accessing care

One example of how patients interviewed explained how telehealth decreased stress they had with in-person care included: "*I have much more information to give them and, and being able to directly give stuff from the telehealth to them to make sure that I have a complete profile that I'm giving them is very, it relieves a lot of stress. So, I can actually get down to my immediate concerns…"* Interviewed patients not only mentioned telehealth decreasing stressors from their typical in-person appointments, but also mentioned that telehealth decreased stress associated with accessing care during a pandemic with stay-at-home orders within the state of Georgia.

d. Overall satisfaction with perinatal care that includes telehealth

One participant mentions regarding satisfaction: *"And if they said, it could be telehealth, then I knew it was safe for telehealth… I think in the future without COVID being an issue, I would still want to receive the care the same way. Because the benefits [of telehealth] are so huge, and knowing that, you know, I would go in when I really needed to go in, but I didn't have to when it was not necessary."*

On the other hand, the interviewees mentioned some perceptions about how telehealth could be improved. Interviewees, whether urban or rurally located mentioned similar appointments. Therefore, any potential difference in access to technology within urban and rural patients cannot be assessed within those interviews. These findings of what would increase the satisfaction of interviewed patients with their telehealth service are summarized in *Table 4.*

Table 4. The most mentioned telehealth improvements that would make respondents more willing to use and satisfied with telehealth services for perinatal care.

Telehealth Improvements	**In-Depth Interview Example Quote(s)**
Providing **educational materials** to patients normally provided at in-person appointments (10 out of 17 interviewees mentioned it as an improvement)	*"I think having more written material like emailed to me would have been nice for each appointment."* *"…they would physically give me one, you know, a handout with different stretches and exercises I could do to help with pelvic pain and that kind of stuff. Whereas telehealth, they never obviously, you can't give anything physically, but they also never gave me anything through email or anything like that."*
Increasing the **structure of appointments**, specifically to have a schedule and/or appointment objectives (mentioned by 6 out of 17 interviewees)	*"Maybe just maybe more clear guidance from what to expect? What would they [might] be looking for what the doctor might be looking for…"* *"...but then it that might have been nice to sort of have even like a[n] overview of what the appointment was going to be about."* *"…. here's more of a guideline of what to expect at each appointment and which topics are going to be*

	covered or you know what, milestones are going to talk about rather than just...like a check in kind of thing. Like, it is the way kind of for me to also kind of prepare for the appointment."
Providing at-home monitoring equipment including but not limited to blood pressure cuffs, weight scales, and fetal doppler machines (6 out of 17 interviewees mentioned).	*"...um if you're not taking their vitals, so I mean, you know, just… those basic things like, you know, temperature, reading weight, and maybe providing them with a monitor to track their blood pressure, if you're going to do something like that for a pregnant person, I think would be really helpful"*
Having **increased ability to visualize through online platforms** with an emphasis on increasing video capacity (6 out of 17 interviewees mentioned).	*I would [like] a lot for them to do video when I was doing my blood pressure. That way they could have seen how big my feet and stuff were. I was trying to explain to them, and it was really hard for me to find the explanation about how big my feet were because they were about as big as a softball my ankles"*
Holding **prenatal classes and other support classes** over zoom (3 out of 17 interviewees mentioned).	*"… [the location] like to do centering, having like group meetings, and we weren't able to do that... What I'm really passionate about is connecting with first time moms and making sure they're good. So, I was actually going to participate in those this time around. And that was just that got taken off the table. Because there was no… good way to do it… They could figure out a way to do the centering over zoom or something like this. That would probably [have] helped out a lot of people."*
Mentioned less frequently, but may still be of importance, are **providing technology/connectivity support** and prenatal classes over zoom (2 out of 17 mentioned each).	*"…they would use some other program where it was just, you know, you had to sign in here in login here and add a password in order to finally get in. So, I'm sure that would be very frustrating."*

As shown in *Table 4.*, most of the interview respondents had at least one suggestion on what would increase their willingness and satisfaction with perinatal telehealth appointments. Although other improvements were suggested, these were the improvements suggested more than once by interviewees. Additionally, two out of the seventeen in-depth interview respondents mentioned not wanting to change anything

about their current appointments (including both their telehealth and in-person care appointments).

V. DISCUSSION AND CONCLUSIONS

The purpose of this study is to understand access to and satisfaction with telehealth in perinatal care patients residing and seeking care within the state of Georgia. A major component of this study is to understand if there are any similarities or differences in these three areas of telehealth perinatal care between rural and urban patients.

As seen in *Figure 3.*, survey respondents live all over Georgia, but tend to travel or seek care in urban locations for their perinatal health care. The survey respondents reported living in Dekalb the most, however when seeking care, Fulton County was vastly more reported than any other county of Georgia. The county where the most respondents sought perinatal care is reported as 40% more people than the county with the highest number of respondents reporting residing, suggesting that distribution of care within Georgia is not representative of the distribution of respondent residence locations. The literature tends to be mixed, as some researchers report that rural patients seek care in urban areas, while others report that rural patients access care in rural locations and will continue to do so (*Improving Access to Maternal Health Care in Rural Communities*, 2019b; Jolles et al., 2020). Therefore, this finding provides more evidence that in Georgia, many rural maternity care patients seek care in urban locations. The most residences in one county were in Dekalb County, with 24 interview participants residing there. However, the location with the highest number of patients seeking care was Fulton County, with 40 interviewees seeking care there.

Telehealth is an important strategy to increase patients', especially those rurally located, access to quality prenatal care (Alves, et al., 2020; Dotters-Katz et al, 2020; Spelke et al., 2016). One of the important findings of the study are that many rural patients are seeking care in urban locations, which should be further studied to understand why. Most Georgia counties do not have maternal care providers, so rural patients are further from care, which is tied to poorer health outcomes (*Improving Access to Maternal Health Care in Rural Communities*, 2019b; Jolles et al., 2020; Kozhimannil et al., 2019; Meyer et al., 2016; Spelke et al., 2016). As presented in *Table 1.*, out of 61 patients rurally residing, only 22, so about one third of them, still sought care in rural locations. Respondents did prefer some locations that were not the closest to their residence, so this may be due to preference, quality of care, or other factors pregnant persons use when deciding where to seek perinatal care. Therefore, it is important for future legislation to consider how to increase access to quality care to pregnant persons to mitigate them travelling large distances to give birth.

Some respondents reported being confined to locations within their insurance networks, which made them subject to hospital closures, restriction in the locations they could receive care at, and restrictions in the providers they could receive care from. The impact of insurance on these patients throughout Georgia is consistent with findings nationally that although there are many options for birth settings and providers of pregnancy care, these choices are restricted by policy and financing options that further restrict insurance coverage (National Academies of Sciences, Engineering, & Medicine, 2020). Consequently, insurance seems to play a large role in the access, satisfaction, and willingness around perinatal telehealth care in those interviewed in this study.

Scale question analysis, demonstrated in *Table 2.*, reveals that 58.8% of participants were either extremely or very willing to use telehealth services in the future, 29.4% were neutral about using telehealth in the future, and then 5.9% of interview participants were unwilling to use telehealth in the future. With over 35% of respondents interviewed feeling neutral or unwilling to use telehealth, there is room for improvement in telehealth offerings.

Over 94% of interviewed participants were extremely satisfied or satisfied with their perinatal care and the remaining participant felt neutral about their perinatal care. Interviewed participants were mostly satisfied with their perinatal care with telehealth aspects and were generally willing to use telehealth services in the future. The majority of both urban and rurally residing women were satisfied with their virtual perinatal care and willing to use telehealth services for their healthcare appointments in the future. Therefore, no significant difference was found between the willingness and satisfaction between the two geographic groups.

Even with high satisfaction and willingness, there is still room for improvement with telehealth care, especially in what would increase patient willingness to utilize telehealth services in the future for perinatal and other types of care. This study found many distinct themes of how telehealth could still be improved.

Qualitative theme findings of what interviewees were satisfied with regarding their care included telehealth decreasing indirect costs, with interviewees often mentioning this as income loss from time off work, transportation costs, and childcare costs. Furthermore, interviewees often mentioned ways telehealth decreased stressors associated with accessing care (i.e., making appointments and entering a facility during a pandemic). A last important reason for patient satisfaction was the ease of access of telehealth services in comparison to

in-person visits, especially among rural patients. The findings of what patients are satisfied with within their appointments are important for policy officials and telehealth implementers to consider when deciding on what aspects of telehealth should be offered for the best satisfaction of perinatal patients.

In interpreting telehealth improvements mentioned in *Table 4.*, there were no major differences between what urban and rural patients reported that would improve telehealth, as the two subgroups mentioned them similar rates. Rural residents uniquely provided a desire for prenatal and support classes and technology support, so this may be a telehealth improvement more applicable to rural patients. Other major themes that were mentioned in at least a third of in-depth interviews comprise of increasing the ability to visualize, providing at-home monitoring equipment, more structure to, and access to educational materials with telehealth appointments seem to be important to perinatal patients across Georgia.

Many previous studies focus on program evaluation, so this study helps to build on the research relating to state-wide satisfaction of telehealth for perinatal care. Two out of the 14 patients mentioned they would not change anything about their appointments, so it does seem that some enjoyed their telehealth perinatal telehealth offerings. This study provides important qualitative findings, but to draw conclusions more qualitative and quantitative data at this scale needs to be collected. Additional research should be done with a larger sample size to validate that these trends have held true as major areas of improvement, as interviews were conducted in 2020 in an ongoing COVID-19 pandemic which makes for a qualitative exploratory analyses and basic quantitative analysis to be further improved upon.

VI. IMPLICATIONS, RECOMMENDATIONS, AND FUTURE DIRECTIONS

This study uncovered patient trends around access to perinatal care, information on perinatal patient satisfaction and willingness, as well as important themes around telehealth improvements within Georgia during the COVID-19 pandemic. This was a study done with a small group of pregnant or recently pregnant persons that could be evaluated with a larger sample size expanded on within Georgia and throughout the country. Another recommendation for future researchers includes expanding on this study to include non-English speakers as well as expanding it to more locations and perinatal patients within Georgia.

Future directions of building upon the knowledge gained from this study include creating additional studies with a larger pool of participants and including participants who have had varying amounts of telehealth use in their appointments to find out more specifically the satisfaction of patients who receive completely telehealth, partial telehealth, or no telehealth in their perinatal care.

The state of Georgia should increase evidence-based telehealth guidelines statewide to mitigate the causes of dissatisfaction and unwillingness that respondents mentioned within this study. An additional and necessary Georgia policy recommendation is to increase access to perinatal care by ensuring that public and private insurances cover basic pregnancy care, including by telehealth. Furthermore, Georgia needs to create more comprehensive basic care regulations that hospitals are required to provide regarding telehealth and reaching the entire pregnancy population within Georgia. The state of Georgia must do better in providing quality access to telehealth services across the state that are accessible regardless of a patients' insurance, financial situation, internet, and other factors that make it difficult for

study respondents to access care, be satisfied with their care, or decreased their willingness to use telehealth care in the future.

Recommendations to Georgia can be expanded and the results tested more broadly within the United States and then globally. This study increased the understanding of how patients perceived their perinatal care with telehealth integrated during the COVID-19 pandemic, but since the pandemic has yet to end, there is still room for more exploration and research on how to improve telehealth offerings in Georgia now and in the future. The COVID-19 pandemic has led to widespread use of telehealth to prevent the spread of disease, but also has created an opportunity to broadly examine patient satisfaction and use of telehealth during pregnancy as the pandemic persists and beyond.

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