A Quantitative Exploration of Latinx Childbearing People's Experiences of Obstetric Violence and Respectful Maternity Care in the United States: A Secondary Analysis of the Giving Voices to Mothers Survey

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Obstetric violence (OV) refers to abuse or mistreatment by a health care provider or any invasive or surgical procedure performed without informed consent, that is coerced, or when procedures have been declined. OV stands in contrast to Respectful maternity care (RMC). This dissertation explores factors associated with OV and RMC and to what extent the intersectionality of nativity, parity, and history of social risk predict OV and RMC among Latinx childbearing people.

This is a secondary analysis of the Giving Voices to Mothers (GVtM) survey Latinx subsample which included 292 Latinx respondents across the United States. I employed logistic and linear regressions to assess relationships between socio-demographic variables obstetric characteristics intersectional composite variable and experiences of OV and RMC. A modified Mistreatment (MIST) index measured OV and the Mothers on Respect index (MORi) measured RMC. The intersectional composite consisted of all combinations of nativity, parity, and history of social risk.

Findings show that hospital births were significantly associated with greater likelihood of OV (OR=11.85) and lower MORi scores (Coeff = -6.74). A history of social risk also raised the odds of OV (OR=4.65). Lower MORi scores were associated with lack of support during labor (Coeff=-12.61), and operative/instrumental births (Coeff = -8). The intersectional composite variable, adjusting for delivery location, explains about 27% of the variation in respect scores and

demonstrated a high level of discriminatory accuracy in predicting obstetric violence. However, it is not clear from this analysis which individual characteristic in the intersectional composite drives these effects.

This study confirms the role of the hospital environment in driving OV and impeding RMC, underscoring the need to address structural factors driving OV and RMC. These include, for example, re-thinking training for medical professionals, re-evaluating polices that contradict the tenets of RMC and creating accountability structures to address OV. This study also calls for ensuring access to different birthing models and support during labor and delivery. Lastly, this study demonstrates that an intersectional lens results in models with good predictive power for OV and RMC. Future studies should focus on marginalized identities and ensuring statistical power to thoroughly explore these phenomena.

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Preface

I dedicate this dissertation to my family and friends, whose relentless cheerleading kept me going when the climb seemed impossible. To my committee, thank you so much for all your feedback and support throughout this very arduous process. Thank you for mentoring me and helping me reach this milestone.

1.0 Introduction

Every day, women around the world get pregnant or give birth to a new baby. For many women, giving birth is filled with the utmost joy and happiness, but for others it can also be a very harrowing and traumatic experience with lasting consequences. Additionally, pregnancy and childbirth play a key role in maternal morbidity and mortality worldwide. The Centers for Disease Control (CDC) estimates that in 2021 the number of reported pregnancy-related deaths was 20.4 per 100,000 live births in the United States.[1] Worldwide, the United Nations Population Fund, estimates that for every woman who dies during pregnancy, 20 to 30 will experience chronic or acute morbidities.[2] These complications can lead to long-lasting psychical, psychological, social, and economic consequences for women and their families, many of which are both treatable and most importantly, preventable.[3–6]

With the modernization of medicine, pregnancy care and childbirth have become more and more influenced by medical technology and interventions. One method to reduce maternal morbidity and mortality is to emphasize facility-based childbirth and skilled attendance at birth in lieu of other models of care. In many high resource countries like the United States, this has been operationalized to mean a hospital birth under the care of an obstetrician for all births.[7]

Obstetric violence (OV) refers to the "abuse or mistreatment by a health care provider of a female who is engaged in fertility treatment, preconception care, pregnant, birthing, or postpartum; or the performance of any invasive or surgical procedure during the full span of the childbearing continuum without informed consent, that is coerced, or in violation of refusal. It is sex-specific form of violence against women (VAW) that is a violation of human rights."[8 p.1] Experiencing obstetric violence during pregnancy and childbirth has been associated with negative health

outcomes for both mother and child, increasing the risk of experiencing traumatic birth, developing severe mental conditions such as postpartum depression and PTSD following birth, and fear of or reluctance to seek care in the future4. While this topic has been investigated in low-income settings, not much research has been undertaken in high-resource settings. Additionally, lack of consensus around terminology has hindered attempts to investigate and address this issue in high income settings such as the United States. However, that is changing, multiple national and international organizations are recognizing the importance of conducting research in this area, that it is a human rights violation[9–13] and joined calls for rejecting language that minimizes this phenomenon and calling it by what it is.[12,14] This dissertation builds upon these calls by embracing the terminology of Obstetric Violence to discuss this human rights violation.

Latinx are one of the fastest growing populations in the United States.[15] Yet, they still face many health inequities[16,16,17] and as such might be at in increased risk of experiencing obstetric violence and may face barriers to respectful maternity care and autonomy and decision making. The goal of this study is to explore obstetric violence (OV) and respectful maternity care (RMC) as reported by Latinx childbearing people in the United States during pregnancy and/or childbirth, informed by intersectionality theory, social ecological model, and the reproductive justice framework. This study is a secondary analysis of the Giving Voices to Mothers (GVtM) data set. Specifically, this study will address the following two research questions:

1. What factors are associated with obstetric violence and respectful maternity care among this population?

2. To what extent does the intersectionality of nativity, parity, and history of social risk predict obstetric violence and respectful maternity care among this population?

This dissertation is organized into five chapters. Chapter two covers a review of current literature around obstetric violence and respectful maternity care in high income settings, including a discussion on terminology. Chapter three describes the methodological approach adopted in this dissertation, while chapter four summarizes the findings. Lastly, chapter five forms the discussion and conclusion of this dissertation.

1.1 Positionality Statement

Before delving into the particulars of this study, I would like to acknowledge how my lived experiences and identities affect how I think, speak, and approach this topic. I am an educated cisgendered Latinx woman, a wife, a mother, an immigrant, and a qualitative researcher first and foremost. I experienced a privileged upbringing in the Dominican Republic and lived in Europe as a child. This allowed me to not only witness but experience high quality healthcare and respectful and dignified care. It also allowed me to witness obstetric violence against birthing people and to experience it firsthand. Witnessing obstetric violence in the context of maternity care is what drew me to public health in the first place and has driven my interest in this phenomenon. Volunteering at public maternity hospitals in the Dominican Republic, I witnessed women being verbally abused, denied pain relieving medications, undergoing routine episiotomies, and denied companionship and support through the labor and delivery process. These actions violate women's human rights and autonomy and simply should not happen. When I was giving birth, I was given medications that to this day I do not know what they were. While some would argue that this is a not necessarily an instance of obstetric violence, or at the very least is a minor concern, I view at as such because I was unable to consent to that intervention as no one really explained it to me.

Informed consent is a key tenant in research and healthcare and should always be ensured. These experiences have cemented my interest in this topic and shaped the way that I approach them. I view this issue as a gendered phenomenon and human rights violation that demands to be acknowledged in a straightforward fashion and requires urgent addressing by the health workforce.

I use the terminology of obstetric violence intentionally. I recognize that it might be an off-putting term for many healthcare providers, but I believe it is important to discuss this topic in a straightforward fashion. Additionally, while obstetric violence describes situations that happen at the individual and interpersonal levels, it underscores the structural mechanisms that allow these injustices to persist despite attempts to eliminate them. It should be understood akin to structural violence, where the focus is not so much the individuals' perpetuating actions that oppress others (which is still important to address and root out) but rather the mechanisms by which an environment that allows these actions to happen is perpetuated. This term also opens the door to redress for those who want it and allows for accountability systems to be created as has been shown in other countries where it is been enshrined in the legal system. Lastly, the term obstetric violence is rooted in Latin American grassroots efforts to improve maternity care conditions for childbearing people, considering the target population of this study is the Latinx population it seems appropriate to use this language.

2.0 Literature Review

In this chapter I will discuss the current literature around obstetric violence and respectful maternity care. This review will be centered on how these phenomena present themselves in high-resource settings. It concludes with a summary of the research gaps identified and situates this dissertation in the literature. This chapter begins with a discussion of the terminology around obstetric violence, followed by a discussion of obstetric violence and respectful maternity care in high-resource settings. I then delve into the experiences of Latinx childbearing people around OV and RMC and discuss the research gaps. Finally, I conclude with a discussion of the theoretical framework that guides this dissertation.

2.1 Defining Obstetric Violence and Respectful Maternity Care

One of the challenges of conducting research in this area is the lack of consensus around a uniform terminology and definitions in the field. [18] In low-resource settings, terms such as obstetric violence, mistreatment, dehumanized care and disrespect and abuse are common, and the human rights and systemic implications of these terms are clear. However, high-resource settings shy away from using this terminology, preferring to instead use terms such as traumatic birth experience and negative birth experience, which center this phenomenon on the individual rather than recognizing the wider systemic implications of this phenomenon. Additionally, these terms describe and focus on a potential result of experiencing potential obstetric violence, rather than the act(s) of obstetric violence. In this section, I will discuss these terms and argue that they all refer

to the same phenomenon; obstetric violence and should be referred as such regardless of the setting in which it presents itself.

2.1.1 Mistreatment and Disrespect and Abuse

Two of the most used terms in low-middle resource settings referring to these phenomena are "mistreatment" and "disrespect and abuse". What follows is an overview of the definitions of these terms and their dimensions.

2.1.1.1 Disrespect and Abuse

In 2010, Bowser and Hill published a "landscape report" and coined the term "disrespect and abuse" during facility-based childbirth. They identified seven categories of disrespectful and abusive care during childbirth. These were physical abuse, non-consented clinical care, non-confidential care, non-dignified care, discrimination, abandonment and detention in health facilitates.[19] Their report included examples for each of the seven categories or domains, taken from multiple low-to-middle-resource settings. The goal of that report was to encourage discussion and the development of an implementation agenda to address this human rights issue. In response to the growing evidence of D&A and the Bowser and Hill report, the White Ribbon Alliance, a reproductive health organization, published the universal rights of childbearing women a year later.[13]

Following these reports there was (and still is) a call for a consensus on a definition for disrespect and abuse. In 2014, Freedman et al. developed the following definition, "*as interactions or facility conditions that local consensus deems to be humiliating or undignified, and those interactions or conditions that are experienced as or intended to be humiliating or undignified*."

They developed this definition by recognizing that by defining the construct by standards or only

the specific instances of disrespect and abuse, you exclude how these things are interconnected to

lead to D&A happening and being pervasive in the healthcare system. Freedman et al.

conceptualized their definition by breaking it down into two dimensions, the experiential building

blocks (individual level experiences or specific examples of D&A) and normative blocks (systems

level factors associated with D&A).[20] While this provided a definition for D&A, the definition is

hard to operationalize for use in measurement efforts.

2.1.1.2 Mistreatment

In 2015, Bohren et al. further fleshed out dimensions set forth by Bowser and Hill by

conducting a systematic review of the literature. This review built upon their work by providing a

comprehensive typology of disrespect and abuse and arguing that a better term would be

"*mistreatment*", as it is a "*broader more inclusive term that better captures the full range of

experiences of women and healthcare providers.*"[21(p. 21)] The Bohren team organized their findings

into two groups. First, which covers specific events or instances of mistreatment, second and third-

order themes which are classifications of first order themes into meaningful groups based on

common attributes. Table 2.1.1 presented below, shows the seven dimensions as established by

the Bohren team, and its corresponding universal right.[21]

Table 2.1: The Bohren Typology of Mistreatment[13,21]

	Bohren Typology of Mistreatment and Universal Human Rights		
Third order Theme	**Second-order Theme**	**First-order Theme**	**Corresponding Right**
Physical Abuse	Use of force, physical restraint.	Women beaten, slapped, kicked, or pinched during delivery, women physically restrained to the bed or gagged during delivery	Freedom from harm and ill treatment.
Sexual Abuse	Sexual abuse	Sexual abuse or rape	
Verbal Abuse	Harsh language, threats and blaming	Harsh or rude language, judgmental or accusatory comments, threats of withholding treatment or poor outcomes, blaming for poor outcomes	Dignity and respect
Stigma and Discrimination	Discrimination based on sociodemographic characteristics; discrimination based on medical conditions	Discrimination based on ethnicity/race/religion, age, socioeconomic status, HIV status	Equality, freedom from discrimination, equitable care.
Failure to meet professional standards of care	Lack of informed consent and confidentiality, physical examinations, and procedures, neglect, and abandonment	Lack of informed consent process, breaches of confidentiality, painful vaginal exams, refusal to provide pain relief, performance of unconsented surgical operations, neglect, abandonment, or long delays, skilled attendant absent at time of delivery.	Right to information, informed consent and refusal, and respect for choices and preferences, including the right to companionship of choice wherever possible.

Confidentiality, privacy |
| *Health System conditions and constraints* | Lack of resources and policies, facility culture | Physical condition of facilities, staffing constraints and shortages, supply constraints, lack of privacy, lack of redress, bribery and extortion, unclear fee structure and unreasonable requests of women by health workers. | |
| *Poor rapport between women and providers* | Ineffective communication, lack of supportive care, loss of autonomy | Poor communication, dismissal of women's concern, language and interpretation issues, poor staff attitudes, lack of supportive care from health workers, denial or lack of birth companion, women treated as passive participants during childbirth, denial of food, fluids, or mobility, lack of respect for women's preferred birth positions, denial of safe traditional practices, objectification of women, detainment in facilities. | Liberty, autonomy, self-determination, and freedom from coercion.

Right to timely healthcare and to the highest attainable level of health. |

This table summarizes the different dimensions of mistreatment as established by the Bohren team along with its corresponding Universal right as established by the White Ribbon Alliance. The Bohren typology is organized into three main levels, the first order themes which covers specific events or instances of mistreatment, and the second and third-order themes which are classifications of first order themes into meaningful groups based on common attributes.

2.1.2 Traumatic Birth and Negative Birth Experiences

To date, multiple studies have recognized that the phenomenon of mistreatment/obstetric violence during pregnancy and childbirth occurs around the world, regardless of social stratum. In high resource settings, until recently, research has focused on traumatic births and negative birth experiences.[9,11,18,22–34] In this section, I will argue that these terms represent a potential outcome of disrespect and abuse during pregnancy and childbirth and I will highlight the importance of discussing disrespectful care and its results from this perspective. To this point, some studies have found descriptions of mistreatment when discussion this topic.[35,36]

Research estimates that about one third of women worldwide experience trauma during childbirth.[37] Traumatic birth experiences have been defined as "*the perception of actual or threatened injury or death to the mother or her baby*" caused by or related to birth. In 2004, Beck criticized this definition, and highlighted how the perception of trauma is "*in the eye of the beholder*" and as such should be left to the women experiencing it to define.[38] This criticism is one that permeates the discussion around disrespect and abuse provided the very subjective and individual nature of what is deemed respectful and disrespectful.[20,39]

Multiple studies have looked at the underlying factors that could lead to a traumatic birth experience. These factors include physical complications for mother and baby, lack of informed consent, unnecessary or non-consented medical intervention, birth type, lack of control or autonomy in decision making, and interactions with medical professionals.[9,40–45] The latter being a prominent finding in qualitative research exploring traumatic birth experiences.[9,18,22,31,32] Most, if not all, of these factors can be mapped back into the Bohren typology of mistreatment. An example of this comes from the article published by Reed et al. In this study, the authors detail the results of their mixed methods study, which included 748 online survey responses and responses

to the following open-ended question: "*describe the birth trauma experience and what you found traumatizing.*" They identified 4 themes, "*prioritizing the care provider's agenda, disregarding embodied knowledge, lies and threats, and violation*". [44(p. 5)] The authors go on to provide explicit examples of disrespect and abuse during childbirth. These examples describe not only psychological/emotional abuse but also physical abuse by members of the medical team.[44]

Further highlighting the relationship between mistreatment and birth trauma, in 2018, Beck published a secondary analysis of mistreatment of women during childbirth in health care facilities. In this paper, the author used a primary data set of women's experiences of traumatic birth obtained from the internet to identify what categories of disrespect and abuse women who had experienced a traumatic birth in a high-resource setting described. Beck found six categories of the Bohren typology. From most to least frequent these were: failure to meet professional standards of care, poor rapport between women and providers, verbal abuse, physical abuse, health system conditions/constraints and stigma/discrimination.[36]

2.1.3 Obstetric Violence

A term that is seeing increased use to describe this phenomenon is obstetric violence. This term appears often in research conducted in Latin America within the context of legislation. For example, in Venezuela, this term is embedded within the Organic Law on Women's Right to a Violence-free Life under article 15(13) and defines it as follows "*...The appropriation of a woman's body by reproductive health personnel, in the form of dehumanizing treatment, abusive medicalization and pathologizing of natural processes, involving a woman's loss of autonomy and of the capacity to freely make her own decisions about her body and her sexuality, which has negative consequences for a woman's quality of life.*"[46(p. 201)] Other countries that have codified

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this term into their legislation include Argentina, Uruguay, Mexico, and Brazil. While this term is embedded into their legislation around protection against violence for women, they lack enforcement mechanisms, or the law has not been implemented.[47]

An alternative definition for obstetric violence comes from an organization called Birth Monopoly, which seeks to empower women voices in the birthing process. They define obstetric violence as "*normalized mistreatment of women and birthing people in the childbirth setting. It is an attempt to control a woman's body and decisions, violating her autonomy and dignity.*"[12] They go on to state that this term is referred to as disrespect and abuse by the world health organization.[10]

Davis defines obstetric violence as "*a form of gender-based violence experienced by people giving birth who are subjected to acts of violence that result in their being subordinated because they are obstetric patients*." Davis goes on to state that the term includes "*dehumanizing treatment and medical abuse, such as birth rape, or violations, experienced during childbirth*."[48(p. 561)] While the author recognized the utility of the term in academic research, they go on to describe how the term fails to fully capture the intersection of this violence and medical racism as experienced by Black women in the United States, preferring instead to use the term obstetric racism.[48] Lastly, this term can evoke negative reactions from clinicians and other healthcare workers.[49–52] While not without its drawbacks and opposition, the term obstetric violence also has its advocates, given that it correctly puts the onus of responsibility of this phenomenon on the healthcare system rather than on the individual subjected to it and clearly nods to its gender violence roots.[53,14,54]

2.1.4 Respectful Maternity Care

I would like to close of this section with a term that represents the anti-thesis to obstetric violence and describes the kind of healthcare that every childbearing person should receive,

Respectful Maternity Care (RMC). This term refers to "*care that maintains dignity, privacy, confidentiality, ensures freedom from harm and mistreatment, and enables informed choices and continuous support during labor and childbirth.*"[55(p.114)] RMC is a right that every childbearing person should have but is often denied due to the factors underlining the phenomenon of mistreatment/obstetric violence.[55–61] A qualitative synthesis conducted by Shakibazadeh et al., detailed 12 domains of RMC. These were: being free from harm and mistreatment, maintaining privacy and confidentiality, preserving women's dignity, prospective provision of information and seeking of informed consent, ensuring continuous access to family and community support, enhancing quality of physical environment and resources, providing equitable maternity care, engaging in effective communication, respecting women's choices that strengthen their capabilities to give birth, availability of competent and motivated human resources, provision of efficient and effective care, and continuity of care.[62] While obstetric violence continues to be an issue, respectful maternity care cannot be realized.

Multiple interventions have sought to promote respectful maternity care. However, most are focused on low-to middle income settings, such as Latin American and African nations.[55,63–72] In high income settings the terminology tends to center around patient-centered care.[73] This is, however, starting to change with the Centers for Disease Control (CDC) developing guidelines in response to their findings suggesting that 1 in 5 birthing people report some form of mistreatment and 1 in 3 of Black, Hispanic, and multiracial birthing people report the same.[74] Additionally, a Green el. al[75] have developed what they coined "the cycle of respectful care", which is a framework that centers core principles that "value blackness, birth equity, reproductive justice, professional oath, holistic maternity care, humanity, and love" to help healthcare providers and

systems advance respectful maternity care. Their framework was developed with Black birthing people in mind, but the principles are applicable to all birthing people.[75]

As noted by these examples, when the term birth trauma is used in academic literature it refers to not only an outcome, but also, its potential causes. This is problematic in that it muddies the discussion in such a way that might make addressing OV more difficult. Additionally, provided its subjective nature, it puts the onus of responsibility on those experiencing the childbirth/pregnancy as traumatic instead of the system that perpetuates the actions that lead to a traumatic birth experience. For the remainder of this paper, I will use the terms obstetric violence (OV), to refer to this phenomenon as it more accurately represents the phenomenon and places the onus of responsibility on the upstream factors that could ultimately lead to a traumatic birth experience. Throughout this study, I adopt the definition established by Garcia (2020), who defines OV as *"abuse or mistreatment by a health care provider of a female who is engaged in fertility treatment, preconception care, pregnant, birthing, or postpartum; or the performance of any invasive or surgical procedure during the full span of the childbearing continuum without informed consent, that is coerced, or in violation of refusal. It is sex-specific form of violence against women (VAW) that is a violation of human rights."*[8(p.1)]

2.2 Obstetric Violence in High-Resource Settings

To date multiple studies have explored this phenomenon in low-to medium-resource settings. In recent years, there has been a growing interest in this topic in high resource settings. The types of OV that occur varies from setting to setting, with low-to-middle income settings experiencing more overt instances and high-resource settings less overt instances of OV This is

not to say that overt instances of OV do not occur in high income settings. In fact, this dissertation highlights how these represent one part of the spectrum rather than a rare occurrence. While more attention is being placed in high resource settings, work remains to fully understand this phenomenon in this context and how the cultural norms and structural factors underlying OV interact to create an environment where OV thrives. What follows is a review of the literature around this topic, focusing on high-resource settings.

In 2010, Bowser and Hill published their landscape analysis exploring disrespect and abuse during facility-based childbirth.[19] This report set the stage for this area of research and was the first to attempt to develop a categorization system, as discussed in the terminology section. The authors conducted a review of published and gray literature and conducted focus group discussions and key informant interviews to develop the Bowser Typology previously described. Their report was mainly composed of examples from low- and middle-income countries but also included some examples from the high-resource settings, namely the United States and Canada. While they identified several studies describing the phenomenon, a lack of consensus on an operationalized definition and measurement resulted in a lack of prevalence data. They further highlighted that while there are many interventions being implemented there was a lack of studies evaluating these interventions. With the development of their typology, the authors hoped to create a foundation for constructive discussion and further evaluation of interventions of this topic.[19] One limitation of this study was that it did not employ a systematic approach to its review of the literature.

Following this report, multiple studies in low- and middle-income countries were published exploring obstetric violence during childbirth. These studies were mainly qualitative in nature, however, there were some that sought to measure the phenomenon.[40,76–92] What follows are some examples of these studies.

In 2014, Bohren et al. conducted the first systematic review of qualitative evidence exploring barriers and facilitators to facility-based delivery in 17 low- and middle-income countries. They found that abuse and mistreatment can lead to women choosing to give birth outside of a hospital system.[81] The authors followed this study up with a mixed methods review of mistreatment during childbirth in health care facilities around the world. This led to development of the Bohren typology, which was described above. While this study sought to synthesize both qualitative and quantitative studies, a meta-analysis of the quantitative data was impossible due to high disparateness in the quantitative studies available, which included inconsistent operationalization of terms and identification criteria. Thus, the authors described the studies and their results.[21] The Bohren team highlighted the lack of quantitative studies on the problem of mistreatment of women during childbirth in health facilities and the importance of further exploration of the interplay of health system constraints, provider behaviors and women's experience of mistreatment. They concluded by stating the need for exploration of this phenomena (i.e. mistreatment/obstetric violence) in other contexts in the reproductive health care cycle, such as antenatal and abortion care.[21]

In 2020, Perrote, Chaudhary and Goodman published a literature review on obstetric violence occurrence worldwide. They found that while the types of obstetric violence and how it's experienced by its victims might differ somewhat, obstetric violence happens in every region of the world. Their review included seven studies from Latin America (majority from Mexico), five from the African continent, three from the U.S, two each from Europe (France) and Asia (Iran and Sri Lanka) and three literature reviews and "philosophical papers". They found an overall prevalence range between 17.3% (overall U.S score, though the reported rate for facility-based births was 28.1%) to 78.6% (Ethiopia). They conclude with a call to further explore this topic

among medical providers and gain a better understanding of how OV might be "*embedded in the structural violence of societies that allow disrespectful and abusive behavior towards women to be normative*".[49] (p. 1558)

2.2.1 Obstetric Violence in the United States

A growing body of literature using the terminology of mistreatment/obstetric violence in high resource settings is increasingly available. However, there is still a lot of work needed to fully understand this phenomenon in the context of countries with high resources and much of the literature uses the term traumatic birth experience or negative birth experience. What follows is a brief overview of some of the literature available on this topic with a focus on studies based in the United States.

Studies in the United States that specifically look at the concept of obstetric violence/mistreatment/D&A are few and far between. Studies have focused on traumatic births and negative birth experiences instead. Some examples of these are described in the "traumatic births" section of this paper. In the following paragraphs, I will discuss five studies that specifically focus on mistreatment in the context of the United States.

In 1958 Schultz published an article in the Ladies Home Journal titled "Cruelty in Maternity Wards", in which the author documented the inhumane treatment with which women in the U.S were being subjected to during pregnancy and childbirth.[93] In 2010, Henci Goer published an article exploring this issue 50 years after that initial report of 1958. In their study, Goer found that despite the initial outrage and many years that had passed since these descriptions of disrespectful and abusive care, not much had changed. Relying on anecdotes from doulas, nurses and excerpts from other studies, Goer lays out a picture of continued mistreatment of birthing

people in the United States. Additionally, they highlight how the types of mistreatments span the full spectrum, from non-consented care to physical and verbal abuse. Goer concludes their paper by discussing how the closed and hierarchical structure of the health system and lack of accountability measures allows obstetric violence to continue to exist despite efforts to eliminate it.[94]

In 2016, Diaz-Tello presented a series of case-studies to describe the issue of obstetric violence in the United States and explore the limitations of the civil justice system to address OV The author presents an example of the existence of forced cesarean sections in the U.S. While physicians might deny that forced c-sections or other interventions are an issue, the health system has tools at its disposal that essentially force a woman to accept an undesired intervention or face legal consequences or the involvement of Children, youth, and family services (CYF), which could have lasting effects on that families' lives. Through this lens and providing other examples of obstetric violence the author makes the argument that the justice system is susceptible to the same structural issues that drive obstetric violence. They conclude by highlighting how there is a need for accountability systems and propose incorporating obstetric violence under the violence against women act as means to provide opportunities for funding of research, victim restitution mechanism and funding of rights-based education on respectful maternity care and prevention of obstetric violence.[95]

In 2018, the bearing witness study by Morton et al. was published and is one of the very few studies to specifically use the terminology of mistreatment. Their study sought to explore how often maternity support workers reported observing disrespectful care during childbirth in the United States and Canada. The authors relied on data from the Maternity Support Survey, which was conducted online from 2012-2013 with maternity support workers (doulas and labor and

delivery nurses) in the U.S and Canada. They had a total of 2,344 nurses and doulas participate. They found that around 65.4% of participants reported witnessing occasionally or often seeing procedures performed on women without sufficient time for informed consent, and about one-fifth witnessed providers doing procedures that were against the patient's wishes. About 21.7% of participants also reported witnessing providers performing more procedures because of the patient's race/ethnicity.[96] Of special note, this study demonstrates how researchers can use the terminology of mistreatment and still get engagement from clinicians on this topic.

In 2019, the Giving Voices to Mothers study was published by the Vedam et al. team. Until recently, this was the only study that measured mistreatment, autonomy, and respect among childbearing women across the United States (from women's perspective). Using a community participatory research approach, they developed one of the first reliable and valid tools to measure this phenomenon. A total of 2,700 women either started or completed their survey. Their analysis is based upon the 2,138 fully completed entries. They found that 17.3% of women in their sample reported having experienced some form of mistreatment and that women of color were more likely than white women to experience it. Specifically, they found that indigenous women (32.8%) followed by Hispanic women (25%) and black women (22.5%) reported at least one form of mistreatment.[97]

In 2020, Declercq, Sakala, and Belanoff explored women's experiences of agency and respect in maternity care by insurance type in California. They used data from the Listening to Mothers in California Survey and found that women with public insurance were more likely to experience a host of issues that undermined their autonomy and sense of respectful care. For example, they found that they had less control over maternity care experiences, including choice of provider and birthing options after cesareans. They also found that women with public insurance

were less likely to be consulted before an episiotomy was performed and more likely to be feel pressured to have c-section. While the authors caution against the generalizability of the results, their findings suggest that women with lower socio-economic status are at a greater risk of experiencing some form of mistreatment on the US.[98]

In 2021 Vargas, Marshall and Mahalingam conducted a study where they used a combination of interpretative phenomenological analysis and thematic analysis to explore "incivility" in childbirth. They introduced this term specifically for the U.S context, where they argue that "lesser intensity" forms of mistreatment are more common. They additionally describe how "*unlike abuse, a key component of incivility is that the intentionality of mistreatment and intent to harm is ambiguous. (p.695)"*. Through their analysis they found that women described instances of inhumane treatment, when they were ignored and their experiences were not listened to or believed. They also discuss how respondents described feeling pressured into procedures and had their privacy disregarded or devalued. Additionally, they described discrimination based on different identities and judgment for their choices around breastfeeding. While the authors categorize these issues as incivility, these experiences very clearly align with the dimensions of obstetric violence and should be described as such.[35,99]

2.2.2 Obstetric Violence in Europe

In 2019 Baranowska et al. conducted a cross-sectional survey in Poland. The survey was online and offered to women who gave birth in medical facilities from 2017 to 2018. Having a stillbirth was the exclusion criteria. Ultimately, 8378 questionnaires were included in the final analysis. The authors found that 81% of respondents had experienced at least 1 occasion of violence or abuse by staff during their hospital stay according to the Bohren typology. They go on

to describe the most reported form of abuse being non-consensual care (55%), verbal violence (inappropriate comments (24.4%), nonchalant treatment (20.3%)), loss of privacy (19.3%) and 8.8% reported feeling discriminated or stigmatized. They concluded their paper by highlighting that mistreatment is something that occurs in Poland and that one of the drivers could be the cultural context, where obtaining patient permission "for various steps of birth related procedures" is uncommon. This study adds to the importance of exploring the more upstream drivers of obstetric violence and develop, not only accountability systems but also interventions that help address some of these root causes.[100]

In 2020, Van der Pijl et al., published the results of their qualitative study exploring D&A as described by an online hashtag (#genoeggezwegen) in the Netherlands. Their sample included 438 stories extracted using the hashtag and coded for Bohren typology of mistreatment and an inductive coding approach. Through the deductive analysis they found that the most discussed types of abuse were loss of autonomy, ineffective communication, and confidentiality. The inductive analysis resulted in 5 themes: lack of informed consent, not being taken seriously or listened to, lack of compassion, use of force, and short and long-term consequences. Underscoring all these themes was the concept of being "left powerless", highlighting the power dynamics that are so embedded in this issue.[101]

In Belgium, Degrie et al. (2020) conducted a qualitative study among 24 women of Turkish and Moroccan descent who gave birth within the past 3 years in Flanders, Belgium. While they were not specifically looking into D&A, they described the birth experiences of these women. Using in-depth interviews and grounded theory to understand the perception of Muslim women with Turkish and Moroccan descent they described their experience of childbirth in Belgium. The authors found two dimensions, "Ereignis", which refers to the woman's experience of "what"

happened and "Erlebnis", which refers to the woman's experience of "how" or "the way in which" care happened. They highlight how the interplay between these two dimensions determines how a woman perceives her childbirth experience. Throughout their narrative they describe multiple instances of mistreatment experienced by the women interviewed. For instance, they describe multiple instances of non-consensual care, verbal abuse, and loss of autonomy. They highlight the importance of ensuring providers take care to pay equal attention to both dimensions and understanding the cultural context of the women they care for. While they do not explicitly discuss mistreatment, the existence of this phenomenon is clear in the examples that they present.[102]

In a series of three articles, the team lead by Mena-Tudela described obstetric violence in Spain in 2020 and 2021. Their sample of 17,541 questionnaires representing all Spanish Autonomous Communities was collected by a link sent via social networks to healthcare professionals, child rearing groups, breastfeeding support groups, administrator blogs and the association Birth is Ours, who were then responsible for sharing the link with their constituents/patients. They found that about 38% of respondents perceived that they had suffered some form of obstetric violence, 44% had an unnecessary procedure performed and 83.4% of these reported not having provided informed consent to those procedures. In their subsequent studies they found that births in Spain have a high rate of interventions and found that about 74% of respondents had experienced lack of informed consent and 87.6% suffered some form of verbal abuse.[103–105]

2.2.3 Summary

In summary, obstetric violence in all its forms occurs in all settings, regardless of how modern or advanced a country might be considered. Studies report between 17%-25% of women

experience some form of mistreatment during pregnancy and childbirth in high income settings.[49,97] Until recently[74], the only national survey of mistreatment in the US was conducted by Vedam et al. As described above, they found that about 17% of their sample reported some type of mistreatment.[97] However, most births in the US occur in hospitals and their sample over-represented women who planned or had births in alternative settings. Using this as an example, I would expect that the reported prevalence range underestimates the true prevalence of mistreatment in high income settings.

While it is true that in low-to-middle income settings, it is common to routinely encounter more severe forms of mistreatment, high income settings are not immune to this. In fact, while some studies argue that it is less likely to occur in these settings, others note how it's just one side of the spectrum of mistreatment.[48,94,95,106–112] There is a growing body of literature exploring mistreatment in high income settings, but lack of consensus on terminology continues to be a hindrance to advancement. While it may be more palatable to healthcare providers to use terms such as "traumatic birth" or "incivility", the use of these terms perpetuate some of the systemic factors that allow mistreatment or obstetric violence to persist in our systems. Additionally, it removes some of the urgency to address the issue, by minimizing it and removing the human rights implications of terms like disrespect and abuse, mistreatment, or obstetric violence. To my point, Vargas et al. describe how they placed the term "rudeness" in parenthesis in their questionnaire to ensure that women understood what they were trying to capture.[99] Furthermore, other studies conducted in high income settings have used this terminology proving that researchers can get buy-in while using appropriate language.[14,97] Lastly, the use of "softer" language can cause researchers to underestimate the prevalence or impact of obstetric violence given that so many seemingly different terms are used to describe the same phenomenon.

2.3 Latinx Childbearing People's Birthing Experiences in the United States

Research has documented persisting health inequalities among women of color in high resource settings. For example, it is commonly accepted that women of color tend to have worst health outcomes and experiences with the healthcare system than their white counterparts, Latinx childbearing people are no exception.[113] Aside from the study conducted by the Vedam team described above and more recently a CDC maternal mortality and morbidity review report[74,97], I did not find any study that specifically looks at the concept of obstetric violence or mistreatment among a diverse sample of childbearing people in the United States. I will describe studies that have looked at the birth experience of Latinx childbearing people in general and more specifically that of immigrant Latinx childbearing people in the United States.

The Latinx community is the largest minority group in the United States, yet they are still underrepresented in research. According to the 2020 Census, there are 62.1 million Hispanics living in the United States and represents about 19% of the U.S population.[15] There are many studies that look at birth experience in the United States, however, most are among white, middle-class women, which leaves the voices of those most vulnerable out of the conversation. One study that sought to address this gap was conducted in 2016 by Niebler et al. They conducted in-depth semi-structured interviews with 10 Latinx childbearing people in Allegheny County, PA about their childbirth experience. They found that overall, women reported positive birth experiences and that ultimately the birth outcome (i.e., healthy baby) made up for anything that could have happened in the process. Additionally, they found that while women reported overall positive experiences, they also reported having negative interactions with healthcare providers consistent with disrespect and abuse (though the authors do not categorize it as such). For example, they talked about women feeling "*ignored, being left with questions or concerns, feeing used as a mere*

case-study for medical residents or feeling discriminated due to insurance status" (p. 470)[114], all of which can be mapped back onto the Bohren typology of mistreatment.

Also in 2016, the team by Fitzgerald, Cronin and Boccella conducted a qualitative study exploring the needs and access issues of pregnant, low-income, Latinx women. They conducted focus groups with Hispanic women who attended a community prenatal education program. The focus groups focused on women's experiences around prenatal education, pregnancy resources, access to care and satisfaction with that care. They found that women were *"fearful and concerned"* about their pregnancy and the postpartum period; that they have a thirst for more knowledge and feel that through education their fears could be assuaged and perhaps improve their interactions with healthcare providers. They also found that women's desire to maintain their culture, religion language and beliefs could hinder their access to the education they seek. Additionally, women recounted examples of situations where they felt discriminated against or mistreated due to their identity or lack of English language skills. The authors highlighted the need for culturally appropriate care. This is another example that showcases the need for further exploration of mistreatment among this population.[115]

Lastly, a study looking at the health experiences of Latinx women with reproductive health services was conducted in 2020 by Ferreti et al. Using semi-structured interviews with 20 young Latinx women and 24 key stakeholders, which included parents, providers, and leaders in the Latinx community, they explored their attitudes and perceptions about sexual health and healthcare access in West Alabama. They found that young Latinx women felt that they did not have access to consistent or high-quality sexual education in their schools and that they experienced discrimination in many areas of their lives. In their expert interviews with healthcare providers, they found that healthcare providers reported that they are not always inclusive of the community

and let their personal bias affect the care they provide. Additionally, they discuss how some healthcare providers believe that by providing care to Latinx community, they are taking away resources meant for others in their state. They also found that young women who try to access contraception services might be judged for it, and discussed how the current legal landscape in the state could be affecting access as well. This study also supports what Morales-Aleman et al. found in their study in 2019.[116] While not specifically focused on birth experience, this study highlights how Latinx women face structural violence and barriers when accessing care.[117]

2.3.1 Summary

As noted by these examples, Latinx women are at an increased risk of experiencing structural violence due to their identity. Additionally, other studies have highlighted how Latinx women face multiple barriers to accessing care, including language barriers, lack of culturally appropriate care and discrimination due to race. As previously mentioned, until recently[74], I was unable to find other studies aside from the Vedam study that specifically explored mistreatment, autonomy and respect during pregnancy and childbirth among this population. This is a glaring gap in the literature. However, it is clear from findings on studies looking at birth experiences and interactions with the healthcare system, that Latinx women do experience mistreatment, and more research is required to fully understand how this population is affected.

2.4 The Role of Systemic Racism and Gender Inequality in Obstetric Violence

Throughout this paper, I have described an extensive body of literature around obstetric violence and respectful maternity care in high income settings. One thing that unifies these experiences is the role of systematic racism in mistreatment based not only on race but gender and socio-economic status. Multiple studies have argued that obstetric violence in pregnancy and childbirth is a phenomenon best explored from the lens of the reproductive justice framework. One such study was conducted by Betron et al. in 2018. They conducted a mapping review of the literature to assess whether gender inequality is a determinant of mistreatment during childbirth. They found that indeed it played a role in the persistence of mistreatment in the healthcare system. Part of the reason these issues persist is that focus for intervention has been on the downstream factors of mistreatment versus the structural/systemic drivers of obstetric violence.[118] For example, interventions have focused on individuals' traumatic experiences and in doing so pathologizing the trauma that results from obstetric violence.

Multiple studies across the United States have documented the negative impact of racism in the health and wellbeing of people of color. Additionally, research has documented the persistence of health inequities among this population.[119–124] In recognition that racism is a major threat to an individual's health and wellbeing that operates at all levels of the socio-ecological model and thus perpetuates health disparities[21,46,47], the focus of research has shifted to exploring how systematic racism in the healthcare systems create an environment that allows phenomena like disrespect and abuse to thrive despite efforts to eradicate it. For example, in 2018, Dana-Ain Davis published their study around obstetric racism, in which the author analyzed the birth stories of black women in the United States. The author found that the birth stories contained multiple examples of racism throughout different timepoints in the pregnancy and birthing process. They

argue that healthcare workers are mediators of obstetric racism but could be part of the solution by disrupting the medicalization of birth that does not serve black women. They also highlight how obstetrics in the United States was built upon multiple violations of black people. Davis concludes by describing how using the lens of obstetric racism can be helpful for other women of color, such as indigenous and Latinx women.[48]

In 2021, Crear-Perry et al. explored the social and structural determinants of health inequities in maternal health. They conducted a review to describe the state of maternal health using Black maternal health as a model. They describe multiple factors and policies that lead adverse outcomes among black women and conclude that it is imperative to have a "*shared understanding of how inequities in outcomes based upon race, class, and gender are created by police and practice*" (p.234) in order to be able to effectively address these issues.[125]

I would like to conclude this section with describing the study published by Brittany Morey, which looked at how anti-immigrant stigma exacerbates racial/ethnic health disparities. The author frames the conversation around the 2016 presidential election, which saw the rise of a wave of anti-immigrant sentiment in the United States. Morey argues that anti-immigrant stigma increases the risk of mostly communities of color of experiencing racial/ethnic disparities, which happens through increasing discrimination at multiple levels. The author concludes that "*Public health has a moral obligation to consider how immigration policy is health policy*" and that they need to be prepared to respond to the effects of anti-immigrant stigma.[126(p. 463)]

Putting it all together, structural factors both in our communities and the system in which we interact with create an environment where health inequities can thrive. Additionally, as shown here, there are real documented consequences of systemic racism on health and wellbeing, which as public health practitioners and researchers we have an obligation to address.

2.5 Research Gaps and Conclusion

Obstetric violence happens worldwide and is a human and reproductive rights violation that demands swift attention especially in high income settings. While multiple definitions and terminology have been put forth to characterize this phenomenon, there appears to still be a lack of consensus on what terms to use. This presents an issue for the accurate measurement and exploration of the issue. While I recognize this tension, I believe that the terms obstetric violence, mistreatment or disrespect and abuse are appropriate terminology. These terms clearly establish the human and reproductive rights violations that this phenomenon constitutes and studies like the bearing witness study[96] highlight how this is achievable.

An additional gap in the literature, is the lack of studies specifically exploring obstetric violence and respectful maternity care from childbearing people's perspective in high income settings. Especially people of color. Until recently, there was only one study that specifically explored the concept of disrespect and abuse in the United States across a diverse sample of childbearing people. They found that indigenous women followed by Hispanic women reported the highest rates of experiencing at least one form of mistreatment during pregnancy and childbirth.[74,97] The study by Morton's team[96], while shining a light on the fact that this phenomenon occurs in the U.S and Canada, looked at the perspectives of nurses and doulas versus the person experiencing obstetric violence. Further exploration of this topic among women of color is imperative. Especially studies that take an intersectional approach to the topic. Additionally, research needs to explore barriers to respectful maternity care from providers perspective. While this was not the focus of this review, I only found a handful of studies exploring obstetric violence that included the caregiver perspective.[78,79,82,127–133] Another important gap is a lack of studies looking at the long-term effects of experiencing this phenomenon. Specifically, more research is

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needed to understand the impact of obstetric violence as it relates to the health outcomes of mother and child. Lastly, exploration of the structural drivers of obstetric violence is necessary for the development of effective interventions as are evaluations of existing interventions.

2.6 Theoretical Frameworks of Intersectionality, Social-Ecological Model, and Reproductive Justice

This dissertation is guided by the social ecological model, intersectionality theory and reproductive justice framework. What follows is a description of how these theories and frameworks can help examine the issue of OV and inform this study based on this literature review.

2.6.1 Social Ecological and Social/Cultural Aspects of Obstetric Violence

The social-ecological model posits that one's health is affected by interactions between "*the individual, the group/community, and the physical, and political environments*".[134–136] Given that in the United States, most pregnancy care and childbirth occur in a hospital setting, this phenomenon presents itself within this system. Obstetric violence is present at multiple levels of the social-ecological model. For example, at the individual level is the childbearing persons previous experiences with the healthcare system, beliefs around childbirth and knowledge of their patient rights. At the inter-personal level, is the patient-provider relationship and how these might have different priorities. At the institutional level, there are the policies and regulations placed that could exacerbate instances of obstetric violence. At the community/public policy level are the different laws and regulations that protect or fail to protect women from these events. Lastly, in

the context of Latinx birthing people, it is especially important to consider the social-cultural norms that either normalize obstetric violence or prevent birthing people from voicing their experiences. For example, in Latinx communities, the concept of respect for authority could make birthing people reluctant to call out their healthcare provider for obstetric violence. Additionally, society might pressure birthing people into not " complaining" when the outcome was a healthy baby and "healthy" mother.[137]

2.6.2 Reproductive Justice Framework and Intersectionality Theory

The reproductive justice framework (RJF) is defined by SisterSong as "*the human right to maintain personal bodily autonomy, have children, not have children, and parent children in safe and sustainable communities*".[138] It highlights the importance of examining power systems, addressing intersecting oppressions, and centering the voices of those who are most marginalized when addressing issues reproductive health.[138] It is valuable to discuss intersectionality alongside this framework.

Intersectionality is a framework for understanding how different social positions (i.e., race, gender, sexual orientation, socio-economic status, and disability) "*intersect at the micro level of individual experience to reflect interlocking systems of privilege and oppression (i.e. racism, sexism, heterosexism, classism) at the macro social structural level*."[139(p.1267)] There are three core principles underlying intersectionality. Firstly, individuals possess multiple social identities and roles that intersect and mutually shape each other, with these identities being dynamic and influenced by the context. Secondly, to fully understand these social positions, it is essential to examine power dynamics and inequalities, recognizing the varying degrees of power present in each position. Lastly, the interaction between an individual's various identities and the broader

structural elements of society plays a significant role in generating unequal health outcomes.[140,139,141]

2.6.3 Model Integration

These two frameworks coupled with the social-ecological model provide a nuanced lens through which to explore obstetric violence among Latinx women in the United States. For example, the RJF framework highlights the importance to have access to dignified and safe maternity care, assessed in this proposal across all specific aims. Intersectionality theory directs us to explore this topic by taking into consideration the multiple identities that Latinx women might have, such their immigration status, language ability, socio-economic status, and education level and how these might either compound the issue of obstetric violence or act as protective identities. Additionally, these frameworks underscore the importance of understanding the structural drivers of obstetric violence, which might include policies within hospital systems, immigration policies and normalized violence against women in society. While this study focuses on individual and interpersonal level measures, these frameworks allow us to situate the results within those higher-level processes. By employing these three frameworks to understand the issue of obstetric violence and respectful maternity care, this dissertation provides a holistic and nuanced understanding of how this phenomenon presents itself among Latinx women in the United States.

3.0 Methodology

Using the Giving Voices to Mothers (GVtM) Latinx data set, I explored how Latinx childbearing people in the United States experience obstetric violence and respectful maternity care. The dataset includes 2700 respondents, of which 297 were Latinx. Informed by intersectionality theory, I also explored to what extent different social categories predict these outcomes. In this section, I describe my primary data source, (3.2) primary outcomes of interest, (3.3) and independent variables, as well as my analytical approach (3.4).

3.1 Specific Aims and Hypotheses

The main outcomes of the GVtM study are (1) obstetric violence as measured by the Mistreatment index (MIST) and Pressured care variables; and (2) respectful maternity care as measured by the Mothers on Respect Index (MORi). My specific aims are:

Aim 1: Examine factors associated with Latinx childbearing people's experiences of obstetric violence and respectful maternity care.

- Hypothesis 1.1: Latinx subgroups will differ significantly in their reports of obstetric violence and respectful maternity care.

- Hypothesis 1.2: Latinx childbearing people who have a community birth (i.e. birthing outside of a hospital setting) will be less likely to report obstetric violence than their counterparts and will score higher on MORi.

- Hypothesis 1.3: Latinx women who fall into younger age groups, lower socio-economic status, have a history of social risk (such as drug use, incarceration or intimate partner violence) or elevated pregnancy risk (i.e. high BMI, health complications during pregnancy, vaginal birth after cesarean section (VBAC), first time mothers, or those who have an instrumental delivery have increased odds of reporting obstetric violence and are more likely to score lower on MORi.

- Hypothesis 1.4: Access to midwifery care, race/ethnicity/cultural/heritage-concordant care, and/or support persons during labor and delivery, will be associated with decreased odds of reporting obstetric violence and higher scores on MORi.

Aim 2: Examine the effect of obstetric violence on respectful maternity care.

- Hypothesis 2.1: Latinx women reporting obstetric violence will report lower levels of respect in maternity care, as measured by the MORi.

Aim 3: Examine the intersectional influences of parity, nativity, and history of social risk on obstetric violence and respectful maternity care within Latinx childbearing people.

- Hypothesis 3.1: The intersection of nativity, parity, and history of social risk will significantly predict differences in individual reports of obstetric violence and respectful maternity care among Latinx childbearing people.

3.2 Primary Data Source: The Giving Voices to Mothers (GVtM) Dataset

In 2019, the GVtM team, led by Dr. Saraswathi Vedam, surveyed women across the United States (US) about their experiences with respect and autonomy during pregnancy, childbirth and

beyond.[97] Using a cross-sectional design with intersectionality theory and community based participatory methodology, the GVtM developed and implemented a set of patient designed indicators of mistreatment in the US. GVtM is the first study of its kind and demonstrated the applicability of their mistreatment and respectful maternity care indicators in high resources settings and provided preliminary association between race and mistreatment in the US.

3.2.1 Methods of GVtM

The GVtM study used a community-based participatory research process to convene a multi-stakeholder team to explore the experiences of women who were pregnant in the US between 2010 and 2016. This stakeholder group had representation from community members, clinicians, community health service leaders, and researchers. They adapted an instrument developed and tested in Canada to better fit the US context. To ensure representation of communities of color, during the survey adaptation-process, community agencies were asked to recruit women from the target populations (four communities of color, African American, Indigenous, Hispanic, and Asian) to serve on an expert panel. This panel (N=31) participated in a formal content validation of the proposed survey. Next, the study team revised, retained, or discarded items based on best practice guidelines around content validation.[97] The final GVtM survey instrument had 218 items, with 60 items measuring different aspects of mistreatment. It included previously validated scales such as the Mothers Autonomy in Decision Making (MADM) scale[142], the Mothers on Respect (MORi)[143] , and an adapted version of the Perceptions of Racism (PR) scale.[144] The final survey that was designed for the US context was translated to Spanish and included skip patterns to accommodate women who had a pregnancy loss or were currently pregnant.

The GVtM study aimed to obtain a diverse survey sample, specifically ensuring representation of the African American, Hispanic/Latinx, Indigenous, and Asian childbearing people. These groups are underrepresented in research and are among those most vulnerable to experiencing mistreatment during pregnancy and childbirth, but also in healthcare as a whole.[145,146] Women were eligible to take the survey if they had experienced at least one pregnancy in the US between 2010 and 2016. Women who were pregnant at the time of the survey were also eligible to participate.

3.2.2 Overview of Results of GVtM

2700 women began the survey which resulted in variable denominators across the different sections. The primary GVtM analysis was restricted to the 2138 women who completed the survey in its entirety.[97] Table 3.1 below breaks down the socio-demographic characteristics of the full data set (n=2700). For a full description of the dataset please refer to the published articles on GVtM.[23] One in six women (17.3%) in the sample reported having experienced some form of mistreatment, with women of color being more likely than white women to experience it. The GVtM study found that indigenous women (32.8%), Hispanic women (25%) and Black women (22.5%) reported at least one form of mistreatment as measured by the Mistreatment index.[97]

Table 3.1: Social-Demographic Characteristics of the GVtM Study's Full Survey Sample (2700 Respondents)

Socio-demographic characteristics	Number	%
Age at time of birth		
17-24	132	5.7%
25-30	736	31.8%
31-39	1306	56.4%
40 and older	140	6.1%
Residence at time of data collection		
New York	778	28.8%
California	206	7.6%
Washington	121	4.5%
Texas	115	4.3%
Other	1477	54.8%
Languages spoken at home		
English	2420	89.6%
Spanish	240	8.9%
Other or Missing	40	1.5%
Born in the US		
Yes	2172	90%
No	253	10%
Highest level of education completed		
High School	79	3%
Some college, but no degree	409	16%
College	718	30%
Associate degree	190	8%
Some graduate school, but no degree	176	7%
Graduate degree (e.g., MSc or PhD)	721	30%
Professional degree (e.g., MD or JD)	94	4%
Other	34	1%
Main source of payment for maternity care		
Medicaid/CHIP	365	14%
Private insurance	1371	51%
Out-of-Pocket	544	19%
Other/Not sure	450	17%
Total household income before taxes		
$ 0—19,999	122	6%
$ 20,000-49,999	485	23%
S 50,000-99,999	734	35%
$ 100,000—159,999	467	22%
160,000-over	289	14%

3.2.3 Strengths and Limitations of GVtM

Until recently, this was the only US based study to look at quantifying mistreatment among a diverse sample of women. The CDC recently published a similar study reporting similar results.[74] Among the strengths of the GVtM study are the large sample size, nationwide representation, and racially diverse sample. Additionally, the GVtM relied on a patient designed and validated tool to measure mistreatment.

While the GVtM has many strengths, it also has several limitations. One limitation is that this was not a probability sample, which introduces bias. Of importance for this dissertation, the proportion of Hispanic women (10%) was lower than the proportion of Hispanic women who gave birth in 2016 in the US (24%). Most births in the US are in hospitals. Half (50%) of the sample included in the GVtM reported giving birth outside of a hospital setting. This is another limitation that might result in the underreporting of mistreatment as literature suggests that giving birth outside the hospital is a protective factor for mistreatment. Additionally, the sample is skewed towards a higher socioeconomic status than what would normally appear in the general population. Despite these limitations, the GVtM represents the first step in understanding the phenomenon of mistreatment in the US.

3.3 Variables in Analysis

3.3.1 Primary Outcomes (Dependent Variables)

3.3.1.1 Obstetric Violence (OV)

Obstetric Violence (OV) was a dichotomous variable recording presence or absence of obstetric violence. Presence meant that the respondent had marked "yes" to any one of the seven items in the Mistreatment Index (MIST) or any of the 21 items that explore pressured or coerced care. OV refers to the "*abuse or mistreatment by a health care provider of a female who is engaged in fertility treatment, preconception care, pregnant, birthing, or postpartum; or the performance of any invasive or surgical procedure during the full span of the childbearing continuum without informed consent, that is coerced, or in violation of refusal. It is sex-specific form of violence against women (VAW) that is a violation of human rights.*"[8(p.1)] I extend this definition to include auxiliary personnel in the hospital setting.

MIST is a set of indicators of mistreatment that align with the Bohren typology.[21,97] A patient-led content validation process resulted in the development of the MIST.[97] The Bohren typology of mistreatment is a commonly accepted categorization of the various forms of abuses that can occur throughout the course of maternity care. It includes seven categories: physical abuse, sexual abuse, verbal abuse, stigma and discrimination, failure to meet professional standards of care, poor rapport between women and providers, and poor conditions and constraints within the health system[21]. The pressured care items asked respondents if they had felt pressure to have or avoid various procedures. These procedures were epidural, the use of medication to start labor, an epidural, continuous fetal monitoring, episiotomy, medicine for pain relief, a cesarean or

medication to speed up labor. A copy of the MIST index and the pressured care items are available in Appendix C.[97]

3.3.1.2 Respectful Maternity Care (RMC)

The second outcome of interest is Respectful Maternity Care (RMC) as measured by the Mothers on Respect Index (MORi), which refers to care that "*maintains dignity, privacy, confidentiality, ensures freedom from harm and mistreatment, and enables informed choices and continuous support during labor and childbirth*".[55(p. 114)] MORi examines the nature of respectful patient-provider interactions and it's impact on a person's comfort, behavior and perceptions of racism or discrimination.[143] The psychometric properties in the US context were assessed and reported elsewhere. Briefly the authors reported a Cronbach alpha of 0.94 and was found to have content and construct validity.[143]

MORi is composed of 14 items measured on a 6-point Likert scale[143]. Responses are added to create a range of scores between 14-84 with higher scores indicating more respectful care. Each item has a value from 1-6, with some items being reverse scored. The scores are organized into quartiles: 14-31 very low respect, 32-49 low respect, 50-66 moderate respect, 67-84 high respect. I calculated a mean summary score for MORi for each participant and report on the mean and standard deviation of MORi. A copy of the index and scoring information is available in Appendix D. Table 3.2 below summarizes the outcomes in this study.

Table 3.2: Outcome Measures Response Options and Variable Type

Outcome	Measurement tool	Response options	Scoring	Variable type
Obstetric violence	MIST[97] and Pressured Care Items (21 items: 7 in MIST, 14 in Pressured Care)	Check all that apply (absence or presence)	>=1 item checked "yes" means OV is present	Dichotomous (1 OV present, 0 OV Absent)
Respectful maternity care	MORi[143] (14-items)	(1) Strongly Disagree, (2) Disagree (3) Somewhat Disagree (4) Somewhat Agree (5) Agree (6) Strongly Agree	Sum of values for item. The scores are organized into quartiles: 14-31 very low respect 32-49 low respect 50-66 moderate respect 67-84 high respect	Continuous score Range 14-84

3.3.2 Independent Variables

The following independent variables have been chosen based on the results of GVtM, the literature around drivers of obstetric violence and respectful maternity care.[9,21,49,57,118,147–151] Table 3.3 provides an overview of each of the independent variables considered in this study and their treatment in analysis.

Table 3.3: Independent Variables: Response Options and Treatment in Analysis

Variable	Response Options	Variable Type
Nativity	2 (US born, foreign born)	Categorical
History of social risk	2 (History of social risk, no history of social risk)	Categorical
Parity	2 (Nulliparity/Primiparity, Multigravida)	Categorical
Age	4 groups (17-25, 26-30, 31-35, and 36+)	Ordinal
Language	3 (English, Spanish, other language)	Categorical
Latinx subgroup	5 groups (Caribbean, Mexican, Other/Multiple Hispanic heritages, Puerto Rico, and South/Central American)	Categorical
Socio-economic status composite	2 (moderate/high SES, low SES)	Categorical
Support during labor and delivery	2 options (yes/no)	Categorical
Race/Ethnicity concordant care	2 options (yes/no)	Categorical
Elevated pregnancy risk Composite	2 (Elevated Pregnancy Risk, No Elevated Pregnancy Risk)	Categorical
Delivery Location	2 groups (Hospital Setting, Community Birth)	Categorical
Provider type	2 Groups (Doctors (OB)/Allied health, Midwifery)	Categorical
Delivery type	2 groups (Vaginal birth, instrumental birth)	Categorical
Intersectional composite variable	8 groups (US born, no history of social risk, multigravida (100), US born, no history of social risk, primigravida (101), US born, history of social risk, multigravida (110), US born, history of social risk, primigravida (111), foreign born, no history of social risk, multigravida (200), foreign born, no history of social risk, primigravida (201), foreign born, history of social risk, multigravida (210), foreign born, history of social risk, primigravida (211),	Categorical

3.3.2.1 Nativity

Nativity status was a dichotomous variable, where 1 represents being born in the US and 0 represents being born outside of the US. In the US, immigration status is a barrier to access social services including quality healthcare. This is especially impactful in states that have strong anti-immigrant policies in place.[17,152–154]

3.3.2.2 History of Social Risk

History of social risk is a dichotomous variable with 1 representing a history of social risk and 0 representing no history of social risk. It is a composite variable that includes women who reported substance use/abuse (smoking or daily drinking during pregnancy, and/or drug dependence during pregnancy), women with a history of incarceration (herself or partner), involvement of child or family services, and/or reported intimate partner violence. Having any one of these characteristics classified respondents as having a history of social risk.

3.3.2.3 Parity

Parity was a dichotomous variable with 1 representing a primigravida/nulliparity and 0 multigravida. Previous birthing experience provides childbearing people with better understanding and allows for more realistic expectation setting of what the birthing experience will be like. This is important provided the subjective nature of respect and how childbearing people might internalize interactions.

3.3.2.4 Age

Age was calculated using the reported year of birth and year of survey completion. Responses were grouped into four categories 17-25, 26-30, 31-35 and 36+ years. The GVtM study

found that women who were young (17-25) tended to report more OV compared to older women. Additionally, studies on maternal health experiences have shown that age is associated with a number of adverse health outcomes.[59,98]

3.3.2.5 Language

Language was determined by the responses to the following prompt: "*The language I speak at home*". In this study, this variable consisted of three groups, Spanish, English and Other. The latter included any other language participants may have marked including native Latin American languages and non-Latin American languages.

3.3.2.6 Latinx Subgroup

Participants who identified as Hispanic or Latinx were asked to further classify themselves into seven groups, Central American, South American, Cuban, Spanish, Mexican, Puerto Rican and Other. These are categorical variables and were re-categorized into five groups: Caribbean (Cubans, Dominicans, Haitians), Mexican, Puerto Rican, South/Central America, and other/multiple Hispanic heritages (Spaniards, any combination of Latinx group). Historically, the Latinx population has been treated as a monolith in research. This has the potential to mask the effect of risk factors associated with negative health outcomes.[155,156]

3.3.2.7 Socio-Economic Status

Socio-economic status (SES) was determined based on a recoded composite score created in GVtM. This composite included those who were 150% below the federal poverty guidelines for the year of data collection, or had low education, those who reported that heat or electricity was turned off, inability to buy enough food, and respondents who reported receiving a housing

subsidy, assistance from Indian health services or state health plan, temporary assistance for needy families, food stamps, women, infant and children (WIC) food vouchers or money to buy food. It is a dichotomous variable with 1 representing low income and 0 representing those with high income. Studies have shown that women with low SES report worse health experiences in maternity care compared to those with higher SES.[157] GVtM also found that women with low income were more likely to report experiencing OV.[97]

3.3.2.8 Presence of Support During Labor and Delivery

Presence of support during labor and delivery was a dichotomous, categorical variable, where 1 represents having support during labor and delivery and 0 represents not having support during labor and delivery. In GVtM, this question allowed for the respondent to specify who provided support (i.e., doula, friend, partner, midwife, doctor, nurse, family member, other or did not receive support). In this analysis, this was simplified into having support or not.

3.3.2.9 Race/Ethnicity Concordant Care

Race/Ethnicity concordant care was a dichotomous, categorical variable, where 1 represented having care providers who matched the respondent's race, ethnicity, or culture and 0 represented not having care that matched their race, ethnicity, or culture.

3.3.2.10 Elevated Pregnancy Risk

Elevated pregnancy risk was a dichotomous variable, where 1 represents an elevated pregnancy risk and 0 represents no elevated pregnancy risk. It is a composite variable created by GVTM. It refers to women who reported pre-pregnancy BMI of 40 or higher, were carrying twins, or reported that they had experienced high blood pressure, gestational diabetes, or other health

complications during pregnancy (including breech baby, problems with baby's growth/health, preterm labor, but not preterm birth). Having any one of these characteristics classified respondents in the elevated pregnancy risk category.

3.3.2.11 Delivery Location

Delivery location was a dichotomous variable that refers to the location where the birth took place and has the following options: birth center inside a hospital; freestanding birth center, outside a hospital; home, planned in a home with a midwife or physician present; home unplanned, accidental or enroute to the hospital; home planned, unassisted; hospital, planned hospital birth; hospital, transfer from planned home birth after labor started; hospital, transfer from freestanding birth center after labor started, other. This variable was recoded into two groups, Hospital birth and Community birth (any birth outside a hospital setting, such as free-standing birthing center or home birth). Previous studies have shown that women who give birth in hospital settings are more likely to report OV than those who have community births. Additionally, having a community birth has been associated with increased feelings of respect and autonomy among childbearing people.[97]

3.3.2.12 Provider Type

The *type of provider* who attended the childbirth was categorical variable with the following response options: certified nurse midwife, certified professional midwife, certified midwife, licensed midwife, midwife but unsure what type, obstetrician-gynecologist doctor, family doctor, doctor not sure what type, a nurse who was not a midwife, nurse practitioner, a physician assistant, not sure, none of the above. This variable was regrouped into midwifery, and doctor/allied health (includes nurses and physician assistants but not nurse midwifes). Previous

research has shown that women who give birth under the care of a physician are more likely to report obstetric violence and lower levels of respect and autonomy than women who birth under midwifery care.[97]

3.3.2.13 Delivery Type

Delivery type was a dichotomous variable, where 1 is operative/instrumental birth (i.e. c-section/vaginal birth with forceps) and 0 represents vaginal births.

3.3.2.14 Intersectional Composite Variable

Social categories are defined as a combination of various maternal characteristics that research has shown to have an association with the outcomes of interest (OV, RMC).[158] Building upon the findings of the main of the GVtM study, existing body of literature around the topic and sample size considerations, I explored the intersectional effects of three social categories: nativity, history of social risk and parity following the example of other published works in quantitative intersectionality.[159–165] Specifically, an intersectional composite variable was constructed based on all possible combinations of the individual identities described by nativity, history of social risk and parity. This composite had eight categories: US born, no history of social risk, multigravida (100), US born, no history of social risk, primigravida (101), US born, history of social risk, multigravida (110), US born, history of social risk, primigravida (111), foreign born, no history of social risk, multigravida (200), foreign born, no history of social risk, primigravida (201), foreign born, history of social risk, multigravida (210), foreign born, history of social risk, primigravida (211),

3.4 Data Analysis Plan

3.4.1 Data Preparation and Descriptive Analysis

A data request was submitted to the Birthplace Lab for the GVtM Latinx data set. I reviewed the data for completeness and identified any missing data and extraneous values using descriptive statistics. Next, I conducted descriptive statistics to describe the Latinx sample using summary statistics to report on proportions and means and examine the distribution of intersecting identities and contextual factors of interest.

3.4.2 Missing Data

Data was assumed to be missing at random and missing values were imputed as follows. If data was missing from an outcome, the approach depended on the type of variables. For OV, which was treated as a categorical variable, I used complete case analysis (i.e. exclude missing observations from the analysis and only include complete observations). For respect, which was a continuous variable, I replaced missing values using imputation. Under the mentorship of Birthplace Lab statistician, I replaced missing values for those who completed at least eleven of the MORi items (respect scale), with the average score of the completed items. In other words, respondents must have completed at least 80% of items to have missing items replaced. For the composite variables created for this study (elevated pregnancy risk, SES and history of social risk) if a participant did not respond to one of the subcomponents within each composite variable respectively, then they were considered to be missing. For example, in the creation of the socioeconomic status variable, I took into consideration several variables, such as being under

150% income threshold for their state during the year of data collection and education level among others. If a respondent did not provide a response for one of the components of that variable, say income level or household size, that observation would be considered a missing observation in the SES variable.

3.4.3 Aim 1: Examine Factors Associated with Latinx Childbearing People's Experiences of Obstetric Violence and Respectful Maternity Care

To address aim 1, I conducted a series of bivariate analyses to explore initial relationships and correlations among all variables to inform the development of models and social categories in further analyses. I conducted chi-square tests and logistic regressions to explore the association of OV with the different covariates (age, pregnancy risk, Latinx subgroup, SES, provider type, birth location etc.) and social categories (parity, nativity, and social risk). I also conducted linear regressions to explore the relationship between the different independent variables and respectful maternity care as measured by MORi. To describe the overall prevalence of the outcomes of interest among the Latinx population, I calculated the proportion of women who reported OV and the mean respect scores across each variable of interest. Following best practices, a p-value of 0.25 was used to screen the variables for inclusion in subsequent analyses.[166] The Table 3.5 below summarizes the analysis plan followed for aim 1.

Hypothesis	Outcome/Dependent Variable	Independent Variable	Analysis	Output
1.2: Latinx childbearing people who have a community birth (i.e. birthing outside of a hospital setting) will be less likely to report obstetric violence than their counterparts and score higher on the MORi index.	Obstetric violence (presence/absence)	Delivery location (2 groups)	Logistic Regression	Odds ratio P-values 95% CI
	Respectful maternity Care		Linear Regression	Coefficients P-values 95% CI
1.1: Latinx subgroups will differ significantly in their reports of obstetric violence and respectful maternity care.	Obstetric violence (presence/absence)	Latinx Subgroup (5 groups)	Logistic regression or linear regression	Odds ratio P-values 95% CI
	Respectful Maternity Care			Coefficients P-values 95% CI
1.3: Latinx women with who fall into younger age groups, lower socio-economic status, have a history of risky behavior (such as drug use) or elevated pregnancy risk (i.e. high BMI, health complications during pregnancy, VBAC), first time mothers, and those who had an instrumental birth are more likely to score lower on MORi and be more likely to report obstetric violence.	Obstetric violence (presence/absence)	Age (4 groups) SES (2 groups) History of Social Risk (2 groups) Pregnancy Risk (2 groups) Parity (2 groups) Delivery type (2 groups)	Logistic regression	Odds Ratios P-values 95% CI
	Respectful Maternity Care		Linear regression	Coefficients P-values 95% CI
1.4: Access to supportive factors, such as midwifery care, race/ethnicity/cultural/heritage-concordant care, and/or support persons, will be associated with of higher scores on MORi and lower odds of women reporting obstetric violence.	Obstetric violence (presence/absence)	Provider type (2 groups) Spoken Language (3 groups) Support LD (2 groups) Race Concordant care (2 groups)	Logistic regression	Odds ratio P-values 95% CI
	Respectful Maternity Care		Linear regression	Coefficients P-values 95% CI

3.4.4 Aim 2: Examine the Effect of Obstetric Violence on Respectful Maternity Care

To determine the effect of OV on respectful maternity care, I conducted a linear regression analysis to control for important covariates. Specifically, I examined the effects of obstetric violence (here an independent variable) on respectful maternity care (dependent variable) as

measured by the MORi scale controlling for delivery location, delivery type, history of social risk and support during labor and delivery. Table 3.6 provides an overview of the analysis plan for aim 2.

Table 3.5: Aim 2 Analysis Plan: Outcomes, Variable Type, Response Options, Analysis Outputs

Outcome/Dependent Variable	Independent Variable	Covariates/Controls	Analysis	Output
Respectful Maternity Care (MORi Score)	Obstetric Violence (Categorical)	Delivery location (2 groups) Delivery type (2 groups) History of Social Risk (2 groups) Support LD (2 groups) All are categorical	Linear Regression	Coefficients P-values 95% CIs

3.4.5 Aim 3: Examine the Intersectional Influences of Nativity, Parity, and History of Social Risk on Obstetric Violence, Respectful Maternity Care within Latinx Childbearing People

This analysis focuses on the Latinx sup-population and because OV is a gendered phenomenon (only childbearing people can experience it) it falls under the intra-categorical complexity of intersectionality, which "*focuses on a particular social group at neglected points of intersection in order to revel the complexity of lived experiences withing such groups.*"[167](p. 1774) To examine the extent to which the intersectionality of nativity, history of social risk and parity predicted respectful maternity care and OV, I conducted linear and logistic regressions using a composite variable for intersectionality. This variable consisted of eight intersectional strata resulting from all possible combinations of three dichotomous variables: nativity, parity, and history of social risk. Following protocols established by other intersectional quantitative studies, I ran two models for each outcome.[159–165] The first model only included the intersectional composite variable while the second model adjusted for the effect of delivery location, which previous research identifies as an important driver of respectful maternity care and obstetric violence. Table 3.7 below provides an overview of the aim 3 analysis plan.

Table 3.6: Aim 3 Analysis Plan: Intersectional Analysis, Variable Type, Response Options, Analysis Outputs

Outcome/Dependent Variable (1 analysis/variable)	Categorical Independent Variables	Control	Analysis	Output
Obstetric Violence (Presence/Absence)	Intersectional composite (8 levels) defined by: •Nativity (2 groups) •Parity (2 groups) •History of social risk (2 groups)	Delivery location	Logistic Regression	Odds Ratio p-values 95% CI
Respectful Maternity Care (MORi score)			Linear Regression	Coefficient p-values 95% CI

3.4.5.1 Variable Selection and Model Diagnostics

3.4.5.1.1 Variable Selection

Variables were first screened for inclusion using a p-value of less than or equal to 0.25. All of those that met the inclusion criteria were included in a multiple regression to assess the relationship of the independent variables with the outcomes. I assessed the significance of each variable included in the model using the Wald test. I first tested all variables with a p-value over 0.05 as a group and then conducted individual Wald tests for each variable in turn before deciding on excluding the variable from the model. Results from these tests can be found under Appendix E.

3.4.5.1.2 Logistic Regressions

For the logistic regressions, I tested model fit by conducting goodness of fit test. I tested the model specification through the link test and Akaike information criterion (AIC), Bayesian Information Criterion (BIC) and tested the predictive accuracy of the model using the area under the receiver curve test. I also conducted visual inspections of residuals and to detect influential points, I conducted an analysis of the leverage points and influential points. Lastly, I used the

variance inflation coefficient (VIF) to assess multicollinearity. Results of these diagnostics can be found under Appendix E.

3.4.5.1.3 Linear Regressions

For the linear regression, I tested model fit using the R-squared statistics. I tested model specification for each model through the link test and Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC). I conducted a visual inspection of residuals and assessed influential points and leverage points. Lastly, I used the variance inflation coefficient (VIF) to assess multicollinearity. Results of these diagnostics tests can be found under Appendix E.

3.4.5.1.4 Software and Estimation

For all analyses, I used STATA 18.

3.4.5.2 Dissemination Plan

Data was compiled into this dissertation and will serve as the basis to produce manuscripts for submission for publication to peer-reviewed academic journals and professional conferences. Additionally, I will create plain English summaries of the results to share with non-academic audiences. Results will be shared with the original GVtM team and their steering committee. Lastly, all materials resulting from this study will be translated to Spanish and Portuguese to increase the reach of the results and honor the original study's inclusion efforts.

3.5 Ethical Considerations

This study was reviewed by the University of Pittsburgh's Institutional Review Board (IRB) and received exempt status (see Appendix A for IRB approval). It is a secondary analysis of an existing data set. As such, there is no direct contact with participants. Childbearing people who participated in the original study gave consent for their data to be shared with other researchers conducting similar research. The study team was trained in Health Insurance Portability and Accountability Act (HIPPA) data privacy and security provisions and have completed the necessary human subjects training from the Collaborative Institutional Training Initiative (CITI), which instructs researchers on ethical behavior in research. Additionally, the data set was de-identified by the original team to protect participant confidentiality. Lastly, the study team adhered to the consent forms completed by the participants of the original study, a copy of which can be found under Appendix B.

4.0 Results

In the previous chapter, I discussed the study aims and methodological approach selected to address them. As a reminder, this study had three main aims:

1. Examine factors associated with Latinx childbearing people's experiences of obstetric violence and respectful maternity care.

2. Examine the relationship between obstetric violence and respectful maternity care.

3. Examine the intersectional influences of nativity, history of social risk and parity on obstetric violence and respectful maternity care.

In this chapter, I will present the results of this study organized around each of these aims. Before delving into the results for each aim, it is beneficial to understand who is in the sample. Tables 4.1a, 4.1b 4.2a, and 4.2b below summarizes the demographic characteristics of the sample and the distribution of the outcome variables across them.

4.1 Sample Description

After data cleaning and sequestering, the sample included a total of 297 observations. Of the 297 Latinx people in my sample, 37.37% had low socioeconomic status, approximately 21% were not born in the US, 45% had a midwife assisted childbirth, 78% had support during labor and delivery, almost 20% had elevated pregnancy risk, 47% were first time mothers, 8% had a history of social risk, 17% had an instrumental birth and about 55% birthed in a hospital.

Tables 4.1a-b show that in this sample, 46% of those aged 17-25, 43% of those 26-30, 32% of those 31-35 and 25% of those 36+ reported obstetric violence. Among Latinx groups, 26% or respondents who identified as Caribbeans and 43% of respondents who identified as Puerto Ricans reported OV. Out of those who were not born in the US, 33% reported obstetric violence compared to 37% among those born in the US. Among first time mothers, 45% reported OV compared to 28% among those with previous birthing experiences. Of those who birthed in a hospital setting, 55% reported OV compared to 15% among those who had community births 15%. Of the respondents who identified as Black, 73% reported OV. Lastly, 79% of respondents with a history of social risk compared to 37% of those with no history.

Table 4.1a: Demographic Description of the Sample's Pregnancy and Delivery Characteristics across

Obstetric Violence

	Total		Obstetric Violence			
			Obstetric Violence		No Obstetric Violence	
	N=297	%	N	Row %	N	Row %
Maternal Age at Birth						
17-25	35	12%	16	46%	12	34%
26-30	82	28%	39	48%	33	40%
31-35	96	32%	36	38%	42	44%
36+	55	19%	18	33%	28	51%
Missing	29	10%	12	41%	4	14%
Nativity						
US born	234	79%	95	41%	92	39%
Foreign born	63	21%	26	41%	27	43%
Latinx Subgroup						
Caribbean	27	9%	9	33%	14	52%
Mexican	113	38%	45	40%	43	38%
Puerto Rican	76	26%	37	49%	25	33%
SA/CA	51	17%	19	37%	24	47%
Other Hispanic heritage	30	10%	11	37%	13	43%
Race						
Biracial/multi-racial	36	12%	15	42%	16	44%
Black	15	5%	11	73%	3	20%
White	42	14%	12	29%	24	57%
Another race	13	4%	5	38%	5	38%
Missing	191	64%	78	41%	71	37%
History of Social Risk						
Yes	24	8%	19	79%	4	17%
No	273	92%	102	37%	115	42%
Education Level						
Below High School/High School/Trade School	10	4%	5	50%	4	40%
Some College	71	24%	31	44%	32	45%
College/Associates	126	42%	45	36%	52	41%
Graduate/Professional	75	25%	32	43%	27	36%
Missing	15	5%	8	53%	4	27%
Socio Economic Status (SES)*						
Low	111	37%	56	46%	50	45%
Moderate/High	123	41%	56	50%	62	50%
Language						
English	123	41%	47	38%	53	43%
Spanish	155	52%	64	41%	61	39%
Other	19	6%	10	53%	5	26%
***SES variable is a composite that includes education**						

Table 4.2b: Demographic Description of the Sample's Pregnancy and Delivery Characteristics across Obstetric Violence

	Total Sample		Obstetric Violence			
	N= 297	Percent	Obstetric Violence		No Obstetric Violence	
Parity			N	Percent	N	Percent
Primigravida	140	47%	68	49%	42	30%
Multigravida	156	53%	52	33%	77	49%
Missing	1	0.34%	1	100%	-	-
Elevated Pregnancy Risk						
No elevated risk	239	80%	88	37%	103	43%
Elevated risk	58	20%	33	57%	16	28%
Delivery location			-		-	
Community birth	123	41%	20	16%	85	69%
Hospital birth	163	55%	101	62%	33	20%
Missing	11	4%	-	-	1	9%
Type of provider at Labor and delivery						
Doctor/Allied Health	110	37%	79	72%	29	26%
Midwifery	134	45%	41	31%	90	67%
Missing	53	18%	1	2%	-	
Provider Ethnicity/Race Concordance						
No	200	67%	87	44%	80	40%
Yes	88	30%	34	38%	38	43%
Missing	9	3%	-		1	11%
Delivery type						
Operative/Instrumental birth	49	16%	38	78%	9	18%
Vaginal Birth	196	66%	82	42%	110	56%
Missing	52	18%	1	2%	-	-
Support during labor & delivery						
No	65	22%	10	15%	2	3%
Yes	232	78%	111	48%	117	50%
Obstetric Violence						
Experienced	121	40%				
Not Experienced	119	41%	-		-	
Missing	57	20%	-		-	

Regarding respectful maternity care (Tables 4.2a and 4.2b), the sample had a mean respect score of 73.06 on the Mothers on Respect index (MORi) with a standard deviation of 14.26. The lowest score was 22, while the highest score was 84. The 50th percentile of the index as a was 80. As noted by these very high scores, the data set skewed towards scoring high on the respect measure. For example, the lowest mean MORi score reported hovered around the high 60s, and

this was among childbearing people who had a physician or other allied health provider had a mean MORi score of 67. Similarly, for those who birthed in a hospital setting (mean score 67) compared to a community birth which had a mean MORi score of 80. Lastly, having an operative or instrumental birth tended to result in a mean score of 61 in this sample.

Table 4.3a: Mean and Standard Deviation of MORi Scores by Demographic Characteristics of The Sample

	Total Sample		MORi		
	N=297	**Percent (%)**	**N= 250**	**Mean**	**SD**
Maternal Age at Birth					
17-25	35	12%	27	69.41	14.98
26-30	82	28%	74	71.38	16.69
31-35	96	32%	78	74.56	13.05
36+	55	19%	47	76.46	10.25
Missing	29	10%	24	70.79	14.92
Nativity					
US born	234	79%	200	72.71	14.79
Foreign born	63	21%	50	74.44	11.95
Latinx Subgroup					
Caribbean	27	9%	23	74.41	13.33
Mexican	113	38%	93	71.58	16.43
Puerto Rican	76	26%	68	73.38	13.84
SA/CA	51	17%	44	73.93	12.09
Other Hispanic heritage	30	10%	22	75.14	10.69
Race					
Biracial/multi-racial	36	12%	27	72.56	13.18
Black	15	5%	13	66.96	13.99
White	42	14%	40	77.70	9.77
Another race	13	4%	10	68.70	20.96
Missing	191	64%	160	72.75	14.74
History of Social Risk*					
Yes	24	8%	23	62.52	15.15
No	273	92%	227	74.12	13.76
Education Level					
High School/Trade School	10	3%	9	75.44	14.61
Some College	71	24%	62	73.69	15.26
College/Associates	126	42%	104	73.31	14.58
Graduate/Professional	75	25%	64	73.08	12.33
Missing	15	5%	11	65.00	15.72
Socio Economic Status (SES)*					
Low	111	37%	104	71.38	15.93
Moderate/High	123	41%	116	74.56	13.14
Missing	-		30	73.03	11.87
Language					
English	123	41%	106	74.39	12.79
Spanish	155	52%	127	72.25	15.22
Other	19	6%	17	70.76	15.67
*SES variable is a composite that includes education					

Table 4.4b: Mean and Standard Deviation of MORi Scores by Demographic Characteristics of the Sample

	Total Sample		MORi Scores		
	N=297	**Percent (%)**	**N= 250**	**Mean= 73.06**	**SD =14.26**
Parity					
Primigravida	140	47%	116	70.08	15.77
Multigravida	156	53%	133	75.90	11.95
Missing	1	0.34%	1	40.00	-
Elevated Pregnancy Risk					
No elevated risk	239	80%	197	74.40	13.65
Elevated risk	58	20%	53	68.08	15.47
Delivery location					
Community birth	123	41%	103	80.13	8.68
Hospital birth	163	55%	137	67.24	15.32
Missing	11	4%	10	79.9	9.34
Type of provider at Labor and delivery					
Doctor/Allied Health	110	37%	108	67.06	15.65
Midwifery	134	45%	120	77.70	11.30
Missing	53	18%	22	77.14	10.74
Provider Race/Ethnicity Concordance					
No	200	67%	176	72.49	14.60
Yes	88	30%	72	74.34	13.57
Missing	9	3%	2	77.00	8.49
Delivery type					
Operative/Instrumental birth	49	16%	47	61.40	17.25
Vaginal Birth	196	66%	182	75.47	12.23
Missing	52	18%	21	78.24	9.65
Presence of Support Labor & Delivery					
No	65	22%	33	69.30	16.62
Yes	232	78%	217	73.63	13.82
Obstetric Violence					
Experienced	121	41%	114	65.16	16.44
Not Experienced	119	40%	110	79.97	6.83
Missing	57	19%	26	78.38	8.70

4.2 Aim 1 Examine Factors Associated with Latinx Childbearing People's Experiences of Obstetric Violence and Respectful Maternity Care

This section first presents the findings from the logistic regression analyses conducted to explore the associations between various independent variables and obstetric violence (OV) followed by the linear regressions to do the same for respectful maternity care. Each independent variable was individually assessed for its relationship with the outcomes, providing preliminary insights into the factors that may influence these experiences and addressing the hypotheses of this aim as delineated under the specific aims.

4.2.1 Screening of Independent Variables and Identification of Associated Factors

Table 4.2 summarizes the results of the simple logistic regressions for OV. The variables that met the threshold for model inclusion were Latinx subgroup (Puerto Rican), parity, elevated pregnancy risk, history of social risk, delivery location, type of healthcare provider at labor and delivery, delivery type, maternal age (17-25 and 26-30), spoken language at home and presence of support during labor and delivery. Aside from Latinx subgroup, maternal age and spoken language at home, all other variables were statistically significant at the standard significance value of $p<0.05$. While some of the associations were significant, the confidence intervals were wide, indicating that the estimates are not precise. After ruling out multicollinearity and coding issues, I believe this is a symptom of the sample size, which might not be sufficient to establish more precise estimates.

Table 4.5: Obstetric Violence and Potential Covariates: Bivariate Logistic Regressions

	Odds Ratio	P-value	95% CI
Socioeconomic Status			
Moderate/High SES	REF		
Low SES	1.24	0.422	0.73, 2.10
Nativity			
Foreign Born	REF		
US Born	1.27	0.464	0.67, 2.42
Latinx Subgroup			
Caribbean	REF		
Mexican	1.63	0.307	0.64, 4.15
Other Hispanic Heritage	1.31	0.642	0.41, 4.20
Puerto Rico	2.30	**0.095**	0.86, 6.13
SA/CA	1.23	0.692	0.44, 3.45
Parity			
Multigravida	REF		
Nulli/Primigravida	2.40	**0.001**	1.42, 4.04
Elevated Pregnancy Risk			
No Elevated Risk	REF		
Elevated Risk	2.41	**0.009**	1.25, 4.68
History of Social Risk			
No history of social risk	REF		
History of social risk	5.36	**0.003**	1.76, 16.26
Delivery Location			
Community Birth	REF		
Hospital Birth	13.01	**p<0.0001**	6.96, 24.32
Type of Healthcare Provider at Labor and Delivery			
Doctor/Allied Health	5.98	**p<0.0001**	3.40, 10.50
Midwifery	REF		
Provider Same Ethnicity/Race			
No	1.22	0.490	0.70, 2.11
Yes	REF		
Delivery type			
Operative/Instrumental Birth	5.66	**p<0.0001**	2.59, 12.37
Vaginal Birth	REF		
Maternal Age at Birth			
17-25	2.07	**0.134**	0.80, 5.39
26-30	1.84	**0.113**	0.87, 3.90
31-35	1.33	0.447	0.64, 2.80
36+	REF		
Language			
English	REF		
Other	2.26	**0.163**	0.72, 7.07
Spanish	1.18	0.531	0.70, 2.00
Presence of Support Labor & Delivery			
No	5.27	**0.034**	1.13, 24.59
Yes	REF		
Variables that meet model threshold (p<0.25) are bolded.			
REF = Reference Category			

Table 4.3 summarizes the results of the simple linear regressions conducted for respectful maternity care. The variables that met the threshold for model inclusion were SES, parity, elevated pregnancy risk, history of social risk, delivery location, type of healthcare provider at labor and delivery, delivery type, maternal age (17-25 and 26-30), and presence of support during labor and delivery. Aside from SES and presence of support during labor and delivery, all other variables were statistically significant at the standard significance value of $p<0.05$.

Table 4.6: Respectful Maternity Care (MORi) and Potential Covariates: Bivariate Linear Regressions

	Coefficient	P-value	95% CI
Socioeconomic Status			
Moderate/High SES	REF		
Low SES	-3.18	**0.106**	-7.05, 0.68
Nativity			
Foreign Born	REF		
US Born	-1.73	0.444	-6.18, 2.72
Latinx Subgroup			
Caribbean	REF		
Mexican	-2.84	0.396	-9.41, 3.74
Other Hispanic Heritage	0.73	0.865	-7.69, 9.12
Puerto Rico	-1.03	0.766	-7.83, 5.78
SA/CA	-0.48	0.897	-7.74, 6.78
Parity			
Multigravida	REF		
Nulli/Primigravida	-5.82	**0.001**	-9.29, -2.36
Elevated Pregnancy Risk			
No elevated risk	REF		
Elevated risk	-6.32	**0.004**	-10.604, -2.04
History of Social Risk			
No history of social risk	REF		
History of social risk	-11.60	**p<0.0001**	-17.59, -5.62
Delivery Location			
Community Birth	REF		
Hospital Birth	-12.89	**p<0.0001**	-16.21, -9.58
Type of Healthcare Provider at Labor and Delivery			
Doctor	-10.64	**p<0.0001**	-14.18, -7.11
Midwifery	REF		
Provider same Ethnicity/Race			
No	-1.85	0.355	-5.80, 2.09
Yes	REF		
Delivery type			
Operative/Instrumental Birth	-14.07	**p<0.0001**	-18.39, -9.75
Vaginal Birth	REF		
Maternal Age at Birth			
17-25	-7.05	**0.040**	-13.76, -0.34
26-30	-5.08	**0.055**	-10.26, 0.10
31-35	-1.90	0.467	-7.03, 3.23
36+	REF		
Language			
English	REF		
Other	-3.63	0.331	-10.97, 3.72
Spanish	-2.14	0.255	-5.84, 1.55
Presence of Support Labor & Delivery			
No	-4.32	**0.105**	-9.55, 0.91
Yes	REF		
Variables that meet model threshold (p<0.25) are bolded.			
REF= reference category			

When testing whether there was statistically significant difference based on Latinx subgroup, no significant difference was found among the subgroups compared to the Caribbean reference group, suggesting the effect of Latinx subgroup on respect scores are not statistically distinguishable within this sample. Socio-economic status did not show a significant effect, although it was close to significance.

4.2.2 Obstetric Violence and Respectful Maternity Care Factor Exploration

In the next stage of analysis, I developed multiple logistic and linear regression models based upon the results of the simple regression analyses. Table 4.4 and Table 4.5 summarizes the results of the factor exploration stage for OV and respectful maternity care and provides an overview of each model.

4.2.2.1 Obstetric Violence

The unrestricted model included all variables that were identified during preliminary analysis as passing the threshold of a p-value of <0.25. This model was statistically significant (p<0.0001), included 221 observations, the chi square statistic was 90.88 with 11 degrees of freedom and the pseudo r2 was 0.2969. Within the unrestricted model, only history of social risk and place of delivery were statistically significant with p-values of 0.041 and p<0.0001 respectively. This model showed that women who delivered in a hospital setting were 11.85 times more likely to report obstetric violence compared to those that had a community birth and women who had a history of social risk were 4.65 times more likely to report obstetric violence compared to those who did not have a history of social risk. While these results were statistically significant, the standard errors were high (delivery location 6.23 and history of social risk 3.50).

The restricted model included 239 observations, was also statistically significant (p<0.0001) and had a chi square statistic of 84.14 with 2 degrees of freedom, and a pseudo r2 of 0.2540. The results indicated that women with a history of social risk were 4 times more likely to report obstetric violence than those with no history of social risk and women who birthed in a hospital setting were 12 times more likely to report obstetric violence compared to those who birthed in a community setting. While these were still statistically significant, the standard errors were still large, 2.32 and 3.93 respectively. Appendix E the Wald tests for variable selection and model diagnostics for both the full and restricted model.

Table 4.7: Factors Associated with Obstetric Violence: Model Comparison

	Unrestricted OV Model			Restricted OV Model		
Observations (N)	221			239		
	Odds Ratio	**P-value**	**95% CI**	**Odds Ratio**	**P-value**	**95% CI**
Parity						
Multigravida	REF	-	-			
Nulli/Primigravida	1.29	0.471	0.64, 2.61			
Type of Healthcare Provider at Labor and Delivery						
Doctor	1.14	0.789	0.43, 3.01			
Midwifery	REF	-	-			
Delivery type						
Operative/Instrumental Birth	1.76	0.240	0.68, 4.54			
Vaginal Birth	REF	-	-			
Latinx Subgroup						
Puerto Rico	1.14	0.739	0.52, 2.52			
Maternal Age at Birth						
17-25	1.32	0.588	0.48, 3.66			
26-30	REF	-				
History of social risk						
No history of social risk	REF	-		REF		
History of social risk	4.65	0.041*	1.06, 20.34	3.62	0.045*	1.03, 12.73
Elevated Pregnancy Risk						
No elevated risk	REF					
Elevated risk	0.62	0.277	0.26, 1.47			
Presence of Support Labor & Delivery						
No support	1.44	0.709	0.22, 9.56			
Support	REF					
Language						
English	REF					
Other	2.50	0.255	0.52, 12.09			
Spanish	0.84	0.628	0.41, 1.70			
Delivery Location						
Community Birth	REF			REF		
Hospital Birth	11.85	P<0.0001*	4.24, 33.15	12.18	P<0.0001*	6.48, 22.91
Intercept	0.16	P<0.0001*	0.08, 0.33	0.215*		0.13, 0.36
Model Information						
Akaike Information Criterion (AIC)	239.37			253.14		
Bayesian Information Criterion (BIC)	280.05			263.57		
Log likelihood	-107.63			-123.57		
χ^2	90.88			84.14		
Model DF	11			2		
Model test p-value	P<0.0001			P<0.0001		
Pseudo R-squared	0.2969			0.2540		
Area under receiver curve (c-statistic)	0.8374			0.7946		

(*) Statistically significant, p-value≤.0.05
REF: Reference Categories

4.2.2.2 Respectful Maternity Care

As in the analyses above, the unrestricted model for respect included all variables that met the threshold: maternal age, history of social risk, parity, provider type, elevated pregnancy risk, birth location, support during labor and delivery, socio-economic status. The unrestricted model included 199 observations and had a statistically significant p-value (p<0.0001). The R-squared statistic suggest that the unrestricted model explains about 34% of the variance in MORi scores. This model resulted in three statistically significant results (delivery location, delivery type, and presence of support during labor and delivery). When examining the model diagnostics, the residuals violated two assumptions of linear regression: homoscedasticity and normal distribution. Therefore, I ran another model that produced robust standard errors and addressed the heteroscedasticity issue. To do this, I used the robust option in STATA. This option tells the program to calculate Huber-White standard errors, which provide more reliable inferences in the presence of heteroscedasticity.[168,169] The result of this robust model is summarized in table 4.8 below. Appendix E details the Wald test for variable selection and model diagnostics for both the full and restricted model.

Table 4.8: Factors Associated with Respectful Maternity Care: Model Comparison

	Unrestricted RMC Model			Restricted RMC Model		
Observations (N)	199			228		
	Coefficient	**P-Value**	**95% CI**	**Coefficient**	**P-Value**	**95% CI**
Parity						
Multigravida	REF	-	-			
Nulli/Primigravida	-3.29	0.089	-7.08, 0.51			
Type of Healthcare Provider at Labor and Delivery						
Doctor	-1.73	0.550	-7.45, 3.98			
Midwifery	REF	-	-			
Delivery Type						
Instrumental Birth	-7.97	0.014*	-14.32, -1.63	-7.88	0.007*	-13.57, -2.18
Vaginal Birth	REF	-	-			
Socioeconomic Status						
Moderate/High SES	REF	-	-			
Low SES	-1.90	0.323	-5.68, 1.88			
Maternal Age at Birth						
17-25	-2.92	0.328	-8.77, 2.94			
26-30	REF					
History of Social Risk						
No history of social risk	REF	-	-			
History of social risk	-5.05	0.158	-12.08, 1.98			
Elevated Pregnancy Risk						
No Elevated risk	REF	-	-			
Elevated risk	0.43	0.871	-4.73, 5.58			
Presence of Support Labor & Delivery						
No support	-12.61	0.010*	-22.11, -3.12	-13.37	0.003*	-22.05, -4.70
Support	REF			REF		
Delivery Location						
Community Birth	REF	-	-	REF	-	-
Hospital Birth	-6.74	0.033*	-12.94, -0.54	-9.03	P<0.0001*	-12.33, -5.72
Intercept	83.07	P<0.0001*	80.80, 85.35	80.00	P<0.0001*	78.23, 81.77
Model Information						
Akaike Information Criterion (AIC)	1565.55			1797.98		
Bayesian Information Criterion (BIC)	1598.48			1811.69		
F statistic	(9, 189) 11.40			(3, 224) 28.73		
R-squared	0.33			0.29		
Log likelihood	-772.77			-894.99		

(*) Statistically significant, p-value≤.0.05
REF: Reference Categories; Models run using the robust option in STATA.

4.2.2.3 Aim 1 Summary and Conclusion:

In summary, hospital delivery was a significant predictor of presence of obstetric violence and lower respect. History of social risk significantly predicted obstetric violence. Presence of support during labor and delivery and vaginal, non-instrumented delivery significantly predicted respect.

4.3 AIM 2: Examine the Effects of Reported Obstetric Violence on Respectful Maternity Care

The second aim of this study tested the hypothesis that Latinx women reporting obstetric violence will score lower on respectful maternity care as measured by the Mothers on Respect index (MORi). Table 4.9 summarizes the results of linear regressions to assess the relationship between obstetric violence and MORi scores. The first model (unadjusted model) only considered obstetric violence. In this model, women who reported obstetric violence scored about 15 points lower on MORi compared to women who did not report obstetric violence. This model was statistically significant and included 224 observations. The R-squared statistic suggest it explains about 26% of the variation in MORi. The adjusted model took this a step further by controlling for other important variables, specifically, delivery location, presence of support and delivery type. This model included 222 observations, was also statistically significant with an R-squared of 37%. The adjusted model suggests that women who report obstetric violence scored 9.81 points lower on MORi on average compared to women who did not report obstetric violence. Like the diagnostics of the multiple linear regression in aim 1, the diagnostics for the original model showed a violation of the homoscedasticity and normality of residuals assumptions. As such, I ran another

regression with the robust option to account for the violation, results of which are presented in Table 4.9 below. Refer to Appendix E for the diagnostic plots associated with this model and the original model without the robust option.

Table 4.9: Aim 2 Linear Regressions Summarizing the Relationship of Obstetric Violence with Respect and as Measured by MORi

	Unadjusted Model			Adjusted Model		
Observations (N)	224			222		
	Coefficient	**P-value**	**95% CI**	**Coefficient**	**P-value**	**95% CI**
Obstetric Violence						
No Obstetric Violence	REF			REF		
Obstetric Violence	-14.81	P<0.0001*	-18.11, -11.52	-9.81	P<0.0001*	-14.32, -5.30
Delivery type						
Instrumental Birth				-7.16	0.011*	-12.69, -1.63
Vaginal Birth				REF		
Delivery Location						
Community Birth				REF		
Hospital Birth				-3.58	0.117	-8.07, 0.91
Presence of Support Labor & Delivery						
No support				-15.46	P<0.0001*	-22.90, -8.02
Support				REF		
Intercept	79.98	P<0.0001*	78.69, 81.26	81.66	P<0.0001*	80.36, 82.95
MODEL INFORMATION						
Akaike Information Criterion (AIC)	1775.30			1727.46		
Bayesian Information Criterion (BIC)	1782.12			1744.48		
F statistic	(1, 222) 78.46			(4, 217) 45.17		
R-squared	0.2563			0.3712		
Log likelihood	-885.65			-858.73		
(*) Statistically significant, p-value≤.0.05 **REF: Reference Categories; model with robust standard errors**						

In summary the presence of obstetric violence has a significant negative association with respect even when accounting for the significant variables in the model. Lastly, compared with the restricted model of respectful maternity care, there is a notable increase in the r-squared of the model. In Table 4.9 we see that obstetric violence alone explains about 26% of the variance in MORi scores and the restricted model for respect showed that delivery location, support during labor and delivery and delivery type explained about 29% of the variance in MORi scores. When obstetric violence is added to that model, the r-squared value jumps to 37%, indicating that obstetric violence roughly explains about 10% of the variance in MORi scores and is an important predictor of lower scores.

4.4 Aim 3: Examine the Intersectional Influences of Nativity, Parity, and History of Social Risk on Obstetric Violence, Respectful Maternity Care within Latinx Childbearing People

The last aim of this study sought to understand to what extent the intersectional composite variable defined by nativity, parity, and history of social risk predicted obstetric violence and respectful maternity care. Tables 4.10 and 4.11, describe the distribution of the two outcomes of interest across the intersectional composite variable. This variable is defined by all possible combinations of nativity, parity, and history of social risk, resulting in eight social strata. While these strata created a better distributed data set, there were some groups with very small sample size. Specifically, the data set seemed to be concentrated among those who were US born and no history of social risk. Foreign childbearing people, with no history of social risk and who are multigravida had the lowest reported proportion of obstetric violence (only 31% of childbearing people in this group reported obstetric violence). On the other hand, US born childbearing people,

with a history of social risk and who were primigravida or nulligravida reported the highest proportion of obstetric violence (77%). In general, childbearing people who were primigravida and those with a history of social risk tended to have a higher proportion of reported obstetric violence compared to those that were multigravida with no such history. Regarding Respect, US born childbearing people, with no history of social risk, and who were multigravida had the highest mean respect score on the MORi scale (77.22, SD 11.01). Those with the lowest mean scores were found in the smallest groups, all of which included foreign childbearing people.

Table 4.10: Obstetric Violence Distribution Across Intersectional Composite Variable

Intersectional Stratum (code)	Total Sample		Obstetric Violence					
	N=296	Percent	OV	Percent	No OV	Percent	Missing	Percent
US born, No History, Multigravida (100)	111	38%	33	30%	56	50%	22	20%
US born, No History, Primigravida (101)	102	34%	46	45%	32	31%	24	26%
US born, History, Multigravida (110)	7	2%	5	71%	2	29%	-	
US born, History, Primigravida (111)	13	4%	10	77%	2	15%	1	8%
Foreign born, No History, Multigravida (200)	35	12%	11	31%	19	54%	5	14%
Foreign born, No History, Primigravida (201)	24	8%	11	45%	8	33%	5	21%
Foreign born, History, Multigravida (210)	3	1%	3	100%	-		-	
Foreign born, History, Primigravida (211)	1	0.34%	1	100%	-		-	
Missing	1	0.34%	1	100%	-		-	

Table 4.11: Respectful Maternity Care Distribution Across Intersectional Composite Variable

Intersectional Stratum (Code)	Total Sample (%)		Respectful Maternity Care			
	N=296	Percent	N=250	Percent	Mean	SD
US born, No History, Multigravida (100)	111	38%	96	38%	77.22	11.01
US born, No History, Primigravida (101)	102	34%	84	34%	69.83	16.52
US born, History, Multigravida (110)	7	2%	7	3%	58.00	16.96
US born, History, Primigravida (111)	13	4%	12	5%	67.58	14.39
Foreign born, No History, Multigravida (200)	35	12%	27	11%	77.81	8.58
Foreign born, No History, Primigravida (201)	24	8%	19	8%	74.00	12.29
Foreign born, History, Multigravida (210)	3	1%	3	1%	56.33	11.37
Foreign born, History, Primigravida (211)	1	0.34%	1	0.4%	46.00	-
Missing	1	0.34%	1	0.4%	40.00	-

Table 4.12 summarizes the logistic regressions for obstetric violence, while Table 4.13 summarizes the linear regressions for respectful maternity care. For each model, the coefficient (odds ratio for logistic regression), 95% confidence interval and model description are reported. The rest of this section is organized around the two types of regressions for simplicity.

4.4.1 Logistic Regressions: Obstetric Violence

The logistic regression results for model 1 (intersectional composite only) were statistically significant with a p-value of 0.0026 and a pseudo r-squared of 0.0561. The model includes 235 observations and omitted strata 210 and 211 because they predicted obstetric violence perfectly and thus had no variability. These strata had very small sample sizes and correspond to those who

are foreign born, have a history of social risk and are multigravida (210) or primigravida (211). The reference group were US born, with no history of social risk and multigravida since from an intersectional perspective they would be considered the more advantaged group. In this model, two intersectional groups were statistically significant, birthing people who were US born, had no history of social risk and were primigravida (101) and those who had a history of social risk and were multigravida (111). Those who were foreign born with no history of social risk and primigravida (201) and those who were US born with a history of social risk and multigravida (110) tended towards statistical significance. As illustrated by Figure 1 below, the area under the receiver curve suggests that the intersectional composite variable had a moderate discriminatory accuracy (c-statistic of 0.64).

Area under the reciever curve
OV unadjusted intersectional analysis

Area under ROC curve = 0.6403
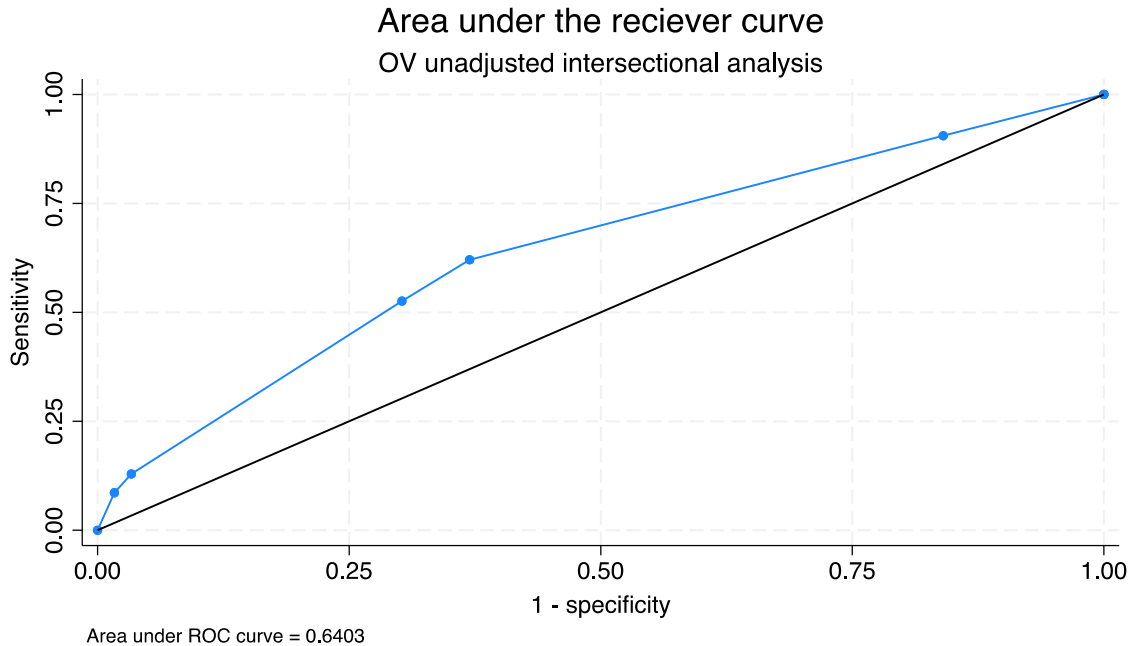
Figure 1 Area Under the Receiver Curve: Intersectional Composite Variable

Adjusting for delivery location results in another statistically significant model (p<0.0001), with a chi-square statistic of 74.04 with 6 degrees of freedom and a pseudo r-square of 0.247. This model included 234 observations and like in the unadjusted model omitted strata 210 and 211. With the addition of delivery location, none of the intersectional groups are significant, suggesting that delivery location is more predictive of OV than the intersectional composite variable. The discriminatory accuracy of the model increases with the inclusion of delivery location. Specifically, it goes from moderate (c-statistic 0.64) to good (c-statistic 0.81) as illustrated in Figure 2 below.
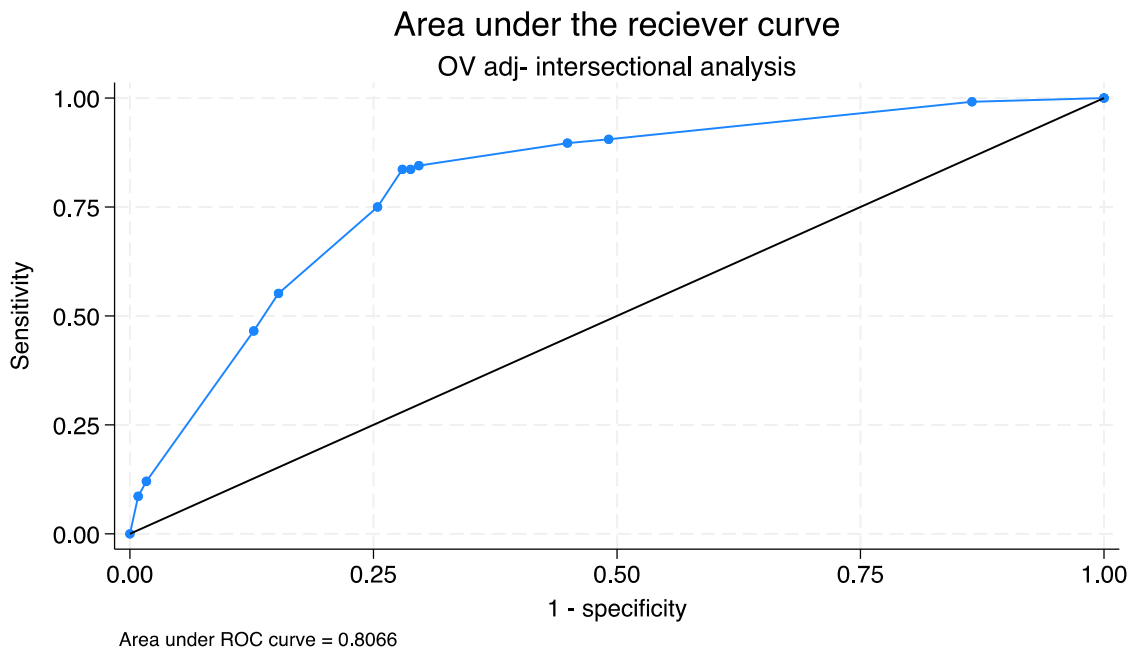
Figure 2 Area Under the Receiver Curve: Intersectional Composite and Delivery Locati

Table 4.12: Obstetric Violence: Intersectional Analysis Summary of Results

	Model 1: Unadjusted			Model 2: Adjusted Model		
Observations (N)	235			234		
	Odds Ratio	**P-value**	**95%CI**	**OR-adj**	**P-value**	**95% CI**
Intersectional Composite Variable (Code)						
US, No History, Multigravida (100)	REF	-	-	REF	-	-
US, No History, Primigravida (101)	2.49	0.005*	1.31, 4.55	1.47	0.308	0.70, 3.10
US, History, Multigravida (110)	4.24	0.095	0.78, 23.11	2.75	0.314	0.38, 19.80
US, History, Primigravida (111)	8.48	0.008*	1.75, 41.11	3.13	0.194	0.56, 17.53
Foreign, No History, Multigravida (200)	0.98	0.968	0.42, 2.32	0.86	0.773	0.31, 2.37
Foreign, No History, Primigravida (201)	2.33	0.099	0.85, 6.39	1.35	0.623	0.41, 4.39
Foreign, History, Multigravida (210)	omitted	-	-	omitted		-
Foreign, History, Primigravida (211)	omitted	-	-	omitted		-
Delivery Location						
Community Birth	-	-	-	REF		-
Hospital Birth	-	-	-	11.38	p<0.0001*	5.92, 21.87
Intercept	0.60	0.016*	0.38, 0.91	0.20	p<0.0001*	0.11, 0.36
Model Information						
X2	(5) 18.29			(6) 81.99		
P-value	0.0026			p<0.0001		
Pseudo R2	0.0561			0.2528		
Log Likelihood	-153.73			-121.19		
Akaike Information Criterion (AIC)	319.46			256.39		
Bayesian Information Criterion (BIC)	340.23			280.58		
Area under the receiver curve	0.64			0.81		

(*) Statistically significant, p-value≤.0.05
REF: Reference Categories

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4.4.2 Intersectional Linear Regression: Respectful Maternity Care

The Intersectional linear regression for respect model 1 included 249 observations and had a significant Wald statistic (7, 241) of 205.27 (p<0.0001). The reference group was US born childbearing people, with no history of social risk and multigravida provided they had the highest mean MORi score in the sample. The r-squared suggests that this intersectional composite alone explains about 13% of the variation in MORi scores in this sample. The model showed that on average all but one group (foreign born, no history of social risk, multigravida) had lower MORi scores compared to the reference category. Additionally, all but two groups were significant in the model (Foreign born, no history of social risk & multigravida (200) and those that were primigravida (201)). In summary, this model suggests that there is variation in MORi scores depending on membership in these intersectional groups defined by nativity, history of social risk and parity.

The second model for respect adjusted for the effects of delivery location. The model includes 239 observations and is also statistically significant. Including delivery location increases the model's ability to explain the variation in MORi scores from 13% to 27%. This model shows that in general, US born birthing people regardless of parity and history of social risk status score lower on MORi compared to foreign born birthing people. While there were some statistically significant relationships identified, confidence intervals were wide. Upon examination of the model diagnostics and like the models in aims 1 and 2, I re-ran the regression using robust standard errors to address the issue of heteroskedasticity and non-normal residuals identified during model diagnostics. Refer to Appendix E for the different diagnostic plots associated with this model and a comparison of the original model and the one with robust standard errors presented here.

Table 4.13: Respectful Maternity Care Intersectional Analysis Summary of Results

	Model 1: Unadjusted			Model 2: Adjusted Model		
Observations (N)	249			239		
	Coefficient	**P-value**	**95% Confidence Interval**	**Coefficient**	**P-value**	**95%Confidence Interval**
Intersectional Composite Variable (code)						
US, No History, Multigravida (100)	REF	-	-	REF	-	-
US, No History, Primigravida (101)	-7.38	0.001*	-11.61, -3.15	-5.03	0.019*	-9.23, -0.84
US, History, Multigravida (110)	-18.36	0.003*	-30.45, -6.27	-15.14	0.012*	-26.89, -3.39
US, History, Primigravida (111)	-9.64	0.023*	-17.91, -1.36	-5.44	0.210	-13.97, 3.08
Foreign, No History, Multigravida (200)	0.60	0.766	-3.35, 4.54	0.90	0.598	-2.46, 4.27
Foreign, No History, Primigravida (201)	-3.22	0.286	-9.15, 2.71	-0.89	0.755	-6.51, 4.72
Foreign, History, Multigravida (210)	-20.89	P<0.0001*	-31.85, -9.92	-18.18	0.010*	-31.91, -4.45
Foreign, History, Primigravida (211)	-31.22	P<0.0001*	-33.46, -28.98	-24.92	P<0.0001*	-28.16, -21.67
Delivery Location						
Community Birth	-		-	REF	-	-
Hospital Birth	-		-	-10.79	P<0.0001*	-13.97, -7.61
Intercept	77.22	P<0.0001	74.98, 79.46	81.71	P<0.0001*	78.81, 83.60
Model Information						
Wald Test	(7, 241) 205.27			(8, 230) 357.92		
P-Value	p<0.0001			p<0.0001		
R-squared	0.1312			0.2717		
Akaike Information Criterion (AIC)	2003.63			1887.24		
Bayesian Information Criterion (BIC)	2028.25			1915.05		
(*) Statistically significant, p-value≤.0.05						
REF- Reference category; Model using robust standard errors						

5.0 Discussion

The goal of this dissertation was to address the following two research questions, (1) What factors are associated with obstetric violence and respectful maternity care among Latinx childbearing people? And (2) To what extent does the intersectionality of nativity, parity, and history of social risk predict obstetric violence and respectful maternity care among this population. In this final chapter, organized by study aim, I will situate these findings within the broader literature, discuss the strengths and limitations of this study and describe implications for public health research and practice.

5.1 Factors Associated with Obstetric Violence and Respectful Maternity Care among Latinx Childbearing People in the United States

5.1.1 Influence of Delivery Location and Delivery Type

The analysis showed that the delivery setting and delivery type had a significant influence on the reporting of obstetric violence and respectful maternity care. Specifically, women who had a community birth were less likely to report obstetric violence and have higher scores of respectful maternity care compared to those who delivered in a hospital setting regardless of provider type. Additionally, those who had an operative/instrumental (i.e., cesarean section or use of forceps) birth tended to score lower on the respect measure and in bivariate analyses increased likelihood

of reporting obstetric violence, although in the latter the statistical significance disappeared in multiple regression.

In recent years, there has been increasing recognition of the importance of person-centered care and respectful maternity care in improving maternal health outcomes. The findings support previous studies that highlight the importance of delivery setting in shaping birthing experiences.[25,59,128,170,171] It is important to acknowledge the cultural and systemic factors that influence the delivery setting and provider-patient interactions. For example, Fraker recounts the experience of a doula caring for a birthing individual in New York City. Fraker describes how the doula's client was administered an epidural, which was incorrectly placed. The staff at the hospital would have picked up on this if they had checked on the patient through the night versus relying on "machines and interventions to speed up labor".[172(p110)] In this scenario, one can also see how the policies and structures in place in hospital settings can be at odds with best practices for respectful maternity care. Most recently, this was brought to attention during the COVID-19 pandemic when the mother-child dyad were systemically separated, hindering the ability to have skin-to-skin contact.[173,174]

Coercion is a type of obstetric violence and a direct contradiction to respectful maternity care. In this study, this was captured as a type of obstetric violence. There are many examples in the literature about coercion in healthcare.[106,110,175–178] It is at times used as a tool to get patient compliance. Tactics such as threats to involve authorities and threats to life of patient or child are commonly used.[110,177] Coercion exists in all of healthcare but is especially prevalent in maternity care where a higher level of paternalism is persistent.[110] Despite campaigns for improving patient autonomy and decision-making, scholars have noted that the power dynamics inherent in the provider-patient relationship can hinder the parturient ability to exert their right to make decisions

about their care.[177,179] For example, Liese et al[109] describe how informal coercion is used to get birthing people to acquiesce to their plan. They describe how a physician might tell a patient that they will allow them to go for a walk for an hour, but if they have not dilated enough in that time, they will proceed with administering Pitocin to speed labor. The physician concedes walking to the patient knowing that in an hour they will not have dilated enough and thus their course of action will be enacted. While there are times when patients might be unable to provide informed consent, every effort to insure free-willed and informed consent must be made. There are tools available to assist physicians in reaching this goal. For example, in the context of maternity care, birth plans have become increasingly popular among patients but their use and or acceptance by healthcare professionals is lacking. It is oftentimes left to the patient to not only craft their birth plan but to advocate for it.[180–184] Whereas this could be an opportunity to open dialogue with providers in the prenatal period to ensure patients have a more realistic expectation of what occurs during childbirth and how patients can exercise their bodily autonomy rights and be a partner in their own care.

Addressing obstetric violence and promoting respectful maternity care requires a multifaceted approach that includes changes in institutional policies and practices, provider training and education, and increased accountability and oversight. It is crucial to acknowledge that obstetric violence is not limited to any specific country or region, but rather a global issue rooted in power dynamics and gender inequalities within healthcare systems. Understanding these power dynamics and structural inequalities is essential in promoting respectful maternity care. Furthermore, ensuring proper training and awareness of medical staff is essential to this goal. Studies on the perception of medical providers on obstetric violence highlight how it tends to be minimized or not recognized unless it's an extreme situation and how many medical professionals

(doctors, nurses and other allied health) are not aware of the concept of respectful maternity care and it's rights-based approach to care.[8,95,109] Other studies have also highlighted the lack of awareness of the concept of obstetric violence and birthing people's rights among childbearing people.[41,109] Indicating that there is a need for education and awareness raising among both healthcare professionals and birthing people. Efforts to do this both in the US and abroad are currently in place. For example, Green et al.[75] developed a framework for training healthcare providers to address maternity care disparities, biases and racism in healthcare. Their framework was designed with Black childbearing people at its core, but the principles are applicable for all minorities.[75]

Lastly, it is important to recognize that while it is more likely for obstetric violence to occur in a hospital setting it does not mean that it does not happen in a community birth setting. Some studies suggest that the phenomenon of obstetric violence occurs in these settings.[185] The dataset used in this study overrepresented community births, and while reports of obstetric violence were found in community births, it was significantly less likely than in hospital settings. As community births become more popular in the United States, it is important that we understand how this phenomenon presents itself in these settings to ensure that we can develop effective interventions to address the issue, whether that is provider training or policy changes, because obstetric violence constitutes a violation of women's rights and has no place in quality healthcare.

5.1.2 Impact of History of Social Risk

Through the analysis, I identified a significant link between the history of social risk and obstetric violence, as well as respectful maternity care. I used a composite variable to represent

childbearing individuals who reported substance use/abuse (such as smoking or daily drinking during pregnancy, and/or drug dependence), women with a history of incarceration (either themselves or their partner), involvement with child or family services, and/or reporting intimate partner violence. These are traditionally stigmatized identities that place individuals at increased risk for poor health outcomes. [186,187] Some studies have also highlighted how these identities can lead to increased experiences of discrimination and poor treatment.[126,178] Additionally, work around stigma in healthcare more broadly consistently describes how patients with these identities are mistreated during their treatment.[187,188] Considering this, it is not unreasonable to extrapolate that birthing people with these identities are at an increased risk of experiencing obstetric violence. The results of this study indicated that birthing people with a history of social risk were nearly four times more likely to experience obstetric violence compared to those without such history. In bivariate analyses, having a history of social risk was negatively linked to respect scores; childbearing people with any of these characteristics scored about 12 points lower than those without them. This finding aligns with existing literature suggesting that individuals with these characteristics generally have worse health outcomes and experiences in course of seeking healthcare.[97,189–193] The results of this study also confirm the findings of the parent study, which found childbearing people who had a history of social risk were more likely to report obstetric violence than their counterparts.[97]

5.1.3 Support Presence

Birthing people who reported having a support person present during labor and delivery were significantly less likely to experience obstetric violence compared to those who did not have

support. This protective effect was reinforced by the finding that birthing people with support had higher respect scores, indicating that the presence of a support person during labor and delivery contributes to a more respectful maternity care experience. While this study did not explore if there were differences by support type, such as a partner, family member, or doula, focusing rather on whether they reported receiving support, previous research has shown the beneficial effects of continuous support during labor and delivery.[194–197] For example, studies have shown that continuous support during labor and delivery is associated with shorter labor, fewer interventions, and decreased likelihood of cesarean section, particularly in primiparous birthing people.[194] Moreover, the presence of a support person can provide emotional and physical comfort, advocate for the parturient rights and preferences, and help to alleviate fears and anxiety during the childbirth process.[194,196,198] A support person could play a pivotal role in addressing obstetric violence and advancing respectful maternity care by supporting birthing people in exerting their birthing rights and ensuring that their autonomy and dignity are respected throughout the childbirth process. However, for this to happen, the support person needs to be well versed on the rights of birthing people but also feel empowered to advocate in healthcare settings. This is important to note provided some of the emerging literature detailing barriers to doula support in maternity care in the United States.[197–199] These findings underscore the importance of including support persons during labor and delivery as a key aspect of promoting respectful maternity care and addressing obstetric violence.

5.1.4 Impact of Obstetric Violence on Respectful Maternity Care

The second aim of this dissertation explored the relationship of reported obstetric violence on experiences of respectful maternity care. I found that birthing people who reported obstetric

violence scored significantly lower on the Mothers on Respect index compared to those who did not report obstetric violence even when adjusting for delivery location, delivery type and support presence during labor and delivery. This is an expected finding, which underscores the importance of addressing obstetric violence for birthing people to fully experience their right to respectful maternity care. This study found that delivery type, location, and lack of presence of support were individually associated obstetric violence. This finding indicates a more complex relationship of these variables. For example, it may be that presence of support person during labor and delivery also shield birthing people form obstetric violence to some extent. This highlights the need to further understand the relationship between these variables to identify which may be acting as a protective factor. Additionally, respect is a subjective experience, as such, some forms of obstetric violence might not be experienced as disrespectful care. For example, one birthing person might experience shouting or verbal abuse as disrespect, where another might not think of it that way considering the context.[200] Furthermore, gender roles in Latinx communities also play a role on how childbearing people perceive interactions. For example, it is not uncommon for Latinx communities to view physicians as higher in hierarchy then themselves. As such, they may not feel disrespected even if they experience a form of obstetric violence. [201–204] Addressing obstetric violence requires a shift in societal attitudes and cultural norms surrounding childbirth. This shift entails challenging stereotypes and biases that perpetuate unequal treatment and advocating for comprehensive reproductive justice that prioritizes the autonomy, agency, and well-being of birthing people, particularly those from marginalized communities. [153,205–209]

Among high income settings, the United States has a maternal mortality and morbidity rate that rivals middle-to-low-income settings.[1,210] This is underscored in the persistence of inequities in healthcare, where non-white birthing people are disproportionality impacted by discrimination,

lack of access to care and more likely to have poor health outcomes.[119,122,211] Structural racism, which undervalues women of color, is a key driver of maternal mortality and morbidity. Its impact has been well documented in the literature. For example, Black birthing people are two to three times more likely to die from pregnancy-related complications than white birthing people and Latinx birthing people's maternal mortality rate increased from 18.2 deaths per 100,000 in 2020 to 28 deaths per 100,000 in 2021.[1] In response to these challenges, alternative birthing models have emerged as a preferred option among birthing people of color. The emphasis on the involvement of family and community members in the birthing process have been recognized as a culturally relevant and empowering option for birthing people of color, which offer a sense of autonomy and cultural continuity during childbirth. Despite these benefits, access to this type of services in the United States is limited not only by availability of services but restrictive laws on the practice of midwifery models of care.[97,212] Efforts are needed to increase access to alternative models of care such as midwifery, but there is also a need to reform traditional models of care. If we are to reach the goal of providing respectful maternity care for all childbearing people, then it is necessary to make changes to the polices and structures that go against the tenets of respectful maternity care.

5.2 Intersectionality of Nativity, Parity, and History of Social Risk and its Relationship to Obstetric Violence and Respectful Maternity Care

Exploring the influence of nativity, parity, and history of social risk on maternity care experiences through an intersectional lens provides a more comprehensive understanding of the challenges faced by Latinx individuals. The main goal of the intersectional exploration was to

understand how well groups defined by nativity, parity and history of social risk predicted obstetric violence and respectful maternity care. To my knowledge, this is the first study that uses this approach in the context of obstetric violence and respectful maternity care. In this study, I found that the intersectional composite variable had good discriminatory accuracy when adjusting for delivery location for obstetric violence. Additionally, the composite variable explained about 27% of the variation in respect scores. These findings highlight the importance of further exploring this topic from an intersectional lens.

In this study, nativity was used as a proxy to assess immigrant status in the United States, a known barrier to quality healthcare among the Latinx population in this country.[16,213,214] While nativity alone did not show statistical significance on MORi scores or obstetric violence, exploring it through an intersectional lens yielded different results. I found that there were differences in both the odds of reporting obstetric violence and the respect scores of respondents. In the context of Latinx population, special attention to immigration policy and rhetoric is necessary, given the literature demonstrating the negative health outcomes and healthcare experience of undocumented immigrants in the US. For example, Morey argued that the immigration policy established during the Trump administration, increased anti-immigrant stigma and as a result triggered "multilevel discrimination and stress, deportation and detention and policies that limit health resources".[126(p.460)] Wolf expands on this idea by framing obstetric violence as a form of immigration injustice and describing the experiences of immigrant childbearing people in US detention centers along the US-Mexico border. [215] These studies highlight the importance to shed light on the effect of immigration policy on healthcare and consider how it perpetuates obstetric violence by increasing stigma and discrimination.

Previous birthing experiences also play a crucial role in understanding obstetric violence and how it is perceived by childbearing people. Birthing people's expectations and experiences are heavily influenced by their previous encounters and the cultural context in which the occur. I found that being primigravida was negatively associated with both obstetric violence and respect.[171,216,217] This persisted in the intersectional analysis where primigravida groups tended to fare worse than those who were multigravida. Interestingly foreign-born birthing people, with no history of social risk and who had previous birthing experiences, tended to fare better than birthing people with other combinations of social positions. This may be due to the expectations set by past experiences. It is well established in the literature that middle-to-low-income settings suffer from persistent issues of quality and lack of respectful maternity care, with some of the most severe forms of obstetric violence have been documented in these settings.[49,57,77,86,133,147,218] For example, Castro recounts witnessing medical providers yelling at birthing people, refusing to listen to patients when they declined care, and neglecting a postpartum mother in recovery room resulting in the death of the patient.[219] Furthermore, a study conducted in the Dominican Republic found that, obstetric violence is normalized to the extent that while participants acknowledged experiencing obstetric violence, they rarely described this in a negative light, but rather as an "uneventful or inevitable" part of the birthing experience.[86] As such, even if respondents experienced some form of obstetric violence, comparatively their experience in the US is just better.

Lastly, as previously discussed, a history of social risk increased the likelihood of birthing people reporting obstetric violence and having lower respect scores. From an intersectional lens, this analysis suggests that all groups with a history of social risk were more likely to report obstetric violence. However, this interpretation needs to be taken with caution provided that this

analysis was unable to determine which individual characteristic drives these effects. Additionally, provided the small sample size for foreign born birthing people, I could not make inferences about these groups. More research exploring the main effects of these characteristics and their intersections is needed.

While this study found mainly negative associations between these intersectional groups, obstetric violence and respectful maternity care, intersectionality theory challenges us to also consider the strengths that a particular social position might have. For example, previous research has shown that Latinx immigrants exhibit what has been coined the "Hispanic Paradox", which refers to the observation that Hispanic Americans often have similar or better health outcomes than their white counterparts.[220] While obstetric violence and respectful maternity care are not in and of themselves health outcomes, they can affect health outcomes. Some studies have linked experiencing obstetric violence to developing post-traumatic stress disorder post birth.[221] As previously discussed, multigravida birthing people have the benefit of experience to set their expectations of the birthing experience. Lastly, birthing people with a history of social risk might have resilient characteristics and support systems that help them overcome barriers imposed by the healthcare system. The finding of this dissertation suggests that overlooking the interconnectedness of identities can obscure the influence of individual characteristics in maternity care contexts. It also urges researchers to move beyond broad single demographic categories and consider the unique experiences and challenges faced by individuals sharing similar identities.

Obstetric violence is a pervasive issue that affects childbearing people from diverse backgrounds and is influenced by various power dynamics within healthcare systems. To address obstetric violence and realize the right to respectful maternity care, we need a multi-level approach that address the issue from different perspectives. Education alone will not address this issue;

policies need to be reviewed to ensure that they promote respectful maternity care and penalize obstetric violence. As a culture, we need to wrestle with the reality that obstetric violence happens every day in the United States and is an issue that requires our attention and addressing. From a public health practice perspective, this means intentionally exploring these issues and find interventions that promote respectful maternity care and underscore a rights-based approach to care.

5.3 Study Strengths and Limitations

This study's strength and limitations are derived from the parent study given its nature as a secondary analysis. As a secondary analysis, this study focuses on aims that the data collected was not intended to address and so, this dissertation is limited by the original data collected. For example, no data on immigration status or sexual orientation was collected in this data set, which could be influential in childbearing people's experiences of pregnancy and childbirth. I used nativity as a proxy for immigration status to reduce this limitation. In a future study, it would be important to collect immigration information. Another example was the race variable. While the GVtM survey had a very detailed race question, it did not ask respondents what race they are perceived as. This is important to note because in the Latinx context many might identify as white, though society does not perceive them as such. Additionally, the GVtM survey asked participants about their spoken language at home but did not ask participant how confident they were in their language skills. This is important to note because language barriers have been shown to impact quality of care, but it's impossible to know if respondents had a language barrier based solely on the language spoken at home. While about 10% of the GVtM data set identified as Latinx, there

were missing data that reduced the sample size available for analysis, which had an impact on the power of the study and may not allow for the identification of all existing differences. The parent study did not use a population-based sampling strategy. As such, while the sample is diverse, it is not representative of the US population distribution. Lastly, this dataset only includes Latinx birthing people who survived childbirth. Provided the well documented inequities in the US around maternal mortality and morbidity,[1] it is likely that birthing people who passed away during childbirth experienced forms obstetric violence and undignified care.

Respondents in this sample skewed towards highly educated, which could act as a protective variable for both respect and obstetric violence. Additionally, the sample skewed towards US born respondents. Another limitation comes from the information captured by the variable of support during labor and delivery. This variable only captured whether someone had support not if they felt supported. This is a nuanced distinction but an important one. Studies have shown the importance of perceived support compared to merely having support during labor and delivery.[222–225] Additionally, while this study captures obstetric violence, there is no measure of severity of the experience. This would be interesting to explore to better describe the impact of obstetric violence on birthing people. The respect measure results also skewed towards high respect, which had implications for the modelling presented here. Specifically, the linear regressions violated the homoscedastic and normal distribution of the residual assumption. To address, this issue I reported on robust standard errors, which are more precise in situations where these assumptions are violated.

Using an existing dataset and creating new insights is a strength of this dissertation. Another strength associated with this dissertation is the diversity of backgrounds of the mentorship team and primary investigator. By expanding on an existing data set, this study fills some of the

gap in the literature around obstetric violence in high-resource settings. This study also underscores that obstetric violence happens in high-resource settings, and healthcare providers need to acknowledge this. Additionally, the involvement of the primary study's author ensures that the analysis and interpretation of the data is well grounded on the original data set contents. The use of intersectionality framework to further explore the Latinx population is a key strength of this study. Latinos tend to be aggregated as a group, but literature shows that there are differences among this population, not only by race (since Latinx is an ethnicity), but also country of origin. [226] Using an intersectional approach provides a better understanding of this phenomenon among this population. The original analysis plan relied on a multilevel technique to address the intersectional aim. However, due to sample size I was unable to use this approach which would have provided a more detailed exploration of the intersectional effects. This intersectional analysis is limited in its ability to disentangle the effects of the social categories. Despite this, the use of this categorization approach provides insights into intersectional effects and sets the stage for future exploration of these effects. Lastly, the overall focus on the subject matter and terminology use is a strength of this study and it moves the needle forward in addressing obstetric violence and advancing respectful maternity care.

5.4 Conclusion and Future Directions

This study provided insight into the experiences of obstetric violence and respectful maternity care among Latinx childbearing people in the United States, a population that is typically underrepresented in research. I found that birthing in a hospital setting significantly increased the odds of reporting obstetric violence and less respect. Having a history of social risk was associated

with increased odds of obstetric violence, and the presence of support during labor and delivery was associated with higher scores in the respect measure. Lastly, when considering the intersectionality of nativity, parity, and history of social risk, adjusting for delivery location, explains about 27% of the variation in respect scores and has a high level of discriminatory accuracy. However, which individual characteristic drives these effects is not clear from this analysis. This work underscores the importance of multifaceted approach to addressing obstetric violence and advancing respectful maternity care. From a public health practice standpoint, this means ensuring hospital policies align with respectful maternity care practices. Additionally, accountability mechanisms are needed around obstetric violence. Education and awareness building of both birthing people and healthcare professionals are also needed. Lastly, ensuring access to alternative birthing options, such as midwifery care models in the US are also needed.

5.4.1 Future Research

This dissertation represents an initial step in understanding the drivers of obstetric violence and respectful maternity care among Latinx birthing people in the United States. However, further research is needed to fully understand and address this issue. In future studies, there is a critical need for quantitative studies that intentionally incorporates intersectionality theory from its inception. These studies need to be adequately powered to capture the nuances of the experiences faced by Latinx childbearing people. For example, studies that intentionally sample for nativity/immigrant status, SES and Latinx subgroup, and include a measure of perceived support would provide a more thorough understanding of these phenomena. Additionally, research that seeks to understand the long-term consequences of obstetric violence among this population is also

needed. Studies that seek to measure the severity of obstetric violence are also needed to provide a broader picture of this phenomenon in the US context.

On the qualitative front, research exploring the experiences of both birthing people and providers are still needed. For example, studies exploring the experiences of birthing people who are sexual minorities or have disabilities within this population. Additionally, studies that explore the concept of respect, obstetric violence, and effect of perceived support among Latinx childbearing people are needed. As noted in this dissertation, how someone experiences their childbirth is shaped by their lived experiences including their own interpretation of respect and what it constitutes. Understanding how Latinx birthing people think about respect can help tailor interventions that create more welcoming environment for them. Additionally, as immigration to the US by Latinx childbearing people continues, understanding their perspectives on these topics is of key importance for program development. It would also be important to understand how providers perceive this issue and their understanding of both respectful maternity care and obstetric violence. Provided the lack of consensus on terminology, studies that seek to understand how birthing people and providers conceptualize these issues could help establish common ground. I plan to analyze the open-ended responses included in the GVtM survey in an effort to start addressing some of the qualitative research needs.

Studies that explore the upstream drivers of obstetric violence and respectful maternity care are also needed. Understanding how the polices in hospital settings promote respectful care and/or enable obstetric violence has important implications for public health practice. Lastly, exploring how obstetric violence and respectful maternity care are introduced or discussed in medical training, if at all, would be especially important considering the need for a multilevel approach to this problem.

Appendix A IRB Approval University of Pittsburgh

University of Pittsburgh | Institutional Review Board
Office of Research Protections

NOT HUMAN RESEARCH DETERMINATION

Date:	September 8, 2022
Review Type:	Initial Study
IRB:	STUDY22010050
PI:	Flor d Abril Gonzalez
Title:	The Giving Voices to Mothers (GVtM) survey: A secondary analysis of the Latinx sub-population
Funding:	None
Documents Reviewed:	• Exempt application form, Category: IRB Protocol;

The Institutional Review Board determined that the proposed activity is not research involving human subjects as defined by DHHS and FDA regulations.

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made and there are questions about whether these activities are research involving human in which the organization is engaged, please submit a new request to the IRB for a determination. You can create a modification by clicking **Create Modification / CR** within the study.

If you have any questions, please contact the University of Pittsburgh IRB Coordinator, Stacy Eckstein.

Please take a moment to complete our Satisfaction Survey as we appreciate your feedback.

Appendix B Giving Voices to Mothers Consent From

Giving Voice to Mothers Study

Participant Information and Consent

Principal Investigator: Saraswathi Vedam, Associate Professor, Division of Midwifery, University of British Columbia
Email: saraswathi.vedam@midwifery.ubc.ca

Co-Investigator: Eugene Declercq, Professor, Community Health Sciences, Boston University

Community Partners:

> o Choices in Childbirth, New York
> o International Center for Traditional Childbearing (ICTC)
> o Phoenix Midwife, Arizona
> o The Oregon Inter-Tribal Breastfeeding Coalition
> o Mama Sana/Vibrant Woman, Austin, Texas
> o Easy Access Women's Health Clinic, Florida
> o Mountain Midwifery Center, Colorado

You are being asked to take part in a research study. We are doing this study to explore the factors that affect your experience of care during pregnancy, birth and after birth. We want to understand if the place where you deliver, and the type of care you receive, makes a difference. The results from this research will tell the story of how we can improve pregnancy and birth services for everyone.

Activities: This survey will ask questions about what kind of care you prefer; where you planned to give birth (home, birth center, or hospital); how you found your doctor or midwife; who made the decisions about your care; if you felt you were treated with respect; and what happened during your pregnancy and birth. To help us understand why these matter we also ask a few questions about your community and your health.

Risks and benefits: We do not think that answering these questions could harm you or be bad for you. Some of the questions we ask may be sensitive as they may remind you of hard things that happened to you or your family. **You do not have to answer any questions that you do not feel comfortable answering; it is okay to skip questions**. We do not know if you will benefit from being in this study. Your answers will help researchers, doctors, midwives, and policy makers understand what is important to you and your community and why it matters.

Confidentiality: Your participation in this study is anonymous. Only the lead researcher and her staff will ever see the private information that you share with us. Any information that identifies you personally will be kept private from anyone else. Your private information will also not be

shown in any reports. When we or the community partners share results, we will only use statistics, for example "10% of participants felt that…", and possibly some quotes that do not show any private information. The information you provide will be kept confidential to the extent permitted by law.

This is an on-line survey hosted by SoGoSurvey (http://www.sogosurvey.com/), a web survey company located in the USA. All files associated with this study, including your answers to the questions below will be stored on password protected computers. Online surveys will be hosted on secure Canadian servers with encryption features for added protection of data. All files (including print, online and electronic) will be destroyed 5 years after the study has come to an end.

For your information, the **security and privacy policy** for SoGoSurvey can be found here: http://www.sogosurvey.com/Legal/online-survey-privacy.aspx and, the **security and privacy policy** for UBC can be found here: http://universitycounsel.ubc.ca/access-and-privacy/

<u>Contact us</u>: If you have any questions or want more information about this study, please contact the research coordinator, Barbara Karlen by email: [barbara.karlen@ ubc.ca](mailto:barbara.karlen@ubc.ca) or phone 604-875-2000 ext.5879

If you have any concerns or complaints about your rights as a research participant and/or your experiences while participating in this study, contact the Research Participant Complaint Line in the University of British Columbia Office of Research Ethics by e-mail at RSIL@ors.ubc.ca or by phone at 604-822-8598 (Toll Free: 1-877-822-8598)

<u>Consent</u>: **Your participation in this study is entirely voluntary**. You do not have to take part and you can decide to leave the study at any time. By filling out this survey, you consent to participate in the study. If a community agency has arranged for you to participate, and you decide to not participate, you will still receive any services you were entitled to receive whether or not you answer the questions in this survey.

<u>Time</u>: We expect that it will take about 45 minutes to complete the survey. **If you do not have enough time to finish in one session, you will be able to save your answers as you go and continue later.** If you need to complete the survey in more than one sitting, you will be required to enter your email address. This email address is not seen by the researchers; your identity is not known. If, after completing the survey, you decide to not submit the survey, none of your answers will be saved.

Appendix C Mistreatment Index (English and Spanish) and Pressured Care Items

MIST Index

Did you experience any of the following problems or attitudes in your care during pregnancy or birth? (Please select all applicable options)

Your private or personal information was shared without your consent ☐

Your physical privacy was violated, for example being uncovered or having people in the delivery room without your consent ☐

A healthcare provider shouted at or scolded you ☐

Healthcare providers withheld treatment or forced you to accept treatment that you did not want ☐

Healthcare providers threatened you in any other way ☐

Healthcare providers ignored you, refused your request for help or failed to respond to requests for help in a reasonable amount of time ☐

You experienced physical abuse, such as aggressive physical contact, inappropriate sexual conduct, a refusal to provide anesthesia for an episiotomy, etc. ☐

None of the above ☐

Indice de MIST

¿Experimentó usted alguno de los siguientes problemas o comportamientos en el cuidado durante su embarazo o parto? (Por favor, seleccione todas las opciones que se apliquen)

Su información privada o personal fue compartida sin su consentimiento ☐

Su privacidad física fue violada (Ej: fue descubierta o hubo gente en la sala de partos sin su consentimiento) ☐

Proveedores de servicios de salud le gritó o regañó ☐

Proveedores de servicios de salud le amenazaron con no proporcionarle tratamiento o con forzarla a aceptar tratamiento que usted no quería ☐

Proveedores de servicios de salud le amenazaron de cualquier otra manera ☐

Proveedores de servicios de salud le ignoraron, se negaron a proporcionarle ayuda que usted pidió, o no le proporcionaron ayuda que usted pidió en un periodo de tiempo razonable ☐

Usted experimentó abuso físico (incluyendo contacto físico agresivo, conductas sexuales inapropiadas, negativa de proporcionarle anestesia para una episiotomía, etc.) ☐

Ninguna de las anteriores ☐

Appendix C.1 Pressured Care Items

Did you feel pressure from any doctor or midwife to HAVE:

159. Specify Yes / No	Yes	No
(a) Medication to start labor (Select one option)	○	○
(b) An Epidural (Select one option)	○	○
(c) Continuous fetal monitoring (listen to baby's heart by wearing a belt or wire) (Select one option)	○	○
(d) Episiotomy (cut vaginal opening) (Select one option)	○	○
(e) Medicine for pain relief (Select one option)	○	○
(f) A Cesarean (Select one option)	○	○
(g) Medication to speed up labor (Select one option)	○	○

Did you feel pressure from any doctor or midwife to AVOID:

161. Specify Yes / No	Yes	No
(a) Medication to start labor (Select one option)	○	○
(b) An Epidural (Select one option)	○	○
(c) Continuous fetal monitoring (listen to baby's heart by wearing a belt or wire) (Select one option)	○	○
(d) Episiotomy (cut vaginal opening) (Select one option)	○	○
(e) Medicine for pain relief (Select one option)	○	○
(f) A Cesarean (Select one option)	○	○
(g) Medication to speed up labor (Select one option)	○	○

MOR: MOTHERS ON RESPECT INDEX

Please tell us about your discussions with your doctor or midwife about your options for care (for example: prenatal testing, starting your labour, medications, where to give birth, newborn care, whether to have a cesarean, etc.)

My answers describe my conversations or experiences with a:

Family doctor	Midwife
Obstetrician/OB-GYN doctor	Not applicable, did not have a doctor or midwife.

A: Overall while making decisions about my pregnancy or birth care: (select or circle one answer for each statement)

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
I felt comfortable asking questions	1	2	3	4	5	6
I felt comfortable declining care that was offered	1	2	3	4	5	6
I felt comfortable accepting the options for care that my doctor or midwife recommended	1	2	3	4	5	6
I felt pushed into accepting the options my doctor or midwife suggested	6	5	4	3	2	1
I chose the care options that I received	1	2	3	4	5	6
My personal preferences were respected	1	2	3	4	5	6
My cultural preferences were respected	1	2	3	4	5	6
	SECTION A TOTAL SCORE:					

B: During my pregnancy I felt that I was treated poorly by my doctor or midwife because of: (select or circle one answer for each statement)

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
My race, ethnicity, cultural background or language*	6	5	4	3	2	1
My sexual orientation and / or gender identity*	6	5	4	3	2	1
My type of health insurance or lack of insurance*	6	5	4	3	2	1
A difference of opinion with my caregivers about the right care for myself or my baby*	6	5	4	3	2	1
ADD ALL SCORES IN SECTION B:	SECTION B TOTAL SCORE:					

C: During my pregnancy I held back from asking questions or discussing my concerns because: (select or circle one answer for each statement)

	Strongly Disagree	Disagree	Somewhat Disagree	Somewhat Agree	Agree	Strongly Agree
My doctor or midwife seemed rushed*	6	5	4	3	2	1
I wanted maternity care that differed from what my doctor or midwife recommended*	6	5	4	3	2	1
I thought my doctor or midwife might think I was being difficult*	6	5	4	3	2	1
ADD ALL SCORES IN SECTION C:	SECTION C TOTAL SCORE:					

Scoring Table	
Enter total score section A	
Enter total score section B	
Enter total score section C	
A + B + C = TOTAL SCORE	

The range of scores is 14-84, with higher score indicating more respectful care.

KEY **Level of Respect Experienced** (by quartiles)	
Total Score	*Indication of Respect*
14 - 31	Very Low Respect
32 – 49	Low Respect
50 – 66	Moderate Respect
67 – 84	High Respect

* Reverse-scored items

MOR: ÍNDICE DE MADRES EN RESPETO

Por favor, utilice las siguientes preguntas para contarnos acerca de las conversaciones y experiencias con su doctor(a) o partera sobre sus opciones de cuidado (Por ejemplo: exámenes prenatales, comienzo del trabajo de parto, medicamentos, cesárea, lugar para dar a luz, cuidado del bebé, etc.)

Mis respuestas en esta sección describen mis conversaciones o experiencias con un(a)... (Elija una opción)

Doctor(a) de familia   Partera

Doctor(a) Obstetra/ Ginecólogo/a   No se aplica, no tuve un(a) doctor(a) o partera

En general, al tomar decisiones sobre mi embarazo:
(Puntúe cada una de las situaciones enunciadas)

	Muy en desacuerdo	En desacuerdo	Relativamente en desacuerdo	Relativamente de acuerdo	De acuerdo	Muy de acuerdo
Me sentí cómoda haciendo preguntas	1	2	3	4	5	6
Me sentí cómoda no aceptando el cuidado que se me ofrecía	1	2	3	4	5	6
Me sentí cómoda aceptando las opciones de cuidado que mi doctor(a) o partera recomendaba	1	2	3	4	5	6
Me sentí presionada para aceptar las opciones que mi doctor(a) o partera sugería*	6	5	4	3	2	1
Escogí las opciones de cuidado que recibí	1	2	3	4	5	6
Mis preferencias personales fueron respetadas	1	2	3	4	5	6
Mis preferencias culturales fueron respetadas	1	2	3	4	5	6

PUNTUACIÓN TOTAL DE LA SECCIÓN A:

Durante mi embarazo, sentí que mi doctor(a) o partera me estaba tratando mal DEBIDO A: (Puntúe cada una de las situaciones enunciadas)

	Muy en desacuerdo	En desacuerdo	Relativamente en desacuerdo	Relativamente de acuerdo	De acuerdo	Muy de acuerdo
Mi raza, etnia, antecedentes culturales o idioma*	6	5	4	3	2	1
Mi orientación sexual y/o mi identidad de género*	6	5	4	3	2	1
Mi tipo de seguro médico o falta de seguro*	6	5	4	3	2	1

Diferencia de opiniones con mis proveedores de cuidado sobre el cuidado apropiado para mí o mi bebé*	6	5	4	3	2	1

PUNTUACIÓN TOTAL DE LA SECCIÓN B:						

Durante mi embarazo, me contuve de hacer preguntas o discutir mis inquietudes PORQUE: (Puntúe cada una de las situaciones enunciadas)

	Muy en desacuerdo	En desacuerdo	Relativamente en desacuerdo	Relativamente de acuerdo	De acuerdo	Muy de acuerdo
Mi doctor(a) o partera parecía apurado/a*	6	5	4	3	2	1
Quería un tipo de cuidado materno que difería del que recomendaba mi doctor(a) o partera*	6	5	4	3	2	1
Pensé que mi doctor(a) o partera podía pensar que yo era una paciente difícil*	6	5	4	3	2	1
PUNTUACIÓN TOTAL DE LA SECCIÓN C:						

Tabla de puntuación	
Puntuación total sección A	
Puntuación total sección B	
Puntuación total sección C	
A + B + C = puntuación total	

El rango de puntuación es de 14 a 84; la puntuación más alta indica una atención más respetuosa.

Nivel de Autonomía (por cuartiles):	
Puntuación total	Nivel de respecto
14 - 31	Respeto Muy bajo
32 – 49	Respeto Bajo
50 – 66	Respeto Moderado
67 – 84	Respeto Alto

*Artículos con calificación inversa

Appendix E Variable Selection Process and Model Diagnostics

Appendix E.1 RMC Unrestricted Model Variable Selection and Wald Test

```
. reg MORI_total_MVR i.Nulli_primi_parity i.ProviderType2Num ib2.deliverytypenum i.LOW_SES_FLOR 1.maternalage 2b
> .maternalage i.Social_risk_composite i.Elevated_pregnancy_risk_composit ib2.supportldnum i.Actual_place_birth_
> hospital_or_a, baselevels
```

Source	SS	df	MS
Model	13783.8402	9	1531.5378
Residual	27501.2592	189	145.509308
Total	41285.0994	198	208.510603

```
Number of obs  =      199
F(9, 189)      =    10.53
Prob > F       =   0.0000
R-squared      =   0.3339
Adj R-squared  =   0.3021
Root MSE       =   12.063
```

MORI_total_MVR	Coefficient	Std. err.	t	P>|t|	[95% conf. interval]	
Nulli_primi_parity						
Multigravida	0	(base)				
Nulli/Primigravida	−3.285828	1.862676	−1.76	0.079	−6.960133	.3884773
ProviderType2Num						
Doctor	0	(base)				
Midwifery	1.732517	2.564537	0.68	0.500	−3.326277	6.791311
deliverytypenum						
Instrumental Birth	−7.97446	2.458562	−3.24	0.001	−12.82421	−3.124713
Vaginal Birth	0	(base)				
LOW_SES_FLOR						
Moderate/High SES	0	(base)				
Low SES	−1.898351	1.804114	−1.05	0.294	−5.457138	1.660436
maternalage						
17−25	−2.915417	2.731217	−1.07	0.287	−8.303003	2.472169
26−30	0	(base)				
Social_risk_composite						
No history of social risk	0	(base)				
History of social risk	−5.051105	3.201437	−1.58	0.116	−11.36624	1.264034
Elevated_pregnancy_risk_composit						
No elevated pregnancy risk	0	(base)				
elevated pregancy risk	.4256616	2.365478	0.18	0.857	−4.240469	5.091792
supportldnum						
No support	−12.61118	4.35174	−2.90	0.004	−21.1954	−4.026958
Support	0	(base)				
Actual_place_birth_hospital_or_a						
Community Birth	0	(base)				
Hospital Birth	−6.741156	2.746161	−2.45	0.015	−12.15822	−1.324093
_cons	81.34242	2.959896	27.48	0.000	75.50374	87.18109

Appendix Figure 1 RMC Unrestricted model without robust adjustment

Appendix E.1.1 RMC Wald Test Unrestricted Model

```
.  testparm  i.LOW_SES_FLOR i.Nulli_primi_parity i.ProviderType2Num  1.maternalage 2b.maternalage i.Social_risk_
> composite i.Elevated_pregnancy_risk_composit

 ( 1)  1.Nulli_primi_parity = 0
 ( 2)  2.ProviderType2Num = 0
 ( 3)  1.LOW_SES_FLOR = 0
 ( 4)  1.maternalage = 0
 ( 5)  1.Social_risk_composite = 0
 ( 6)  1.Elevated_pregnancy_risk_composit = 0

       F(  6,   189) =    1.82
            Prob > F =    0.0970

.

. testparm  i.LOW_SES_FLOR

 ( 1)  1.LOW_SES_FLOR = 0

       F(  1,   189) =    1.11
            Prob > F =    0.2940

.  testparm i.Nulli_primi_parity

 ( 1)  1.Nulli_primi_parity = 0

       F(  1,   189) =    3.11
            Prob > F =    0.0793

.  testparm i.ProviderType2Num

 ( 1)  2.ProviderType2Num = 0

       F(  1,   189) =    0.46
            Prob > F =    0.5001

.  testparm  1.maternalage 2b.maternalage

 ( 1)  1.maternalage = 0

       F(  1,   189) =    1.14
            Prob > F =    0.2871

.  testparm   i.Social_risk_composite

 ( 1)  1.Social_risk_composite = 0

       F(  1,   189) =    2.49
            Prob > F =    0.1163

.  testparm   i.Elevated_pregnancy_risk_composit

 ( 1)  1.Elevated_pregnancy_risk_composit = 0

       F(  1,   189) =    0.03
            Prob > F =    0.8574
```

Appendix Figure 2 RMC wald test without robust adjustment

Appendix E.1.2 Robust Regression RMC Wald Test

```
. testparm  i.LOW_SES_FLOR i.Nulli_primi_parity i.ProviderType2Num  1.maternalage 2b.maternalage i.Social_risk_c
> omposite i.Elevated_pregnancy_risk_composit

 ( 1)  1.Nulli_primi_parity = 0
 ( 2)  2.ProviderType2Num = 0
 ( 3)  1.LOW_SES_FLOR = 0
 ( 4)  1.maternalage = 0
 ( 5)  1.Social_risk_composite = 0
 ( 6)  1.Elevated_pregnancy_risk_composit = 0

       F(  6,   189) =    2.00
           Prob > F =    0.0676

. testparm  i.LOW_SES_FLOR

 ( 1)  1.LOW_SES_FLOR = 0

       F(  1,   189) =    0.21
           Prob > F =    0.6442

. testparm i.Nulli_primi_parity

 ( 1)  1.Nulli_primi_parity = 0

       F(  1,   189) =    2.27
           Prob > F =    0.1333

. testparm i.ProviderType2Num

 ( 1)  2.ProviderType2Num = 0

       F(  1,   189) =    1.02
           Prob > F =    0.3147

. testparm  1.maternalage 2b.maternalage

 ( 1)  1.maternalage = 0

       F(  1,   189) =    2.32
           Prob > F =    0.1293

. testparm   i.Social_risk_composite

 ( 1)  1.Social_risk_composite = 0

       F(  1,   189) =    2.80
           Prob > F =    0.0959

. testparm   i.Elevated_pregnancy_risk_composit

 ( 1)  1.Elevated_pregnancy_risk_composit = 0

       F(  1,   189) =    2.85
           Prob > F =    0.0928
```

Appendix Figure 3 RMC Wald test with robust adjustment

Appendix E.2 OV Unrestricted Model Variable Selection And Wald Test

```
. logistic OVFinal i.Nulli_primi_parity i.ProviderType2Num i.deliverytypenum 4.FinalLatinxGroupNum 1.maternalage
> 2b.maternalage i.Social_risk_composite i.Elevated_pregnancy_risk_composit i.supportldnum ib1.spokenlannNum i.
> Actual_place_birth_hospital_or_a, baselevels
```

```
Logistic regression                                    Number of obs =     221
                                                       LR chi2(11)   =   90.88
                                                       Prob > chi2   =  0.0000
Log likelihood = -107.63397                            Pseudo R2     =  0.2969
```

OVFinal	Odds ratio	Std. err.	z	P>|z|	[95% conf. interval]	
Nulli_primi_parity						
Multigravida	1	(base)				
Nulli/Primigravida	1.294038	.4625576	0.72	0.471	.6422185	2.607423
ProviderType2Num						
Doctor	1	(base)				
Midwifery	.8758984	.4328093	-0.27	0.789	.3325431	2.307063
deliverytypenum						
Instrumental Birth	1	(base)				
Vaginal Birth	.5675047	.2738208	-1.17	0.240	.2204271	1.46108
FinalLatinxGroupNum						
Puerto Rico	1.14353	.4600882	0.33	0.739	.5197267	2.516056
maternalage						
17-25	1.324385	.6861641	0.54	0.588	.479741	3.656132
26-30	1	(base)				
Social_risk_composite						
No history of social risk	1	(base)				
History of social risk	4.64677	3.5006	2.04	0.041	1.061467	20.3421
Elevated_pregnancy_risk_composit						
No elevated pregnancy risk	1	(base)				
elevated pregancy risk	.6190279	.2730673	-1.09	0.277	.2607509	1.469585
supportldnum						
No support	1	(base)				
Support	.6968301	.674381	-0.37	0.709	.1045557	4.644149
spokenlannNum						
English	1	(base)				
Other	2.497589	2.00955	1.14	0.255	.5159974	12.08911
Spanish	.83985	.3021591	-0.49	0.628	.4149144	1.699984
Actual_place_birth_hospital_or_a						
Community Birth	1	(base)				
Hospital Birth	11.85037	6.21891	4.71	0.000	4.236753	33.14597
_cons	.4587537	.5461091	-0.65	0.513	.0444931	4.730053

Note: **_cons** estimates baseline odds.

Appendix Figure 4 Logistic regression variable selection

Appendix E.2.1 OV Unrestricted Model Wald Test

```
. testparm  i.Nulli_primi_parity i.ProviderType2Num i.deliverytypenum 4.FinalLatinxGroupNum 1.maternalage 2b.mat
> ernalage i.Elevated_pregnancy_risk_composit i.supportldnum ib1.spokenlannNum

 ( 1)  [OVFinal]1.Nulli_primi_parity = 0
 ( 2)  [OVFinal]2.ProviderType2Num = 0
 ( 3)  [OVFinal]2.deliverytypenum = 0
 ( 4)  [OVFinal]4.FinalLatinxGroupNum = 0
 ( 5)  [OVFinal]1.maternalage = 0
 ( 6)  [OVFinal]1.Elevated_pregnancy_risk_composit = 0
 ( 7)  [OVFinal]2.supportldnum = 0
 ( 8)  [OVFinal]3.spokenlannNum = 0
 ( 9)  [OVFinal]4.spokenlannNum = 0

           chi2(  9) =     5.58
         Prob > chi2 =    0.7811

. testparm  i.Nulli_primi_parity

 ( 1)  [OVFinal]1.Nulli_primi_parity = 0

           chi2(  1) =     0.52
         Prob > chi2 =    0.4708

. testparm  i.ProviderType2Num

 ( 1)  [OVFinal]2.ProviderType2Num = 0

           chi2(  1) =     0.07
         Prob > chi2 =    0.7886

. testparm i.deliverytypenum

 ( 1)  [OVFinal]2.deliverytypenum = 0

           chi2(  1) =     1.38
         Prob > chi2 =    0.2404

. testparm 4.FinalLatinxGroupNum

 ( 1)  [OVFinal]4.FinalLatinxGroupNum = 0

           chi2(  1) =     0.11
         Prob > chi2 =    0.7389

. testparm 1.maternalage 2b.maternalage

 ( 1)  [OVFinal]1.maternalage = 0

           chi2(  1) =     0.29
         Prob > chi2 =    0.5876

. testparm i.Elevated_pregnancy_risk_composit

 ( 1)  [OVFinal]1.Elevated_pregnancy_risk_composit = 0

           chi2(  1) =     1.18
         Prob > chi2 =    0.2769

. testparm  i.supportldnum

 ( 1)  [OVFinal]2.supportldnum = 0

           chi2(  1) =     0.14
         Prob > chi2 =    0.7090

. testparm ib1.spokenlannNum

 ( 1)  [OVFinal]3.spokenlannNum = 0
 ( 2)  [OVFinal]4.spokenlannNum = 0

           chi2(  2) =     1.88
         Prob > chi2 =    0.3913
```

Appendix Figure 5 Logistic regression unrestricted model Wald test

Appendix E.3 Model Diagnostics

Appendix E.3.1 Unrestricted RMC Model Diagnostics

MORi Scores Histogram
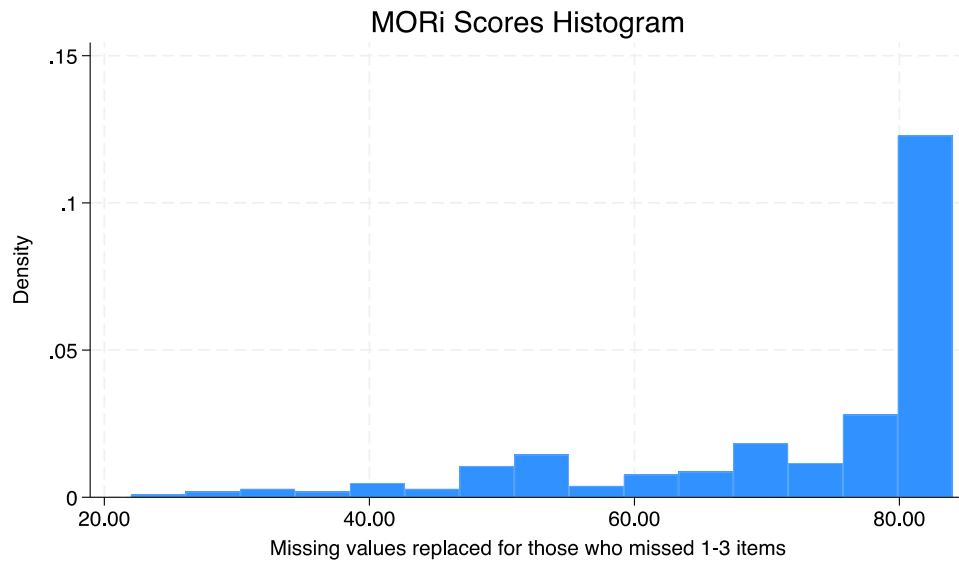
Appendix Figure 6 MORi scores histogram

RMC Unrestricted Model Diagnostics: Residuals vs Fitted Values
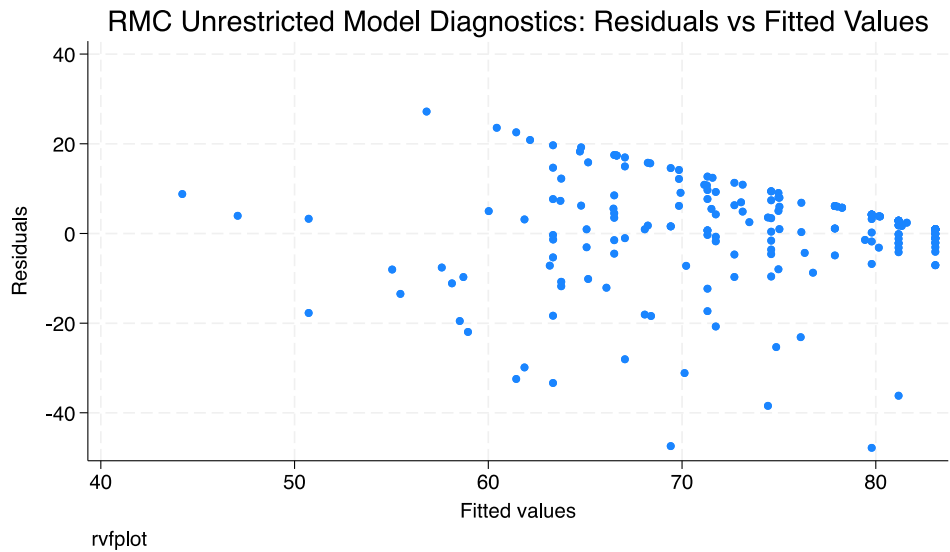
Appendix Figure 7 RMC unrestricted model residuals vs fitted values plot

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RMC unrestricted model diagnostics
Studentized/Jack knife residuals histogram
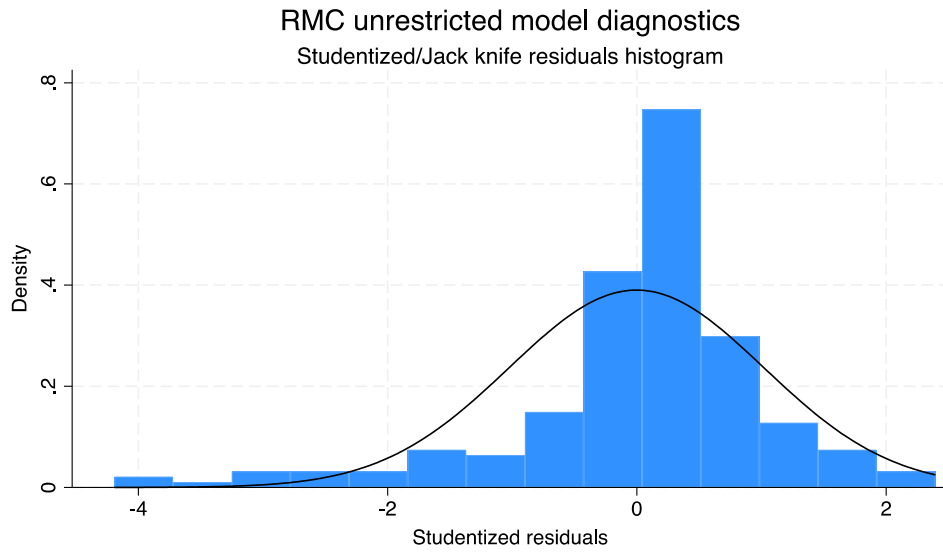
Appendix Figure 8 RMC unrestricted model studentized/Jack knife residuals historgram

RMC unrestricted model diagnostics
OLS residual histogram
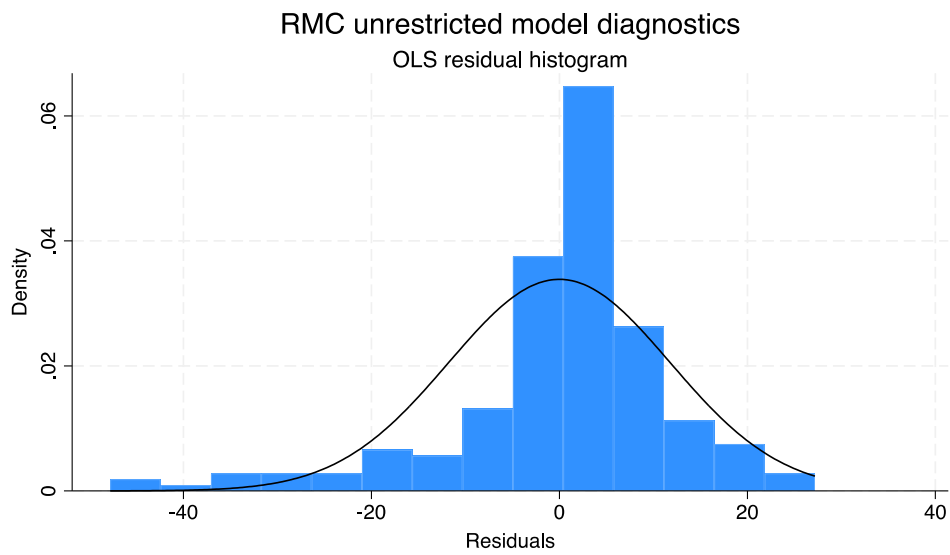
Appendix Figure 9 RMC unrestricted model OLS residual histogram

RMC full model: Partial regression plots

coef = -3.2858281, se = 1.8626759, t = -1.76

coef = 1.7325171, se = 2.5645374, t = .68

coef = -7.9744602, se = 2.458562, t = -3.24

coef = -1.8983509, se = 1.8041143, t = -1.05

coef = -2.9154171, se = 2.7312173, t = -1.07

coef = -5.0511051, se = 3.2014374, t = -1.58

coef = .42566162, se = 2.3654781, t = .18

coef = -12.611178, se = 4.3517398, t = -2.9

coef = -6.7411559, se = 2.7461607, t = -2.45
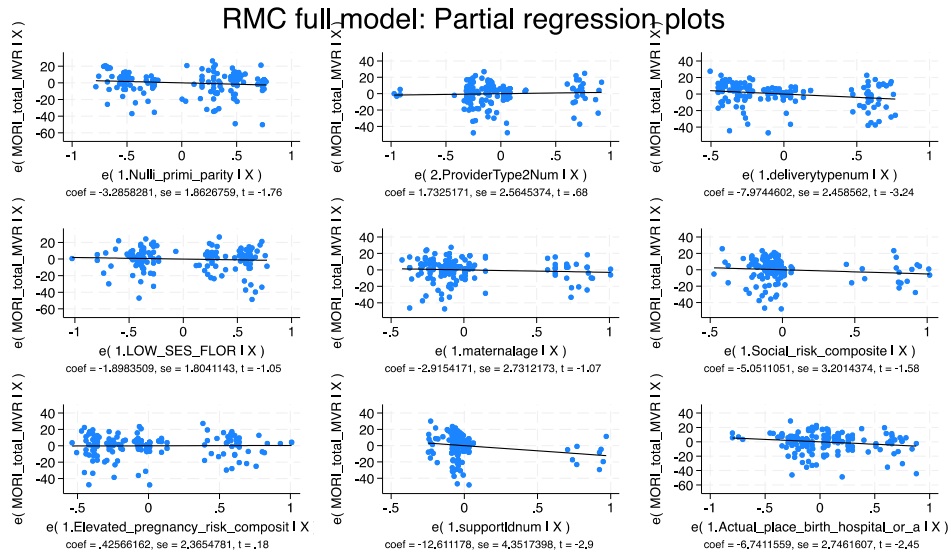
Appendix Figure 10 RMC unrestricted model partial regression plots

RMC full model: Unique identifier plot of Cook's D

Dashed line represents Cook's D cutoff of 0.020
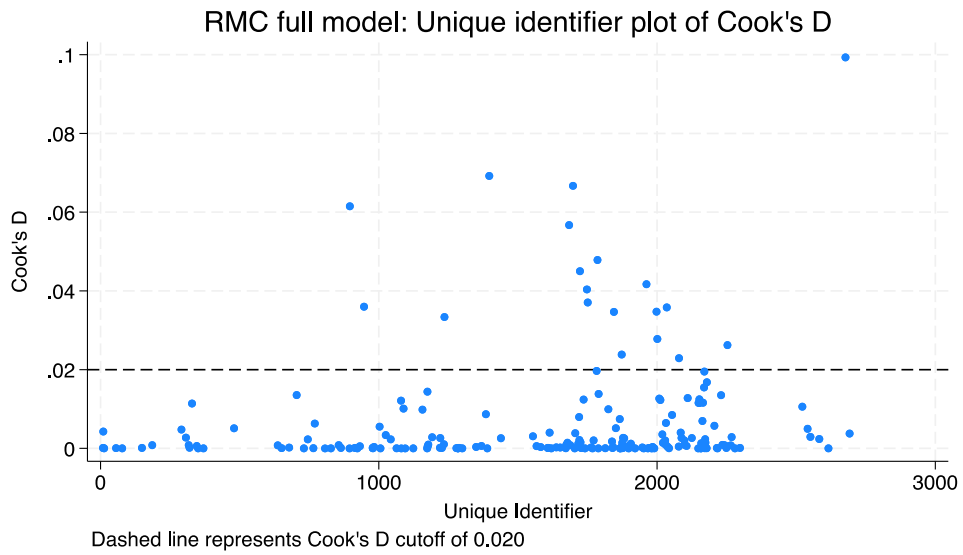
Appendix Figure 11 RMC unrestricted model unique identifier plots of Cook's D values

RMC unrestricted model: Unique identifier plot of DFFITS
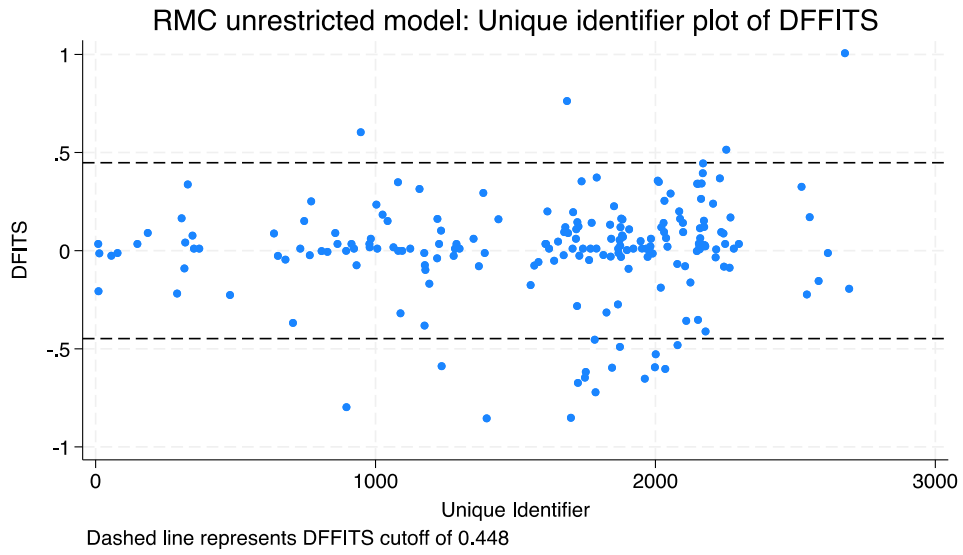
Appendix Figure 12 RMC unrestricted model unique identifier plot of DFFITs values

RMC unrestricted model: Jack Knife residuals vs Circles proportional to Cook
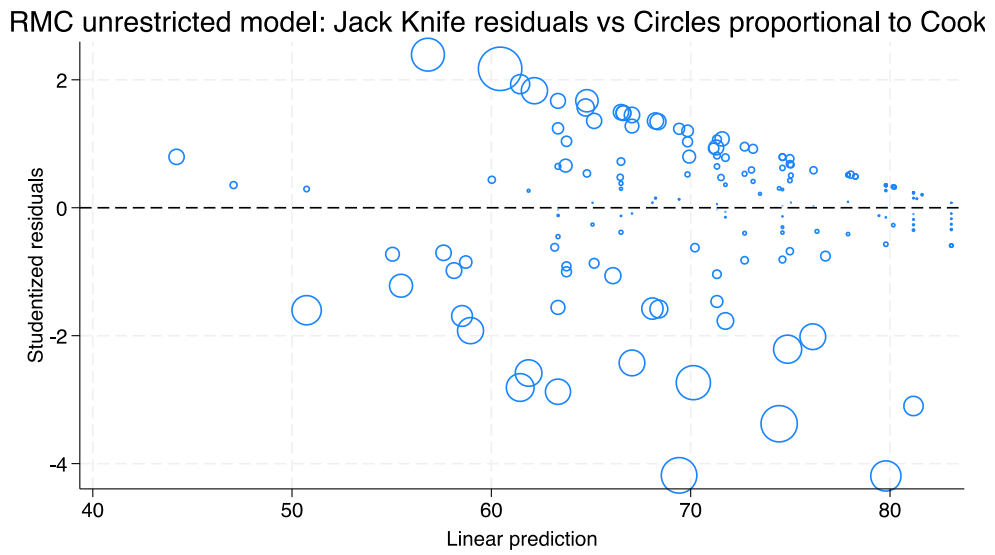
Appendix Figure 13 RMC unrestricted model Jack knife residuals versus Cook's D propotional circles

RMC unrestricted model: Unique identifier plot of leverage values

Dashed line represents leverage cutoff of 0.101
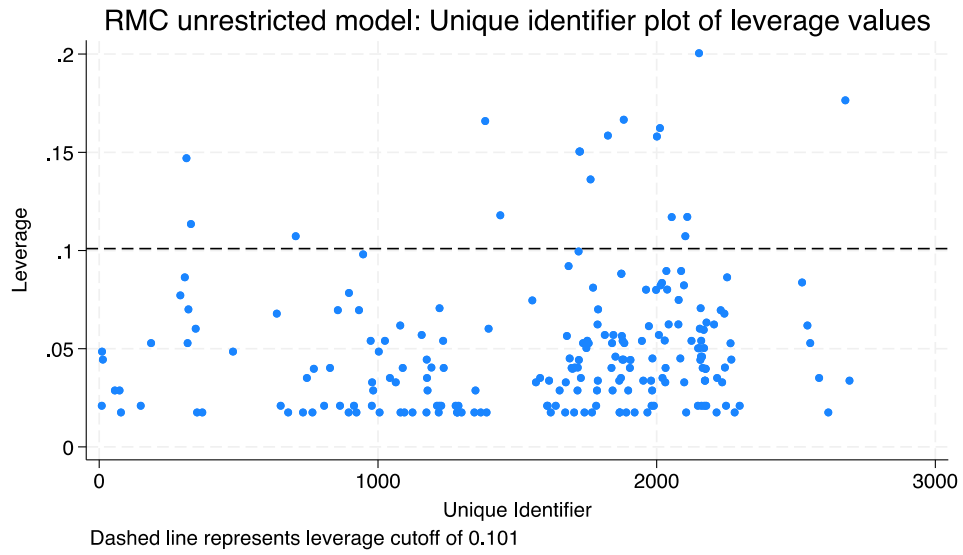
Appendix Figure 14 RMC unrestricted model unique identifier plot of leverage values

RMC unrestricted model: Leverage residual plot

lvr2plot
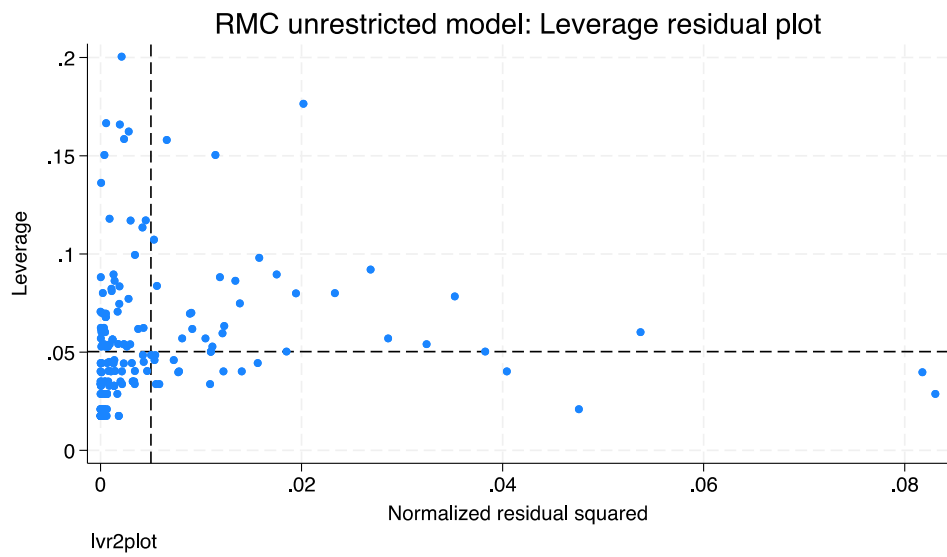
Appendix Figure 15 RMC unrestricted model leverage residual plot

```
. vif
```

Variable	VIF	1/VIF
1.Nulli_pr~y	1.18	0.847808
2.Provider~m	2.22	0.449721
1.delivery~m	1.30	0.767710
1.LOW_SES_~R	1.11	0.902458
1.maternal~e	1.16	0.863002
1.Social_r~e	1.15	0.867167
1.Elevated~t	1.27	0.784796
1.supportl~m	1.12	0.894174
1.Actual_p~a	2.55	0.392201
Mean VIF	1.45	

Appendix Figure 16 RMC unrestricted model variance inflation coefficients
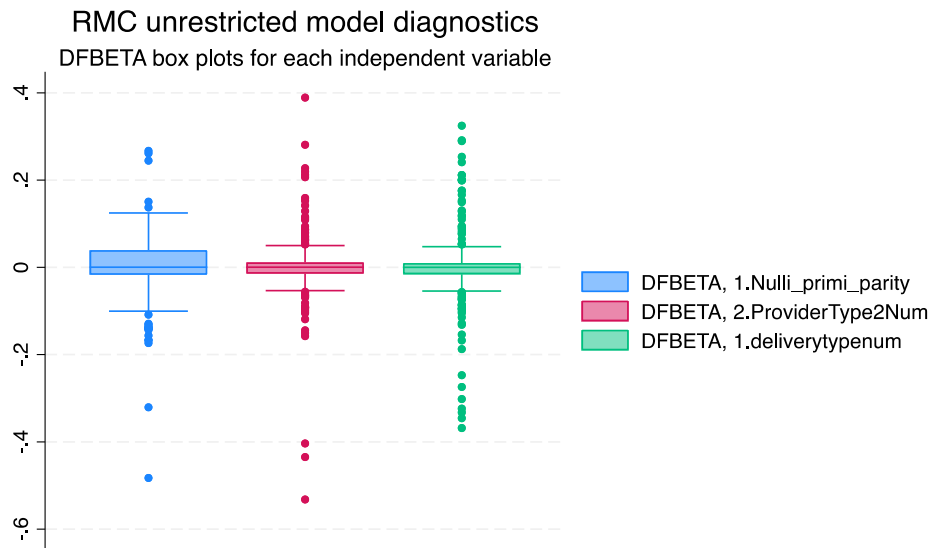
Appendix Figure 17 RMC unrestricted model DFBeta box plots for parity, provider type and delivery type
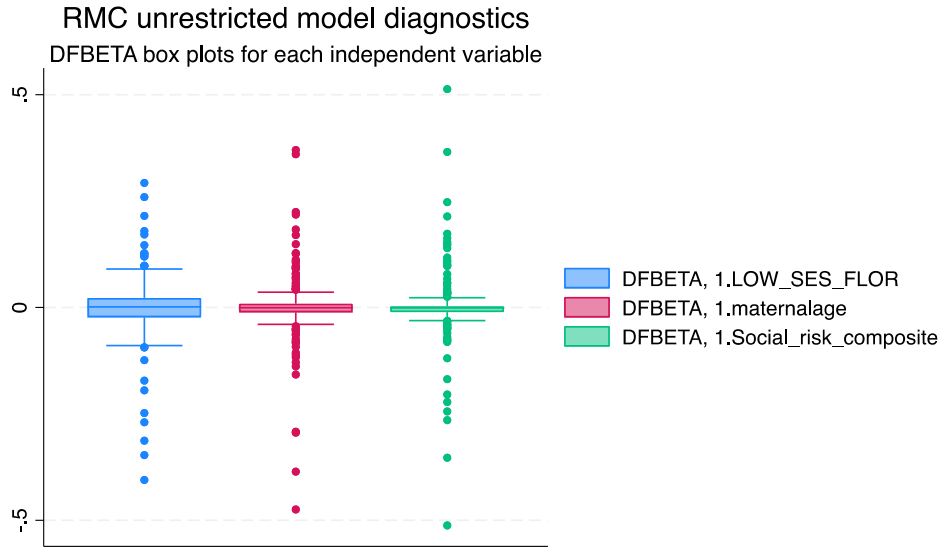
Appendix Figure 18 RMC unrestricted model DFBeta box plots for SES, maternal age and history of social
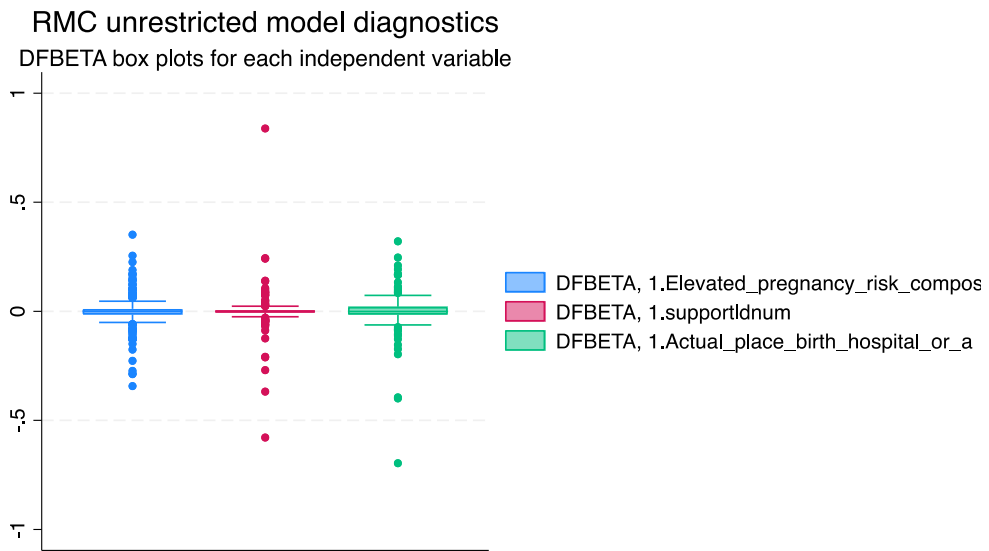
risk

Appendix Figure 19 RMC unrestricted model DFBeta box plots for elevated pregnancy risk, support during

labor and delivery and delivery location

```
. regcheck

┌─────────────────────────────────────────┬─────────────────────────────────────────────────┬──────────────────┐
│   Regression assumptions:                │ Test:                                           │ We seek values   │
├─────────────────────────────────────────┼─────────────────────────────────────────────────┼──────────────────┤
│ 1) heterokedasticity problem             │ Breusch-Pagan hettest                           │    > 0.05        │
│                                          │ Chi2(1): 28.886                                 │                  │
│                                          │ p-value: 0.000                                  │                  │
├─────────────────────────────────────────┼─────────────────────────────────────────────────┼──────────────────┤
│ 2) no multicollinearity problem          │ Variance inflation factor                       │    < 5.00        │
│                                          │ 1.Nulli_primi_parity : 1.18                     │                  │
│                                          │ 2.ProviderType2Num : 2.22                       │                  │
│                                          │ 1.deliverytypenum : 1.30                        │                  │
│                                          │ 1.LOW_SES_FLOR : 1.11                           │                  │
│                                          │ 1.maternalage : 1.16                            │                  │
│                                          │ 1.Social_risk_composite : 1.15                  │                  │
│                                          │ 1.Elevated_pregnancy_risk_composit : 1.27       │                  │
│                                          │ 1.supportldnum : 1.12                           │                  │
│                                          │ 1.Actual_place_birth_hospital_or_a : 2.55       │                  │
├─────────────────────────────────────────┼─────────────────────────────────────────────────┼──────────────────┤
│ 3) residuals are not normally distributed│ Shapiro-Wilk W normality test                   │    > 0.01        │
│                                          │ z: 6.362                                        │                  │
│                                          │ p-value: 0.000                                  │                  │
├─────────────────────────────────────────┼─────────────────────────────────────────────────┼──────────────────┤
│ 4) no specification problem               │ Linktest                                        │    > 0.05        │
│                                          │ t: -0.603                                       │                  │
│                                          │ p-value: 0.547                                  │                  │
├─────────────────────────────────────────┼─────────────────────────────────────────────────┼──────────────────┤
│ 5) appropriate functional form            │ Test for appropriate functional form            │    > 0.05        │
│                                          │ F(3,186):2.409                                  │                  │
│                                          │ p-value: 0.069                                  │                  │
├─────────────────────────────────────────┼─────────────────────────────────────────────────┼──────────────────┤
│ 6) no influential observations            │ Cook's distance                                 │    < 1.00        │
│                                          │ no distance is above the cutoff                 │                  │
└─────────────────────────────────────────┴─────────────────────────────────────────────────┴──────────────────┘
```

Appendix Figure 20 RMC unrestricted model diagnostics tests using regcheck command in STATA

These plots and tests indicate that there are multiple outliers and a problem with heteroskedasticity. I first tested the effect of the influential points by excluding them from the model and comparing the results to the original model using the more restrictive Cook's distance cut off of 4/n. This resulted in significantly different coefficient results and some changes to statistical significance of variables as noted in the STATA output below:

```
. regress MORI_total_MVR i.Nulli_primi_parity i.ProviderType2Num ib2.deliverytypenum i.LOW_SES_FLOR 1.maternalage 2b.maternalage i.Social_risk_c
> omposite i.Elevated_pregnancy_risk_composit ib2.supportldnum i.Actual_place_birth_hospital_or_a if RMCcooksD1<0.020, baselevels

      Source │       SS           df       MS            Number of obs   =       180
─────────────┼──────────────────────────────────         F(9, 170)       =     15.71
       Model │  8742.79464         9   971.421626         Prob > F        =    0.0000
    Residual │  10515.1864       170   61.8540378         R-squared       =    0.4540
─────────────┼──────────────────────────────────         Adj R-squared   =    0.4251
       Total │  19257.9811       179   107.586486         Root MSE        =    7.8647

─────────────────────────────┬────────────────────────────────────────────────────────────────
              MORI_total_MVR │ Coefficient  Std. err.      t    P>|t|     [95% conf. interval]
─────────────────────────────┼────────────────────────────────────────────────────────────────
            Nulli_primi_parity │
                 Multigravida │          0  (base)
            Nulli/Primigravida │  -3.135366   1.274101   -2.46   0.015    -5.650462   -.6202705
                               │
              ProviderType2Num │
                       Doctor │          0  (base)
                     Midwifery │   1.614319   1.823858    0.89   0.377    -1.986008    5.214646
                               │
                deliverytypenum │
             Instrumental Birth │  -4.961407   1.814002   -2.74   0.007    -8.542276   -1.380537
                 Vaginal Birth │          0  (base)
                               │
                  LOW_SES_FLOR │
              Moderate/High SES │          0  (base)
                      Low SES │     .14942   1.240162    0.12   0.904     -2.29868     2.59752
                               │
                   maternalage │
                        17-25 │  -2.757814   1.952927   -1.41   0.160    -6.612926    1.097297
                        26-30 │          0  (base)
                               │
           Social_risk_composite │
        No history of social risk │          0  (base)
          History of social risk │  -7.624707    2.44472   -3.12   0.002    -12.45063   -2.798789
                               │
Elevated_pregnancy_risk_composit │
       No elevated pregnancy risk │          0  (base)
          elevated pregancy risk │    .271835   1.658313    0.16   0.870    -3.001702    3.545372
                               │
                   supportldnum │
                   No support │  -14.31841   3.519305   -4.07   0.000    -21.26557    -7.37124
                      Support │          0  (base)
                               │
  Actual_place_birth_hospital_or_a │
              Community Birth │          0  (base)
               Hospital Birth │  -5.319899   1.939587   -2.74   0.007    -9.148676   -1.491121
                               │
                        _cons │   81.31018   2.047664   39.71   0.000     77.26805     85.3523
─────────────────────────────┴────────────────────────────────────────────────────────────────
```

Appendix Figure 21 RMC unrestricted model removing observations with Cook's distance < 0.20

Following this, I ran another check using the less restrictive cutoff of 1 and reviewed the points for data errors. After discarding data entry errors, I decided to use the less restrictive cutoff of 1 under the assumption that these observations were important. Additionally, given the results around assumptions of linear regression, to address the heteroskedasticity, I decided to run a regression with robust standard errors (robust option in STATA) to account for the violation of assumptions. This approach does not change the coefficients but produces more precise standard errors and confidence intervals in the presence of heteroskedasticity. Below is the raw output from

Stata but the results of the robust standard error regression are discussed in the body of this document.

```
. reg MORI_total_MVR i.Nulli_primi_parity i.ProviderType2Num ib2.deliverytypenum i.LOW_SES_FLOR 1.maternalage 2b.maternalage i.Soci
> al_risk_composite i.Elevated_pregnancy_risk_composit ib2.supportldnum i.Actual_place_birth_hospital_or_a, baselevels vce(robust)

Linear regression                               Number of obs   =        199
                                                F(9, 189)       =      11.40
                                                Prob > F        =     0.0000
                                                R-squared       =     0.3339
                                                Root MSE        =     12.063
```

MORI_total_MVR	Coefficient	Robust std. err.	t	P>|t|	[95% conf. interval]	
Nulli_primi_parity						
Multigravida	0	(base)				
Nulli/Primigravida	−3.285828	1.925088	−1.71	0.089	−7.083248	.5115914
ProviderType2Num						
Doctor	0	(base)				
Midwifery	1.732517	2.896625	0.60	0.550	−3.981352	7.446386
deliverytypenum						
Instrumental Birth	−7.97446	3.218454	−2.48	0.014	−14.32317	−1.625754
Vaginal Birth	0	(base)				
LOW_SES_FLOR						
Moderate/High SES	0	(base)				
Low SES	−1.898351	1.915897	−0.99	0.323	−5.677641	1.880939
maternalage						
17-25	−2.915417	2.969866	−0.98	0.328	−8.773759	2.942925
26-30	0	(base)				
Social_risk_composite						
No history of social risk	0	(base)				
History of social risk	−5.051105	3.562043	−1.42	0.158	−12.07757	1.975362
Elevated_pregnancy_risk_composit						
No elevated pregnancy risk	0	(base)				
elevated pregancy risk	.4256616	2.612143	0.16	0.871	−4.727039	5.578362
supportldnum						
No support	−12.61118	4.813909	−2.62	0.010	−22.10707	−3.115285
Support	0	(base)				
Actual_place_birth_hospital_or_a						
Community Birth	0	(base)				
Hospital Birth	−6.741156	3.142253	−2.15	0.033	−12.93955	−.5427631
_cons	81.34242	2.914078	27.91	0.000	75.59412	87.09071

Appendix Figure 22 RMC unrestricted model regression with robust adjustment

Appendix E.3.2 Restricted RMC Model Diagnostics

```
. reg MORI_total_MVR i.Actual_place_birth_hospital_or_a ib2.supportldnum ib2.deliverytypenum, baselevels
```

```
      Source |       SS           df       MS      Number of obs   =       228
-------------+----------------------------------   F(3, 224)       =     29.97
       Model | 13759.8663          3  4586.62211   Prob > F        =    0.0000
    Residual | 34277.4702        224  153.024421   R-squared       =    0.2864
-------------+----------------------------------   Adj R-squared   =    0.2769
       Total | 48037.3366        227  211.618223   Root MSE        =     12.37
```

```
------------------------------------------------------------------------------------
                MORI_total_MVR | Coefficient  Std. err.      t    P>|t|    [95% conf. interval]
-------------------------------+----------------------------------------------------
Actual_place_birth_hospital_or_a |
               Community Birth |         0   (base)
                Hospital Birth | -9.02583    1.865257    -4.84   0.000   -12.70153   -5.350135
                               |
                   supportldnum |
                    No support | -13.3745     3.76411    -3.55   0.000    -20.7921   -5.956904
                       Support |         0   (base)
                               |
                deliverytypenum |
            Instrumental Birth | -7.875424   2.267806    -3.47   0.001   -12.34439   -3.406461
                Vaginal Birth |         0   (base)
                               |
                         _cons | 80.00471    1.249589    64.02   0.000    77.54225    82.46716
------------------------------------------------------------------------------------
```

Appendix Figure 23 RMC restricted model without robust adjustment

```
. regcheck
```

Regression assumptions:	Test:	We seek values
1) heterokedasticity problem	Breusch-Pagan hettest Chi2(1): 22.643 p-value: 0.000	> 0.05
2) no multicollinearity problem	Variance inflation factor 1.Actual_place_birth_hospital_or_a : 1.27 1.supportldnum : 1.05 1.deliverytypenum : 1.25	< 5.00
3) residuals are not normally distributed	Shapiro-Wilk W normality test z: 6.432 p-value: 0.000	> 0.01
4) no specification problem	Linktest t: 0.181 p-value: 0.856	> 0.05
5) appropriate functional form	Test for appropriate functional form F(1,223):0.326 p-value: 0.568	> 0.05
6) no influential observations	Cook's distance no distance is above the cutoff	< 1.00

Appendix Figure 24 RMC restricted model diagnostics using regcheck command in STATA

Given these results and to address the heterskedasticity, I decided to run a regression with robust standard errors (robust option in STATA) to account for the violation of assumptions. Below is the raw output from Stata but the results of the robust regression are discussed in the body of this document.

```
. reg MORI_total_MVR i.Actual_place_birth_hospital_or_a ib2.supportldnum ib2.deliverytypenum, robust baselevels
```

```
Linear regression                               Number of obs    =         228
                                                F(3, 224)        =       28.73
                                                Prob > F         =      0.0000
                                                R-squared        =      0.2864
                                                Root MSE         =       12.37
```

MORI_total_MVR	Coefficient	Robust std. err.	t	P>|t|	[95% conf. interval]	
Actual_place_birth_hospital_or_a						
Community Birth	0	(base)				
Hospital Birth	−9.02583	1.67749	−5.38	0.000	−12.33151	−5.72015
supportldnum						
No support	−13.3745	4.403977	−3.04	0.003	−22.05303	−4.695975
Support	0	(base)				
deliverytypenum						
Instrumental Birth	−7.875424	2.891651	−2.72	0.007	−13.57374	−2.177104
Vaginal Birth	0	(base)				
_cons	80.00471	.9005743	88.84	0.000	78.23003	81.77939

Appendix Figure 25 RMC restricted model with robust adjustment

```
. fitstat
```

	regress
Log-likelihood	
Model	−894.988
Intercept-only	−933.462
Chi-square	
Deviance(df=224)	1789.977
R2	
R2	0.286
Adjusted R2	0.277
McFadden	0.041
McFadden(adjusted)	0.037
Cox-Snell/ML	0.286
Cragg-Uhler/Nagelkerke	0.287
IC	
AIC	1797.977
AIC divided by N	7.886
BIC(df=4)	1811.694

```
Note: Some measures based on pseudolikelihoods.
```

Appendix Figure 26 RMC restricted model fit statistics

Appendix E.3.3 Unrestricted OV Model Diagnostics

Appendix Figure 27 OV unrestricted model standardized pearson residuals vs predicted probabilities

Appendix Figure 28 OV unrestricted model standerdized pearson residuals versus index

Appendix Figure 29 OV unrestricted model deviance residuals versus index

Appendix Figure 30 OV unrestricted model Pregibon levarge

127

OV unrestricted model diagnostics
Influential points DFBETA

Dashed line represents cut off point for influence, 1

Appendix Figure 31 OV unrestricted model influential points DFBETA versus index

```
. extremes Unovdbeta
```

obs:	Unovdb~a
248.	.0006224
62.	.0021701
72.	.0021701
219.	.0021701
267.	.0021701

137.	.9527369
158.	1.163726
9.	1.78822
192.	1.78822
198.	1.78822

```
note: 2 values of .9527369
```

Appendix Figure 32 OV unrestricted model top and bottom five extreme DFBETA values

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```
. linktest

Iteration 0:  Log likelihood = -153.07465
Iteration 1:  Log likelihood = -108.16901
Iteration 2:  Log likelihood = -107.25202
Iteration 3:  Log likelihood = -107.24578
Iteration 4:  Log likelihood = -107.24577


Logistic regression                              Number of obs =      221
                                                 LR chi2(2)    =    91.66
                                                 Prob > chi2   =   0.0000
Log likelihood = -107.24577                      Pseudo R2     =   0.2994


      OVFinal │ Coefficient  Std. err.      z    P>|z|     [95% conf. interval]
──────────────┼────────────────────────────────────────────────────────────────
         _hat │   1.051651   .1458518     7.21   0.000     .7657868    1.337515
       _hatsq │   .1146325   .1361801     0.84   0.400    -.1522756    .3815405
        _cons │  -.2052337   .2928624    -0.70   0.483    -.7792334    .3687659
```

Appendix Figure 33 OV unrestricted model link test for model specification

```
. fitstat

                              │    logistic
──────────────────────────────┼──────────────
Log-likelihood                │
                        Model │    -107.634
                Intercept-only │    -153.075
──────────────────────────────┼──────────────
Chi-square                    │
             Deviance(df=209) │     215.268
                    LR(df=11) │      90.881
                      p-value │       0.000
──────────────────────────────┼──────────────
R2                            │
                     McFadden │       0.297
           McFadden(adjusted) │       0.218
                  Cox-Snell/ML │       0.337
       Cragg-Uhler/Nagelkerke │       0.450
                        Efron │       0.370
                    Tjur's D │       0.371
                        Count │       0.783
              Count(adjusted) │       0.551
──────────────────────────────┼──────────────
IC                            │
                          AIC │     239.268
              AIC divided by N │       1.083
                   BIC(df=12) │     280.046
```

Appendix Figure 34 OV unrestricted model fit statistics

Appendix E.3.4 Restricted OV Model Diagnostics

```
. logistic OVFinal i.Social_risk_composite i.Actual_place_birth_hospital_or_a, baselevels

Logistic regression                                  Number of obs =     239
                                                     LR chi2(2)    =   84.14
                                                     Prob > chi2   =  0.0000
Log likelihood = -123.57155                          Pseudo R2     =  0.2540
```

OVFinal	Odds ratio	Std. err.	z	P>|z|	[95% conf. interval]
Social_risk_composite						
No history of social risk	1	(base)				
History of social risk	3.619389	2.322706	2.00	0.045	1.028929	12.73166
Actual_place_birth_hospital_or_a						
Community Birth	1	(base)				
Hospital Birth	12.18417	3.926677	7.76	0.000	6.478482	22.91493
_cons	.2201898	.0558693	-5.96	0.000	.1339121	.3620551

Note: **_cons** estimates baseline odds.

```
. estat gof, group(10)
note: obs collapsed on 10 quantiles of estimated probabilities.

Goodness-of-fit test after logistic model
Variable: OVFinal

 Number of observations =     239
        Number of groups =       3
Hosmer-Lemeshow chi2(1) =    0.04
          Prob > chi2 =  0.8345

Warning: There are only 3 distinct quantiles because of ties.
```

Appendix Figure 35 OV restricted model and Hosmer-Lemeshow goodness of fit test

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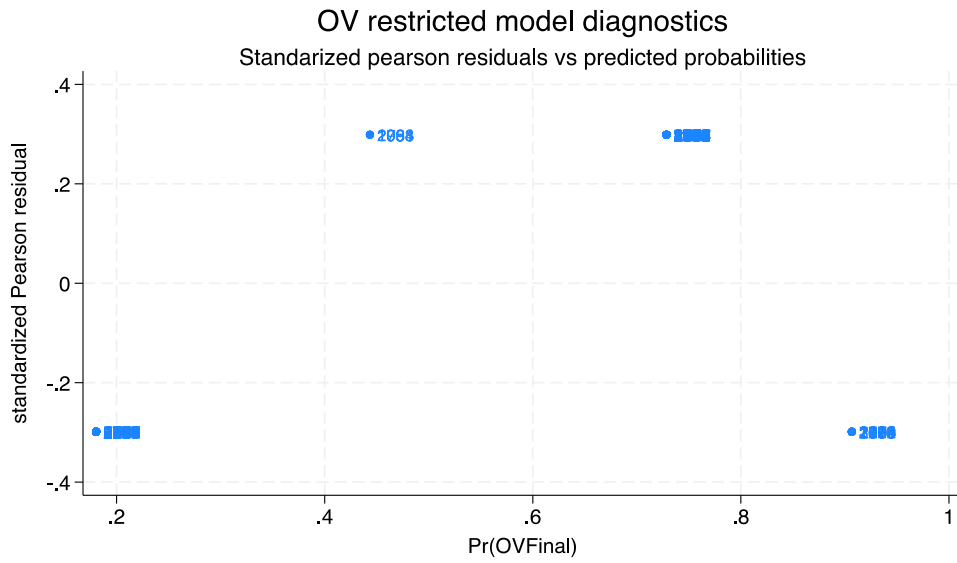
Appendix Figure 36 OV restricted model standardized pearson residuals versus predicted probabilities
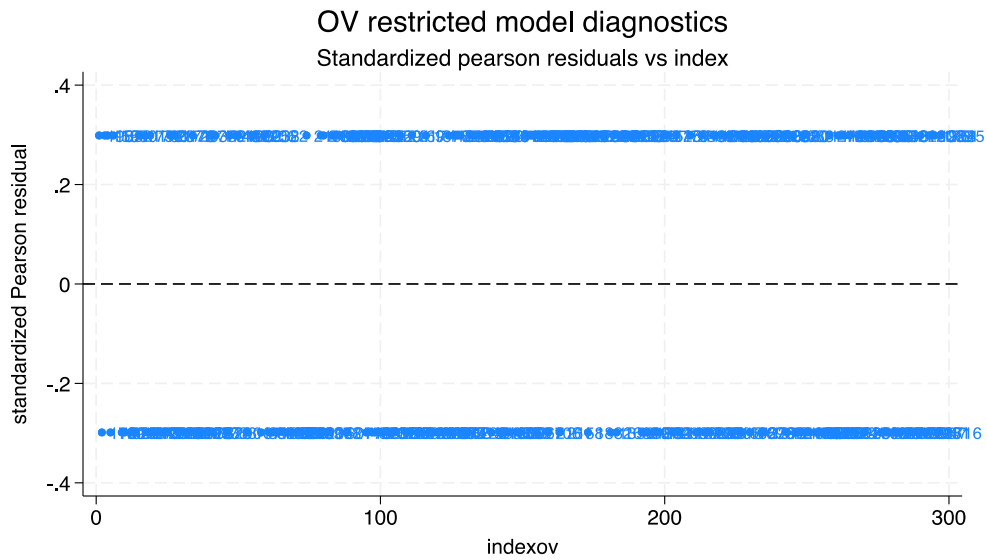
Appendix Figure 37 OV restricted model standardized pearson residuals index plot

Appendix Figure 38 OV restricted model deviance residuals index plot

Appendix Figure 39 OV restricted model leverage plot

Appendix E.3.5 OV on RMC Model Diagnostics
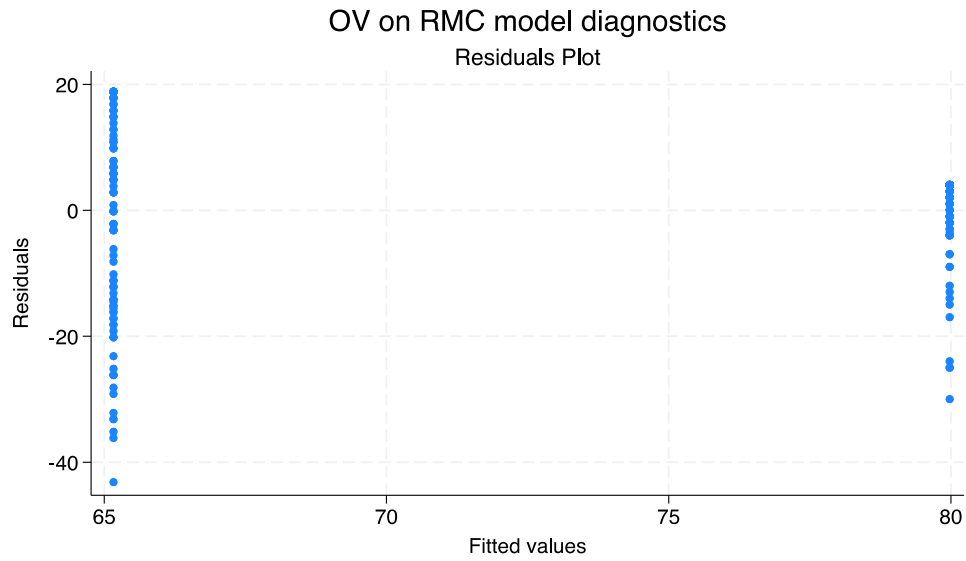
Appendix Figure 40 OV and RMC model residuals plot

```
. vif
```

Variable	VIF	1/VIF
1.OVFinal	**1.00**	**1.000000**
Mean VIF	**1.00**	

Appendix Figure 41 OV and RMC model variance inflation coefficient
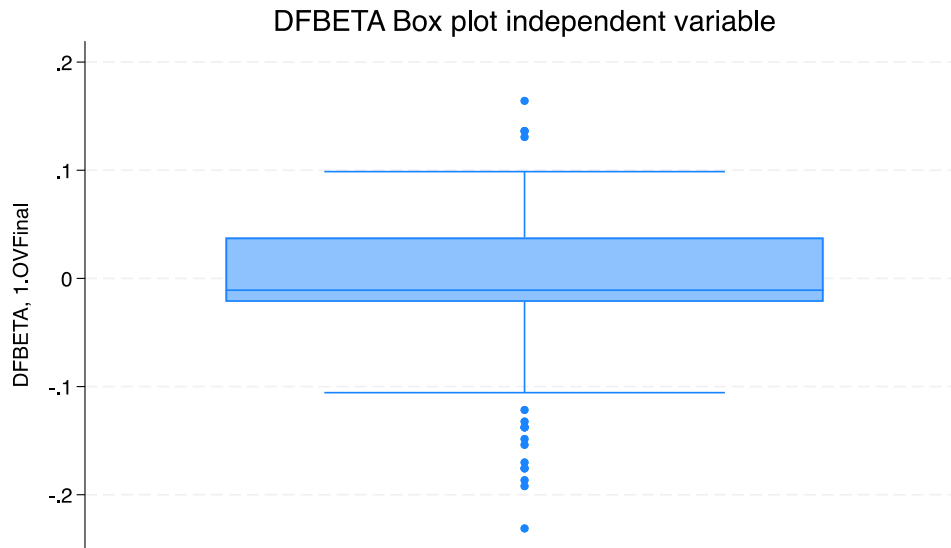
Appendix Figure 42 OV and RMC model DFBETA box plot of OV

As above, given that the residuals are not normally distributed and there is an issue with heteroskedasticity, I report on robust standard errors using the robust option in STATA. Raw output of which is below:

```
. reg MORI_total_MVR OVFinal,robust baselevels

Linear regression                               Number of obs   =        224
                                                F(1, 222)       =      78.46
                                                Prob > F        =     0.0000
                                                R-squared       =     0.2563
                                                Root MSE        =     12.671

                             Robust
MORI_total~R   Coefficient  std. err.      t     P>|t|    [95% conf. interval]

     OVFinal    -14.81363   1.672339    -8.86    0.000    -18.10932   -11.51794
       _cons     79.97692   .6514645   122.76    0.000     78.69308    81.26077
```

Appendix Figure 43 OV and RMC model with robust adjustment

Appendix E.3.6 OV and RMC Model Adjusted For Delivery Location

```
. regress MORI_total_MVR OVFinal i.Actual_place_birth_hospital_or_a i.deliverytypenum i.supportldnum, baselevels
```

Source	SS	df	MS
Model	17569.9356	4	4392.48391
Residual	29766.0512	217	137.170743
Total	47335.9869	221	214.189986

Number of obs	= 222
F(4, 217)	= 32.02
Prob > F	= 0.0000
R-squared	= 0.3712
Adj R-squared	= 0.3596
Root MSE	= 11.712

MORI_total_MVR	Coefficient	Std. err.	t	P>|t|	[95% conf. interval]	
OVFinal	−9.813751	1.936959	−5.07	0.000	−13.63141	−5.996089
Actual_place_birth_hospital_or_a						
Community Birth	0	(base)				
Hospital Birth	−3.583483	2.082011	−1.72	0.087	−7.687036	.520069
deliverytypenum						
Instrumental Birth	0	(base)				
Vaginal Birth	7.159651	2.188279	3.27	0.001	2.846649	11.47265
supportldnum						
No support	0	(base)				
Support	15.46364	3.884607	3.98	0.000	7.807251	23.12003
_cons	59.03603	4.500659	13.12	0.000	50.16543	67.90663

Appendix Figure 44 OV and RMC model accounting for delivery location without robust adjustment

```
. regcheck

┌─────────────────────────────────────┬──────────────────────────────────────────────────────┐
│     Regression assumptions:         │  Test:                                We seek values │
├─────────────────────────────────────┼──────────────────────────────────────────────────────┤
│  1) heterokedasticity problem       │  Breusch-Pagan hettest                      > 0.05   │
│                                     │  Chi2(1): 38.279                                     │
│                                     │  p-value: 0.000                                      │
├─────────────────────────────────────┼──────────────────────────────────────────────────────┤
│  2) no multicollinearity problem    │  Variance inflation factor                  < 5.00   │
│                                     │  OVFinal : 1.52                                      │
│                                     │  1.Actual_place_birth_hospital_or_a : 1.72           │
│                                     │  2.deliverytypenum : 1.25                            │
│                                     │  2.supportldnum : 1.05                               │
├─────────────────────────────────────┼──────────────────────────────────────────────────────┤
│  3) residuals are not normally distributed │ Shapiro-Wilk W normality test          > 0.01 │
│                                     │  z: 5.754                                            │
│                                     │  p-value: 0.000                                      │
├─────────────────────────────────────┼──────────────────────────────────────────────────────┤
│  4) no specification problem        │  Linktest                                   > 0.05   │
│                                     │  t: -0.413                                           │
│                                     │  p-value: 0.680                                      │
├─────────────────────────────────────┼──────────────────────────────────────────────────────┤
│  5) appropriate functional form     │  Test for appropriate functional form       > 0.05   │
│                                     │  F(3,214):2.261                                      │
│                                     │  p-value: 0.082                                      │
├─────────────────────────────────────┼──────────────────────────────────────────────────────┤
│  6) no influential observations     │  Cook's distance                            < 1.00   │
│                                     │  no distance is above the cutoff                     │
└─────────────────────────────────────┴──────────────────────────────────────────────────────┘
```

Appendix Figure 45 OV and RMC accounting for delivery location model diagnostics using regcheck command in STATA

As above, given that the residuals are not normally distributed and there is an issue with heteroskedasticity, I report on robust standard errors using the robust option in STATA. Raw output of which is below:

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```
. reg MORI_total_MVR OVFinal i.Actual_place_birth_hospital_or_a ib2.supportldnum ib2.deliveryt
> ypenum, robust baselevels

Linear regression                                   Number of obs   =        222
                                                    F(4, 217)       =      45.17
                                                    Prob > F        =     0.0000
                                                    R-squared       =     0.3712
                                                    Root MSE        =     11.712
```

MORI_total_MVR	Coefficient	Robust std. err.	t	P>|t|	[95% conf. interval]	
OVFinal	-9.813751	2.28762	-4.29	0.000	-14.32255	-5.304951
Actual_place_birth_hospit~a						
Community Birth	0	(base)				
Hospital Birth	-3.583483	2.278205	-1.57	0.117	-8.073725	.9067585
supportldnum						
No support	-15.46364	3.774239	-4.10	0.000	-22.9025	-8.024781
Support	0	(base)				
deliverytypenum						
Instrumental Birth	-7.159651	2.804389	-2.55	0.011	-12.68698	-1.632324
Vaginal Birth	0	(base)				
_cons	81.65933	.6569525	124.30	0.000	80.3645	82.95415

Appendix Figure 46 OV and RMC model with robust adjustment

Appendix E.3.7 Intersectional RMC Model Diagnostics

```
. regress MORI_total_MVR i.stratumID_NativitySocialNulli, baselevels
```

Source	SS	df	MS			
Model	6501.02488	7	928.717839			
Residual	43047.5539	241	178.620555			
Total	49548.5787	248	199.792656			

```
                              Number of obs   =        249
                              F(7, 241)       =       5.20
                              Prob > F        =     0.0000
                              R-squared       =     0.1312
                              Adj R-squared   =     0.1060
                              Root MSE        =     13.365
```

MORI_total_MVR	Coefficient	Std. err.	t	P>|t|	[95% conf. interval]	
stratumID_NativitySocialNulli						
100	0	(base)				
101	-7.384501	1.996764	-3.70	0.000	-11.31784	-3.451163
110	-18.36161	5.232385	-3.51	0.001	-28.66865	-8.054561
111	-9.635417	4.092148	-2.35	0.019	-17.69636	-1.574473
200	.5960648	2.911393	0.20	0.838	-5.13896	6.33109
201	-3.21875	3.355848	-0.96	0.338	-9.829287	3.391787
210	-20.88542	7.835867	-2.67	0.008	-36.32095	-5.449885
211	-31.21875	13.43433	-2.32	0.021	-57.68245	-4.755054
_cons	77.21875	1.364049	56.61	0.000	74.53177	79.90573

Appendix Figure 47 RMC simple intersectional model without robust adjustment

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```
. regcheck
```

Regression assumptions:	Test:	We seek values
1) heterokedasticity problem	Breusch-Pagan hettest Chi2(1): 9.369 p-value: 0.002	> 0.05
2) no multicollinearity problem	Variance inflation factor 101.stratumID_NativitySocialNulli : 1.24 110.stratumID_NativitySocialNulli : 1.04 111.stratumID_NativitySocialNulli : 1.07 200.stratumID_NativitySocialNulli : 1.14 201.stratumID_NativitySocialNulli : 1.11 210.stratumID_NativitySocialNulli : 1.02 211.stratumID_NativitySocialNulli : 1.01	< 5.00
3) residuals are not normally distributed	Shapiro-Wilk W normality test z: 7.182 p-value: 0.000	> 0.01
4) no specification problem	Linktest t: 0.000 p-value: 1.000	> 0.05

test not possible

Appendix Figure 48 RMC simple intersectional model without robust adjustment model diagnostics using regcheck command in STATA

As above, given that the residuals are not normally distributed and there is an issue with heteroskedasticity, I report on robust standard errors using the robust option in STATA. Raw output of which is below:

```
. reg MORI_total_MVR i.stratumID_NativitySocialNulli, robust baselevels

Linear regression                                    Number of obs   =        249
                                                     F(6, 241)       =          .
                                                     Prob > F        =          .
                                                     R-squared       =     0.1312
                                                     Root MSE        =     13.365

─────────────────────────────────────────────────────────────────────────────────
                             │               Robust
             MORI_total_MVR  │ Coefficient  std. err.      t    P>|t|   [95% conf. interval]
─────────────────────────────┼───────────────────────────────────────────────────────
stratumID_NativitySocialNulli │
                        100  │          0   (base)
                        101  │  -7.384501   2.146176    -3.44   0.001   -11.61216   -3.156843
                        110  │  -18.36161   6.136822    -2.99   0.003   -30.45026    -6.27295
                        111  │  -9.635417   4.198537    -2.29   0.023   -17.90593   -1.364903
                        200  │   .5960648   2.000922     0.30   0.766   -3.345463    4.537593
                        201  │   -3.21875   3.011632    -1.07   0.286   -9.151232    2.713732
                        210  │  -20.88542    5.56648    -3.75   0.000   -31.85058   -9.920251
                        211  │  -31.21875   1.136184   -27.48   0.000   -33.45687   -28.98063
                             │
                      _cons  │   77.21875   1.136184    67.96   0.000    74.98063    79.45687
─────────────────────────────────────────────────────────────────────────────────
```

Appendix Figure 49 RMC simple intersectional model with robust adjustment

```
. testparm  i.stratumID_NativitySocialNulli

 ( 1)  101.stratumID_NativitySocialNulli = 0
 ( 2)  110.stratumID_NativitySocialNulli = 0
 ( 3)  111.stratumID_NativitySocialNulli = 0
 ( 4)  200.stratumID_NativitySocialNulli = 0
 ( 5)  201.stratumID_NativitySocialNulli = 0
 ( 6)  210.stratumID_NativitySocialNulli = 0
 ( 7)  211.stratumID_NativitySocialNulli = 0

       F(  7,   241) =  205.27
            Prob > F =   0.0000
```

Appendix Figure 50 RMC simple intersectional model Wald test

Appendix E.3.8 RMC Intersectional: Adjusted

```
. regress MORI_total_MVR i.stratumID_NativitySocialNulli i.Actual_place_birth_hospital_or_a, baselevels

      Source │       SS           df       MS        Number of obs   =       239
─────────────┼──────────────────────────────────    F(8, 230)       =     10.73
       Model │  13121.3694          8  1640.17117    Prob > F        =    0.0000
    Residual │   35173.099        230  152.926517    R-squared       =    0.2717
─────────────┼──────────────────────────────────    Adj R-squared   =    0.2464
       Total │  48294.4683        238  202.917934    Root MSE        =    12.366


─────────────────────────────────┬────────────────────────────────────────────────────────────────
               MORI_total_MVR │ Coefficient  Std. err.      t    P>|t|     [95% conf. interval]
─────────────────────────────────┼────────────────────────────────────────────────────────────────
  stratumID_NativitySocialNulli │
                          100 │          0  (base)
                          101 │  -5.031856    1.96264    -2.56   0.011    -8.898908   -1.164804
                          110 │  -15.14247   4.875676    -3.11   0.002    -24.74917   -5.535768
                          111 │  -5.443127   4.034685    -1.35   0.179     -13.3928    2.506541
                          200 │   .9036297   2.707222     0.33   0.739    -4.430496    6.237755
                          201 │  -.8920131   3.138406    -0.28   0.776    -7.075714    5.291688
                          210 │  -18.18009    7.26804    -2.50   0.013    -32.50054   -3.859634
                          211 │  -24.91677   12.47351    -2.00   0.047    -49.49372    -.339812
                              │
Actual_place_birth_hospital_or_a │
               Community Birth │          0  (base)
                Hospital Birth │  -10.78995   1.703473    -6.33   0.000    -14.14636   -7.433543
                              │
                        _cons │   81.70672   1.468778    55.63   0.000     78.81274     84.6007
─────────────────────────────────┴────────────────────────────────────────────────────────────────
```

```
. regcheck
```

Regression assumptions:	Test:	We seek values
1) heterokedasticity problem	Breusch-Pagan hettest Chi2(1): 34.019 p-value: 0.000	> 0.05
2) no multicollinearity problem	Variance inflation factor 101.stratumID_NativitySocialNulli : 1.33 110.stratumID_NativitySocialNulli : 1.06 111.stratumID_NativitySocialNulli : 1.12 200.stratumID_NativitySocialNulli : 1.15 201.stratumID_NativitySocialNulli : 1.13 210.stratumID_NativitySocialNulli : 1.02 211.stratumID_NativitySocialNulli : 1.01 1.Actual_place_birth_hospital_or_a : 1.11	< 5.00
3) residuals are not normally distributed	Shapiro-Wilk W normality test z: 6.368 p-value: 0.000	> 0.01
4) no specification problem	Linktest t: 0.031 p-value: 0.975	> 0.05
5) appropriate functional form	Test for appropriate functional form F(3,227):0.579 p-value: 0.629	> 0.05
6) no influential observations	Cook's distance no distance is above the cutoff	< 1.00

Appendix Figure 51 RMC intersectional model accounting for delivery location

As above, given that the residuals are not normally distributed and there is an issue with heteroskedasticity, I report on robust standard errors using the robust option in STATA. Raw output of which is below:

```
. reg MORI_total_MVR i.stratumID_NativitySocialNulli i.Actual_place_birth_hospital_or_a, robust baselevels

Linear regression                                    Number of obs   =      239
                                                     F(7, 230)       =        .
                                                     Prob > F        =        .
                                                     R-squared       =   0.2717
                                                     Root MSE        =   12.366

                                  |             Robust
                   MORI_total_MVR | Coefficient  std. err.      t    P>|t|     [95% conf. interval]
----------------------------------+----------------------------------------------------------------
stratumID_NativitySocialNulli     |
                              100 |          0   (base)
                              101 |  -5.031856   2.129458   -2.36   0.019   -9.227594   -.8361177
                              110 |  -15.14247   5.964514   -2.54   0.012   -26.89454   -3.390397
                              111 |  -5.443127   4.328197   -1.26   0.210   -13.97111    3.084856
                              200 |   .9036297   1.709519    0.53   0.598    -2.46469    4.27195
                              201 |  -.8920131   2.850558   -0.31   0.755   -6.508559    4.724532
                              210 |  -18.18009   6.970596   -2.61   0.010   -31.91447   -4.445699
                              211 |  -24.91677   1.649169  -15.11   0.000   -28.16618   -21.66736
                                  |
Actual_place_birth_hospital_or_a  |
                  Community Birth |          0   (base)
                   Hospital Birth |  -10.78995   1.615752   -6.68   0.000   -13.97352   -7.606383
                                  |
                            _cons |   81.70672   .9617523   84.96   0.000    79.81175    83.60169
----------------------------------+----------------------------------------------------------------
```

Appendix Figure 52 RMC intersectional accounting for delivery location with robust adjustment

```
. testparm i.stratumID_NativitySocialNulli i.Actual_place_birth_hospital_or_a

 ( 1)  101.stratumID_NativitySocialNulli = 0
 ( 2)  110.stratumID_NativitySocialNulli = 0
 ( 3)  111.stratumID_NativitySocialNulli = 0
 ( 4)  200.stratumID_NativitySocialNulli = 0
 ( 5)  201.stratumID_NativitySocialNulli = 0
 ( 6)  210.stratumID_NativitySocialNulli = 0
 ( 7)  211.stratumID_NativitySocialNulli = 0
 ( 8)  1.Actual_place_birth_hospital_or_a = 0

       F(  8,   230) =  357.92
             Prob > F =   0.0000
```

Appendix Figure 53 RMC intersectional accounting for delivery location with robust adjustment Wald test

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Appendix E.3.9 Original Linear Regressions Without Robust Option Applied

Appendix Table E.1: Factors Associated with Respectful Maternity Care: Original Model Comparison

	Unrestricted RMC Model			Restricted RMC Model		
Observations (N)	199			228		
	Coefficient	**P-Value**	**95% CI**	**Coefficient**	**P-Value**	**95% CI**
Parity						
Multigravida	REF	-	-			
Nulli/Primigravida	-3.29	0.079	-6.96, 0.39			
Type of Healthcare Provider at Labor and Delivery						
Doctor	-1.73	0.500	-6.791, 3.33			
Midwifery	REF	-	-			
Delivery Type						
Instrumental Birth	-7.97	0.001*	-12.82, -3.13	-7.88	0.001*	-12.34, -3.41
Vaginal Birth	REF	-	-	REF		
Socioeconomic Status						
Moderate/High SES	REF	-	-			
Low SES	-1.90	0.294	-5.46, 1.66			
Maternal Age at Birth						
17-25	-2.92	0.287	-8.30, 2.47			
26-30	REF					
History of Social Risk						
No history of social risk	REF	-	-			
History of social risk	-5.05	0.116	-11.37, 1.26			
Elevated Pregnancy Risk						
No Elevated risk	REF	-	-			
Elevated risk	0.43	0.857	-4.24, 5.09			
Presence of Support Labor & Delivery						
No support	-12.61	0.004*	-21.20, -4.03	-13.37	P<0.0001*	-20.79, -5.96
Support	REF			REF		
Delivery Location						
Community Birth	REF	-	-	REF	-	-
Hospital Birth	-6.74	0.015*	-12.19, -1.32	-9.03	P<0.0001*	-12.70, -5.35
Intercept	83.08	P<0.0001*	79.92, 86.23	80.01*	P<0.0001*	77.54, 82.47
Model Information						
Akaike Information Criterion (AIC)	1565.55			1797.98		
Bayesian Information Criterion (BIC)	1598.48			1811.69		
F statistic	10.53			29.97		
R-squared	0.33			0.29		
Log likelihood	-772.77			-894.99		
(*) Statistically significant, p-value≤.0.05 **REF: Reference Categories**						

Appendix Table E.2: Aim 2 Original Linear Regressions Summarizing the Relationship of Obstetric Violence with Respect and as Measured by MORi

	Unadjusted Model			Adjusted Model		
Observations (N)	224			222		
	Coefficient	**P-value**	**95% CI**	**Coefficient**	**P-value**	**95% CI**
Obstetric Violence						
No Obstetric Violence	REF			REF		
Obstetric Violence	-14.81	P<0.0001*	-18.15, -11.48	-9.81	P<0.0001*	-13.63, -6.00
Delivery type						
Instrumental Birth				-7.16	0.001*	-12.74, -3.89
Vaginal Birth				REF		
Delivery Location						
Community Birth				REF		
Hospital Birth				-3.58	0.087	-7.69, 0.52
Presence of Support Labor & Delivery						
No support				-15.46	P<0.0001*	7.81, 23.12
Support				REF		
Intercept	79.97	P<0.0001*	77.60, 82.36	66.20	P<0.0001*	58.11, 74.28
MODEL INFORMATION						
Akaike Information Criterion (AIC)	1775.30			1727.46		
Bayesian Information Criterion (BIC)	1782.12			1744.48		
F statistic	(1, 222) 76.51			(4, 217) 32.02		
R-squared	0.2563			0.3712		
Log likelihood (ll)	-885.65			-858.73		
(*) Statistically significant, p-value≤.0.05						
REF: Reference Categories;						

Appendix Table E.3: Respectful Maternity Care Intersectional Analysis Summary of Results: Original Model Without Robust Option

	Model 1: Unadjusted			Model 2: Adjusted Model		
Observations (N)	249			239		
	Coefficient	**P-value**	**95% Confidence Interval**	**Coefficient**	**P-value**	**95%Confidence Interval**
Intersectional Composite Variable (code)						
US, No History, Multigravida (100)	REF	-	-	REF	-	-
US, No History, Primigravida (101)	-7.39	P<0.0001*	-11.32, -3.45	-5.03	0.011*	-8.90, -1.17
US, History, Multigravida (110)	-18.36	0.001*	-28.67, -8.06	-15.14	0.002*	-24.75, -5.54
US, History, Primigravida (111)	-9.64	0.019*	-17.70, -1.57	-5.44	0.179	-13.39, 2.51
Foreign, No History, Multigravida (200)	0.60	0.838	-5.14, 6.33	0.90	0.739	-4.43, 6.24
Foreign, No History, Primigravida (201)	-3.22	0.338	-9.83, -3.39	-0.89	0.776	-7.08, 5.29
Foreign, History, Multigravida (210)	-20.89	0.008*	-36.32, -5.45	-18.18	0.013*	-32.50, -3.86
Foreign, History, Primigravida (211)	-31.22	0.021*	-57.68, -4.76	-24.92	0.047*	-49.49, -0.34
Delivery Location						
Community Birth	-		-	REF+	-	-
Hospital Birth	-		-	-10.79*	P<0.0001	-14.15, -7.43
Intercept	77.22	P<0.0001	74.53, 79.91	81.71*		78.81, 84.60
	Model Information					
F-statistic	(2, 241) 5.20			(8, 230) 10.73		
P-Value	p<0.0001			p<0.0001		
R-squared	0.34			0.43		
Akaike Information Criterion (AIC)	2005.63			1889.24		
Bayesian Information Criterion (BIC)	2033.77			1920.53		
(*) Statistically significant, p-value≤.0.05						
REF- Reference category;						

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Appendix E.3.10 Intersectional OV Model Diagnostics

```
. logistic OVFinal i.stratumID_NativitySocialNulli, baselevels
note: 210.stratumID_NativitySocialNulli != 0 predicts success perfectly;
      210.stratumID_NativitySocialNulli omitted and 3 obs not used.

note: 211.stratumID_NativitySocialNulli != 0 predicts success perfectly;
      211.stratumID_NativitySocialNulli omitted and 1 obs not used.
```

```
Logistic regression                              Number of obs =      235
                                                 LR chi2(5)     =    18.29
                                                 Prob > chi2    =   0.0026
Log likelihood = -153.72774                      Pseudo R2      =   0.0561
```

OVFinal	Odds ratio	Std. err.	z	P>|z|	[95% conf. interval]	
stratumID_NativitySocialNulli						
100	1	(base)				
101	2.439394	.7758243	2.80	0.005	1.307874	4.549858
110	4.242424	3.669538	1.67	0.095	.7786757	23.11381
111	8.484813	6.830978	2.66	0.008	1.751275	41.10835
200	.9824561	.4301552	-0.04	0.968	.4165106	2.317396
201	2.333333	1.199046	1.65	0.099	.8522444	6.388361
210	1	(empty)				
211	1	(empty)				
_cons	.5892857	.1293213	-2.41	0.016	.3832888	.9059948

```
Note: _cons estimates baseline odds.

. estat gof, group(10)
note: obs collapsed on 10 quantiles of estimated probabilities.

Goodness-of-fit test after logistic model
Variable: OVFinal

 Number of observations =     235
       Number of groups =       4
Hosmer-Lemeshow chi2(2) =    0.00
         Prob > chi2 =  1.0000

Warning: There are only 4 distinct quantiles because of ties.
```

Appendix Figure 54 OV simple intersectional model and Hosmer-Lemeshow goodness of fit test

```
. lfit, group(10) table
note: obs collapsed on 10 quantiles of estimated probabilities.

Goodness-of-fit test after logistic model
Variable: OVFinal

    Table collapsed on quantiles of estimated probabilities

  ┌────────┬────────┬───────┬───────┬───────┬───────┬───────┐
  │ Group  │  Prob  │ Obs_1 │ Exp_1 │ Obs_0 │ Exp_0 │ Total │
  ├────────┼────────┼───────┼───────┼───────┼───────┼───────┤
  │      1 │ 0.3667 │    11 │  11.0 │    19 │  19.0 │    30 │
  │      5 │ 0.3708 │    33 │  33.0 │    56 │  56.0 │    89 │
  │      9 │ 0.5897 │    57 │  57.0 │    40 │  40.0 │    97 │
  │     10 │ 0.8333 │    15 │  15.0 │     4 │   4.0 │    19 │
  └────────┴────────┴───────┴───────┴───────┴───────┴───────┘


    Number of observations =    235
          Number of groups =      4
  Hosmer-Lemeshow chi2(2) =   0.00
            Prob > chi2 = 1.0000

  Warning: There are only 4 distinct quantiles because of ties.
```

Appendix Figure 55 OV simple intersectional model goodness of fit test

```
. fitstat

                             │      logistic
  ───────────────────────────┼─────────────────
  Log-likelihood             │
                     Model   │      -153.728
             Intercept-only  │      -162.870
  ───────────────────────────┼─────────────────
  Chi-square                 │
          Deviance(df=229)   │       307.455
               LR(df=5)      │        18.285
               p-value       │         0.003
  ───────────────────────────┼─────────────────
  R2                         │
               McFadden      │         0.056
       McFadden(adjusted)    │         0.019
            Cox-Snell/ML     │         0.075
   Cragg-Uhler/Nagelkerke    │         0.100
                  Efron      │         0.075
                Tjur's D     │         0.075
                  Count      │         0.626
          Count(adjusted)    │         0.241
  ───────────────────────────┼─────────────────
  IC                         │
                    AIC      │       319.455
          AIC divided by N   │         1.359
               BIC(df=6)     │       340.213
```

Appendix Figure 56 OV simple intersectional model fit statistics

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```
. linktest

Iteration 0:  Log likelihood = -162.87044
Iteration 1:  Log likelihood = -153.79545
Iteration 2:  Log likelihood = -153.72775
Iteration 3:  Log likelihood = -153.72774
```

```
Logistic regression                          Number of obs =     235
                                             LR chi2(2)    =   18.29
                                             Prob > chi2   =  0.0001
Log likelihood = -153.72774                  Pseudo R2     =  0.0561
```

OVFinal	Coefficient	Std. err.	z	P>|z|	[95% conf. interval]	
_hat	1	.2769819	3.61	0.000	.4571255	1.542875
_hatsq	4.50e-07	.3551211	0.00	1.000	-.696024	.6960249
_cons	-9.99e-08	.1766348	-0.00	1.000	-.3461979	.3461977

```
. vif
```

Variable	VIF	1/VIF
strat~lNulli		
101	1.26	0.791126
110	1.05	0.955056
111	1.08	0.927771
200	1.17	0.855253
201	1.12	0.895244
210	1.02	0.979689
211	1.01	0.993044
Mean VIF	1.10	

.

Appendix Figure 57 OV simple intersectional link test and variance inflation coefficient
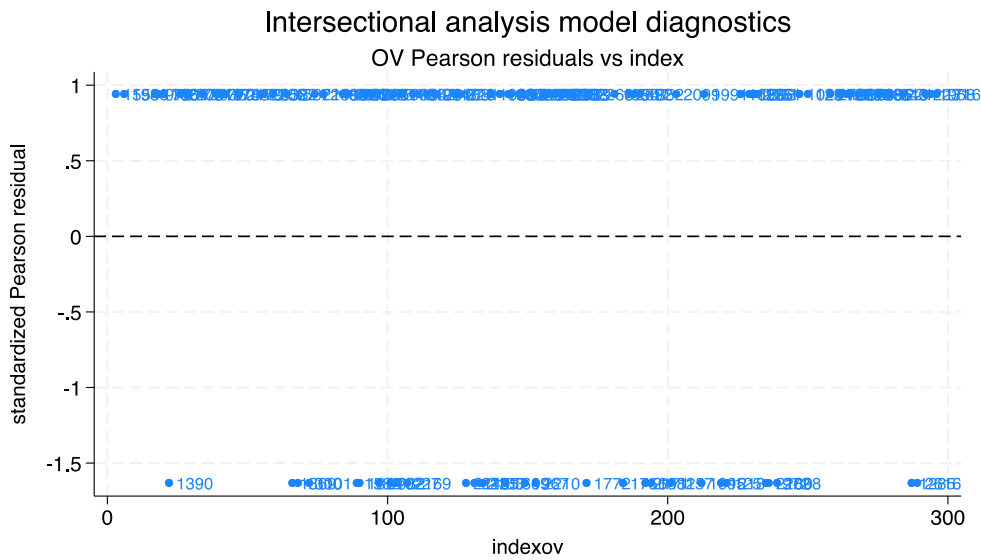
Appendix Figure 58 OV simple intersectional pearson residuals index plot
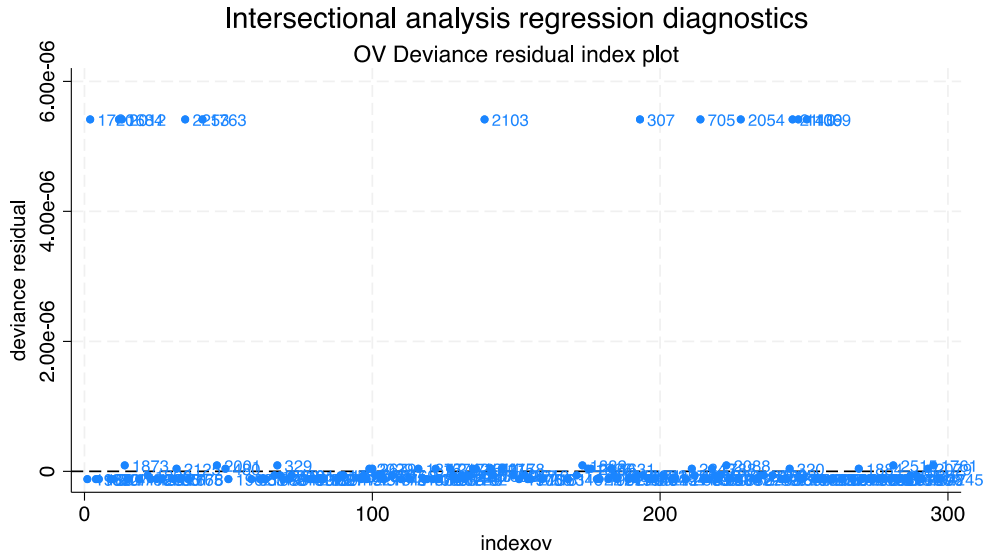
Appendix Figure 59 OV simple intersectional deviance residuals index plot
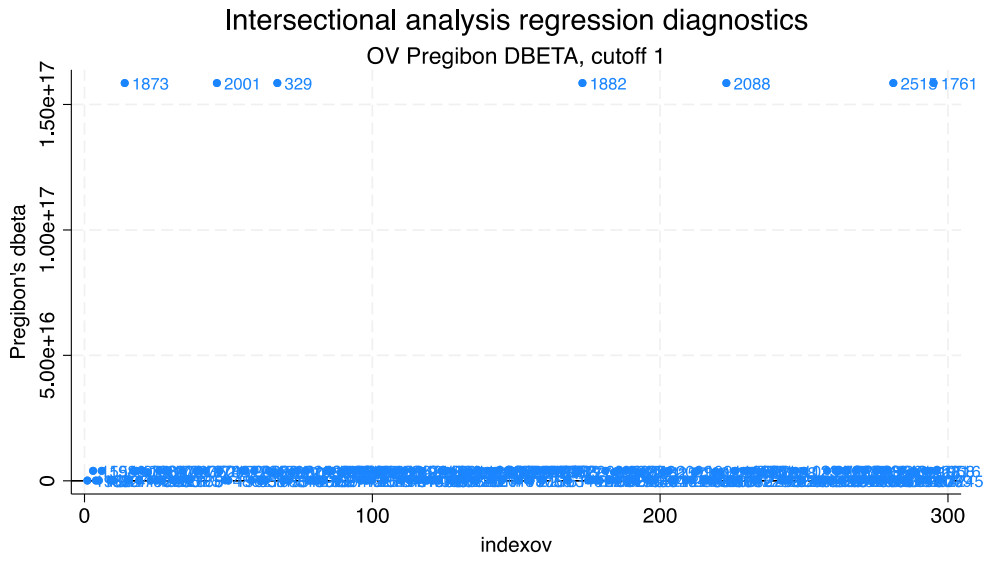
Appendix Figure 60 OV simple intersectional model Pregibon DFBETA

```
. roctab OVFinal inovxb1

                         ROC                        Asymptotic normal
            Obs         area      Std. err.       [95% conf. interval]
           ─────────────────────────────────────────────────────────
            235       0.6403       0.0343          0.57302     0.70756
```

Appendix Figure 61 OV simple intersectional model area under the receiver curve test

```
. lstat

Logistic model for OVFinal

                      ──────── True ────────
  Classified           D            ~D            │     Total
  ─────────────────────────────────────────────────────────
      +                72            44            │      116
      −                44            75            │      119
  ─────────────────────────────────────────────────────────
    Total             116           119            │      235

Classified + if predicted Pr(D) >= .5
True D defined as OVFinal != 0
─────────────────────────────────────────────────────────
Sensitivity                       Pr( +| D)      62.07%
Specificity                       Pr( −|~D)      63.03%
Positive predictive value         Pr( D| +)      62.07%
Negative predictive value         Pr(~D| −)      63.03%
─────────────────────────────────────────────────────────
False + rate for true ~D          Pr( +|~D)      36.97%
False − rate for true D           Pr( −| D)      37.93%
False + rate for classified +     Pr(~D| +)      37.93%
False − rate for classified −     Pr( D| −)      36.97%
─────────────────────────────────────────────────────────
Correctly classified                             62.55%
─────────────────────────────────────────────────────────
```

Appendix Figure 62 OV simple intersectional model classification table

Appendix E.3.11 Obstetric Violence Model Adjusted for Delivery Location

```
. fitstat

                                  │   logistic
──────────────────────────────────┼─────────────
Log-likelihood                    │
                          Model    │   -121.194
                  Intercept-only   │   -162.188
──────────────────────────────────┼─────────────
Chi-square                        │
              Deviance(df=227)     │    242.389
                      LR(df=6)     │     81.987
                       p-value     │      0.000
──────────────────────────────────┼─────────────
R2                                │
                      McFadden     │      0.253
            McFadden(adjusted)     │      0.210
                  Cox-Snell/ML     │      0.296
        Cragg-Uhler/Nagelkerke     │      0.394
                         Efron     │      0.324
                      Tjur's D     │      0.324
                         Count     │      0.778
               Count(adjusted)     │      0.552
──────────────────────────────────┼─────────────
IC                                │
                          AIC      │    256.389
              AIC divided by N     │      1.096
                     BIC(df=7)     │    280.576
```

Appendix Figure 63 OV intersectional model accounting for delivery location model fit statistics

```
. linktest

Iteration 0:   Log likelihood = -162.18789
Iteration 1:   Log likelihood = -121.27506
Iteration 2:   Log likelihood = -121.16495
Iteration 3:   Log likelihood = -121.16484
Iteration 4:   Log likelihood = -121.16484

Logistic regression                             Number of obs =      234
                                                LR chi2(2)    =    82.05
                                                Prob > chi2   =   0.0000
Log likelihood = -121.16484                     Pseudo R2     =   0.2529


     OVFinal │ Coefficient  Std. err.      z    P>|z|     [95% conf. interval]
─────────────┼────────────────────────────────────────────────────────────────
        _hat │   .983856    .1408745     6.98   0.000     .7077471    1.259965
      _hatsq │  -.0471412   .1929316    -0.24   0.807    -.4252802    .3309978
       _cons │   .0773254   .3551718     0.22   0.828    -.6187986    .7734494
```
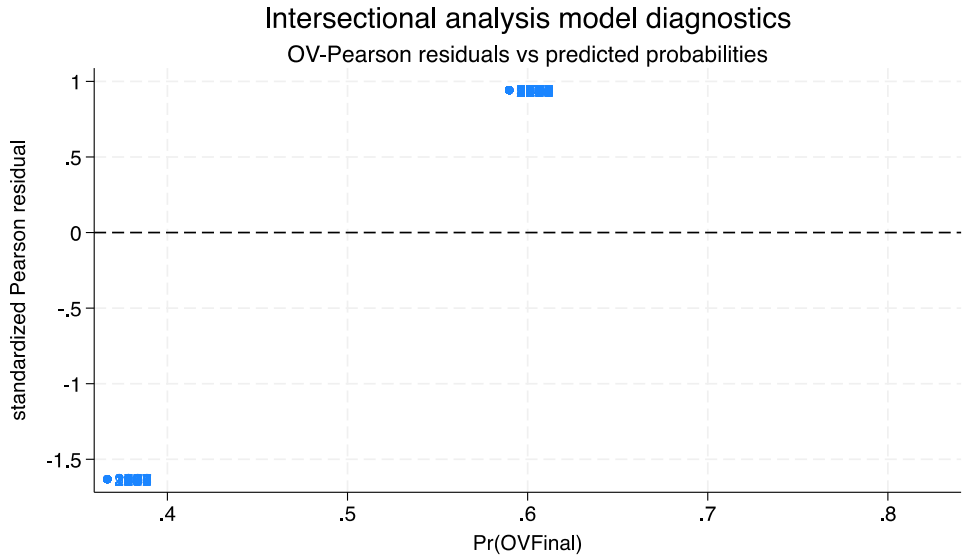
Appendix Figure 64 OV intersectional model accounting for delivery location link test for model specification

151

```
. estat gof, group(10)                                          . vif
note: obs collapsed on 10 quantiles of estimated probabilities.
                                                        Variable |      VIF     1/VIF
Goodness-of-fit test after logistic model               strat~lNulli |
Variable: OVFinal                                             101 |     1.35    0.741545
                                                             110 |     1.06    0.943102
 Number of observations =     234                             111 |     1.14    0.879220
        Number of groups =       7                            200 |     1.17    0.855179
Hosmer-Lemeshow chi2(5) =    0.78                             201 |     1.14    0.873408
            Prob > chi2 = 0.9784                              210 |     1.02    0.975689
                                                             211 |     1.01    0.986189
Warning: There are only 7 distinct quantiles because of ties.  1.Actual_p~a |     1.12    0.890293

                                                        Mean VIF |     1.13
```
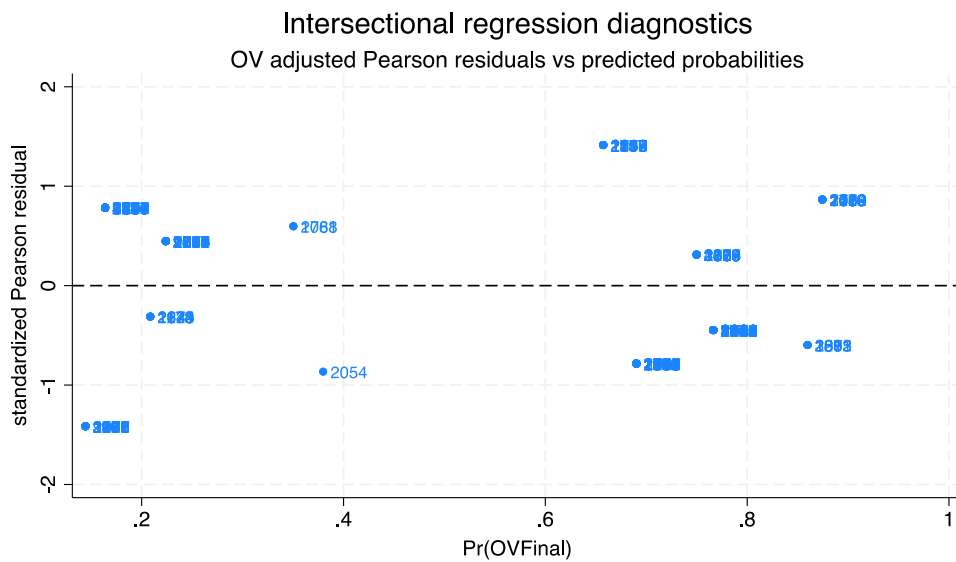
Appendix Figure 65 OV intersectional model accounting for delivery location Hosmer-Lemeshow goodness of

fit test and variance inflation coefficient

Appendix Figure 66 OV intersectional model accounting for delivery location pearson residuals versus
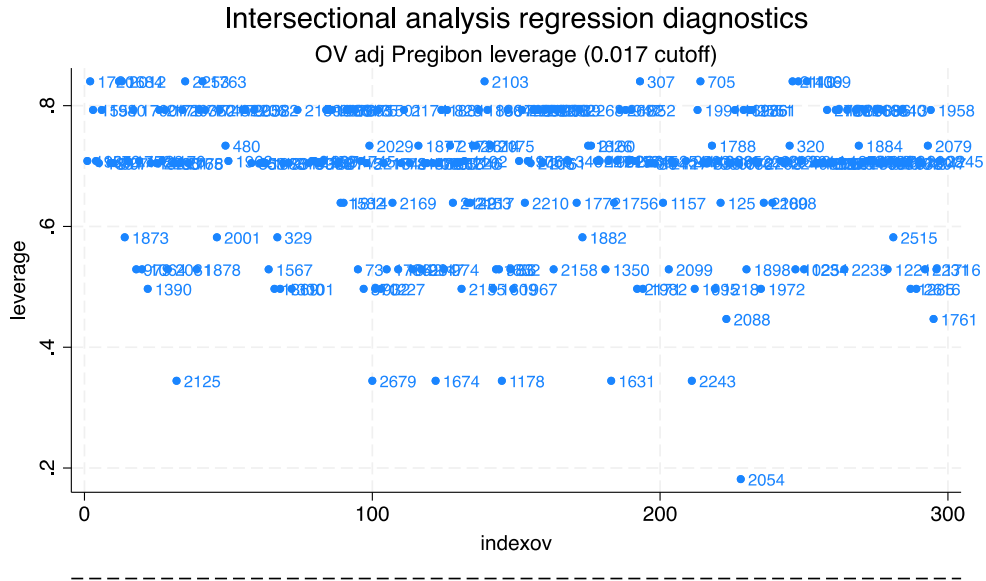
predicted probabilities
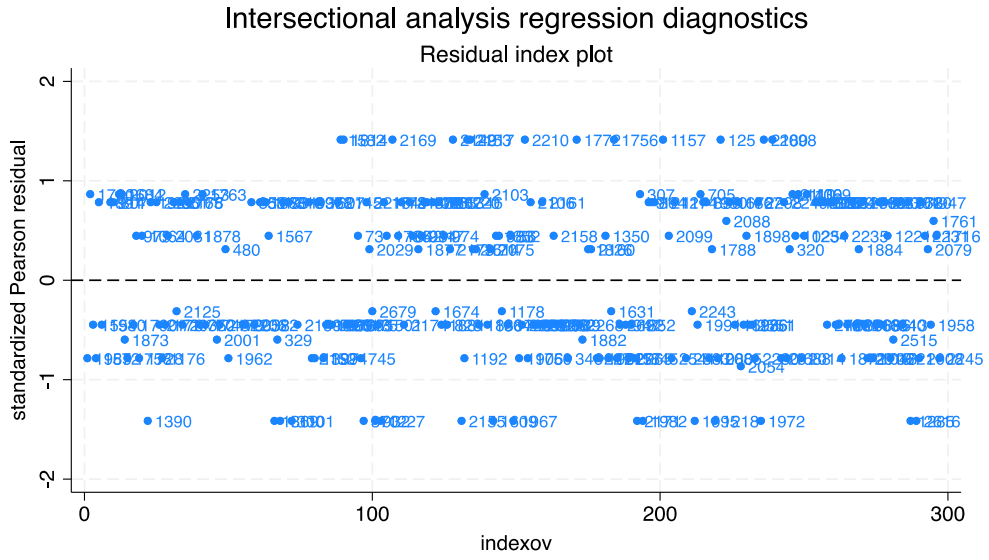
Appendix Figure 67 OV intersectional model accounting for delivery location residual index plot
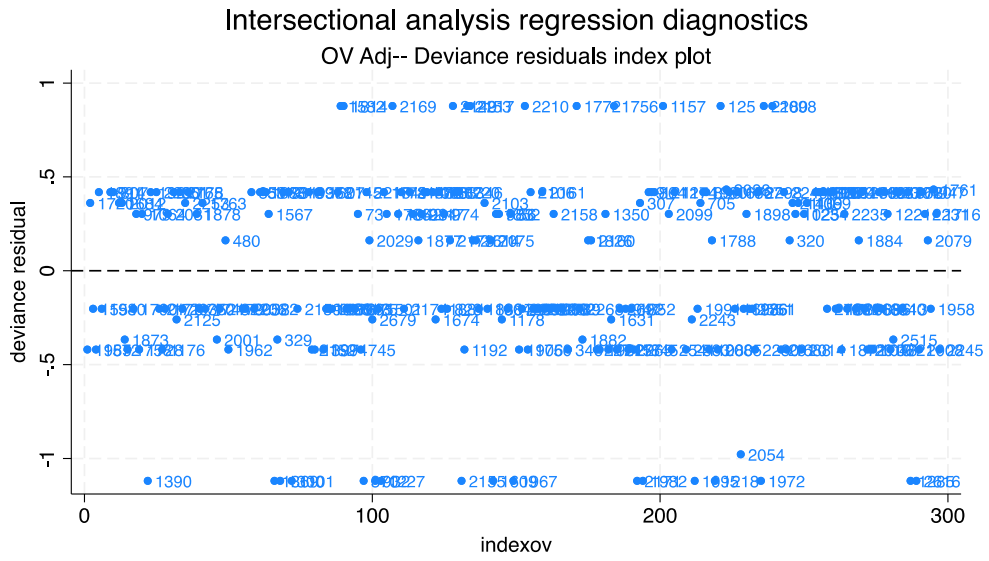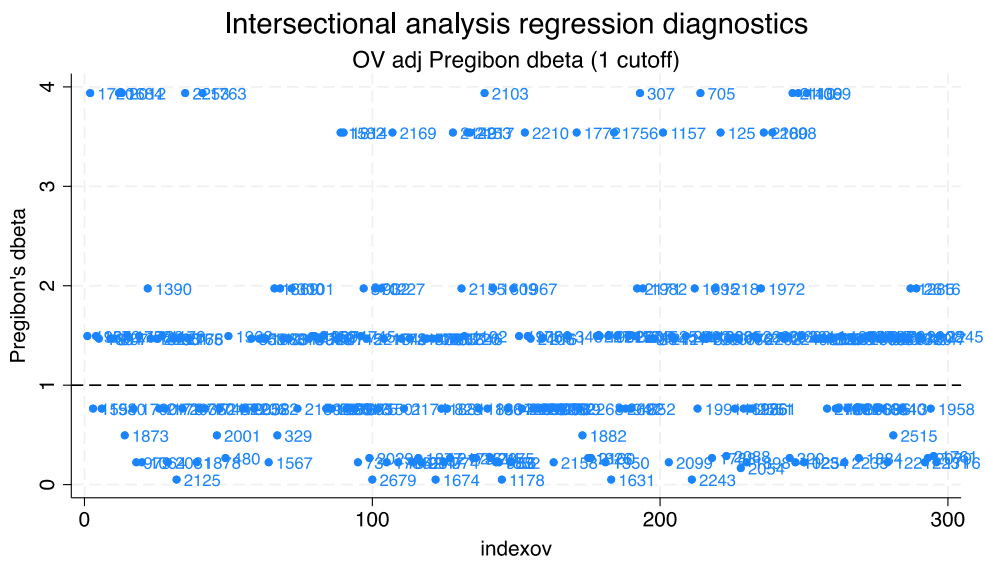

Appendix Figure 68 OV intersectional model accounting for delivery location deviance residuals index plot

Appendix Figure 69 OV intersectional model accounting for delivery location Pregibon leverage versus index

Provided that the cutoff point for Pregibon leverage of 0.017 (2k/n) is outside of the 0.1<phat<0.9 range this metric is not useful in identifying extreme covariate pattern.

Appendix Figure 70 OV intersectional model accounting for delivery location Pregibon DBETA plot

```
. lstat

Logistic model for OVFinal

                    ———————— True ————————
    Classified |        D            ~D    |       Total
    ———————————+————————————————————————————+——————————
           +   |       97            33     |        130
           −   |       19            85     |        104
    ———————————+————————————————————————————+——————————
        Total  |      116           118     |        234

Classified + if predicted Pr(D) >= .5
True D defined as OVFinal != 0
————————————————————————————————————————————————————————
Sensitivity                     Pr( +| D)     83.62%
Specificity                     Pr( −|~D)     72.03%
Positive predictive value       Pr( D| +)     74.62%
Negative predictive value       Pr(~D| −)     81.73%
————————————————————————————————————————————————————————
False + rate for true ~D        Pr( +|~D)     27.97%
False − rate for true D         Pr( −| D)     16.38%
False + rate for classified +   Pr(~D| +)     25.38%
False − rate for classified −   Pr( D| −)     18.27%
————————————————————————————————————————————————————————
Correctly classified                          77.78%
————————————————————————————————————————————————————————
```

Appendix Figure 71 OV intersectional model accounting for delivery location classification table

```
. lfit, group(10) table
note: obs collapsed on 10 quantiles of estimated probabilities.

Goodness−of−fit test after logistic model
Variable: OVFinal

    Table collapsed on quantiles of estimated probabilities

    +——————————————————————————————————————————————————————————+
    | Group |  Prob  | Obs_1 | Exp_1 | Obs_0 | Exp_0 | Total |
    |———————+————————+———————+———————+———————+———————+———————|
    |    3  | 0.1637 |   11  |  11.3 |   60  |  59.7 |   71  |
    |    4  | 0.2239 |    7  |   6.6 |   23  |  23.4 |   30  |
    |    5  | 0.6738 |   11  |   9.6 |    5  |   6.4 |   16  |
    |    6  | 0.6902 |   23  |  24.2 |   12  |  10.8 |   35  |
    |    7  | 0.7499 |   10  |   9.7 |    3  |   3.3 |   13  |
    |———————+————————+———————+———————+———————+———————+———————|
    |    9  | 0.7665 |   40  |  40.6 |   13  |  12.4 |   53  |
    |   10  | 0.8746 |   14  |  13.9 |    2  |   2.1 |   16  |
    +——————————————————————————————————————————————————————————+

     Number of observations =    234
         Number of groups =      7
Hosmer−Lemeshow chi2(5) =    0.78
           Prob > chi2 = 0.9784

Warning: There are only 7 distinct quantiles because of ties.
```

Appendix Figure 72 OV intersectional model accounting for delivery location Hosmer-Lemeshow goodness of

fit test

```
. roctab OVFinal inovxb2

                        ROC                    Asymptotic normal
            Obs        area     Std. err.     [95% conf. interval]
        ─────────────────────────────────────────────────────────
            234       0.8066      0.0284        0.75098     0.86226
```

Appendix Figure 73 OV intersectional model accounting for delivery location area under the receiver curve

test

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