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Peter Schindler 6/9/17

Men's Values of the Reproductive Rights of their Partners, Antenatal Care Attendance, and Associations with Reproductive Health

By

Peter Schindler
Doctor of Philosophy

Nursing

_____

Jennifer Foster, PhD, CNM, MPH
Advisor

_____

Anne L. Dunlop, MD, MPH
Committee Member

_____

Michael Kramer, PhD
Committee Member

Accepted:

_____

Lisa A. Tedesco, Ph.D.
Dean of the James T. Laney School of Graduate Studies

_____

Date

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Peter Schindler
MS, Emory University 2016

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An abstract of
A dissertation submitted to the Faculty of the
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Abstract

Men's Values of the Reproductive Rights of their Partners, Antenatal Care Attendance, and Associations with Reproductive Health
By Peter Schindler

Introduction: Increased paternal engagement in antenatal care (ANC) and birth positively influence pregnancy outcomes. There is very little research that describes the men's value of the reproductive health of their partner and its impact on paternal engagement in preconception, antenatal, and postpartum care. The purpose of this study was to examine the potential associations with paternal ANC attendance, paternal values of women's empowerment, and reproductive health related variables.
Methods: Secondary analysis of a men's survey conducted by the Demographic and Health Surveys (DHS) (n=26892) was undertaken in nine sub-Saharan countries. Data were pooled into an aggregate dataset and examined through various regression methods.
Results: (Pooled data) Paternal values of women's empowerment (PVWE) was positively associated with Maternal ANC attendance. PVWE was also positively associated with Paternal ANC attendance. Contraceptive use, knowledge of ovulatory cycle, knowledge of HIV/STI: risk reduction strategies, and risky sexual behavior were positively associated with PVWE. Contraceptive use, knowledge of HIV/STI: risk reduction strategies, and risky sexual behavior were positively associated with Paternal ANC attendance. Knowledge of ovulatory cycle was negatively associated with Paternal ANC attendance.
Conclusions: Men's values of the reproductive rights of their partner may contribute to ANC attendance, or ANC may shape men's values of women. Further research can build upon this study to provide more insight as to how masculinity shapes men's values of the respective rights of women. Partners are a key piece of an immensely complex equation that influences maternal-newborn health.

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Chapter 1:

Introduction

Introduction

Every year, it is estimated that more than 303,000 women die from pregnancy or childbirth-related causes worldwide.[1] In 2012, almost 5 million infants died from preventable causes such as preterm and intrapartum birth complications, pneumonia, and diarrhea.[2] Worldwide, 73% of all deaths of children under the age of five occur during the first year of life.[2] One strategy recommended by the World Health Organization to reduce maternal and infant mortality is to promote attainment of antenatal medical care, with one significant milestone being eight antenatal (ANC) visits.[3] Worldwide, however, only about 85% of women attend at least one ANC visit.[4] Some barriers to ANC attendance are structural (cost, access and availability), which are on the agendas of national health departments and nongovernmental organizations. Low paternal involvement can be a barrier, not only by hampering a woman's ability to seek antenatal medical care, but also by increasing a woman's overall burden, especially if she must care for dependents. Available literature indicates that increased male engagement in ANC and birth positively influences pregnancy outcomes[5-10], with associated reductions in negative maternal health behaviors[6, 8-11] and rates of preterm birth, low birth weight, fetal growth restriction, and infant mortality.[6-11] There is epidemiological evidence that male involvement reduces maternal stress[5, 6, 9, 11-13] (by emotional, logistical, and financial support) as well as increases the uptake of ANC.[14] Additionally, paternal participation leads to improved communication between couples, provides opportunities for men to learn about the health needs of mothers and infants, and supports paternal involvement in their future parental roles from an early stage.[15-18] Despite the evidence of their importance, antenatal programs continue to suffer from low participation rates among fathers.[19-27]

Although much is known about the benefits of paternal participation in ANC, there is very little research that describes constructions of masculinity and its impact on paternal engagement in preconception, antenatal, and postpartum care.[15] Little is known about the relationships between paternal participation in ANC and paternal perceptions and knowledge of: women's empowerment, partner's reproductive health, HIV/STI transmission, domestic violence, and contraception. These relationships are vital to understand because they can reveal how particular norms of masculinity influence reproductive health. For example, predominant sexual norms for men and the associated values of women's empowerment encourage male promiscuity, avoidance of condom use, and sanction violence against women.[28-32] Furthermore, it is unclear if male sexual norms associated with particular masculinist values of women's empowerment can be present and compatible with paternal participation in ANC.

The 2008 United Nations (UN) Commission on the Status of Women concluded that men are key to the health of the family and must be active participants in ANC as well as many aspects of pregnancy health.[33] The commission further concluded that individual men are often dismissed or blamed for low engagement without adequately questioning the social and contextual constructions of gender relations that are lead to inequalities.[28] Dominant ideologies of masculinity determine the current most honored way of being a man. Idealized versions of manhood require men to position themselves in relation to such idealizations; in so doing, they legitimize and perpetuate the global subordination of women to men.[34-36]

The three-manuscript approach to the dissertation is presented. The first manuscript presents a conceptual framework to these issues, and the two subsequent manuscripts hypothesize and test relevant questions regarding paternal involvement in maternal-newborn health. Entitled, "A Gender and Power Framework to Incorporate Paternal Influence on Maternal-Newborn Health Outcomes," manuscript I includes a

review of the literature, a new model entitled, the Maternal-Newborn-Partner Risk-Exposure Model, and concludes with a case exemplar of an application of the model as one explanatory framework for the disparities in preterm birth seen within the most vulnerable populations.

The subsequent two manuscripts explore several important associations. Manuscript II, "Paternal Values of Women's Empowerment and Associations with Maternal Antenatal Care Attendance" explores whether paternal values of women's empowerment influence paternal clinic attendance, as this information is vital for understanding why men do or do not participate with their partners. This was the first aim of the dissertation.

Aim I: To investigate whether fathers' values of women's empowerment are associated with maternal ANC attendance, controlling for sociodemographic characteristics.

H1: Maternal ANC attendance will be associated with fathers' values of women's empowerment, controlling for known sociodemographic variables.

Subsequently, the third manuscript, "Paternal Antenatal Care Attendance, Paternal values of Women's Empowerment and associations with Knowledge and Practice of Sexual Health Behaviors" explores whether paternal values of women's empowerment influences men's family planning and HIV/STI knowledge and beliefs and sexual risk behaviors that influence maternal health.

Manuscript III, therefore, addresses Aims II and III.

Aim II: To investigate whether fathers' values of women's empowerment are associated with paternal: knowledge of family planning methods, knowledge and practice of sexual health behaviors in nine sub-Saharan African countries, controlling for sociodemographic characteristics.

H1: Paternal values of women's empowerment will be associated with fathers' knowledge of family planning methods, controlling for known sociodemographic variables.

H2: Paternal values of women's empowerment will be associated with fathers' knowledge of sexual risk behaviors, controlling for known sociodemographic variables.

H3: Paternal values of women's empowerment will be associated with fathers' practice of sexual risk behaviors, controlling for known sociodemographic variables.

Aim III: To investigate the relationship between paternal ANC attendance and paternal: values of women's empowerment, knowledge of family planning methods, knowledge and practice of sexual risk behaviors and in nine sub-Saharan African countries, controlling for sociodemographic characteristics.

H1: Paternal ANC attendance will be associated with father's values of women's empowerment, controlling for known sociodemographic variables.

H2: Paternal ANC attendance will be associated with knowledge of family planning methods, controlling for known sociodemographic variables.

H3: Paternal ANC attendance will be associated with knowledge of sexual risk behaviors, controlling for known sociodemographic variables.

H4: Paternal ANC attendance will be associated with practice of sexual behaviors, controlling for known sociodemographic variables.

The conclusion summarizes the results of the three manuscripts and pulls together the final thoughts on the work presented. The references, listed on the following page, are cited throughout the manuscripts where they are relevant.

References

1. Alkema, L., Chou, D., Hogan, D., Zhang, S., Moller, A. B., Gemmill, A., & Say, L. (2016). Global, regional, and national levels and trends in maternal mortality between 1990 and 2015, with scenario-based projections to 2030: A systematic analysis by the UN Maternal Mortality Estimation Inter-Agency Group. *The Lancet*, *387*(10017), 462-474.
2. Group WB. World development indicators 2012: World Bank Publications; 2012.
3. World Health Organisation. WHO recommendations on antenatal care for a positive pregnancy experience. Geneva: WHO; 2016.
4. UNICEF. (2017). Only half of women worldwide receive the recommended amount of care during pregnancy. Retrieved April 26, 2017, from https://data.unicef.org/topic/maternal-health/antenatal-care/#
5. Padilla YC, Reichman NE. Low birthweight: Do unwed fathers help? *Children and Youth Services Review*. 2001;23(4):427-52.
6. Alio AP, Bond MJ, Padilla YC, Heidelbaugh JJ, Lu M, Parker WJ. Addressing policy barriers to paternal involvement during pregnancy. *Maternal and Child Health Journal*. 2011;15(4):425-30.
7. Alio AP, Kornosky JL, Mbah AK, Marty PJ, Salihu HM. The impact of paternal involvement on feto-infant morbidity among Whites, Blacks and Hispanics. *Maternal and Child Health Journa*l. 2010;14(5):735-41.
8. Alio AP, Mbah AK, Kornosky JL, Wathington D, Marty PJ, Salihu HM. Assessing the impact of paternal involvement on racial/ethnic disparities in infant mortality rates. *Journal of Community Health*. 2011;36(1):63-8.
9. Ghosh JKC, Wilhelm MH, Dunkel-Schetter C, Lombardi CA, Ritz BR. Paternal support and preterm birth, and the moderation of effects of chronic stress: a study in Los Angeles County mothers. *Archives of Women's Mental Health*. 2010;13(4):327-38.
10. Ngui E, Cortright A, Blair K. An investigation of paternity status and other factors associated with racial and ethnic disparities in birth outcomes in Milwaukee, Wisconsin. *Maternal and Child Health Journal*. 2009;13(4):467-78.
11. Feldman PJ, Dunkel-Schetter C, Sandman CA, Wadhwa PD. Maternal social support predicts birth weight and fetal growth in human pregnancy. *Psychosomatic Medicine*. 2000;62(5):715-25.
12. Austin MP, Leader L. Maternal stress and obstetric and infant outcomes: epidemiological findings and neuroendocrine mechanisms. *Australian and New Zealand Journal of Obstetrics and Gynaecology*. 2000;40(3):331-7.
13. Martin LT, McNamara MJ, Milot AS, Halle T, Hair EC. The effects of father involvement during pregnancy on receipt of prenatal care and maternal smoking. *Maternal and Child Health Journal*. 2007;11(6):595-602.
14. Zambrana RE, Dunkel-Schetter C, Scrimshaw S. Factors which influence use of prenatal care in low-income racial/ethnic women in Los Angeles County. *Journal of Community Health*. 1991;16(5):283-95.
15. Dolan A, Coe C. Men, masculine identities and childbirth. *Sociology of Health & Illness*. 2011;33(7):1019-34.
16. Fägerskiöld A. A change in life as experienced by first-time fathers. *Scandinavian Journal of Caring Sciences*. 2008;22(1):64-71.
17. Gungor I, Beji NK. Effects of fathers' attendance to labor and delivery on the experience of childbirth in Turkey. *Western Journal of Nursing Research*. 2007;29(2):213-31.

18. Kainz G, Eliasson M, von Post I. The child's father, an important person for the mother's well-being during the childbirth: A hermeneutic study. *Health Care for Women International*. 2010;31(7):621-35.
19. Barker G. Engaging men and boys in caregiving: Reflections from research, practice and policy advocacy in Latin America. Preparado para la reunión del grupo de expertos sobre el reparto equitativo de las responsabilidades entre mujeres y hombres, incluidos los cuidados prestados en el contexto del VIH/SIDA, organizado por la División de las Naciones Unidas para el Adelanto de la Mujer, Ginebra. 2008.
20. Ditekemena J, Koole O, Engmann C, Matendo R, Tshefu A, Ryder R, et al. Determinants of male involvement in maternal and child health services in sub-Saharan Africa: A review. *Reproductive Health*. 2012;9(1):32.
21. Dudgeon MR, Inhorn MC. Men's influences on women's reproductive health: Medical anthropological perspectives. *Social Science & Medicine*. 2004;59(7):1379-95.
22. Kakaire O, Kaye DK, Osinde MO. Male involvement in birth preparedness and complication readiness for emergency obstetric referrals in rural Uganda. *Reproductive Health*. 2011;8(12):1-7.
23. Koo K, Makin JD, Forsyth BW. Barriers to male-partner participation in programs to prevent mother-to-child HIV transmission in South Africa. *AIDS Education and Prevention*. 2013;25(1):14-24.
24. Maman S, Moodley D, Groves AK. Defining male support during and after pregnancy from the perspective of HIV-positive and HIV-negative women in Durban, South Africa. *Journal of Midwifery & Women's Health*. 2011;56(4):325-31.
25. Mohlala BK, Gregson S, Boily M-C. Barriers to involvement of men in ANC and VCT in Khayelitsha, South Africa. *AIDS Care*. 2012;24(8):972-7.
26. Mullany BC. Barriers to and attitudes towards promoting husbands' involvement in maternal health in Katmandu, Nepal. *Social Science & Medicine*. 2006;62(11):2798-809.
27. Nkuoh GN, Meyer DJ, Tih PM, Nkfusai J. Barriers to men's participation in antenatal and prevention of mother-to-child HIV transmission care in Cameroon, Africa. *Journal of Midwifery & Women's Health*. 2010;55(4):363-9.
28. MacPhail C, Campbell C. 'I think condoms are good but, aai, I hate those things': Condom use among adolescents and young people in a Southern African township. *Social Science & Medicine*. 2001;52(11):1613-27.
29. Bowleg L. Love, sex, and masculinity in sociocultural context HIV concerns and condom use among African American Men in heterosexual relationships. *Men and Masculinities*. 2004;7(2):166-86.
30. Amaro H. Love, sex, and power: Considering women's realities in HIV prevention. *American Psychologist*. 1995;50(6):437.
31. Nyanzi S, Nyanzi-Wokholi B, Kalina B. Male promiscuity: The negotiation of masculinities by motorbike taxi-riders in Masaka, Uganda. Men and Masculinities. 2008.
32. Anderson KL, Umberson D. Gendering violence: Masculinity and power in men's accounts of domestic violence. *Gender & Society*. 2001;15(3):358-80.
33. Bhutta ZA, Chopra M, Axelson H, Berman P, Boerma T, Bryce J, et al. Countdown to 2015 decade report (2000–10): Taking stock of maternal, newborn, and child survival. *The Lancet*. 2010;375(9730):2032-44.
34. Connell RW. Masculinities and globalization. *Men and Masculinities*. 1998;1(1):3-23.
35. Connell RW, Connell R. Masculinities. Univ of California Press; 2005.
36. Connell RW, Messerschmidt JW. Hegemonic masculinity: Rethinking the concept. *Gender & Society*. 2005;19(6):829-59.

Chapter 2:

A Gender and Power Framework to Incorporate Paternal Influence on Maternal-Newborn Health Outcomes

Abstract

Maternal-newborn health has advanced in the past several decades. However, many countries did not achieve the Millennium Development Goals focusing on maternal and newborn health by 2015, and some countries will not reach them by 2020. One strategy to improve maternal-newborn outcomes has been to involve partners in reproductive health, specifically antenatal care. There are numerous benefits that have been identified through several hallmark studies. Despite the benefits of partner involvement, the mechanism by which male partners improve maternal and newborn health outcomes in unknown. We propose that a social theory of Gender and Power influences maternal-newborn health in the form of partner (paternal) exposures. The paper presents the maternal-newborn-partner risk-exposure model, and concludes with a case exemplar of an application of this model as one explanatory framework for preterm birth. This theoretical model may help guide researchers to examine potential risks and exposures, which influence maternal-newborn outcomes. In the past, partners have mainly been conceptualized as a source of social support, rather than a potential champion or opponent (passive or active) of gender equality.

Keywords: Fathers, Theoretical model, Maternal-newborn health, Partner Participation in Pregnancy, Gender equality

A Gender and Power Framework to Incorporate Paternal Influence on Maternal-Newborn Health Outcomes

Introduction

In this paper, we argue for the salience of a social theory about gender and power in the consideration of improving maternal-newborn care worldwide by partner involvement in antenatal care. First, we lay out the established literature about barriers to antenatal care, and what is known about partner participation in antenatal care. We go on to review an existing theory of Gender and Power, as it has been adapted into the public health literature. We then apply this theory in relation to partner participation in antenatal care, which has been shown in increase maternal antenatal care (ANC) attendance and has been shown to prevent preterm birth.[1] We conclude with a case exemplar of how the maternal-newborn-partner risk-exposure model can be used to guide maternal-newborn health research, specifically around the topic of preterm birth. In order to understand the importance of partners in terms of maternal-newborn health and the influence they have, it is important to discuss some of the major maternal-newborn health issues and then how partners may affect outcomes.

Every year, it is estimated that more than 303,000 women die from pregnancy or childbirth-related causes worldwide.[2] In 2012, almost 5 million infants died from preventable causes such as preterm and intrapartum birth complications, pneumonia, and diarrhea.[3] Worldwide, 41% of all deaths of children under the age of five occur during the 28 days of life.[3] One strategy recommended by the World Health Organization to reduce maternal and newborn mortality and morbidity is to promote attainment of antenatal medical care, with one significant milestone being eight antenatal care (ANC) visits.[4] Worldwide, however, only about 85% of women attend at least one ANC visit.[5] Some barriers to ANC attendance are structural (cost, access and availability),

which are on the agendas of national health ministries and nongovernmental organizations.

Low paternal involvement can be a barrier, not only by hampering a woman's ability to seek antenatal medical care, but also by increasing a woman's overall burden, especially if she has to care for dependents. Of note, most of the available literature operationalizes paternal involvement in ANC as simply attending the visit. While there certainly are other ways fathers can participate in pregnancy, available literature indicates that increased paternal engagement in ANC and birth positively influences pregnancy outcomes[6-11],with associated reductions in negative maternal health behaviors[7, 9-12] and lower rates of preterm birth, low birth weight, fetal growth restriction, and infant mortality.[7-12] There is epidemiological evidence that paternal involvement in ANC reduces maternal stress. Paternal involvement in ANC is generally thought of as emotional, logistical, and financial support of the pregnant partner and her ability to seek and obtain care.[6-7, 10, 12-14] Moreover, paternal involvement is associated with early pregnancy ANC attendance and increased frequency of maternal ANC visits .[15] Additionally, paternal participation leads to improved communication between couples, provides opportunities for men to learn about the health needs of mothers and infants, and supports paternal involvement in their future parental roles from an early stage.[16-19] Despite the evidence of their importance, fathers do not participate very much in antenatal programs[20-28], again, which has been the predominant way to measure paternal partipation in ANC. Arguably there are other ways in which fathers can particpate in pregnancy (caring for other dependents, equtiabily dividing household chores, for example), but very little data is available to describe *how*. Additionally, men who particpate in ANC probably are engaged in other activities or hold different values/beleifs that contribute to the overall benefits of ANC attendance. Hence, it seems only appropriate to begin to explore more deeply the attributes associated with men who

particpate in ANC and those who do not.

Although much is known about the benefits of paternal participation in ANC, there is very little research that describes paternal attitudes, values, and beliefs about women and their impact on paternal engagement in preconception, antenatal, and postpartum care.[16] Little is known about the relationships between paternal participation in ANC and paternal knowledge and values toward women's empowerment, related to reproductive health, specifically, HIV/STI transmission, domestic violence, and contraception. These relationships are vital to understand because they can reveal how particular cultural norms influence reproductive health. Several US and South African studies indicate that the predominant sexual norms for men with the associated low valuation of women's empowerment encourage male promiscuity, perpetuate the avoidance of condom use, and sanction violence against women.[29-33] Furthermore, it is unclear if male sexual norms associated with particular masculinist values related to women's empowerment are or are not associated with paternal participation in ANC.

The 2008 United Nations (UN) Commission on the Status of Women concluded that men are key to the health of the family and must be active participants in ANC as well as many aspects of pregnancy health.[34] The commission further concluded that individual men are often dismissed or blamed for low engagement, without adequately questioning the social and contextual constructions of gender relations that lead to gender-based health inequalities.[34] Dominant, or hegemonic ideologies of masculinity determine the currently most honored way of being a man. Idealized versions of manhood require men to position themselves in relation to such idealizations; in so doing, they legitimize and perpetuate the subordination of women to men.[35-37] There are many roles men and women can assume in the domain of sexual and reproductive

health, including sexual behavior and knowledge, contraception, and pregnancy care. Men traditionally have been absent from women's reproductive health for a variety of reasons. One such reason it that is considered a female domain, and men who are involved in such a domain can be viewed as not being masculine. An example of such a case is in the area of contraception use. Bowleg[30] found that many men from the United States in their study saw contraception as their (female) partners' responsibility. In general, it appears that men are not typically involved in areas of reproductive health and they do not "care." Caring has long been associated as a core attribute of women. In many cases, men place the responsibility of reproductive health knowledge, contraception, and pregnancy care on women. It appears the masculine domain, in terms of sexual and reproductive health, exists more in terms of controlling the sexual experience, such as number of total and concurrent partners, and sexual activities, rather than being involved in the reproductive health of their partner.

Masculinity itself is a socially constructed phenomenon that changes over time, is intricately linked with culture, and within a given society and time period, can mean different things to different people.[38] There is not one type of masculinity, but many different alternative forms of masculinity that are always in relation to a hegemonic ideal.[29] Hegemonic idealizations of masculinity often are manifested in practices such as playing through physical injuries and risk-taking behavior such as unprotected sex with multiple partners.[39] Hegemonic masculinity can often have adverse health consequences for both men and women when it results in the idealization of behavior that creates unequal social and political relations.[40-41] Generally, paternal participation in pregnancy can be viewed as males entering a feminine domain. Men who share in women's work are therefore viewed in opposition to a hegemonic masculine ideal. It is important to understand how men negotiate their masculinity when their thoughts, wants, needs, and

desires do not conform to hegemonic ideals, such as in participation in pregnancy. We need to learn why some men participate in ANC visits and others do not.

Paternal participation in pregnancy is an under explored way to improve maternal-newborn health. Much of the literature operationalizes paternal participation in ANC clinics as simply paternal attendance during at least one visit (yes or no). Some interesting questions emerge when thinking about how ANC clinic attendance improves maternal-newborn outcomes. Why are only some of the fathers showing up to ANC clinic visits? What are the characteristics of these men? Do they value women more than those who do not attend? Or perhaps do men show up as part of a power and control play? Is paternal ANC attendance associated with other characteristics such as men's family planning knowledge?

It is unlikely that by simply showing up at ANC visits, men help improve maternal-newborn outcomes. Arguably there are other paternal health beliefs, values, attitudes, and behaviors that contribute to healthy mothers and newborns. One plausible explanation is that men who take the time to accompany their partners to ANC visits value women differently than those who do not attend ANC visits. To determine potential partner interactions or exposures which contribute to maternal-newborn health, a framework is needed that can guide researchers and practitioners when theorizing about potential partner interactions. In the next section, we explore an existing theory that may have applications to maternal-newborn health, the Theory of Gender and Power. The theory is evaluated using a concept analysis structure outlined by Risjord.[42]

Theory of Gender and Power

The Theory of Gender and Power is a theoretical construct originally developed by Raewyn Connell which describes sexual inequality, gender, and power imbalance.[43] The main phenomenon the theory attempts to explain is how the imbalance of power and equality are structured and maintained based on gender. The theory consists of three major elements that exist on a societal level and thus reflected within institutions. The original theory, described and summarized thoroughly by Wingood and DiClemente[44], will be elaborated here briefly. The first of three elements in the original theory of Gender and Power is the sexual division of labor. This element is responsible for the inequalities that occur based on the differential value placed on labor in the public sphere, in comparison to the labor in the private (home) sphere (i.e. childbearing and child-raising).

The second element is the sexual division of power. Inequalities in power between men and women creates women's dependence on men. Historically, the sexual division of power can be clearly seen in the ownership of land. If men are privileged with ownership rights and women are not, women become dependent on men because they do not have access to capital and they have no autonomy regarding allocation of financial resources. The last element in Connell's original theory is the element of cathexis. The last element explains how social norms regarding sexuality, gender roles, and stereotypes lead to and further perpetuate gender based inequalities.

Additions to the Theory of Gender and Power

In 2000, Wingood and Diclemente applied the theory of Gender and Power with several modifications to describe women's risk of HIV.[44] Their additions helped bring the theory into the realm of health outcomes research. One change is the renaming of Connell's structure of "Cathexis" to the "Structure of Social Norms and Affective Attachments." Additionally, the authors further divide each element into risk factors and exposures.

The risk factors signify internal factors that affect an individual. Exposures are factors that are external to the individual. The disparities stemming from the sexual division of labor are exhibited as economic exposures and socioeconomic risk factors. The inequities resulting from the sexual division of power are manifest as physical exposures and behavioral risk factors. The inequities resulting from the social mechanisms occurring within the element of social norms and affective attachments are manifest within the field of public health, whereas social exposures and are manifest in the psychosocial domain as personal risk factors. The subdivision of the conceptual elements into risk factors and exposures allows for a more organized approach when operationalizing the elements in the theory. It is Wingood's and Diclemente's modifications that form the basis for the adaptation of the model specifically for maternal-newborn health discussed below.

Theory Assessment: **Presuppositions and Empirical support**

The theory is predicated on several assumptions, three of which are discussed here. The theory presupposes: 1) gender based disparities are primarily constructed and reproduced through social mechanisms, 2) gender based disparities lead to adverse health outcomes, and 3) there are micro and macro systems which produce and reinforce gender based inequalities. Such presuppositions can be better understood through an examination of their ontology, the empirical evidence on health disparities, and existing social theories.

The first presupposition is vital for the theory to function. Gender based disparities have previously been conceived as inevitable in biology. "Biology" has been used in a variety of ways to prove that one group of people is more "fit" than the other. In the case of biological sex, biology was a basic way to differentiate men from women, distinct from the socially constructed ideas of gender, but

thought to be the predominant driving force behind why gender based disparities "naturally" occurred. Based on Darwinian theories of adaptation, those more fit for survival naturally assume more power. An example of this ideology comes from Paul Broca.[45] Paul Broca was a scientist studying brain anatomy and anthropology in the 1800s. He deemed that women were inferior to men based on their physical and intellectual attributes. It was this "biological fact" that further legitimized gender based disparities. Since Paul Broca's work, there have been several scientists that have provided evidence to discredit his theory and research about women. Ideas about innate differences between men and women, such as intelligence, have been shown to be almost obsolete.[46-47] Most differences that have been noted in previous studies have later been corrected due to inherent methodological error.[48] The contemporary scientific consensus, though not without its criticisms, is that the biological differences between men and women are very small in comparison to the way societies treat gender differences.[43]

If there are not substantial biological differences to explain how inequalities exist between men and women, then why are there such large disparities? Connell and many others have argued that gender based disparities are in fact not primarily based on biology, but rather primarily constructed and reproduced through social mechanisms. The biological differences between men and women are related to reproduction and are arguably negligible in comparison to the social inequalities that exist between them.

The second presupposition implied in Connell's theory, but elaborated by Wingood and Diclemente[44], is that there are health disparities that are embedded in social institutions. It is these social institutions that perpetuate an environment of inequality. In other words, the second presupposition assumes that gender based health disparities result from social structures that are disadvantageous to women. The evidence of this is present in the health disparities literature.[49-52] In many regions of the

world, women lack basic health care and face life-debilitating and life-threatening conditions as a result of their unmet reproductive health needs. Maternal mortality, morbidities such as obstetric fistula, female genital cutting, child marriage, HIV/AIDs, and cervical cancer are a few of the issues that plague many subpopulations of women across many nations. These nations can range from high resource to low resource countries. In other words, all nations have some degrees of inequality, some more than others. Arguably all of the aforementioned health disparities arise because of social inequalities that exist on the basis of gender relations.

One claim that disputes that women suffer health disparities disproportionately is the gender and health paradox.[53] It is well established that men live shorter lives and experience more life-threatening chronic diseases, while women live longer but have more nonfatal acute and chronic conditions and disability. There are broad, sociological/cultural reasons why men live shorter lives than women. Suicide and homicide are substantially higher in men than women[54-55], which are certainly influenced by society and culture. There are some biological explanations as well. One such explanation that has been gaining traction is that male infants are more medically fragile and inherently more vulnerable than their female counterparts.[56]

While there have been various explanations why life expectancy is different between genders, very few of the explanations challenge the existence of social inequalities in which women remain subordinate to men. To address gender inequality, there is much programmatic work that is being done across the globe, and much of the published literature is about Africa.

For example, non-governmental organizations (NGOs) across sub-Saharan Africa are using gender transformative workshops in order to promote

gender equity and reduce gender disparity gaps, especially in the realm of HIV/AIDs.[57] Inherent in gender transformative work is the recognition that there are social inequalities in which women remain subordinate to men. By making some of the larger social structures that tend to give privilege and power to men explicit, gender transformative workshops aim to work with men to reorganize such social structures to ultimately improve the lives of both women and men.

The final presupposition is the interplay of macro and micro environments in which gender inequalities are created and reinforced. The Theory of Gender and Power is based on the existence of two linked systems, as articulated in Giddens' 1984 theory of structuration.[58] Structuration assumes a larger structure (macro) and agents within the structure (micro). These elements interact to create, reproduce, and redefine social systems. Giddens' theory of structuration is a widely-discussed pillar of contemporary sociology. While Connell's theory and Giddens' theory both presuppose the same elements, Giddens theorizes how the two systems interact.[58] It is this presupposition that ties in individual people to larger social forces. In sum, the theory has three presuppositions 1) there are structures of inequality in society; 2) there is a link between social inequalities and health outcomes; and 3) the larger social structures influence the individual living environment. The theory of Gender and Power is predicated on ideas that have been established either directly in the literature or indirectly through the linkage with other theories. The following section examines the empirical evidence that supports the theory.

The empirical evidence supporting the theory of Gender and Power is growing. Seven studies published after the 2000 article by Wingood and Diclemente[44], were in HIV/AIDs research.[59-65] One of Diclemente's articles included a randomized controlled trial of a behavioral intervention intended to lower HIV transmission risk behaviors.[59] The Theory of Gender and Power was applied to identify, develop, and implement the

study's intervention which stressed celebrating gender, maintaining existing and finding new network members, HIV transmission information, communication and condom use skills, and healthy relationships.

Another study used the Theory of Gender and Power to examine domestic violence among other health issues for women.[60] The study found significant associations between all three of the theory's structures and a woman's vulnerability to partner violence, sexual negotiation, and risk of HIV/AIDS. The articles explored different aspects of the Theory of Gender and Power ranging from education as moderator in reducing vulnerability to STIs/ HIV[61], risk factors of condom use[62-63], and sexual behavior patterns and attitudes.[64] It is important to note that the applicability of the theory of Gender and Power is certainly not limited to HIV/AIDs research, even though this is where much of the evidence is situated. The implementation to maternal child health research will be discussed in the following sections.

Theory Significance to Nursing & Maternal-newborn Health

The Theory of Gender and Power has the potential to redefine how maternal-newborn health researchers view major health outcomes, including, but not limited to, maternal-newborn mortality, preterm birth, and STI risk during pregnancy. Previous theoretical work has not included the exposures, or the external risks, to mother and baby. The exposures can come in various forms such as an abusive partner, a dangerous neighborhood (in which violence and abuse is normalized), or social norms that do not permit certain preventive health efforts. The personal risk factors are often seen as the easiest to target, and arguably have been the focus of more conceptualization and operationalization when compared to the external factors.

For example, theories related to self-efficacy and The Health Belief Model have been used in maternal-newborn health for decades.[66] They have been used as conceptual frames for research in breastfeeding, childbirth, utilization of pregnancy health services such as antenatal clinics, vaccination decision making, and HIV prevention strategies. Often extrinsic influences receive very little attention. Currently, there are no available frameworks in maternal-newborn research that incorporate the influence of partners' values toward women, while also acknowledging the influence of larger social structures that lead to inequalities. Although previous research suggests that fathers can have a profound influence on maternal-newborn health[6-19], the influence of partners remains largely invisible within the frameworks that exist to conceptualize maternal-newborn health. It is plausible that perhaps partners have been included in many models of the social determinants of health, albeit implicitly.[34] The social determinants of health models recognize the influence of neighborhood and community on maternal newborn health, but, currently, there is no model of maternal-newborn health that explicitly highlights the influences of partners.

Proposed Model Conceptualizing the Influence of Gender and Power on Maternal-newborn Health: **The Maternal-newborn-Partner Risk/Exposure (Mn-PRE) Model**

In our adaption of this theory, much like Diclemente's, we postulate that gender-based inequalities and disparities in expectations that arise from each of the three major concepts generate different risks and exposures that influence maternal-newborn health. The Mn-PRE-theoretical model is a model that prompts researchers to view maternal-newborn health issues from a broader framework than personal risk factors or even medically based risk factors. Specifically, it allows researchers to examine how partners potentially influence maternal-newborn health outcomes. As seen on Figure I, the model

differentiates between maternal internal or individual risk factors, and external factors, in which the partner is an agent of exposure (to varying degrees) representing the broad elements of inequality previously described. Each structure is then subdivided into an exposure and risk factor. Exposures in this model are at the institutional level. These institutional exposures take place within social environments including work sites, schools, families, medical systems, media, communities, or religion. The individual risk factors traditionally have been seen as modifiable. The individual risk factors have been the target of behavioral health interventions for decades, with little attention to the influence of larger institutions. There also are biologically mediated risk factors that contribute to maternal –child health outcomes. The risk factors are due to biological variances between women. For example, some women may be at higher risk for preterm birth because they have a "short cervix." The biologically meditated risk factors have been the target of modern medicine with varying degrees of success.

Mn-PRE-posits that as inequities increase in the sexual division of labor, the sexual division of power, or in social norms and affective attachments, there will be poorer maternal-newborn health outcomes. The general social mechanisms in which inequity is created and reproduced is through unequal pay, imbalances in control, and constraints in expectations for women. The model helps to explain how and why women's empowerment has lowered crude maternal-newborn health outcomes such as infant and maternal mortality. In the following section, a case study illustrates the Mn-PRE-and its potential applications to maternal-newborn health research.

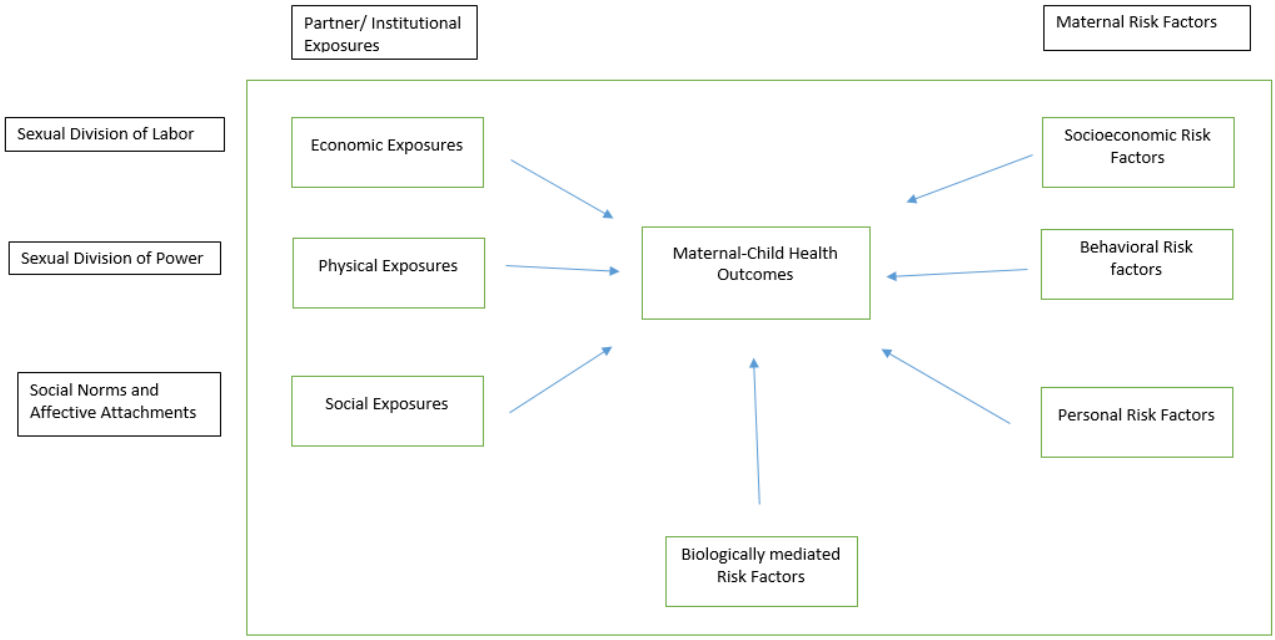

Figure I: Mn-PRE Theoretical Model

Case Exemplar: Preterm Birth

Using the Mn-PRE theoretical framework as a guide, the known factors as well as the potentially undiscovered factors will be examined. This is especially true when examining preterm birth, one of the primary disparities in maternal-newborn health. The mechanisms by which maternal demographic characteristics are related to preterm birth are unknown.[67] According to the framework, there are factors that are both internal and external to the mother-fetus that are associated with preterm birth.

Socioeconomic Exposures

Economic exposures are operationally defined as economic factors stemming from divisions in labor that affect maternal-newborn health which are not immediately modifiable by mother or fetus. The socioeconomic exposures that have been shown to be associated with preterm birth are late or no prenatal care (i.e. no access to resources or

unable to leave work), second-hand smoke in the work environment, long working hours with extensive periods of standing, and a partner with less than high school education.[67]

Physical Exposures

Physical Exposures are operationally defined as interpersonal and institutional factors that stem from differences in power between men and women which are not immediately modifiable by mother or fetus. The physical exposures that have been shown to be associated with preterm birth are: Late/ no prenatal care (partner does not allow it), second hand smoke from partner, short spacing between pregnancies, a partner who disapproves of practicing safe sex, and a high risk (STI) partner.[67]

Social Exposures

Social exposures are operationally defined as social mechanisms occurring within the structure of social norms and affective attachments which are not immediately modifiable by mother or fetus. The social exposures that have been shown to be associated with preterm birth are: Late or no prenatal care (the community norm is to opt out of prenatal care)[6-7,10], low paternal/partner participation[15], lack of social support[68], short spacing between pregnancies (community norm).[69-70]

Socioeconomic Risk Factors

Socioeconomic risk factors are operationally defined as factors that are internal to the individual that manifest from the sexual division of labor. For example, in some economically depressed areas, young women may not be able to participate in the local economy due to the low availability of work. Additionally, in socioeconomically depressed areas, obtaining a loan to start a small business is often difficult. For short term survival, women may find a partner that has work or access to work, relocate, or in

some cases, participate in sex work. The socioeconomic risk factors that have been known to be associated with preterm birth are ethnicity and age.[67]

Behavioral Risk Factors

Behavioral risk factors are operationally defined as factors that are internal to the individual which stem from the sexual division of power. The behavior risk factors that have been associated with preterm birth are: A history of illicit drug use, poor assertive communication skills, poor condom use skills, lower self-efficacy to avoid STIs, and limited perceived control over condom use.[59]

Personal Risk factors

Personal risk factors are operationally defined as factors that are internal to the individual which stem from the structure of social norms and affective attachments. Personal risk factors that have been associated with preterm birth are stress, limited knowledge of STI prevention, negative beliefs not supportive or safer sex.[59]

Biologically Medicated Risk Factors

Biologically Mediated Risk factors are personal risk factors that are primarily rooted in biology. Biologically mediated risk factors associated with preterm birth are: Diabetes, blood clotting disorders, previous preterm birth, certain developmental abnormalities in the fetus, vaginal bleeding, placenta previa, multiple gestation, pre-eclampsia, shortened cervix and incompetent cervix.[67]

It is important to note that while the various exposures and risk factors are in distinct boxes, they are interrelated and influence one-another. For example, a biologically meditated risk factor such as Diabetes may be in partly due to socioeconomic exposures such as not being able to find employment that will allow for the additional

money needed to purchase nutritious food or medications. Also, inherent in the Mn-PRE model is that it takes place within the larger context of the community. The sexual division of labor, power and social norms of affective attachments are structures that exist on a macro community/nation-state level and manifest themselves in a variety of ways on the partner/individual level.

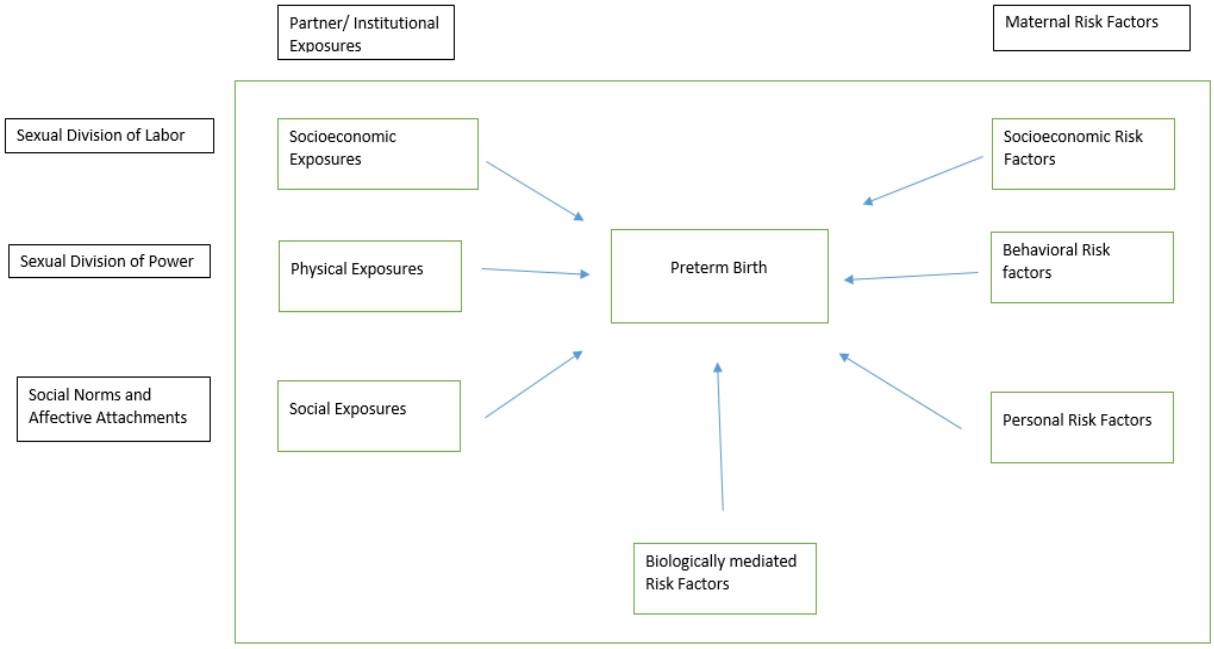

Figure II: Mn-PRE Theoretical Model: Preterm Birth Case Study

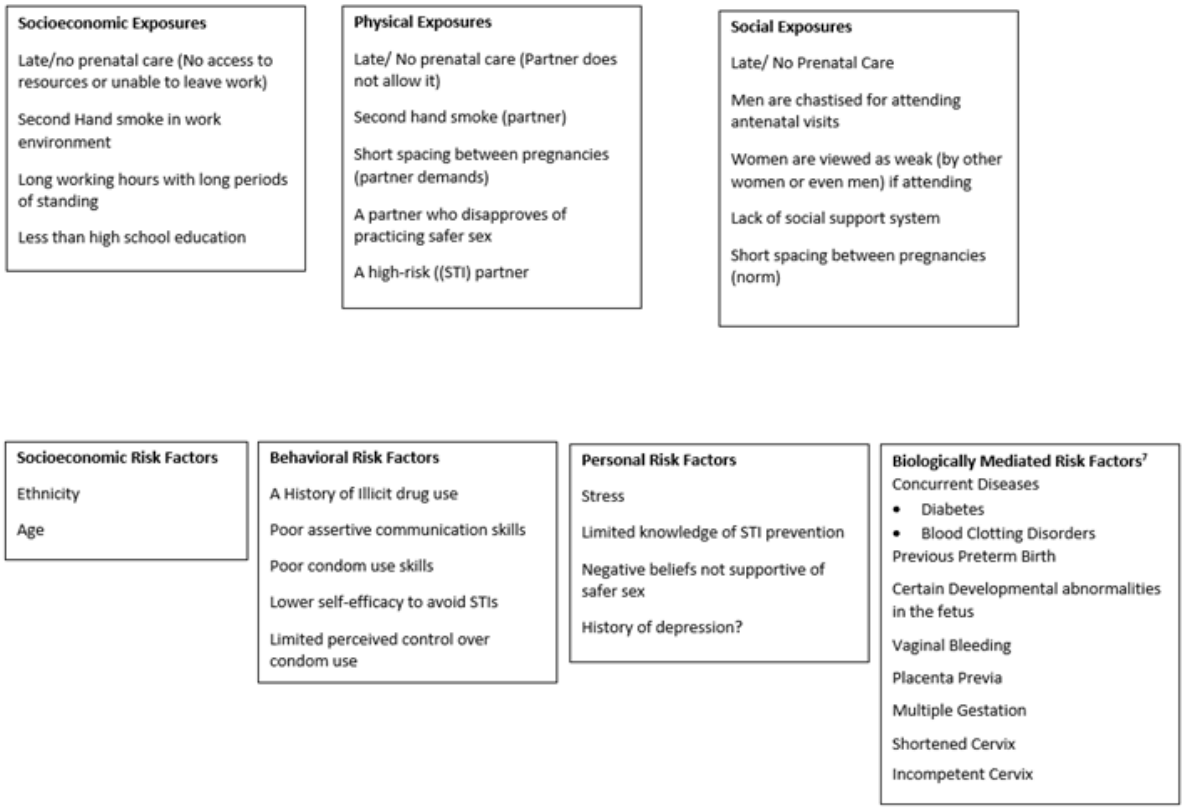

Figure III: Risk Factors and Exposures of Preterm Birth[67, 71-74]

Using the Mn-PRE-Theoretical Model in Maternal-newborn health

The model's contribution to maternal-newborn health is in the form of theorizing how partners can influence the outcome. The left side of the model, or the exposure half, is a new way to understand the influences of partners. While there have been numerous studies highlighting the importance of paternal participation in antenatal care[6-19], the studies fail to explain *how* paternal participation in antenatal care improves maternal-newborn health. As the body of research on paternal participation in reproductive health increases, there must be a theoretical framework to guide current and future research.

According to the model, when there are significant disparities in the sexual division of labor, the sexual division of power, and the social norms and affective attachments, there also are corresponding health disparities. It is plausible that partners with egalitarian beliefs and practices can negate some of the larger societal disparities in

gender and power. For example, while maternal mortality in the aggregate in sub-Saharan Africa is the highest in the world, perhaps within micro contexts where partners have egalitarian values of women, there are better maternal-newborn outcomes. This can be empirically tested. This is just one way the model may be used. Regardless of how the model would be used in the future, it is important to emphasize the potential influence partners have on maternal-newborn health within the context of larger social structures.

Conclusion

Maternal-newborn health disparities are prevalent in all nations, although lower resourced nations bear disproportionately more of the burden. One way to help reduce such health disparities has been to include men in reproductive health, more specifically during the perinatal period. The research that has been conducted to date has identified several benefits from the involvement of partners, in most cases the partner was the father of the baby. Despite the evidence of the benefits of paternal participation in antenatal care, there still is not clarity about the mechanism or series of mechanisms by which fathers may improve maternal-newborn outcomes. The theoretical model introduced in this paper serves to better understand this pathway. While no theoretical model is perfect in representing the phenomenon under study, the Mn-PRE model allows for the examination of factors that are both internal and external o the mother. Given the gendered nature of most societies, it is appropriate to use a model that incorporates gender disparities and health outcomes in a combined model. Diclemente was the first to combine two such models. The Diclemente addition allows for the inclusion of external factors such as partners, which probably has the most pertinent contribution to maternal-newborn health research. Perhaps future research could incorporate the Mn-PRE model, or further developments of it, to better understand the impact of paternal participation in pregnancy.

References

1. Beeckman, K., Louckx, F., Downe, S., & Putman, K. (2013). The relationship between antenatal care and preterm birth: The importance of content of care. *The European Journal of Public Health*, *23*(3), 366-371.
2. Alkema, L., Chou, D., Hogan, D., Zhang, S., Moller, A. B., Gemmill, A., & Say, L. (2016). Global, regional, and national levels and trends in maternal mortality between 1990 and 2015, with scenario-based projections to 2030: A systematic analysis by the UN Maternal Mortality Estimation Inter-Agency Group. *The Lancet*, *387*(10017), 462-474.
3. Group WB. World development indicators 2012: World Bank Publications; 2012.
4. World Health Organisation. WHO recommendations on antenatal care for a positive pregnancy experience. Geneva: WHO; 2016.
5. UNICEF. (2017). Only half of women worldwide receive the recommended amount of care during pregnancy. Retrieved April 26, 2017, from https://data.unicef.org/topic/maternal-health/antenatal-care/#
6. Padilla YC, Reichman NE. Low birthweight: Do unwed fathers help? *Children and Youth Services Review*. 2001;23(4):427-52.
7. Alio AP, Bond MJ, Padilla YC, Heidelbaugh JJ, Lu M, Parker WJ. Addressing policy barriers to paternal involvement during pregnancy. *Maternal and child health Journal*. 2011;15(4):425-30.
8. Alio AP, Kornosky JL, Mbah AK, Marty PJ, Salihu HM. The impact of paternal involvement on feto-infant morbidity among Whites, Blacks and Hispanics. *Maternal and Child Health Journal*. 2010;14(5):735-41.
9. Alio AP, Mbah AK, Kornosky JL, Wathington D, Marty PJ, Salihu HM. Assessing the impact of paternal involvement on racial/ethnic disparities in infant mortality rates. *Journal of Community Health*. 2011;36(1):63-8.
10. Ghosh JKC, Wilhelm MH, Dunkel-Schetter C, Lombardi CA, Ritz BR. Paternal support and preterm birth, and the moderation of effects of chronic stress: A study in Los Angeles County mothers. *Archives of Women's Mental Health*. 2010;13(4):327-38.
11. Ngui E, Cortright A, Blair K. An investigation of paternity status and other factors associated with racial and ethnic disparities in birth outcomes in Milwaukee, Wisconsin. *Maternal and Child Health Journal*. 2009;13(4):467-78.
12. Feldman PJ, Dunkel-Schetter C, Sandman CA, Wadhwa PD. Maternal social support predicts birth weight and fetal growth in human pregnancy. *Psychosomatic Medicine*. 2000;62(5):715-25.
13. Austin MP, Leader L. Maternal stress and obstetric and infant outcomes: Epidemiological findings and neuroendocrine mechanisms. *Australian and New Zealand Journal of Obstetrics and Gynaecology*. 2000;40(3):331-7.
14. Martin LT, McNamara MJ, Milot AS, Halle T, Hair EC. The effects of father involvement during pregnancy on receipt of prenatal care and maternal smoking. *Maternal and Child Health Journal*. 2007;11(6):595-602.
15. Zambrana RE, Dunkel-Schetter C, Scrimshaw S. Factors which influence use of prenatal care in low-income racial ethnic women in Los Angeles County. *Journal of Community Health*. 1991;16(5):283-95.
16. Dolan A, Coe C. Men, masculine identities and childbirth. *Sociology of Health & Illness*. 2011;33(7):1019-34.
17. Fägerskiöld A. A change in life as experienced by first-time fathers. *Scandinavian Journal of Caring Sciences*. 2008;22(1):64-71.
18. Gungor I, Beji NK. Effects of fathers' attendance to labor and delivery on the experience of childbirth in Turkey. *Western Journal of Nursing Research*. 2007;29(2):213-31.

19. Kainz G, Eliasson M, von Post I. The child's father, an important person for the mother's well-being during the childbirth: A hermeneutic study. *Health care for Women International*. 2010;31(7):621-35.
20. Barker G. Engaging men and boys in caregiving: Reflections from research, practice and policy advocacy in Latin America. Preparado para la reunión del grupo de expertos sobre el reparto equitativo de las responsabilidades entre mujeres y hombres, incluidos los cuidados prestados en el contexto del VIH/SIDA, organizado por la División de las Naciones Unidas para el Adelanto de la Mujer, Ginebra. 2008.
21. Ditekemena J, Koole O, Engmann C, Matendo R, Tshefu A, Ryder R, et al. Determinants of male involvement in maternal and child health services in sub-Saharan Africa: A review. *Reproductive Health*. 2012;9(1):32.
22. Dudgeon MR, Inhorn MC. Men's influences on women's reproductive health: Medical anthropological perspectives. *Social science & Medicine*. 2004;59(7):1379-95.
23. Kakaire O, Kaye DK, Osinde MO. Male involvement in birth preparedness and complication readiness for emergency obstetric referrals in rural Uganda. *Reproductive Health*. 2011;8(12):1-7.
24. Koo K, Makin JD, Forsyth BW. Barriers to male-partner participation in programs to prevent mother-to-child HIV transmission in South Africa. *AIDS Education and Prevention*. 2013;25(1):14-24.
25. Maman S, Moodley D, Groves AK. Defining male support during and after pregnancy from the perspective of HIV-positive and HIV-negative women in Durban, South Africa. *Journal of Midwifery & Women's Health*. 2011;56(4):325-31.
26. Mohlala BK, Gregson S, Boily M-C. Barriers to involvement of men in ANC and VCT in Khayelitsha, South Africa. *AIDS Care*. 2012;24(8):972-7.
27. Mullany BC. Barriers to and attitudes towards promoting husbands' involvement in maternal health in Katmandu, Nepal. *Social Science & Medicine*. 2006;62(11):2798-809.
28. Nkuoh GN, Meyer DJ, Tih PM, Nkfusai J. Barriers to men's participation in antenatal and prevention of mother-to-child HIV transmission care in Cameroon, Africa. *Journal of Midwifery & Women's Health*. 2010;55(4):363-9.
29. MacPhail C, Campbell C. 'I think condoms are good but, aai, I hate those things': Condom use among adolescents and young people in a Southern African township. *Social Science & Medicine*. 2001;52(11):1613-27.
30. Bowleg L. Love, sex, and masculinity in sociocultural context HIV concerns and condom use among African American men in heterosexual relationships. *Men and Masculinities*. 2004;7(2):166-86.
31. Amaro H. Love, sex, and power: Considering women's realities in HIV prevention. *American Psychologist*. 1995;50(6):437.
32. Nyanzi S, Nyanzi-Wokholi B, Kalina B. Male promiscuity: The negotiation of masculinities by motorbike taxi-riders in Masaka, Uganda. *Men and Masculinities*. 2008.
33. Anderson KL, Umberson D. Gendering violence: Masculinity and power in men's accounts of domestic violence. *Gender & Society*. 2001;15(3):358-80.
34. Marmot, M., Friel, S., Bell, R., Houweling, T. A., Taylor, S., & Commission on Social Determinants of Health. (2008). Closing the gap in a generation: Health equity through action on the social determinants of health. *The Lancet*, 372(9650), 1661-1669.
35. Connell RW. Masculinities and globalization. *Men and masculinities*. 1998;1(1):3-23.
36. Connell RW, Connell R. Masculinities: Univ of California Press; 2005.
37. Connell RW, Messerschmidt JW. Hegemonic masculinity: Rethinking the concept. *Gender & Society*. 2005;19(6):829-59.

38. Kimmel, M. S., & Bridges, T. (2011). Masculinity. Oxford University Press.
39. Sabo, D., & Gordon, D. F. (Eds.). (1995). Men's health and illness: Gender, power, and the body (Vol. 8). Sage Publications.
40. Scott-Samuel, A., Stanistreet, D., & Crawshaw, P. (2009). Hegemonic masculinity, structural violence and health inequalities.
41. Tyler, M., & Fairbrother, P. (2013). Bushfires are "men's business": The importance of gender and rural hegemonic masculinity. *Journal of Rural Studies*, *30*, 110-119.
42. Risjord M. Rethinking concept analysis. *Journal of Advanced Nursing*. 2009;65(3):684-91.
43. Connell R. Gender and power: Polity Press; 1987.
44. Wingood GM, DiClemente RJ. Application of the theory of gender and power to examine HIV-related exposures, risk factors, and effective interventions for women. *Health Education & Behavior*. 2000;27(5):539-65.
45. Shields, S. (1975). Functionalism, darwinism, and the psychology of women. *American Psychologist*, *30*(7), 739.
46. Irwing, P., & Lynn, R. (2005). Sex differences in means and variability on the progressive matrices in university students: A meta-analysis. *British Journal of Psychology*, *96*(4), 505-524.
47. Nisbett, R. E., Aronson, J., Blair, C., Dickens, W., Flynn, J., Halpern, D. F., & Turkheimer, E. (2012). Intelligence: New findings and theoretical developments. *American psychologist*, *67*(2), 130.
48. Blinkhorn, S. (2005). Intelligence: A gender bender. *Nature*, *438*(7064), 31-32.
49. Collins, P. H. (2002). Black feminist thought: Knowledge, consciousness, and the politics of empowerment. Routledge.
50. Glenn, E. N. (1999). The social construction and institutionalization of gender and race. *Revisioning Gender*, 3-43.
51. Reskin, B. F., & McBrier, D. B. (2000). Why not ascription? Organizations' employment of male and female managers. *American Sociological Review*, 210-233.
52. Watkins-Hayes, C. (2014). Intersectionality and the sociology of HIV/AIDS: Past, present, and future research directions. *Annual Review of Sociology*, 40, 431-457.
53. Rieker PP, Bird CE. Rethinking gender differences in health: Why we need to integrate social and biological perspectives. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*. 2005;60(Special Issue 2):S40-S7.
54. Bertolote, J. M., & Fleischmann, A. (2015). A global perspective in the epidemiology of suicide. *Suicidology*, *7*(2).
55. Stöckl, H., Devries, K., Rotstein, A., Abrahams, N., Campbell, J., Watts, C., & Moreno, C. G. (2013). The global prevalence of intimate partner homicide: A systematic review. *The Lancet*, *382*(9895), 859-865.
56. Balsara SL, Faerber JA, Spinner NB, Feudtner C. Pediatric mortality in males versus females in the United States, 1999–2008. *Pediatrics*. 2013;132(4):631-8.
57. Dworkin, S. L., Hatcher, A. M., Colvin, C., & Peacock, D. (2013). Impact of a gender-transformative HIV and antiviolence program on gender ideologies and masculinities in two rural, South African communities. *Men and Masculinities*, 16(2), 181-202.
58. Giddens A. The constitution of society: Outline of the theory of structuration: Univ of California Press; 1984.

59. Wingood GM, DiClemente RJ, Mikhail I, Lang DL, McCree DH, Davies SL, et al. A randomized controlled trial to reduce HIV transmission risk behaviors and sexually transmitted diseases among women living with HIV: The WiLLOW Program. *Journal of Acquired Immune Deficiency Syndromes*. 2004;37:S58-S67.
60. Panchanadeswaran S, Johnson SC, Go VF, Srikrishnan A, Sivaram S, Solomon S, et al. Using the theory of gender and power to examine experiences of partner violence, sexual negotiation, and risk of HIV/AIDS among economically disadvantaged women in southern India. *Journal of Aggression, Maltreatment & Trauma*. 2007;15(3-4):155-78.
61. Painter JE, Wingood GM, DiClemente RJ, DePadilla LM, Simpson-Robinson L. College graduation reduces vulnerability to STIs/HIV among African-American young adult women. *Women's Health Issues*. 2012;22(3):e303-e10.
62. DePadilla L, Windle M, Wingood G, Cooper H, DiClemente R. Condom use among young women: Modeling the theory of Gender and Power. *Health Psychology*. 2011;30(3):310.
63. Raiford JL, Wingood GM, DiClemente RJ. Correlates of consistent condom use among HIV-positive African American women. *Women & Health*. 2007;46(2-3):41-58.
64. Salud MC, Marshak HH, Natto ZS, Montgomery S. Exploring HIV-testing intentions in young Asian/Pacific Islander (API) women as it relates to acculturation, theory of gender and power (TGP), and the AIDS risk reduction model (ARRM). *AIDS Care*. 2014;26(5):642-7.
65. Higgins, J. A., Hoffman, S., & Dworkin, S. L. (2010). Rethinking gender, heterosexual men, and women's vulnerability to HIV/AIDS. *American Journal of Public Health*, *100*(3), 435-445.
66. Becker, M. H. (1974). The health belief model and personal health behavior (Vol. 2, No. 4).
67. Goldenberg RL, Culhane JF, Iams JD, Romero R. Epidemiology and causes of preterm birth. *The Lancet*. 2008;371(9606):75-84.
68. McDonald, S. W., Kingston, D., Bayrampour, H., Dolan, S. M., & Tough, S. C. (2014). Cumulative psychosocial stress, coping resources, and preterm birth. *Archives of Women's Mental Health*, *17*(6), 559-568.
69. Conde-Agudelo, A., Rosas-Bermúdez, A., & Kafury-Goeta, A. C. (2006). Birth spacing and risk of adverse perinatal outcomes: A meta-analysis. *JAMA*, *295*(15), 1809-1823.
70. Smith, G. C., Pell, J. P., & Dobbie, R. (2003). Interpregnancy interval and risk of preterm birth and neonatal death: Retrospective cohort study. *BMJ 327*(7410), 313.
71. Beck S, Wojdyla D, Say L, Betran AP, Merialdi M, Requejo JH, et al. The worldwide incidence of preterm birth: a systematic review of maternal mortality and morbidity. *Bulletin of the World Health Organization*. 2010;88(1):31-8.
72. Romero R, Espinoza J, Gonçalves L, Kusanovic JP, Friel L, Hassan S, editors. The role of inflammation and infection in preterm birth. Seminars in reproductive medicine; 2007.
73. McDonald A, McDonald J, Armstrong B, Cherry N, Nolin A, Robert D. Prematurity and work in pregnancy. *British Journal of Industrial Medicine*. 1988;45(1):56-62.
74. Blumenshine PM, Egerter SA, Libet ML, Braveman PA. Father's education: An independent marker of risk for preterm birth. *Maternal and Child Health Journal*. 2011;15(1):60-7.

Chapter 3

Paternal Values of Women's Empowerment and Associations with Maternal and Paternal Antenatal Care Attendance

Abstract

Introduction: Increased paternal engagement in antenatal care (ANC) and birth positively influences pregnancy outcomes. There is very little research that describes the men's value of the reproductive health of their partner and its impact on paternal engagement in preconception, antenatal, and postpartum care. The purpose of this study was to examine the potential associations with paternal ANC attendance, paternal values of women's empowerment, and reproductive health related variables.

Methods: Secondary analysis of a men's survey conducted by the Demographic and Health Surveys (DHS) (n=26892). Nine sub-Saharan countries were included. Data were pooled into an aggregate dataset and examined through various regression methods.

Results: (Pooled data) Paternal values of women's empowerment (PVWE) was positively associated with Maternal ANC attendance. PVWE was also positively associated with Paternal ANC attendance.

Conclusions: PVWE is positively associated with maternal and paternal ANC attendance. Men's values of the reproductive rights of their partner may contribute to ANC attendance or ANC may shape a men's values of women. Further research can build upon this study to provide more insight as to how masculinity shapes men's values of the respective rights of women. Partners are a key piece of an immensely complex equation that influences to maternal-newborn health.

Keywords: Fathers, Maternal-newborn health, Partner Participation in Pregnancy,

Gender equality

Paternal Values of Women's Empowerment and Associations with Maternal and Paternal Antenatal Care Attendance

Introduction

Every year, it is estimated that more than 303,000 women die from pregnancy or childbirth-related causes worldwide.[1] In 2012, almost 5 million infants died from preventable causes such as preterm and intrapartum birth complications, pneumonia, and diarrhea.[2] Worldwide, 73% of all deaths of children under the age of five occur during the first year of life.[2] One strategy recommended by the World Health Organization to reduce maternal and infant mortality is to promote attainment of antenatal medical care, with one significant milestone being eight antenatal care (ANC) visits.[3] Many investigations have shown that antenatal care is an effective intervention in improving pregnancy outcomes.[4] Worldwide, however, about 85% of women attend at least one ANC visit, while only about 58% achieve the previously recommended four visit minimum.[5] Many barriers to ANC attendance are structural (cost, access and availability), which are on the agendas of national health ministries and nongovernmental organizations. Low paternal involvement can also be a barrier, not only by hampering a woman's ability to seek antenatal medical care, but also by increasing a woman's overall burden, especially if she must care for dependents.

Available literature indicates that increased male engagement in ANC and birth positively influences pregnancy outcomes[6-11], with associated reductions in negative maternal health behaviors[7, 9-12] and rates of preterm birth, low birth weight, fetal growth restriction, and infant mortality.[7-12] There is epidemiological evidence that male involvement reduces maternal stress[6-7, 10, 12-14] (by emotional, logistical, and financial support) as well as increases the uptake of ANC.[15] Additionally, paternal participation leads to improved communication between couples, provides opportunities for men to

learn about the health needs of mothers and infants, and supports paternal involvement in their future parental roles from an early stage.[16-19] Despite the evidence of their importance, antenatal programs continue to suffer from low participation rates among fathers.[20-28]

Although much is known about the benefits of paternal participation in ANC, there is very little research that describes constructions of masculinity and its impact on paternal engagement in preconception, antenatal, and postpartum care.[16] Little is known about the relationships between paternal participation in ANC and paternal perceptions and knowledge of women's empowerment, partner's reproductive health, HIV/STI transmission, domestic violence, and contraception. These relationships are vital to understand because they can reveal how particular norms of masculinity influence reproductive health.

The 2008 United Nations (UN) Commission on the Status of Women concluded that men are key to the health of the family and must be active participants in ANC as well as many aspects of pregnancy health.[29] The commission further concluded that individual men are often dismissed or blamed for low engagement without adequately questioning the social and contextual constructions of gender relations that lead to gender inequalities.[29] Dominant (hegemonic) ideologies of masculinity determine the current most honored way of being a man. Idealized versions of manhood require men to position themselves in relation to such idealizations; in so doing, they legitimize and perpetuate the global subordination of women to men.[30-32]

There are several important associations that must be explored to better elucidate sociocultural norms of masculinity and their effects on fathers' approach to reproductive health. The associations explored in this study are nested within a larger social context in which culture influences behavior, beliefs, or actions. While the aim of this study is to identify associations among several actions (i.e paternal ANC attendance) and beliefs

(paternal values of women), it is important to acknowledge that there is a larger social context in which the actions and beliefs are occurring. Understanding groups of people's thoughts and actions can give a glimpse of the larger sociocultural ideas around fathers and how they view women's decision-making power.

This study examines whether paternal values of women's empowerment are linked with maternal and paternal ANC attendance. This is important to explore because it is known that women with male partners with non-egalitarian values of the human right to reproductive health have poorer health outcomes than those who have more egalitarian values of that right.[33] However, it remains unknown whether men who have more egalitarian values of women's reproductive health also demonstrate egalitarian values of their partner's access to antenatal care. Additionally, it is unknown if men who have more egalitarian values of women also participate in ANC in the form of antenatal clinic attendance.

Paternal Values of Women's Empowerment

Women's empowerment can be a nebulous concept and is often difficult to define.[34] We have decided to use the conceptualization of empowerment as articulated by Kabbir[35-36] who conceptualizes empowerment as "the expansion of people's ability to make strategic life choices in a context where this ability was previously denied to them."[35(pp437)] Several studies have operationalized the Kabbir[35-36] concept of empowerment in a variety of different ways depending on the context.[37-39] Such studies have ranged from measuring empowerment in the forms of economic indicators to political participation.[37-39] In the current study, we define women's empowerment as a woman's decision-making power over her reproductive health. Thus, paternal values of women's empowerment (PVWE) is defined as men's values of a woman's decision-making power regarding her reproductive health.

We have noted the benefits of paternal participation in ANC and reproductive health previously. However, little is known about the relationships between paternal values/knowledge of: women's empowerment and maternal and paternal participation in ANC. The strength of these relationships may be vital to understand, because they can reveal how particular norms of masculinity may influence different areas of reproductive health. For example, studies in South Africa, Uganda, and the United States have shown that dominant sexual norms for men and associated values of women's empowerment encourage promiscuity, avoid condom use, and sanction violence against women.[40-44] Furthermore, it is unclear if male sexual norms associated with specific masculinist values of women's empowerment and gender relations can be present and compatible with paternal participation in ANC. Some culturally constructed forms of masculinity may be incompatible with men's participation in antenatal care, while others may coexist.

It is known that the lower the men's perception of women, the more power, resources, authority, and control he has over his partner.[45] This power imbalance is often rooted in local and regional masculinist norms, which not only put the partner at risk, but the father himself. It is unknown if a father's participation in ANC acts as a moderator in other domains of reproductive health. To date, there has been one study that has looked at women's empowerment and men's participation in ANC, published in 2014.[46] The study examined Demographic and Health Survey data (DHS) from seven African countries. Results from the study included equivocal relationships with ANC involvement and women's values of empowerment. The authors controlled for the known sociodemographic variables using multivariable logistic modeling. While the study is an important beginning to understand the relationship between sociocultural norms of masculinity and participation by both men and women in ANC, more needs to be explored. In this article, we went beyond analyzing women's empowerment and

partner participation in ANC, to include *paternal* values of women's empowerment and partner participation in ANC. In a subsequent manuscript, we include men's values of women's empowerment and paternal ANC attendance and their associations with men's family planning beliefs, HIV/STI beliefs, and risky sexual behavior.

In the environments where maternal and infant mortality are highest, men tend to embody characteristics that prepare them to combat against possible threats (violence, theft, racism, poverty).[47-48] Preserving masculinity is of the utmost importance for men in such environments.[47] It is not clear how men's embodied identity as men shapes their participation in ANC.

Study Objective: The purpose of this study is to investigate whether paternal values of women's empowerment are associated with maternal and paternal antenatal clinic attendance.

Methods

Demographic and Health Survey

Demographic and Health Surveys (DHS) are nationally-representative household surveys that provide data for a wide range of monitoring and impact evaluation indicators in the areas of population, health, and nutrition. Standard DHS Surveys have large sample sizes (usually between 5,000 and 30,000 households) and typically are conducted about every five years, to allow comparisons over time. Since 1984, the MEASURE DHS (Demographic and Health Surveys) project has provided technical assistance to more than 240 surveys in over 85 countries, advancing global understanding of health and population trends in developing countries. DHS has earned a worldwide reputation for collecting and disseminating accurate, nationally representative data on fertility, family planning, maternal and child health, gender, HIV/AIDS, malaria, and nutrition.

The Measure DHS project is funded by the U.S. Agency for International Development (USAID). Contributions from other donors, as well as funds from participating countries, also support surveys. The project is implemented by ICF Macro. Since October 2008, ICF Macro has been partnering with five internationally experienced organizations to expand access to and use of the DHS data: Johns Hopkins Bloomberg School of Public Health/Center for Communication Programs, PATH, The Futures Institute, CAMRIS International, and Blue Raster. All Measure DHS surveys use consistent sampling methodologies and questions, ensuring comparability among countries and over time while still maintaining flexibility to meet individual country needs. The DHS Program is authorized to distribute, at no cost, unrestricted de-identified survey data files for legitimate academic research. Registration is required for access to data. The data used is frequently cited by the World Health Organization (WHO) as well as other regional and national health organizations.[49]

Sampling Strategy

The sampling strategy for DHS permits data analysis of demographic sub-groups within the sample population with valid statistical results. The survey design used stratified sampling with varying probability of study selection to optimize inference; therefore, analysis incorporating sampling weights is necessary.

Country Selection

The proposed study includes nine Sub-Saharan African countries, because sub-Saharan Africa bears 99% of the global burden of maternal mortality and morbidity.[50] The nine countries were chosen based on having met each of the following inclusion criteria 1) conducted a DHS in the year 2010 or later 2) included a men's survey measuring antenatal accompaniment, women's empowerment questions regarding reproductive health as well as HIV/ STIs and contraception knowledge variables.

The nine countries were grouped into three geographic regions based on United Nations designated geo-political boundaries to achieve an adequate sample. The Democratic Republic of Congo and Rwanda are considered Central Africa; Malawi, Zimbabwe, and Zambia are pooled to form Southern Africa, and Burkina Faso, Liberia, Nigeria, and Sierra Leone are considered West Africa in this study.

Country Settings

The inclusion of these countries provides a diverse, yet comparable landscape for examining women's empowerment in relation to paternal involvement. Per the United Nations Development Programme (UNDP), sub-Saharan Africa has the highest gender inequality in the world, measured by aspects of reproductive health and women's participation in government, higher education, and the labor market.[51] The UNDP gender inequality index represents the loss in human development due to gender inequality, where 1 represents full equality and 0 indicates the lowest possible status for women.

Table I: 2015 UNDP gender inequality index

Country	Index Score
Burkina Faso	.402
Congo Democratic Republic	.592
Liberia	.427
Malawi	.476
Nigeria	.527
Rwanda	.498
Sierra Leone	.420
Zambia	.579
Zimbabwe	.516
United States	.920
Norway	.949
Switzerland	.939
Dominican Republic	.722
Philippines	.682
Sub-Saharan Africa	.533
Arab States	.687

South Asia	.720
Europe and Central Asia	.756

Per the DHS 2010-2011, attendance to at least one ANC visit among women is nearly universal (>90%) in eight countries (Zambia 60.6%). However, Burkina Faso, Malawi, Nigeria, and Zambia have the poorest coverage rates of the recommended four ANC visits at 33.7%, 45.5%, 51.1%, 55.5% respectively with the highest rates in Liberia (95.9%).[52] Access to and utilization of obstetrical care services around the time of delivery (which often requires the support of male partners) are relatively low across countries. Malawi has the highest percentage of women delivering with a skilled birth attendant (71.4%), while the lowest skilled birth attendance rates are in Nigeria (35%) and Sierra Leone (59.7%).[52]

Sample size: Country level analytic samples included Burkina Faso (n=2066), Congo Democratic Republic (n=3001), Liberia (n=1327), Malawi (n=2845), Nigeria (n=4060), Rwanda (n=1712), Sierra Leone (n=2066), Zambia (n=4701), and Zimbabwe (n=1652). Total n = 23430

Outcome Measure: In this study, maternal and paternal clinic attendance were used as outcome variables.

Maternal attendance of ANC: In the DHS, the respondent was asked if the mother of his child attended at least one antenatal appointment for their youngest child (under two years of age).

Paternal attendance of ANC: In the DHS, the respondent was asked if the mother of his child attended at least one antenatal appointment for their youngest child (under two years of age). The follow-up question asked if the respondent attended at least one ANC appointment with the mother of his child.

Explanatory variables

Paternal values of women's empowerment: Paternal values of women's empowerment are measured as a composite score, ranging from 0-4, where 0 represents "Low view of women's empowerment/status of women" and 4 represents "high view of women's empowerment/ status of women." The index is a summation of four questions asked of every man in the survey (Table I). A man can receive a score from 0-4 depending on how he responds to the four dichotomous questions. The low view of the status of women is analogous to norms of masculinity that place low value on women while the high view of the status of women is analogous to more progressive forms of masculinity that tend to have more equitable values of women as persons with human and reproductive rights. Paternal values of women's empowerment will be referred to as the "PVWE index" in the analysis and discussion sections.

Table II: Variables within the Index of Paternal Values of Women's Empowerment
Contraception is woman's business, man should not worry
Women who use contraception become promiscuous
Wife justified refusing sex: husband has other women
Wife justified asking husband to use condom if he has STI

Adjustment Variables: Prior research has shown that age, educational level, fathering children with multiple partners, religion, wealth, number of wives/ partners, country, and urban vs rural geographic locations have been associated with maternal clinic attendance and paternal values of women's empowerment. The adjustment variables will be referred to as simply "adjustment variables" for the remainder of the text.

Analysis

Data were analyzed using SAS 9.3 (Carey, NC). First, we described the sample characteristics for each country using DHS sample weights, adjusting for differences in the probability of selection from the survey design. Second, countries were combined based on their geographic region in Africa (Western, Central, Southern). To address if maternal ANC attendance is associated with paternal beliefs of women's decision-making power, a logistic model was created by first using maternal ANC attendance as the outcome variable and the empowerment index as the explanatory variable using the adjustment variables. The same logistic model was used again, this time pooling all nine countries in the analysis. The regional and combined pooled datasets allowed for an adequate sample size to conduct the analysis. To address if there is an association between paternal ANC attendance and paternal beliefs of women's decision-making power, the same processes were used, substituting the maternal ANC visit variable for the paternal ANC variable. All analyses were adjusted for the complex survey design to correct the variance estimations. Odds ratios were considered statistically significant at $p < .05$.

Ethical considerations

The Emory University Institutional Review Board determined this study to be exempt.

Results

Table III contains the sample demographic characteristics by country. The mean age of fathers in the study ranged from 33 years in Liberia to 37 years in Burkina Faso. Education and religion patterns varied considerably among the nine countries in the study. Urban residence in all nine countries ranged from 10.4% in Malawi to 35.6% in Zambia. Table IV shows the sample demographic characteristics by region and as composite data set. The mean age for all three regions was similar. The aggregate data set has a mean age of 34.67 (± 8.11). Islam, Catholicism, and Protestantism are the

predominant religions in the Western, Central, and Southern regions respectively. In the aggregate data set, Islam is the predominant religion (28.1%) followed closely by Protestantism (22.8%) and non-specific Christian religions (22.6%). Most men in the sample (63.1-66.7%) have fathered children with only one partner. Approximately 74.3 - 86.5% of the men in the sample had only one partner at the time of the survey.

Table V shows how the key variables of interest are distributed among the various regions in the study. Most of the men in the study fall in the "High" empowerment category. Maternal ANC visits (at least 1) ranged from 86.2% in the western African countries to 93.4% in the southern African countries. This is comparable to other studies surveying maternal ANC attendance.[20-28] Paternal ANC attendance ranged from 47.4% in Western Africa to 54.0% in Southern Africa.

Table III: Demographic Characteristics by Country

Region	Western Africa	Central Africa	Western Africa	Southern Africa	Western Africa	Central Africa	Western Africa	Southern Africa	Southern Africa
Country	Burkina Faso	DRC	Liberia	Malawi	Nigeria	Rwanda	Sierra Leone	Zambia	Zimbabwe
Year	2010	2013-2014	2013	2010	2013	2010	2013	2013-2014	2010-2011
Sample Size (N)	2856	3430	1400	3015	5419	1734	2184	4954	1900
Age (Years)	37.33 ± 8.90	34.91 ± 8.56	33.06 ± 7.46	33.23 ± 7.84	35.59 ± 6.99	33.57 ± 8.22	35.72 ± 8.89	34.02 ± 8.12	32.54 ± 7.27
Education									
No Education	2150 (75.3)	177 (5.2)	256 (18.3)	255 (8.5)	1543 (28.5)	286 (16.5)	1276 (58.4)	274 (5.5)	13 (0.7)
Incomplete Primary	335 (11.7)	625 (18.2)	366 (26.1)	1676 (55.6)	307 (5.7)	977 (56.3)	179 (8.2)	1427 (28.8)	189 (9.9)
Complete Primary	103 (3.6)	287 (8.4)	63 (4.5)	261 (8.7)	905 (16.7)	263 (15.2)	86 (3.9)	933 (18.8)	291 (15.3)
Incomplete Secondary	207 (7.2)	1423 (41.5)	456 (32.6)	433 (14.4)	561 (10.4)	132 (7.6)	420 (19.2)	1428 (28.8)	1225 (64.5)
Complete Secondary	22 (0.8)	690 (20.1)	198 (14.1)	320 (10.6)	1300 (24.0)	41 (2.4)	133 (6.1)	527 (10.6)	57 (3.0)
Higher	39 (1.4)	228 (6.6)	61 (4.4)	70 (2.3)	803 (14.8)	35 (2.0)	90 (4.1)	364 (7.3)	125 (6.6)
Religion									
No religion	3 (0.0)	91 (2.7)	43 (3.1)	87 (2.9)	0 (0.0)	36 (2.1)	1 (0.1)	0 (0.0)	466 (43.3)
Muslim	1766 (61.9)	75 (2.2)	191 (13.7)	327 (10.9)	3062 (56.8)	22 (1.3)	1805 (82.8)	35 (0.7)	13 (1.2)
Catholic	614 (21.5)	927 (27.1)	0 (0.0)	621 (20.6)	464 (8.6)	780 (45.0)	0 (0.0)	894 (18.1)	155 (14.4)
Protestant	151 (5.3)	992 (29.0)	0 (0.0)	0 (0.0)	0 (0.0)	655 (37.8)	0 (0.0)	3937 (79.9)	197 (18.3)
Traditional/ Animist	318 (11.2)	24 (0.7)	33 (2.4)	0 (0.0)	65 (1.2)	0 (0.0)	1 (0.1)	0 (0.0)	107 (10.0)
Non-specified Christian	0 (0.0)	1171 (34.2)	1128 (80.9)	1270 (42.1)	1795 (33.3)	0 (0.0)	367 (16.8)	0 (0.0)	133 (12.4)
Other	0 (0.0)	147 (4.3)	0 (0.0)	709 (23.5)	9 (0.2)	241 (13.9)	6 (0.3)	63 (1.3)	4 (0.4)
	2852	3427	1395	3014	5395	1734	2180	4929	1075
Wealth									
Poorest	533 (18.7)	842 (24.5)	487 (34.8)	545 (18.1)	1112 (20.5)	338 (19.5)	530 (24.3)	1105 (22.3)	415 (21.8)
Poorer	601 (21.0)	831 (24.2)	393 (28.1)	682 (22.6)	1135 (20.9)	345 19.9)	465 (21.3)	1256 (24.4)	364 (19.2)
Middle	591 (20.7)	756 (22.0)	261 (18.6)	704 (23.3)	1028 (19.0)	360 (20.8)	450 (20.6)	1081 (21.8)	371 (19.5)
Richer	615 (21.5)	594 (17.3)	153 (10.9)	608 (20.2)	1087 (20.1)	348 (20.1)	419 (19.2)	876 (17.7)	414 (21.8)
Richest	516 (18.1)	407 (11.9)	106 (7.6)	476 (15.8)	1057 (19.5)	342 (19.8)	320 (14.7)	636 (12.8)	336 (17.7)
Geographic location									
Urban	681 (23.8)	936 (27.3)	417 (29.8%)	315 (10.4)	1872 (34.5)	262 (15.1)	612 (28.0)	1763 (35.6)	571 (30.1)
Rural	2175 (76.2)	2494 (72.7)	983 (70.2%)	2700 (89.6)	3547 (65.5)	1472 (84.9)	1572 (72.0)	3191 (64.4)	1329 (69.9)
Number of Women fathered children with									
1	1705 (59.7)	2017 (58.8)	703 (50.2)	1992 (66.1)	2869 (71.4)	1395 (80.4)	1210 (55.4)	3200 (64.6)	1389 (73.1)
2	846 (29.6)	1007 (29.4)	500 (35.7)	796 (26.4)	1227 (22.6)	301 (17.4)	705 (32.3)	1354 (27.3)	403 (21.2)
3 or more	304 (10.6)	402 (11.7)	197 (14.1)	220 (7.3)	298 (5.5)	36 (2.1)	264 (12.1)	395 (8.0)	108 (5.7)
Number of wives/ partners									

No current wife/partner	36 (1.4)	166 (4.8)	141 (10.1)	115 (3.8)	119 (2.2)	79 (4.6)	134 (6.1)	355 (7.2)	96 (5.1)
1	1948 (68.2)	2728 (79.5)	1156 (82.6)	2627 (87.1)	4187 (77.3)	1613 (93.0)	1516 (69.4)	4209 (85.0)	1701 (89.5)
2 or more wives	872 (30.5)	536 (15.6)	103 (7.4)	273 (9.1)	1113 (20.5)	42 (2.4)	534 (24.5)	390 (7.9)	103 (5.4)

Maternal Clinic Attendance and PVWE

Table VI shows the relationship between the PVWE index and maternal ANC attendance. Lower PVWE is associated with lower likelihood that women attend ANC. This association is significant and graded in the pooled analysis with all countries, as well as in region-specific analysis of Central African countries. The pattern is consistent but not significant in other region-specific analyses.

Paternal Clinic Attendance and PVWE

Table VII shows the relationship between the PVWE index and paternal clinic attendance. In the pooled analysis of all nine countries, lower versus higher PVWE was associated with lower likelihood that fathers attended ANC, with the exception of the lowest PVWE score of '0', which was also the least common score. In region-specific analyses, Central and Southern African nations tended to have lower paternal ANC attendance with lower PVWE, although not all associations were significant. In Western Africa, results were more mixed with the contradictory result of the lowest empowerment group reporting significantly greater paternal ANC attendance.

Table IV: Demographic Characteristics by Region and Aggregate of all 9 Countries

Country Year	Western Africa 2010-2013	Central Africa 2010-2014	Southern Africa 2010-2014	Aggregate 2010-2014
Sample Size (N)	11859	5164	9869	26892
Age (Years)	35.74 ± 8.00	34.4 6 ± 8.47	33.49 ± 7.89	34.67 ± 8.11
Education				
No Education	5225 (44.1)	463 (9.0)	542 (5.5)	6239 (23.2)
Incomplete Primary	1187 (10.0)	1602 (31.0)	3292 (33.4)	6081 (22.6)
Complete Primary	1157(9.8)	550 (10.7)	1485 (15.0)	3192 (11.9)
Incomplete Secondary	1644 (13.9)	1555 (30.1)	3086 (31.3)	6285 (23.4)
Complete Secondary	1653 (13.9)	731 (14.2)	904 (9.2)	3288 (12.2)
Higher	993 (8.4)	263 (5.1)	559 (5.7)	1815 (6.7)
Religion				

No religion	47 (0.4)	127 (2.5)	553 (6.1)	727 (2.8)
Muslim	6824 (57.7)	97 (1.9)	375 (4.2)	7296 (28.1)
Catholic	1078 (9.1)	1707 (33.1)	1670 (18.5)	4455 (17.1)
Protestant	151 (1.3)	1647 (31.9)	4134 (45.8)	5932 (22.8)
Traditional/ Animist	417 (3.5)	24 (0.5)	107 (1.2)	548 (2.1)
Non-specified Christian	3290 (27.8)	1171 (22.7)	1403 (15.6)	5864 (22.6)
Other	15 (0.1)	388 (7.5)	776 (8.6)	1179 (4.5)
	11822	5161	9018	26001
Wealth				
Poorest	2662 (22.4)	1180 (22.9)	2065 (20.9)	5907 (22.0)
Poorer	2594 (21.9)	1176 (22.8)	2302 (23.3)	6072 (22.6)
Middle	2330 (19.6)	1116 (21.6)	2156 (21.8)	5602 (20.8)
Richer	2274 (19.2)	942 (18.2)	1898 (19.2)	5114 (19.0)
Richest	1999 (16.9)	750 (14.5)	1448 (14.7)	4197 (15.6)
Geographic location				
Urban	3582 (30.2)	1198 (23.2)	2649 (26.8)	7429 (27.6)
Rural	8277 (69.8)	3966 (76.8)	7220 (73.2)	19463 (72.4)
Number of Women fathered children with				
1	7487 (63.3)	3412 (66.1)	6581 (66.8)	17480 (65.1)
2	3278 (27.8)	1308 (25.4)	2553 (25.9)	7139 (26.6)
3 or more	1063 (8.9)	438 (8.5)	723 (7.3)	2224 (8.3)
Number of wives/ partners				
No current wife/partner	430 (3.6)	245 (4.7)	566 (5.7)	1241 (4.6)
1	8807 (74.3)	4341 (84.1)	8537 (86.5)	21685 (80.6)
2 or more wives	2622 (22.1)	578 (11.2)	766 (7.8)	3966 (14.8)

Table V: Distribution of Key Variables: PVWE & ANC Attendance

Country	Western Africa	Central Africa	Southern Africa	Combined Africa
Year	2010-2013	2010-2014	2010-2014	2010-2014
Sample Size	11859	5164	9869	26892
Lowest Empowerment "0"	319 (2.7)	166 (3.2)	205 (1.1)	590 (2.2)
Low-Medium Empowerment "1"	724 (6.1)	410 (7.9)	557 (5.6)	1691 (6.3)
Medium Empowerment "2"	2796 (23.6)	892 (17.3)	1942 (19.7)	5630 (20.9)
Medium- High Empowerment "3"	3639 (30.7)	1426 (27.6)	3091 (31.3)	8156 (30.3)
Highest Empowerment "4"	4344 (36.6)	2267 (43.9)	4161 (42.2)	10772 (40.1)
Maternal ANC Attendance				
No	1530 (13.0)	400 (7.7)	586 (5.9)	2516 (9.4)
Yes	10224 (87.0)	4720 (92.3)	9217 (94.1)	24161 (90.6)
Paternal ANC Attendance				

No	5358 (52.6)	2272 (48.2)	4227 (46.0)	11857 (49.2)
Yes	4824 (47.4)	2441 (51.8)	4971 (54.0)	12236 (50.8)

Table VI: Odds Ratios and 95% confidence intervals of Maternal Clinic Attendance by PVWE

Region	Western Africa	Central Africa	Southern Africa	Combined Africa
Year	2010-2013	2010-2014	2010-2014	2010-2014
Sample Size	11859	5164	9869	26892
Lowest Empowerment vs Highest empowerment	1.04 (0.63 - 1.73)	**0.20** (0.10 - 0.39)	0.39 (0.15 - 1.01)	**0.62** (0.42 - 0.90)
Low-Medium Empowerment vs Highest Empowerment	0.83 (0.59 - 1.17)	**0.33** (0.20 - 0.56)	**0.59** (0.39 - 0.89)	**0.69** (0.54 - 0.87)
Medium empowerment vs Highest empowerment	0.81 (0.66 - 1.01)	**0.27** (0.13 - 0.57)	0.86 (0.64 - 1.15)	**0.68** (0.56 - 0.82)
Medium-High Empowerment vs Highest Empowerment	**0.81** (0.66 - 0.98)	**0.59** (0.41 - 0.85)	0.95 (0.73 - 1.23)	**0.82** (0.71 - 0.95)

Table VII: Odds Ratios and 95% confidence intervals of Paternal Clinic Attendance by PVWE

Region	Western Africa	Central Africa	Southern Africa	Combined Africa
Year	2010-2013	2010-2014	2010-2014	2010-2014
Sample Size	11859	5164	9869	26892
Lowest Empowerment vs Highest empowerment	**1.68** (1.17 – 2.42)	0.61 (0.32 - 1.15)	0.88 (0.55 - 1.39)	1.00 (0.77 - 1.30)
Low-Medium Empowerment vs Highest Empowerment	0.94 (0.73 - 1.19)	0.66 (0.44 - 1.00)	0.83 (0.66 - 1.04)	**0.74** (0.63 - 0.86)
Medium empowerment vs Highest empowerment	1.06 (0.91 - 1.24)	**0.53** (0.37 - 0.74)	1.01 (0.87 - 1.16)	**0.83** (0.75 - 0.92)
Medium-High Empowerment vs Highest Empowerment	0.93 (0.82 - 1.07)	**0.67** (0.52 - 0.87)	1.04 (0.92 - 1.17)	**0.85** (0.78 - 0.92)

Discussion

In summary, there is a positive association between PVWE and maternal and paternal ANC attendance. In our analysis, the greater a man values a woman's decision-making power (higher PVWE), the greater the likelihood that his partner will attend at least one ANC visit. Additionally, the greater a man values a woman's decision-making power (higher PVWE), the greater the likelihood that he will attend at least one ANC visit. These findings are aligned with other studies of women, which have found that women who are more empowered are more likely to seek health care and use antenatal

care.[53-56]

Our study compares to Jennings[46] in several ways. Both studies utilize African DHS data sets, measure paternal clinic attendance and empowerment, and controlled for similar variables. Our study differs from the previous studies because it measures the perspective of the partner towards women's empowerment (PVWE), operationalizes empowerment differently, uses data from the men's survey only, and examines different African countries. Jennings[46] utilized paired data sets using DHS data. The authors used the paternal clinic attendance as their key variable while using empowerment indicators from the woman's perspective. What may be a worthwhile future study is to determine the consequences of divergent values of women's empowerment between women and their partners. It is possible to obtain empowerment indicators from both the woman's perspective as well as her partner. Related to maternal-newborn health, it is unknown what the consequences are (if any) if there are contradictory values between a woman and her partner about her reproductive rights.

While the association between PVWE and maternal antenatal clinic attendance can be seen from this data, we cannot know from this study how these values affect long term maternal ANC attendance. In the African continent, about 77% of women attend at least one ANC visit, while only about 50% achieve the previously recommended four visit minimum.[5] Identifying the relationship between paternal values and the effect on the number of maternal clinic visits is important. Eight antenatal visits are the ideal number of minimum visits before delivery.[3] There are several important programmatic and research implications. If the positive association remains when looking at the number of antenatal visits, it can provide more evidence of the importance of including fathers when formulating strategies to promote maternal-child health.

Second, there is a positive association between paternal ANC attendance and PVWE, which has several potential explanations. While the exact nature of this

relationship needs to be examined more closely, it is likely that fathers who have egalitarian values of women understand the importance of providing support at an antenatal clinic visit and share the responsibility of childrearing. It is unknown the directionality of the relationship given the nature of this study. In other words, do fathers' antenatal attendance lead to higher empowerment values or do higher empowerment values lead to antenatal care attendance? More studies examining the directionality and strength of the relationship between values of the status of women and antenatal attendance are needed. However, it is known that men with egalitarian values of women's rights may want children because they want to share with their partners and be involved in caring for their children.[57] This seems to be consistent with the relationship between paternal antenatal clinic attendance and PWVE.

Additionally, there is much more being done throughout many countries in Africa that target the gender norms of men within communities. Overall, in many countries paternal participation in antenatal care is low. 50.8% of men in our study attended at least one antenatal care appointment with their partner. Men have traditionally been excluded from the reproductive health of women. There are a variety of historical, political, and social reasons for the lack of participation in reproductive health by men. Recently, there has been a push by governmental and non-governmental agencies to have more men involved in the reproductive health of their partners.[58] One way to do this is though Gender Equality Programming. Non-Governmental Organizations are using gender-training workshops to help engage young men about gender equity. Our study provides some empiric evidence about the association of paternal ANC attendance and PVWE. Although we cannot determine the directionality of this relationship between paternal ANC attendance and PVWE, future studies may reveal that gender programming work can impact men to be more involved in the reproductive lives of their partners in an equitable way. Further, our study raises a number of questions for future

study. What has been the impact of gender training in countries in sub-Saharan Africa that have been intensively promoting gender equality and paternal responsibility/ participation in is public health programming? How are men negotiating their new identity in the context of antenatal engagement? Are men redefining their masculinity by accepting gender equality and fulfilling paternal responsibilities, but in doing so, also finding other ways of expressing themselves as men? More research is needed to understand how gender training workshops are affecting the identity of men.

This study also provides more evidence related to the importance of considering the partners of women in the context of maternal-newborn health. The body of knowledge pertaining to how men improve maternal-newborn health by attending ANC visits is still developing. Paternal ANC attendance seems to be only one aspect of paternal support for women. It is important to note that in many studies, paternal ANC attendance has been used as a proxy indicator of paternal support of women. It is possible that men who do not attend ANC visits with their partner cannot attend because they support their partner in other ways, such as caring for young children. More research is needed to understand other ways in which men support maternal-newborn health. Assessing a man's view of the reproductive rights of women gives us a glimpse (albeit limited) into an undoubtedly complex masculinity. It is plausible that men who have more equitable values of women (higher PVWE) not only tend to show up for ANC appointments, but also are involved in other aspects of their partner's pregnancy. More research is needed to understand what other beliefs, values and behaviors men have in addition to participating in ANC and high PVWE.

The key findings in this study reveal several important programmatic and research implications. To our knowledge, this is the first to-date to examination of the relationship between maternal and paternal antenatal care attendance and PVWE in

sub-Saharan Africa. It is very possible that cultural differences not captured within the DHS survey contributed to the variability of significant findings within each region.

Limitations

The study has several limitations. Women were not surveyed; the outcome and variables could only be obtained from the DHS men's survey. The study is also limited by the cross-sectional nature of the DHS data. The cross-sectional measure does not capture the dynamic nature of empowerment or the change over time. It is possible that men's interpretation and response to the concept of empowerment varied across settings, and some aspects of women's empowerment may not have been captured by the indicators assessed in the DHS. Ultimately, this may decrease the predictive value of the construct.

The construction of the empowerment index was chosen on a pragmatic basis. The index consisted of four items that focused on gender/social norms of empowerment. Due to missing data and the time intensive process of instrument development, four variables were used. This arguably does not give a complete picture of paternal values of women's empowerment, but it does capture several important aspects of it related to reproductive health. The interviewers administrating the survey were all men, which theoretically reduces the social desirability bias. However, having a DHS representative present to administer the survey versus a paper or electronic survey, most likely results in some level of social desirability bias. Future studies using DHS data may consider constructing an index similar to indices created to assess a woman's empowerment from the view point of women. The study's strengths are the use of multiple empowerment variables and use of geographically diverse and large, representative samples, and inclusion of measures with existing literature.

References

1. Alkema, L., Chou, D., Hogan, D., Zhang, S., Moller, A. B., Gemmill, A., & Say, L. (2016). Global, regional, and national levels and trends in maternal mortality between 1990 and 2015, with scenario-based projections to 2030: A systematic analysis by the UN Maternal Mortality Estimation Inter-Agency Group. *The Lancet*, *387*(10017), 462-474.
2. Group WB. World development indicators 2012: World Bank Publications; 2012.
3. World Health Organisation. WHO recommendations on antenatal care for a positive pregnancy experience. Geneva: WHO; 2016.
4. Stringer, M. (1997). Issues in determining and measuring adequacy of prenatal care. *Journal of Perinatology*. 18(1), 68-73.
5. UNICEF. (2017). Only half of women worldwide receive the recommended amount of care during pregnancy. Retrieved April 26, 2017, from https://data.unicef.org/topic/maternal-health/antenatal-care/#
6. Padilla YC, Reichman NE. Low birthweight: Do unwed fathers help? *Children and Youth Services Review*. 2001;23(4):427-52.
7. Alio AP, Bond MJ, Padilla YC, Heidelbaugh JJ, Lu M, Parker WJ. Addressing policy barriers to paternal involvement during pregnancy. *Maternal and Child Health Journal*. 2011;15(4):425-30.
8. Alio AP, Kornosky JL, Mbah AK, Marty PJ, Salihu HM. The impact of paternal involvement on feto-infant morbidity among Whites, Blacks and Hispanics. *Maternal and Child Health Journal*. 2010;14(5):735-41.
9. Alio AP, Mbah AK, Kornosky JL, Wathington D, Marty PJ, Salihu HM. Assessing the impact of paternal involvement on racial/ethnic disparities in infant mortality rates. *Journal of Community Health*. 2011;36(1):63-8.
10. Ghosh JKC, Wilhelm MH, Dunkel-Schetter C, Lombardi CA, Ritz BR. Paternal support and preterm birth, and the moderation of effects of chronic stress: A study in Los Angeles County mothers. *Archives of Women's Mental Health*. 2010;13(4):327-38.
11. Ngui E, Cortright A, Blair K. An investigation of paternity status and other factors associated with racial and ethnic disparities in birth outcomes in Milwaukee, Wisconsin. *Maternal and Child Health Journal*. 2009;13(4):467-78.
12. Feldman PJ, Dunkel-Schetter C, Sandman CA, Wadhwa PD. Maternal social support predicts birth weight and fetal growth in human pregnancy. *Psychosomatic Medicine*. 2000;62(5):715-25.
13. Austin MP, Leader L. Maternal stress and obstetric and infant outcomes: Epidemiological findings and neuroendocrine mechanisms. *Australian and New Zealand Journal of Obstetrics and Gynaecology*. 2000;40(3):331-7.
14. Martin LT, McNamara MJ, Milot AS, Halle T, Hair EC. The effects of father involvement during pregnancy on receipt of prenatal care and maternal smoking. *Maternal and Child Health Journal*. 2007;11(6):595-602.
15. Zambrana RE, Dunkel-Schetter C, Scrimshaw S. Factors which influence use of prenatal care in low-income racial/ethnic women in Los Angeles County. *Journal of Community Health*. 1991;16(5):283-95.
16. Dolan A, Coe C. Men, masculine identities and childbirth. *Sociology of Health & Illness*. 2011;33(7):1019-34.
17. Fägerskiöld A. A change in life as experienced by first-time fathers. *Scandinavian Journal of Caring Sciences*. 2008;22(1):64-71.
18. Gungor I, Beji NK. Effects of fathers' attendance to labor and delivery on the experience of childbirth in Turkey. *Western Journal of Nursing Research*. 2007;29(2):213-31.

19. Kainz G, Eliasson M, von Post I. The child's father, an important person for the mother's well-being during the childbirth: A hermeneutic study. *Health Care for Women International*. 2010;31(7):621-35.
20. Barker G. Engaging men and boys in caregiving: Reflections from research, practice and policy advocacy in Latin America. Preparado para la reunión del grupo de expertos sobre el reparto equitativo de las responsabilidades entre mujeres y hombres, incluidos los cuidados prestados en el contexto del VIH/SIDA, organizado por la División de las Naciones Unidas para el Adelanto de la Mujer, Ginebra. 2008.
21. Ditekemena J, Koole O, Engmann C, Matendo R, Tshefu A, Ryder R, et al. Determinants of male involvement in maternal and child health services in sub-Saharan Africa: A review. *Reproductive Health*. 2012;9(1):32.
22. Dudgeon MR, Inhorn MC. Men's influences on women's reproductive health: Medical anthropological perspectives. *Social Science & Medicine*. 2004;59(7):1379-95.
23. Kakaire O, Kaye DK, Osinde MO. Male involvement in birth preparedness and complication readiness for emergency obstetric referrals in rural Uganda. *Reproductive Health*. 2011;8(12):1-7.
24. Koo K, Makin JD, Forsyth BW. Barriers to male-partner participation in programs to prevent mother-to-child HIV transmission in South Africa. *AIDS Education and Prevention*. 2013;25(1):14-24.
25. Maman S, Moodley D, Groves AK. Defining male support during and after pregnancy from the perspective of HIV-positive and HIV-negative women in Durban, South Africa. *Journal of Midwifery & Women's Health*. 2011;56(4):325-31.
26. Mohlala BK, Gregson S, Boily M-C. Barriers to involvement of men in ANC and VCT in Khayelitsha, South Africa. *AIDS Care*. 2012;24(8):972-7.
27. Mullany BC. Barriers to and attitudes towards promoting husbands' involvement in maternal health in Katmandu, Nepal. *Social Science & Medicine*. 2006;62(11):2798-809.
28. Nkuoh GN, Meyer DJ, Tih PM, Nkfusai J. Barriers to men's participation in antenatal and prevention of mother-to-child HIV transmission care in Cameroon, Africa. *Journal of Midwifery & Women's Health*. 2010;55(4):363-9.
29. Marmot, M., Friel, S., Bell, R., Houweling, T. A., Taylor, S., & Commission on Social Determinants of Health. (2008). Closing the gap in a generation: Health equity through action on the social determinants of health. *The Lancet*, 372(9650), 1661-1669.
30. Connell RW. Masculinities and globalization. *Men and Masculinities*. 1998;1(1):3-23.
31. Connell RW, Connell R. Masculinities: Univ of California Press; 2005.
32. Connell RW, Messerschmidt JW. Hegemonic masculinity: Rethinking the concept. *Gender & Society*. 2005;19(6):829-59.
33. Santana MC, Raj A, Decker MR, La Marche A, Silverman JG. Masculine gender roles associated with increased sexual risk and intimate partner violence perpetration among young adult men. *Journal of Urban Health*. 2006;83(4):575-85.
34. Medel-Anonuevo, C. (1995). Women, Education and Empowerment: Pathways towards Autonomy. UIE Studies 5.
35. Kabeer, N. (1999). Resources, agency, achievements: Reflections on the measurement of women's empowerment. *Development and Change*, *30*(3), 435-464.
36. Kabeer, N. (2001). Discussing Women's Empowerment Theory and Practice.
37 Arriola, L. R., & Johnson, M. C. (2014). Ethnic politics and women's empowerment in Africa: Ministerial appointments to executive cabinets. *American Journal of Political Science*, *58*(2), 495-510.

38. Karim, N., Picard, M., Gillingham, S., & Berkowitz, L. (2014). Building capacity to measure long-term impact on women's empowerment: CARE's women's empowerment impact measurement initiative. *Gender & Development*, *22*(2), 213-232.
39. Malapit, H. J., Sproule, K., Kovarik, C., Meinzen-Dick, R. S., Quisumbing, A. R., Ramzan, F., & Alkire, S. (2014). Measuring progress toward empowerment: Women's empowerment in agriculture index: Baseline report. Intl Food Policy Res Inst.
40. MacPhail C, Campbell C. 'I think condoms are good but, aai, I hate those things': Condom use among adolescents and young people in a Southern African township. *Social Science & Medicine*. 2001;52(11):1613-27.
41. Bowleg L. Love, sex, and masculinity in sociocultural context HIV concerns and condom use among African American men in heterosexual relationships. *Men and Masculinities*. 2004;7(2):166-86.
42. Amaro H. Love, sex, and power: Considering women's realities in HIV prevention. *American Psychologist*. 1995;50(6):437
43. Nyanzi S, Nyanzi-Wokholi B, Kalina B. Male promiscuity: The negotiation of masculinities by motorbike taxi-riders in Masaka, Uganda. *Men and Masculinities*. 2008.
44. Anderson KL, Umberson D. Gendering Violence: Masculinity and power in men's accounts of domestic violence. *Gender & Society*. 2001;15(3):358-80.
45. Simpson, J. A., Farrell, A. K., Oriña, M. M., & Rothman, A. J. (2015). Power and social influence in relationships. APA handbook of personality and social psychology, 393-420.
46. Jennings L, Na M, Cherewick M, Hindin M, Mullany B, Ahmed S. Women's empowerment and male involvement in antenatal care: Analyses of Demographic and Health Surveys (DHS) in selected African countries. *BMC Pregnancy and Childbirth*. 2014;14(1):297.
47. Gilmore DD. Manhood in the making: Cultural concepts of masculinity: Yale University Press; 1990.
48. Lancaster RN. Life is hard: Machismo, danger, and the intimacy of power in Nicaragua: Univ of California Press; 1994
49. ICF International I. Demographic and Health Survey. Country Final Reports Calverton, MD USA. Available from: http://dhsprogram.com/Publications/Publications-by-Country.cfm.
50. WHO. Global health risks: mortality and burden of disease attributable to selected major risks: World Health Organization; 2009.
51. Malik K. Human development report 2014. Sustaining human progress: Reducing vulnerabilities and building resilience. New York: United Nations Development Programme. 2014.
52. ICF International I. Demographic and Health Survey. Country Final Reports Calverton, MD USA. Available from: http://dhsprogram.com/Publications/Publications-by-Country.cfm.
53. Bloom, S. S., Wypij, D., & Das Gupta, M. (2001). Dimensions of women's autonomy and the influence on maternal health care utilization in a north Indian city. *Demography*, *38*(1), 67-78.
54. Patel, V., & Prince, M. (2006). Maternal psychological morbidity and low birth weight in India. *The British Journal of Psychiatry*, *188*(3), 284-285.
55. Woldemicael, G., & Tenkorang, E. Y. (2010). Women's autonomy and maternal health-seeking behavior in Ethiopia. *Maternal and Child Health Journal*, *14*(6), 988-998.

56. Hou, X., & Ma, N. (2012). The effect of women's decision-making power on maternal health services uptake: Evidence from Pakistan. *Health Policy and Planning*, *28*(2), 176-184.
57. Kaufman, G. (2000). Do gender role attitudes matter? Family formation and dissolution among traditional and egalitarian men and women. *Journal of Family Issues*, *21*(1), 128-144.
58. Greene, M. E., Mehta, M., Pulerwitz, J., Wulf, D., Bankole, A., & Singh, S. (2006). Involving men in reproductive health: Contributions to development. Background paper prepared for the UN Millennium Project to contribute to the report Public Choices, Private Decisions: Sexual and Reproductive Health.

Chapter 4:

Paternal Antenatal Care Attendance, Paternal Values of Women's Empowerment and Associations with Knowledge and Practice of Sexual Health Behaviors

Abstract

Introduction: Increased paternal engagement in ANC and birth positively influences pregnancy outcomes. There is very little research that describes the men's value of the reproductive health of their partner and its impact on paternal engagement in preconception, antenatal, and postpartum care. The purpose of this study was to examine the potential associations with paternal ANC attendance, paternal values of women's empowerment, and reproductive health related variables.

Methods: Secondary analysis of a men’s survey conducted from data collected by the Demographic and Health Surveys (DHS) (n=26892) from nine sub-Saharan countries. Data were pooled into an aggregate dataset and examined through various regression methods.

Results: Contraceptive use, knowledge of the ovulatory cycle, knowledge of HIV/STI risk reduction strategies, and risky sexual behavior were associated with PVWE. Contraceptive use, knowledge of HIV/STI risk reduction strategies, and risky sexual behavior was also positively associated with Paternal ANC attendance. Knowledge of the ovulatory cycle was negatively associated with paternal clinic attendance

Conclusions: Several reproductive health variables were associated with paternal ANC and PVWE. It appears that contraceptive use, knowledge of the ovulatory cycle, knowledge of risk reduction strategies, and risky sexual behavior are each independently associated with Paternal ANC and PVWE. More research is needed to determine the direction of these associations. By increasing knowledge about fathers, and more broadly, men, understanding one of the complexities in the root causes of maternal-newborn morbidity and mortality may become clearer.

Keywords: Fathers, Maternal-newborn health, Partner Participation in Pregnancy, Gender equality

Paternal Antenatal Care Attendance, Paternal values of Women's Empowerment and associations with Knowledge and Practice of Sexual Health Behaviors

Introduction

Paternal Antenatal clinic attendance (ANC) has been shown to positively affect pregnancy outcomes[1-6], decrease negative maternal health behaviors[2, 4-7], and reduce rates of preterm birth, low birth weight, fetal growth restriction, and infant mortality.[2-7] Despite the benefits of Paternal ANC attendance, roughly about 50% of men in sub-Saharan Africa attend at least one ANC appointment of their partner.[8] Although much is known about the benefits of paternal participation in ANC, there is very little research that describes constructions of masculinity and its impact on paternal engagement in preconception, antenatal, and postpartum care.[9] Little is known about the relationships between paternal participation in ANC and paternal perceptions and knowledge of: women's empowerment, partner's reproductive health, HIV/STI transmission, domestic violence, and contraception. These relationships are vital to understand because they can reveal how particular norms of masculinity influence reproductive health. For example, there is literature that predominant sexual norms for men and the associated values of women's empowerment encourage male promiscuity, avoidance of condom use, and sanction violence against women.[10-14] Furthermore, it is unclear if male sexual norms associated with masculinist values of women's empowerment can be present and compatible with paternal participation in ANC.

The 2008 United Nations (UN) Commission on the Status of Women concluded that men are key to the health of the family and must be active participants in ANC as well as many aspects of pregnancy health.[15] The commission further concluded that individual men are often dismissed or blamed for low engagement without adequately questioning the social and contextual constructions of gender relations that lead to

inequalities.[10] Dominant ideologies of masculinity determine the current most honored way of being a man. Idealized versions of manhood require men to position themselves in relation to such idealizations; in so doing, they legitimize and perpetuate the global subordination of women to men.[16-18]

There are several important associations that must be explored to better elucidate sociocultural norms of masculinity and their effects on fathers. One way to do this is to explore whether paternal values of women's empowerment influences men's family planning and HIV/STI knowledge and beliefs and sexual risk behaviors that influence maternal health. This is important to explore because it is known that women with male partners with non-egalitarian values of reproductive health have poorer health outcomes than those who have more egalitarian values of reproductive health.[19] However, it remains unknown whether men who have more egalitarian values of women also have more egalitarian values of family planning, HIV/STIs, and domestic violence and/or avoid risky sexual behavior. In other words, it is plausible that sociocultural norms of masculinity create an environment for men to have egalitarian values of women and participate in risky sexual behavior as a form of alternative masculinity to compensate for participating in reproductive health activities, long considered a "feminine" domain. The second and final association that is important to explore is whether there is a relationship between paternal participation in ANC and paternal knowledge/beliefs of family planning and sexual risk behaviors. Do men who participate in an area that is traditionally considered a woman's area develop other beliefs/ attributes that "make up" for potentially appearing feminine? This type of phenomenon can be seen in a variety of areas, most notably in men who are nurses.[20] Men who are nurses tend to create a distance from the 'feminine' aspects of the job. Men have a tendency to gravitate towards 'adrenaline charged' areas of nursing that demand quick thinking under pressure and demand a distance from the emotional aspects of the profession. Men who participate in

a female dominated area tend to adopt strategies to preserve their masculinity. The various strategies are a way to "balance" their masculinity. This concept may also apply to men who participate in ANC. Do men who participate in ANC compensate by being perceived as hyper masculine in other domains of their life such as engaging in risky behavior? Again, do men who value the reproductive rights of women compensate in other domains in their life such as having multiple concurrent sexual partners? The current study is intended to understand more about the men who attend ANC appointments and those who do not attend. Additionally, this study seeks to understand more about the characteristics of men who value the reproductive rights of women and those who do not.

Paternal Values of Women's Empowerment

Our full description of paternal values of women's empowerment (PVWE) has been described elsewhere.[8] In the current study, we measure women's empowerment as women's decision-making power over her reproductive health. Hence, paternal values of women's empowerment can be defined as men's values of a woman's decision-making power regarding her reproductive health.

This inquiry examines if men's family planning and HIV/STI knowledge and beliefs, sexual risk behaviors, and ultimately, maternal health is associated with PVWE and paternal ANC attendance. This is important to explore because it is known that women with male partners with non-egalitarian values of the human right to reproductive health are associated with having poorer health outcomes than those who have more egalitarian values of that right.[19] However, it remains unknown whether men who have more egalitarian values of women also have more egalitarian values of access to family planning and HIV/STIs prevention. Additionally, it is unknown if men who

attend ANC have different knowledge or beliefs pertaining to family planning and HIV/STI prevention.

Methods

Demographic and Health Survey

Demographic and Health Surveys (DHS) are nationally-representative household surveys that provide data for a wide range of monitoring and impact evaluation indicators in the areas of population, health, and nutrition. Standard DHS Surveys have large sample sizes (usually between 5,000 and 30,000 households) and typically are conducted about every 5 years, to allow comparisons over time. The DHS Program is authorized to distribute, at no cost, unrestricted de-identified survey data files for legitimate academic research. Registration is required for access to data. The data is used frequently by the World Health Organization (WHO) as well as other regional and national health organizations.[21] The various aspects of the DHS survey for the current study including sampling, country selection, and country settings have been descried in greater detail in another manuscript by the authors.

Country Selection

The proposed study includes nine Sub-Saharan African countries, because sub-Saharan Africa bears 99% of the global burden of maternal mortality and maternal morbidity.[22] The nine countries were chosen based on having met each of the following inclusion criteria: conducted a DHS in the year 2010 or later that included a men's survey measuring antenatal accompaniment, women's empowerment questions regarding household decision-making, control over earnings, attitudes towards domestic violence, asset ownership, as well as knowledge variables about reproductive health, HIV/ STIs, and contraception. The nine countries were grouped into three regions, based on United

Nations designated geo-political boundaries, to achieve an adequate sample. The Democratic Republic of Congo and Rwanda are considered central Africa, Malawi, Zimbabwe, and Zambia are pooled to form Central Africa, and Burkina Faso, Liberia, Nigeria, and Sierra Leone are considered West Africa.

Outcome Measure:

Paternal Antenatal Clinic Attendance: Paternal antenatal clinic attendance is an outcome variable of interest. The variable is the response from men who have had children under the age of two. The question asked men if they attended at least one antenatal appointment during his partner's last pregnancy.

Paternal values of women's empowerment (PVWE): PVWE are measured as a composite score, ranging from 0-4, where 0 represents "Low view of women's empowerment/status of women" and 4 represents "high view of women's empowerment/ status of women." The index is a summation of four questions asked of every man in the survey (Table I). A man can receive a score from 0-4 depending on how he responds to the four dichotomous questions. The low view of the status of women is analogous to norms of masculinity that place low value on women while the high view of the status of women is analogous to more progressive forms of masculinity that tend to have more equitable values of women.

Table II: Variables within the Index of Paternal Values of Women's Empowerment
Contraception is woman's business, man should not worry
Women who use contraception become promiscuous
Wife justified refusing sex: husband has other women

Wife justified asking husband to use condom if he has STI

Explanatory Variables

Current contraceptive use by method type: This survey variable assesses what type of contraceptive method a man is currently using. There are three potential response options for the current contraceptive use by method type variable: no method, traditional methods (song, dance, prayer, supplements), and modern methods (condoms, IUD, pills, injection).

Knowledge of Ovulatory cycle: This variable assesses a man's knowledge of when a woman is most fertile throughout her cycle. A man was asked when in a woman's menstrual cycle is she most fertile. There were a variety of response choices. The variable is consolidated into a dichotomous variable. The two categories are "accurate knowledge of ovulatory cycle" and "inaccurate knowledge of ovulatory cycle."

Knowledge of risky sexual health behaviors: Two variables assessed risk reduction knowledge based on two separate dichotomous questions:

1) Can people protect themselves from HIV/AIDS by using a condom correctly every time they have sex?
2) Can people protect themselves from the by having one uninfected faithful partner?

These questions are assessing a father's knowledge of STI/HIV risk reduction techniques.

Practice of risky sexual health behaviors: For this analysis, the core indictors of risky sexual behavior will be "higher-risk sex" AND failure to use a condom during the last higher-risk sexual encounter. Per DHS, higher risk sex is defined as having sexual

intercourse with neither a spouse nor a cohabiting partner in the past 12 months prior to the respective surveys. The DHS questionnaire is designed to address heterosexual sex.

Men were categorized as reporting 'higher-risk sex' if they had condomless sex with a woman other than their spouse or cohabiting partner, or if they paid for sex regardless of condom usage. Otherwise they were categorized as engaging in lower-risk sex

Adjustment Variables: Prior research has shown that age, educational level, fathering children with multiple partners, religion, wealth, number of wives/ partners, and geographic location have been associated with paternal ANC attendance and PVWE. These variables will be referred to as simply "adjustment variables" for the remainder of the text.

Analysis

Data were analyzed using SAS 9.3 (Carey, NC). First, we described the sample characteristics for each country. In order to balance the need for adequate sample size while retaining some degree of geographic distinction, countries were combined based on their geographic region in Africa (Western, Central, Southern). To address associations between paternal clinic attendance and men's family planning knowledge, HIV/STI knowledge and beliefs, and sexual risk behaviors, three logistic models were created using paternal ANC attendance as the outcome variable and men's family planning knowledge, HIV/STI knowledge and beliefs, and sexual risk behaviors as explanatory variables, respectively, using the adjustment variables.

Next, to address associations between empowerment and men's family planning knowledge, HIV/STI knowledge and beliefs, and sexual risk behaviors, three logistic models were created using PVWE as the outcome variable and men's family planning

knowledge, HIV/STI knowledge and beliefs, and sexual risk behaviors as explanatory variables, respectively, controlling for the adjustment variables.

Additional logistic models were generated, this time pooling all nine countries in the analysis. Additional regression models were created for each of the explanatory variables examined. All analyses incorporated DHS sample weights, using complex survey design methods to produce valid variance estimations. Odds ratios were considered statistically significant at $p < .05$.

Ethical considerations

The proposed analysis was exempt as described in the guidelines issued by the Emory University Institutional Review Board.

Results

Table II contains the sample demographic characteristics by country. The mean age of fathers in the study ranged from 33.06 (±7.46) in Liberia to 37.33 (±8.90) in Burkina Faso. Education and religion patterns varied considerably among the nine countries in the study. Urban residence was low in all nine countries, ranging from 10.4% in Malawi to 35.6% in Zambia. The number of women a man has fathered children with, as well as his number of wives/ partners, remains relatively constant between countries. Table III shows the sample demographic characteristics by region and as a composite data set. The mean age for all three regions was similar. The aggregate data set has a mean age of 34.67 (± 8.11). Islam, Catholicism, and Protestantism are the predominant religions in the Western, Central, and Southern regions respectively. In the combined data set, Islam seems to be the predominant religion (28.1%) followed closely by Protestantism (22.8%) and non-specific Christian religions (22.6%). Most men in the sample (63.1-66.7%) have

fathered children with only one partner. Approximately 74.3 -86.5% of the men in the sample had only one partner at the time of the survey.

Table III: Demographic Characteristics by Country

Region	Western Africa	Central Africa	Western Africa	Southern Africa	Western Africa	Central Africa	Western Africa	Southern Africa	Southern Africa
Country	Burkina Faso	DRC	Liberia	Malawi	Nigeria	Rwanda	Sierra Leone	Zambia	Zimbabwe
Year	2010	2013-2014	2013	2010	2013	2010	2013	2013-2014	2010-2011
Sample Size (N)	2856	3430	1400	3015	5419	1734	2184	4954	1900
Age (Years)	37.33 ± 8.90	34.91 ± 8.56	33.06 ± 7.46	33.23 ± 7.84	35.59 ± 6.99	33.57 ± 8.22	35.72 ± 8.89	34.02 ± 8.12	32.54 ± 7.27
Education									
No Education	2150 (75.3)	177 (5.2)	256 (18.3)	255 (8.5)	1543 (28.5)	286 (16.5)	1276 (58.4)	274 (5.5)	13 (0.7)
Incomplete Primary	335 (11.7)	625 (18.2)	366 (26.1)	1676 (55.6)	307 (5.7)	977 (56.3)	179 (8.2)	1427 (28.8)	189 (9.9)
Complete Primary	103 (3.6)	287 (8.4)	63 (4.5)	261 (8.7)	905 (16.7)	263 (15.2)	86 (3.9)	933 (18.8)	291 (15.3)
Incomplete Secondary	207 (7.2)	1423 (41.5)	456 (32.6)	433 (14.4)	561 (10.4)	132 (7.6)	420 (19.2)	1428 (28.8)	1225 (64.5)
Complete Secondary	22 (0.8)	690 (20.1)	198 (14.1)	320 (10.6)	1300 (24.0)	41 (2.4)	133 (6.1)	527 (10.6)	57 (3.0)
Higher	39 (1.4)	228 (6.6)	61 (4.4)	70 (2.3)	803 (14.8)	35 (2.0)	90 (4.1)	364 (7.3)	125 (6.6)
Religion									
No religion	3 (0.0)	91 (2.7)	43 (3.1)	87 (2.9)	0 (0.0)	36 (2.1)	1 (0.1)	0 (0.0)	466 (43.3)
Muslim	1766 (61.9)	75 (2.2)	191 (13.7)	327 (10.9)	3062 (56.8)	22 (1.3)	1805 (82.8)	35 (0.7)	13 (1.2)
Catholic	614 (21.5)	927 (27.1)	0 (0.0)	621 (20.6)	464 (8.6)	780 (45.0)	0 (0.0)	894 (18.1)	155 (14.4)
Protestant	151 (5.3)	992 (29.0)	0 (0.0)	0 (0.0)	0 (0.0)	655 (37.8)	0 (0.0)	3937 (79.9)	197 (18.3)
Traditional/ Animist	318 (11.2)	24 (0.7)	33 (2.4)	0 (0.0)	65 (1.2)	0 (0.0)	1 (0.1)	0 (0.0)	107 (10.0)
Non-specified Christian	0 (0.0)	1171 (34.2)	1128 (80.9)	1270 (42.1)	1795 (33.3)	0 (0.0)	367 (16.8)	0 (0.0)	133 (12.4)
Other	0 (0.0)	147 (4.3)	0 (0.0)	709 (23.5)	9 (0.2)	241 (13.9)	6 (0.3)	63 (1.3)	4 (0.4)
	2852	3427	1395	3014	5395	1734	2180	4929	1075
Wealth									
Poorest	533 (18.7)	842 (24.5)	487 (34.8)	545 (18.1)	1112 (20.5)	338 (19.5)	530 (24.3)	1105 (22.3)	415 (21.8)
Poorer	601 (21.0)	831 (24.2)	393 (28.1)	682 (22.6)	1135 (20.9)	345 19.9)	465 (21.3)	1256 (24.4)	364 (19.2)
Middle	591 (20.7)	756 (22.0)	261 (18.6)	704 (23.3)	1028 (19.0)	360 (20.8)	450 (20.6)	1081 (21.8)	371 (19.5)
Richer	615 (21.5)	594 (17.3)	153 (10.9)	608 (20.2)	1087 (20.1)	348 (20.1)	419 (19.2)	876 (17.7)	414 (21.8)
Richest	516 (18.1)	407 (11.9)	106 (7.6)	476 (15.8)	1057 (19.5)	342 (19.8)	320 (14.7)	636 (12.8)	336 (17.7)
Geographic location									
Urban	681 (23.8)	936 (27.3)	417 (29.8%)	315 (10.4)	1872 (34.5)	262 (15.1)	612 (28.0)	1763 (35.6)	571 (30.1)
Rural	2175 (76.2)	2494 (72.7)	983 (70.2%)	2700 (89.6)	3547 (65.5)	1472 (84.9)	1572 (72.0)	3191 (64.4)	1329 (69.9)
Number of Women fathered children with									
1	1705 (59.7)	2017 (58.8)	703 (50.2)	1992 (66.1)	2869 (71.4)	1395 (80.4)	1210 (55.4)	3200 (64.6)	1389 (73.1)
2	846 (29.6)	1007 (29.4)	500 (35.7)	796 (26.4)	1227 (22.6)	301 (17.4)	705 (32.3)	1354 (27.3)	403 (21.2)
3 or more	304 (10.6)	402 (11.7)	197 (14.1)	220 (7.3)	298 (5.5)	36 (2.1)	264 (12.1)	395 (8.0)	108 (5.7)

Number of wives/ partners									
No current wife/partner	36 (1.4)	166 (4.8)	141 (10.1)	115 (3.8)	119 (2.2)	79 (4.6)	134 (6.1)	355 (7.2)	96 (5.1)
1	1948 (68.2)	2728 (79.5)	1156 (82.6)	2627 (87.1)	4187 (77.3)	1613 (93.0)	1516 (69.4)	4209 (85.0)	1701 (89.5)
2 or more wives	872 (30.5)	536 (15.6)	103 (7.4)	273 (9.1)	1113 (20.5)	42 (2.4)	534 (24.5)	390 (7.9)	103 (5.4)

Table VIII shows how the key variables of interest are distributed among the various regions in the study. Most of the men in the study fall in the "High" empowerment category. Contraceptive use varies among the countries included in the three regions. The countries in Southern Africa seem to use more modern methods than any other type (49.6%). Overall the knowledge of when a woman is most fertile is low among all regions of Africa. 12.7 and 33.7% of the sample in the southern and central regions correctly identified when a woman is most fertile.

Most men in the sample believe they can reduce the risk of HIV and STIs by using condoms and by only having one active sexual partner who does not have other partners. Additionally, most of the men in the sample do not practice "high risk" sexual behavior.

Table IV: Demographic Characteristics by Region and Aggregate of all 9 Countries

Country	Western Africa	Central Africa	Southern Africa	Combined Africa
Year	2010-2013	2010-2014	2010-2014	2010-2014
Sample Size (N)	11859	5164	9869	26892
Age (Years)	35.74 ± 8.00	34.4 6 ± 8.47	33.49 ± 7.89	34.67 ± 8.11
Education				
No Education	5225 (44.1)	463 (9.0)	542 (5.5)	6239 (23.2)
Incomplete Primary	1187 (10.0)	1602 (31.0)	3292 (33.4)	6081 (22.6)
Complete Primary	1157(9.8)	550 (10.7)	1485 (15.0)	3192 (11.9)
Incomplete Secondary	1644 (13.9)	1555 (30.1)	3086 (31.3)	6285 (23.4)
Complete Secondary	1653 (13.9)	731 (14.2)	904 (9.2)	3288 (12.2)
Higher	993 (8.4)	263 (5.1)	559 (5.7)	1815 (6.7)
Religion				
No religion	47 (0.4)	127 (2.5)	553 (6.1)	727 (2.8)
Muslim	6824 (57.7)	97 (1.9)	375 (4.2)	7296 (28.1)
Catholic	1078 (9.1)	1707 (33.1)	1670 (18.5)	4455 (17.1)
Protestant	151 (1.3)	1647 (31.9)	4134 (45.8)	5932 (22.8)
Traditional/ Animist	417 (3.5)	24 (0.5)	107 (1.2)	548 (2.1)
Non-specified Christian	3290 (27.8)	1171 (22.7)	1403 (15.6)	5864 (22.6)
Other	15 (0.1)	388 (7.5)	776 (8.6)	1179 (4.5)
	11822	5161	9018	26001
Wealth				
Poorest	2662 (22.4)	1180 (22.9)	2065 (20.9)	5907 (22.0)

Poorer	2594 (21.9)	1176 (22.8)	2302 (23.3)	6072 (22.6)
Middle	2330 (19.6)	1116 (21.6)	2156 (21.8)	5602 (20.8)
Richer	2274 (19.2)	942 (18.2)	1898 (19.2)	5114 (19.0)
Richest	1999 (16.9)	750 (14.5)	1448 (14.7)	4197 (15.6)
Geographic location				
Urban	3582 (30.2)	1198 (23.2)	2649 (26.8)	7429 (27.6)
Rural	8277 (69.8)	3966 (76.8)	7220 (73.2)	19463 (72.4)
Number of Women fathered children with				
1	7487 (63.3)	3412 (66.1)	6581 (66.8)	17480 (65.1)
2	3278 (27.8)	1308 (25.4)	2553 (25.9)	7139 (26.6)
3 or more	1063 (8.9)	438 (8.5)	723 (7.3)	2224 (8.3)
Number of wives/ partners				
No current wife/partner	430 (3.6)	245 (4.7)	566 (5.7)	1241 (4.6)
1	8807 (74.3)	4341 (84.1)	8537 (86.5)	21685 (80.6)
2 or more wives	2622 (22.1)	578 (11.2)	766 (7.8)	3966 (14.8)

Table VIII: Distribution of Key Variables: PVWE, ANC Attendance, & Reproductive health Variables

Country	Western Africa	Central Africa	Southern Africa	Combined Africa
Year	2010-2013	2010-2014	2010-2014	2010-2014
Sample Size	11859	5164	9869	26892
Paternal ANC Attendance				
No	5358 (52.6)	2272 (48.2)	4227 (46.0)	11857 (49.2)
Yes	4824 (47.4)	2441 (51.8)	4971 (54.0)	12236 (50.8)
Empowerment level "0"	319 (2.7)	166 (3.2)	205 (1.1)	590 (2.2)
Empowerment level "1"	724 (6.1)	410 (7.9)	557 (5.6)	1691 (6.3)
Empowerment level "2"	2796 (23.6)	892 (17.3)	1942 (19.7)	5630 (20.9)
Empowerment level "3"	3639 (30.7)	1426 (27.6)	3091 (31.3)	8156 (30.3)
Empowerment level "4"	4344 (36.6)	2267 (43.9)	4161 (42.2)	10772 (40.1)
Current Contraceptive Type				
No Method	9588 (80.8)	3558 (68.9)	4603 (46.6)	17749 (66.0)
Traditional Method	385 (3.2)	525 (10.2)	368 (3.7)	1278 (4.8)
Modern Method	1886 (15.9)	1081 (20.9)	4898 (49.6)	7865 (29.2)
Knowledge of Ovulatory Cycle				
Inaccurate Knowledge	8575 (80.6)	3098 (64.0)	7778 (86.8)	19451 (79.4)
Accurate Knowledge	2059 (19.4)	1739 (36.0)	1255 (13.2)	5053 (20.6)
Reduce risk of getting HIV: Always use condoms during sex				
No	1371 (12.6)	723 (14.9)	1598 (16.5)	3692 (14.5)
Yes	9481 (87.4)	4145 (85.1)	8094 (83.5)	21720 (85.5)

Reduce risk of getting HIV: Have one sex partner only, who has no other partners				
No	711 (6.4)	581 (13.2)	576 (5.8)	1868 (6.9)
Yes	10415 (93.6)	4388 (86.8)	9214 (93.4)	24017 (89.3)
Risky Sexual Behavior				
Low	11126 (92.1)	4487 (89.5)	9036 (93.9)	23729 (91.9)
High	959 (7.9)	529 (10.5)	592 (6.1)	2080 (8.1)

Paternal antenatal clinic attendance and paternal: knowledge of family planning methods, knowledge, and practice of sexual health behaviors

Table V: Shows the association between paternal antenatal clinic attendance and contraceptive use, knowledge of ovulatory cycle, Knowledge of HIV/STI risk reduction strategies, and risky sexual behavior. There are significant but discordant associations between father's antenatal care attendance and contraceptive method across regions of Africa. In western African countries, use of traditional contraceptive methods versus no method is associated with lower probability (0.73 the odds) of attending antenatal care, whereas fathers in central and southern African countries are more likely to attend ANC than their non-contracepting comparison, although the association is not statistically significant in southern Africa. When comparing fathers' in couples using modern contraceptive methods as compared to no methods, ANC attendance is increased in all regions.

Fathers who have accurate knowledge of the ovulatory cycle are associated with a lower antenatal care attendance than fathers who do not have accurate knowledge of the ovulatory cycle. This association is found in both the central Africa region as well the combined data set. There is an association between HIV/STI risk reduction beliefs and paternal antenatal clinic attendance. For example, fathers in the combined data set who hold the belief that condoms can reduce the risk of STI/HIV transmission are more likely to attend antenatal clinic attendance than fathers who do not hold that belief.

Additionally, fathers who hold the belief that having a sexual partner who does not have other sexual partners can reduce the risk of HIV/STI transmission are more likely to attend antenatal care when compared to men who do not hold this belief.

Finally, it appears that fathers who are in the "low risk" category in terms of risky sexual behavior are associated with higher clinic attendance when compared to men who are in the "high risk" category. This association is present in the Central and Southern African regions as well as in the combined data set.

Table IX: Odds Ratios and 95% confidence intervals of paternal antenatal clinic attendance as outcome variable by paternal: contraceptive use, knowledge of ovulatory cycle, Knowledge of HIV/STI risk reduction strategies, and risky sexual behavior.

Region	Western Africa	Central Africa	Southern Africa	Combined Africa
Year	2010-2013	2010-2014	2010-2014	2010-2014
Sample Size	11859	5164	9869	26892
Traditional Contraceptive Method vs no contraceptive method	**0.73** (0.54 - 0.98)	**1.60** (1.24 - 2.07)	1.27 (0.98 - 1.64)	**1.25** (1.07 - 1.46)
Modern Contraceptive Method vs no contraceptive Method	**1.24** (1.08 - 1.43)	**2.27** (1.69 - 3.06)	**1.17** (1.05 - 1.30)	**1.52** (1.41 - 1.65)
Accurate vs inaccurate knowledge of ovulatory cycle	0.89 (0.77 - 1.04)	0.60 (0.48 - 0.76)	0.93 (0.79 - 1.09)	**0.73** (0.66 - 0.81)
Condoms reduce HIV risk yes vs no	1.12 (0.92 – 1.34)	**1.59** (1.21 - 2.09)	**1.12** (1.21 - 2.09)	**1.26** (1.14 - 1.39)
Monogamy reduces HIV risk yes vs no	1.15 (0.92 - 1.44)	0.90 (0.71 - 1.15)	1.24 (0.98 - 1.56)	0.98 (0.86 - 1.12)
Low risk vs high risk sexual behavior	1.19 (0.98 - 1.44)	**1.55** (1.17 - 2.06)	**1.37** (1.09 - 1.71)	**1.51** (1.33 - 1.72)

Table X: Odds Ratios and 95% confidence intervals of PVWE as outcome variable by paternal: contraceptive use, knowledge of ovulatory cycle, Knowledge of HIV/STI risk reduction strategies, and risky sexual behavior.

Region	Western Africa	Central Africa	Southern Africa	Combined Africa
Year	2010-2013	2010-2014	2010-2014	2010-2014
Sample Size	11859	5164	9869	26892
Traditional Contraceptive Method vs no contraceptive method	1.01 (0.77 - 1.32)	**1.41** (1.13 - 1.77)	1.03 (0.81 - 1.31)	**1.19** (1.04 - 1.37)
Modern Contraceptive Method vs no contraceptive Method	**1.50** (1.31 - 1.72)	**2.38** (1.95 - 2.91)	1.10 (0.99 - 1.22)	**1.53** (1.42 - 1.65)
Accurate vs inaccurate knowledge of ovulatory cycle	**1.59** (1.37 - 1.84)	1.04 (0.84 - 1.28)	**1.44** (1.21 - 1.71)	**1.32** (1.20 - 1.46)
Condoms reduce HIV risk yes vs no	**1.40** (1.19 - 1.64)	**1.87** (1.55 - 2.26)	**1.29** (1.13 - 1.46)	**1.48** (1.35 - 1.61)
Monogamy reduces HIV risk yes vs no	**1.91** (1.55 - 2.36)	0.98 (0.75 - 1.27)	**1.55** (1.26 - 1.92)	**1.39** (1.23 - 1.59)
Low risk vs high risk sexual behavior	**1.40** (1.16 - 1.69)	**1.89** (1.50 - 2.38)	**1.61** (1.33 - 1.96)	**1.71** (1.52 - 1.93)

PVWE and paternal: knowledge of family planning methods, knowledge and practice of sexual health behaviors

Table VI: Shows the association between contraceptive use, knowledge of ovulatory cycle, knowledge of HIV/STI risk reduction strategies, risky sexual behavior and PVWE. In Table VI, we examine the association of having a PVWE score of 0 versus 4, as a function of predictor variables including contraceptive use, knowledge of the ovulatory cycle, STI/HIV knowledge/beliefs, and risky sexual behavior.

In Central Africa, those men who use a traditional contraceptive method are 1.4 times more likely to value women's decision-making power than men who use no contraceptive method. Moreover, men who use a modern form of contraception are 2.38 times more likely to value women's decision-making power than men who use no method.

The Western, Southern and combined regions all have an association between knowledge of the ovulatory cycle and PVWE. Father's belief that condoms reduce HIV risk was positively associated with PVWE in all three regions. The western and southern regions also have an association between the belief that monogamy can reduce HIV risk and PVWE when controlling for the adjustment variables. In all regions except Central Africa, fathers who believe monogamy reduces HIV risk are more likely to value women's empowerment than men who do not hold this belief (West Africa OR 1.91).

The final significant association in the study is between risky sexual behavior and PVWE. This association was found in all three regions as well as in the pooled data set. A man who engages in low risky sexual behavior compared to a man who practices risky sexual behavior has 1.89 times the odds of being in a higher empowerment category when controlling for the adjustment variables.

Discussion

The key findings in this study reveal several programmatic and future research implications.

The relationship between paternal ANC attendance and paternal beliefs and knowledge about reproductive health is complex and multifaceted. Overall, there is a relationship between contraceptive method choices and paternal antenatal clinic attendance. The first relationship identified is between type of contraceptive method used and ANC attendance. Men who use traditional methods of contraception have higher odds of attending ANC visits than men who use no contraceptive method. This relationship was present in both the Central African region as well as in the combined data set. The decision to use contraceptives may indicate that there has been a discussion about family planning that has occurred in the partnership. There also is a positive association between PVWE and contraceptive use. This finding may indicate that men

who decide to use contraception tend to hold some additional set of values or beliefs which includes having higher PVWE and being present at ANC appointments. However, this relationship does not hold in the Western African region. West African fathers' knowledge and beliefs of contraception were associated with lower ANC attendance, but not associated with higher support of values of women's empowerment. The odds ratios indicate that fathers who use traditional forms of contraception when compared to fathers who use no contraceptive have 0.73 times the odds of attending ANC visits. This contrasts with the relationships seen in the other regions. It does not appear that identifying with a religious group alone accounts for the significant differences in paternal ANC attendance seen between use of traditional contraceptive methods and no methods. It is possible that fathers who use certain types of traditional contraceptive methods in the western regions also hold traditional beliefs about PVWE. It may be possible that cultural differences are present in the western, southern, and central regions that have not been detected via the DHS survey. A future examination of inter-regional differences of traditional contraceptive beliefs may perhaps better elucidate the differences observed in this study.

Importantly, it was found that fathers who use a modern contraceptive method directly or indirectly have higher odds of attending ANC than fathers who do not use any contraceptive method. This relationship is present in all regions as well as in the combined data set. The relationship between modern contraceptive use and paternal ANC attendance is consistent with the idea that the same fathers who attend ANC appointments because they care about the health and welfare of their family would also use modern forms of contraception to prevent unwanted pregnancy. What is interesting to consider is the direction of this observed relationship. Can modern contraceptive use lead to paternal ANC attendance use or does paternal ANC attendance lead to modern use of contraception? Encouraging fathers to attend ANC visits may indirectly increase

the odds of the use of modern contraceptives among a father and his partner. Modern contraceptives have been widely available in developing countries for quite some time, yet have a relatively low utilization. One barrier to the use can be a male partner. If bringing men into the clinic reduces a future barrier to the use of modern contraception, it may be worthwhile intervention to pursue. The direction of the relationship must be examined in future studies to determine if such an intervention would work in theory.

A surprising relationship was found between paternal knowledge of the ovulatory cycle and paternal ANC attendance. Men with accurate knowledge had lower odds of attending ANC visits than did men who had inaccurate knowledge. This relationship is present in Central Africa as well as in the combined dataset. The Western and Southern African regions displayed a general trend towards this relationship but were not found to be statistically significant. A plausible explanation is the fathers who had accurate knowledge of the ovulatory cycle were also knowledgeable about other aspects of women's health. It would make sense that accurate knowledge of the female ovulatory cycle fertility would positively associate with paternal antenatal care attendance. Such visits theoretically provide opportunities for fathers to learn more about their unborn child as well as basic reproductive physiology. However, this is not the relationship that was observed in this study.

The relationships seen between STI/HIV risk reduction beliefs and paternal ANC attendance were found in two populations. The first association was among men who believe that using condoms can reduce the risk of HIV/ STI transmission and paternal ANC attendance was only found in the combined data set. The second relationship is between men who believe having one sexual partner who has no other partners can reduce the risk of HIV/STI transmission and paternal ANC attendance. This relationship is found in Central Africa only. Overall, ANC attendance does seem to have a weak relationship with STI/HIV risk reduction beliefs. A more comprehensive assessment of

STI/HIV risk reduction beliefs may better assess the nature of the relationship.

Finally, there was a relationship between risky sexual behavior and ANC attendance. In this study, a man who did not practice risky sexual behavior had 1.5 times the odds of attending ANC visits than a man who did practice risky sexual behavior. This relationship seems to make sense. Men who practice risky sexual behavior (see definition in the measurement section) seem to hold different values of women as well as have decreased ANC attendance. Risky sexual behavior may be putting both the father and his partner at risk for STI/HIVs. There are certainly other behavioral characteristics which need to be examined to determine why there exist such differences between the risk groups in ANC attendance. To our knowledge, this is the first study to examine the relationship between paternal antenatal care attendance and PVWE in sub-Saharan Africa. This study is also one of the first to examine the relationship between paternal antenatal clinic attendance and: knowledge of family planning methods, knowledge, and practice of sexual health behaviors in sub-Saharan Africa. There were several associations that were found in the study, but further research is needed.

Limitations

The study's limitations should be considered. It is likely that cultural differences not captured within the DHS survey contributed to the variability of significant findings within each region. The interviewers administrating the survey were all men, which theoretically reduces the social desirability bias. However, having a DHS representative present to administer the survey versus a paper or electronic survey, most likely results in some level of social desirability bias.

Women were not surveyed. Not having the female partners' values on what their own sense of empowerment or how they think their partner values their reproductive rights as women is important, as they can provide valuable insight into the status of their

relationship. The outcome and variables could only be obtained from the DHS men's survey. The study is also limited by the cross-sectional nature of the DHS data. The cross-sectional measure does not capture the dynamic nature of empowerment or the change over time. The values of empowerment were from the paternal viewpoint and may reflect individual bias. It is possible that men's interpretation and response to empowerment varied across settings, and some aspects of women's empowerment may not have been captured by the indicators assessed in the DHS. Ultimately, this may decrease the predictive value of the construct.

The construction of the empowerment index was chosen on a pragmatic basis. The index consisted of four items that focused on gender/social norms of empowerment. Due to missing data and the time intensive process of instrument development, four variables were used. This arguably does not give a complete picture PVWE, but it does capture several important aspects of it. Future studies using DHS data may consider constructing an index of men's values of women's empowerment, similar to indices created to assess women's empowerment from the view point of women. The study's strengths are the use of multiple empowerment variables and use of geographically diverse and representative samples, and inclusion of measures with existing literature.

References

1. Padilla YC, Reichman NE. Low birthweight: Do unwed fathers help? *Children and Youth Services Review*. 2001;23(4):427-52.
2. Alio AP, Bond MJ, Padilla YC, Heidelbaugh JJ, Lu M, Parker WJ. Addressing policy barriers to paternal involvement during pregnancy. *Maternal and Child Health Journal*. 2011;15(4):425-30.
3. Alio AP, Kornosky JL, Mbah AK, Marty PJ, Salihu HM. The impact of paternal involvement on feto-infant morbidity among Whites, Blacks and Hispanics. *Maternal and Child Health Journal*. 2010;14(5):735-41.
4. Alio AP, Mbah AK, Kornosky JL, Wathington D, Marty PJ, Salihu HM. Assessing the impact of paternal involvement on racial/ethnic disparities in infant mortality rates. *Journal of Community Health*. 2011;36(1):63-8.
5. Ghosh JKC, Wilhelm MH, Dunkel-Schetter C, Lombardi CA, Ritz BR. Paternal support and preterm birth, and the moderation of effects of chronic stress: A study in Los Angeles County mothers. *Archives of Women's Mental Health*. 2010;13(4):327-38.
6. Ngui E, Cortright A, Blair K. An investigation of paternity status and other factors associated with racial and ethnic disparities in birth outcomes in Milwaukee, Wisconsin. *Maternal and Child Health Journal*. 2009;13(4):467-78.
7. Feldman PJ, Dunkel-Schetter C, Sandman CA, Wadhwa PD. Maternal social support predicts birth weight and fetal growth in human pregnancy. *Psychosomatic Medicine*. 2000;62(5):715-25.
8. Schindler, Foster, Kramer, & Dunlop. Men's values of the reproductive rights of their partners, antenatal care attendance, and associations with reproductive health Doctoral dissertation. 2017.
9. Dolan A, Coe C. Men, masculine identities and childbirth. *Sociology of Health & Illness*. 2011;33(7):1019-34.
10. MacPhail C, Campbell C. 'I think condoms are good but, aai, I hate those things': Condom use among adolescents and young people in a Southern African township. *Social Science & Medicine*. 2001;52(11):1613-27.
11. Bowleg L. Love, sex, and masculinity in sociocultural context HIV concerns and condom use among African American men in heterosexual relationships. *Men and Masculinities*. 2004;7(2):166-86.
12. Amaro H. Love, sex, and power: Considering women's realities in HIV prevention. *American Psychologist*. 1995;50(6):437.
13. Nyanzi S, Nyanzi-Wokholi B, Kalina B. Male promiscuity: The negotiation of masculinities by motorbike taxi-riders in Masaka, Uganda. *Men and Masculinities*. 2008.
14. Anderson KL, Umberson D. Gendering violence: Masculinity and power in men's accounts of domestic violence. *Gender & Society*. 2001;15(3):358-80.
15. Bhutta ZA, Chopra M, Axelson H, Berman P, Boerma T, Bryce J, et al. Countdown to 2015 decade report (2000–10): Taking stock of maternal, newborn, and child survival. *The Lancet*. 2010;375(9730):2032-44.
16. Connell RW. Masculinities and globalization. *Men and Masculinities*. 1998;1(1):3-23.
17. Connell RW, Connell R. Masculinities: Univ of California Press; 2005.
18. Connell RW, Messerschmidt JW. Hegemonic masculinity: Rethinking the concept. *Gender & Society*. 2005;19(6):829-59.
19. Santana MC, Raj A, Decker MR, La Marche A, Silverman JG. Masculine gender roles associated with increased sexual risk and intimate partner violence perpetration among young adult men. *Journal of Urban Health*. 2006;83(4):575-85.

20. Simpson, R. (2004). Masculinity at work: The experiences of men in female dominated occupations. *Work, Employment and Society*, *18*(2), 349-368.
21. ICF International I. Demographic and Health Survey. Country final reports Calverton, MD USA. Available from: http://dhsprogram.com/Publications/Publications-by-Country.cfm.
22. WHO. Global health risks: Mortality and burden of disease attributable to selected major risks: World Health Organization; 2009.

Chapter 5: Conclusion

In the first manuscript, "A Gender and Power Framework to Incorporate Paternal Influence on Maternal-Newborn Health Outcomes," the argument for the salience of the explicit consciousness of gender and power was established as the organizing framework for this study. As referenced in the conceptual manuscript, there is a much already published in the global literature about barriers to antenatal care, and a much smaller, but established literature about partner participation in antenatal care.

The second manuscript, "Paternal Antenatal Care Attendance, Paternal values of Women's Empowerment and associations with Knowledge and Practice of Sexual Health Behaviors" determined there is a positive association between fathers' values of women's empowerment and maternal ANC attendance. These findings are aligned with other studies of women, which have found that women who are more empowered are more likely to seek health care and use antenatal care.[1-4] The study also determined there is a positive association between paternal ANC attendance and PVWE, and provides new information pertaining to associations of men's value the reproductive rights of their partners and maternal and paternal ANC attendance. More research is needed to investigate the nature of the associations.

The third manuscript, "Paternal Antenatal Care Attendance, Paternal values of Women's Empowerment and Associations with Knowledge and Practice of Sexual Health Behaviors," illustrated the relationship between contraceptive method choices and paternal antenatal clinic attendance. Men who use traditional methods of contraception have higher odds of attending ANC visits than men who use no contraceptive method. Also, the analyses demonstrated there is a positive association between PVWE and contraceptive use. Importantly, it was found that fathers who use a modern contraceptive method have higher odds of attending ANC than fathers who do not use any contraceptive method. The relationship between modern contraceptive use and paternal ANC attendance is consistent with the idea that the same fathers who attend

ANC appointments because they care about the health and welfare of their family would also use modern forms of contraception to prevent unwanted pregnancy. A surprising relationship was found between paternal knowledge of the ovulatory cycle and paternal ANC attendance in that men with accurate knowledge had lower odds of attending ANC visits than did men who had inaccurate knowledge.

One explanatory possibility is that men who have higher knowledge of the ovulatory cycle perhaps have been to other antenatal appointments in the past (for previous children). It may be that the subset of men who have higher knowledge of the ovulatory cycle and do not attend ANC visits may still place high value on women's reproductive rights. More research is needed to understand the how knowledge of the ovulatory cycle and paternal ANC attendance are related. There is also a positive associated between STI/HIV risk reduction beliefs and paternal ANC attendance. Overall, there is a suggestion, albeit weak, that ANC attendance is related with STI/HIV risk reduction beliefs. A more comprehensive assessment of STI/HIV risk reduction beliefs may better assess the nature of the relationship. There was a relationship between risky sexual behavior and ANC attendance. Men who attended ANC care were less likely to participate in risky sexual behavior than those men who did not attend ANC care. The direction of the relationship needs to be established. However, it may be that men who attend ANC learn about how they could potentially influence the health of their partner and child through exposing them to sexually transmitted pathogens from risky sexual behavior.

In sum, this dissertation has provided empirical evidence that men who value the reproductive rights of women tend to behave and act in ways that promote the reproductive health of women. Globally, there is a momentum to involve men more actively in the reproductive health of their partners to offset maternal morbidity,

neonatal morbidity, and other adverse events in the arena of reproductive health. By increasing knowledge about fathers, and more broadly, men, understanding one of the complexities in the root causes of maternal-newborn morbidity and mortality may become clearer. The contribution of this research is potentially useful to governments and non-governmental associations who look for empirical evidence to build on the gender transformative work that is already underway around the globe. Further research can build upon this study to provide more insight as to how masculinity shapes men's values of the respective rights of women.

Qualitative studies are needed to further understand how men navigate cultural norms of masculinity with their own sense of masculinity when participating in activities or areas that are traditionally dominated by women, such as reproductive health, more specifically care during pregnancy.

This study also highlights the importance of partners in reproductive health research. Partners are a key part of the immensely complex determinants of maternal-newborn health. Accounting for the influence of partners in theorizing and investigation of maternal-newborn health is essential to advance the field.

References

1. Bloom, S. S., Wypij, D., & Das Gupta, M. (2001). Dimensions of women's autonomy and the influence on maternal health care utilization in a north Indian city. *Demography*, *38*(1), 67-78.
2. Patel, V., & Prince, M. (2006). Maternal psychological morbidity and low birth weight in India. *The British Journal of Psychiatry*, *188*(3), 284-285.
3. Woldemicael, G., & Tenkorang, E. Y. (2010). Women's autonomy and maternal health-seeking behavior in Ethiopia. *Maternal and Child Health Journal*, *14*(6), 988-998.
4. Hou, X., & Ma, N. (2012). The effect of women's decision-making power on maternal health services uptake: Evidence from Pakistan. *Health Policy and Planning*, *28*(2), 176-184.