Distribution Agreement

In presenting this thesis or dissertation as a partial fulfillment of the requirements for an advanced degree from Emory University, I hereby grant to Emory University and its agents the non-exclusive license to archive, make accessible, and display my thesis or dissertation in whole or in part in all forms of media, now or hereafter known, including display on the world wide web. I understand that I may select some access restrictions as part of the online submission of this thesis or dissertation. I retain all ownership rights to the copyright of the thesis or dissertation. I also retain the right to use in future works (such as articles or books) all or part of this thesis or dissertation.

Signature:

_____ _____

Mallory Ellingson Date

A Survey-Based Study of Zika Virus Communication Preferences among Pregnant Women in Metro-Atlanta

By

Mallory Ellingson
Master of Public Health

Epidemiology

_____

Allison Chamberlain, PhD
Committee Chair

A Survey-Based Study of Zika Virus Communication Preferences among Pregnant Women in Metro-Atlanta

By

Mallory Ellingson

B.A., Duke University, 2015

Thesis Committee Chair: Allison Chamberlain, PhD

An abstract of
A thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
in partial fulfillment of the requirements for the degree of
Master of Public Health in Epidemiology, 2017.

Abstract

A Survey-Based Study of Zika Virus Communication Preferences among Pregnant Women in Metro-Atlanta By Mallory Ellingson

Background: Because of the particularly severe perinatal outcomes associated with antenatal Zika virus infection, it is important for prenatal care providers to communicate Zika virus risks and strategies for prevention to their patients. Although face-to-face communication is ideal, clinic visits may not allow for in-depth discussion of all concerns. While previous studies have shown prenatal providers to be pregnant women's most trusted sources of health information, there is little knowledge on what secondary communication modalities pregnant women prefer for receiving information from their providers about an evolving public health emergency.

Methods: A cross-sectional, descriptive anonymous 27-item survey was distributed to pregnant women at four clinics around Atlanta, Georgia from May 5th to June 20th, 2016. The survey assessed women's interest in and communication preferences about prenatal topics, including Zika virus. Descriptive statistics were calculated and chi-square tests were used to evaluate associations between the primary outcomes and patient characteristics.

Results: Four-hundred and eight women completed the survey. The most popular resource for obtaining Zika virus information was the Centers for Disease Control and Prevention (CDC) website (73.0%). While their prenatal provider's own website for Zika information ranked 5th among sources currently accessed for Zika information, it ranked third behind educational brochures and emails for ways in which women wanted to receive information. The characteristics of Zika virus information deemed most important were: evidence-based (87.5%), endorsed by the CDC (74.1%), and endorsed by their own provider (67.9%).

Conclusion: In any public health emergency affecting pregnant women, women are going to seek advice from their obstetric providers. Because providers may lack sufficient time to discuss concerns with every patient, they may consider providing patient education in other ways. Before doing so, providers should know how women want to receive this information; for the women included in this study, educational brochures, emails and providers' own practice websites were preferred. Providers should consider taking greater advantage of these modalities to supplement in-person exchanges.

A Survey-Based Study of Zika Virus Communication Preferences among Pregnant Women in Metro-Atlanta

By

Mallory Ellingson

B.A., Duke University, 2015

Thesis Committee Chair: Allison Chamberlain, PhD

A thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
in partial fulfillment of the requirements for the degree of
Master of Public Health in Epidemiology 2017

Table of Contents

Abstract

A Survey-Based Study of Zika Virus Communication Preferences among Pregnant Women in Metro-Atlanta By Mallory Ellingson

Background: Because of the particularly severe perinatal outcomes associated with antenatal Zika virus infection, it is important for prenatal care providers to communicate Zika virus risks and strategies for prevention to their patients. Although face-to-face communication is ideal, clinic visits may not allow for in-depth discussion of all concerns. While previous studies have shown prenatal providers to be pregnant women's most trusted sources of health information, there is little knowledge on what secondary communication modalities pregnant women prefer for receiving information from their providers about an evolving public health emergency.

Methods: A cross-sectional, descriptive anonymous 27-item survey was distributed to pregnant women at four clinics around Atlanta, Georgia from May 5th to June 20th, 2016. The survey assessed women's interest in and communication preferences about prenatal topics, including Zika virus. Descriptive statistics were calculated and chi-square tests were used to evaluate associations between the primary outcomes and patient characteristics.

Results: Four-hundred and eight women completed the survey. The most popular resource for obtaining Zika virus information was the Centers for Disease Control and Prevention (CDC) website (73.0%). While their prenatal provider's own website for Zika information ranked 5th among sources currently accessed for Zika information, it ranked third behind educational brochures and emails for ways in which women wanted to receive information. The characteristics of Zika virus information deemed most

important were: evidence-based (87.5%), endorsed by the CDC (74.1%), and endorsed by their own provider (67.9%).

Conclusion: In any public health emergency affecting pregnant women, women are going to seek advice from their obstetric providers. Because providers may lack sufficient time to discuss concerns with every patient, they may consider providing patient education in other ways. For the women included in this study, educational brochures, emails and providers' own practice websites were preferred. Providers should consider taking greater advantage of these modalities to supplement in-person exchanges, particularly during a public health emergency.

Introduction

Zika virus was first reported in South America in May 2015. Since then, it has spread through the Americas and the world. There is active Zika transmission in every country in South and Central America. The first local transmission in the United States was confirmed in July 2016 in Miami, Florida, and in November 2016 transmission of Zika virus was also reported in Brownsville, Texas (1). Zika virus is closely related to other flaviviruses like dengue and is primarily spread by mosquitoes of the genus *Aedes*, which is common across the southeast United States, particularly during the summer months of July to September (2). However, epidemiologic data accrued during this outbreak have revealed that Zika virus can also be transmitted sexually and during pregnancy from a mother to her fetus (3). Four out of five individuals infected with Zika virus are asymptomatic, and while infection typically results in mild clinical symptoms (fever, rash and joint pain), much more serious outcomes have been reported in infants born to mothers infected with the virus during pregnancy. Zika virus has been linked to severe birth defects including microcephaly (4-7). Because of these severe adverse outcomes, pregnant women and those considering becoming pregnant are the primary target population for education about Zika virus prevention and control (8).

Due to the risk of Congenital Zika Syndrome, public health officials in the U.S. have been instructing obstetric care providers to communicate Zika virus risks to their patients since January 2016 (9-12). Many of the guidelines and recommendations issued by the Centers for Disease Control and Prevention (CDC) have been endorsed and promulgated by the American College of Obstetricians and Gynecologists (ACOG), again with a strong focus on communicating risks to pregnant women (13). However, despite the

various recommendations and travel advisories, one survey conducted in early summer 2016 found that as much as one third of pregnant women who traveled to areas with active Zika transmission were unaware of travel advisories and almost half did not know there was Zika virus transmission in the region where they traveled (14). In addition, as it gets further from the initial outbreak there may be an incorrect perception that the risk has passed. Physicians and patients alike have been looking for ways to more proactively communicate about Zika virus. There is also concern that the large amount of media coverage of the disease can lead to confusion, particularly as new knowledge about Zika virus and its epidemiology continues to emerge. Zika virus disease presents a new health communication challenge for prenatal care providers and more evidence is needed on how to best discuss this disease with pregnant women moving forward.

Despite provider-to-patient communication being such an important aspect of risk prevention, relatively little is known on exactly how providers should communicate this information to their patients. While face-to-face conversations are ideal, ample clinic time with every patient is frequently cited as a limitation to adequate communication and discussion of all risks (15-20). Since clinic time is limited, knowing what other modes of communication women would like their prenatal care providers to use to relay Zika virus information may be helpful for managing patient queries and more effectively disseminating public health guidance. To assist providers in conveying Zika virus-related information to their patients, this study sought to ascertain how pregnant women want to receive information about Zika virus from their prenatal care providers, aside from verbal communications.

Methods

This study was granted exempt status by the Emory University Institutional Review Board. Four obstetric care practices from the Greater Atlanta Area were contacted and asked to administer the printed, anonymous survey, made available in English and Spanish. Each practice was given 100 paper copies of the survey; for the two practices with two office locations, 100 copies were delivered to each location. Front desk staff was instructed to offer the survey and informed consent form to all obstetric patients for up to four weeks or until 100 surveys were distributed. No information was collected on patients that declined to take the survey. The survey consisted of 27 items assessing general demographics (age range, highest education level and race/ethnicity) and interest in and preferences for receiving information from their provider about Zika virus as well as two other prenatal care topics: vaccines and safe medications. Race and ethnicity were combined into one survey question. Survey items about communication preferences provided women with six close-ended options as well as an open-ended 'Other' option. The communication options were selected based on previous literature about information-seeking habits of pregnant women (15, 16, 21). All open-ended responses were analyzed for consistent themes warranting creation of any additional discrete preference categories. Information was also collected on women's awareness of any websites and social media accounts (Facebook or Twitter) sponsored by their prenatal care practice, as well as the importance of various qualities of the educational content (endorsed by the CDC, evidence-based, endorsed by their prenatal care provider, endorsed by other mothers, or brief/succinct) provided to them by their prenatal care providers. The survey was administered during the 2016 Zika epidemic; survey

administration commenced at the first practice on May 5th, 2016 and concluded at the last practice on June 20th, 2016.

All data analyses were conducted using SAS version 9.3 (Cary, NC). The primary outcomes were women's preferences for receiving information about Zika virus. Other outcomes of interest included current sources for seeking information on Zika virus, maternal vaccination, and safe medications and degree of interest in these topics, as measured using a five-point Likert scale (not interested, somewhat interested, neutral, interested and very interested). For analyses, the 5-point Likert scale for interest was condensed to a dichotomous variable with 'not interested,' 'somewhat interested' and 'neutral' counting as 'not interested' and 'interested' and 'very interested' counting as 'interested.' Descriptive statistics were computed for primary analysis. The primary outcomes were also analyzed by race/ethnicity, age, education, primaparity, type of provider (ob-gyn vs. midwife) and trimester. Chi-square tests and Fisher's exact tests were used to determine statistical significance. Significance was evaluated at $\alpha=0.05$. Crude odds ratios were calculated using unadjusted logistic regression. Adjusted odds ratios were calculated to evaluate confounding when appropriate.

Results

In total, 408 surveys were completed. The largest age group represented was between 30 and 34 years of age (38.9%) and 69.8% had at least a bachelor's degree or higher (Table 1). Most respondents were either Caucasian (40.4%) or African American/Black (37.0%). About half of the respondents were in their third trimester (50.5%) and were not pregnant for the first time (54.9%). Thirty-four percent of respondents indicated that they considered their prenatal care provider to be their primary

care provider. Most respondents saw obstetricians (79.6%) compared to certified nurse midwives (11.5%); the majority (82.1%) reported seeing female providers.

All four participating practices host practice-sponsored websites and three of the four practices host a Facebook page. Only one practice has a Twitter account. About two thirds of respondents were aware that their provider has a practice website (62.8%), compared to only 9.0% of respondents who were aware of whether or not their practice sponsors a Facebook page.

Regarding Zika virus information, interest in and awareness of Zika virus was high. Nearly all women had heard of Zika virus (94.8%) and 63.0% indicated that they were interested or very interested in information about Zika virus. Pregnant women above the age of 30 were significantly more interested in Zika virus information compared to women younger than 30 years old (Age 30-34: OR=1.99, 95% CI =1.23-3.20; Age 35+: OR=2.95, 95% CI =1.71-5.09). Despite this high level of interest, only 40.8% of women recalled having discussed Zika virus with their providers. Compared to African-American women, Hispanic women and white women were significantly more likely to have discussed Zika virus with their providers (Hispanic: OR=3.81, 95% CI =1.41-10.32; White: OR=2.14 95% CI =1.34 -3.42) (Table 2). Discussion with providers did not differ by trimester. Although age distribution and race/ethnicity varied between the four participating practices, adjusting for practice in the analyses did not alter the relationship between age or race and the outcomes of interest (data not shown).

Aside from conversations with their prenatal providers, the top resources that women are currently using to obtain Zika virus information are the CDC website (73.0%), other pregnancy-related websites (e.g. BabyCenter, WhatToExpect) (44.5%) and the state

health department website (32.3%) (Figure 1). A small proportion of women (15.5%) wrote in other options for their most currently used sources of information about Zika virus. The most common other responses were Google and "the news." When asked how they would like to receive information about Zika virus from their prenatal providers, women were most interested in educational brochures (63.8%), e-mails (55.2%) and a section on their provider's website (40.2%) (Figure 2). Women with at least a bachelor's degree were significantly more interested in finding information about Zika virus through e-mails and on their provider's practice website than women without a bachelor's degree (E-Mails: Bachelor's degree, OR = 2.47, 95% CI = 1.46 - 4.18; Graduate degree, OR = 2.51, 95% CI = 1.54 - 4.08; Practice website: Bachelor's degree, OR = 1.82, 95% CI =1.06 - 3.13; Graduate degree, OR = 2.11, 95% CI = 1.28 - 3.49). In contrast, there was little desire in being able to obtain Zika virus information via a practice-sponsored Facebook page (9.6%) or Twitter feed (1.5%). In regards to the most important qualities of the pregnancy-related information they obtain, being evidence-based (87.5%), endorsed by the CDC (74.1%), and endorsed by their own provider (67.9%) were the top three characteristics. A significantly greater proportion of women use the CDC website for information on Zika virus than for maternal vaccines and safe medications (Zika Virus: 73.0%; maternal vaccines: 57.7%; safe medications: 44.3% $p < 0.0001$). Additionally, more women look on their provider's practice website for information about maternal vaccines and safe medications than for information on Zika virus (safe medications: 38.1%; maternal vaccines: 35.4%; Zika virus: 19.2%; $p < 0.0001$).

Discussion

During an evolving public health threat that disproportionally affects pregnant women, it is important for prenatal care providers to know how best to communicate with their patients. We already know from research on topics like routine maternal vaccinations and general pregnancy information that women trust their obstetric care providers and prefer face-to-face discussions with them (15, 17, 19, 22-25). But in situations where there is not enough time to relay all pertinent information and answer every question a patient has, there is a dearth of research on what secondary communication modalities women prefer and the qualities of public health information they value most. It is particularly important during an emergency situation to identify those modalities and preferences so that providers can capitalize on them to quickly and efficiently relay information to their most at-risk patient groups.

Although nearly all women in this study had heard of Zika virus, only 40% recalled discussing Zika virus with their providers. There is a difference between having heard of the virus and being knowledgeable about the risks associated with the disease and methods of prevention. A nationally representative poll conducted by the Kaiser Family Health Foundation in June 2016 found that 85% of Americans were aware of Zika virus. Of that 85%, 74% agreed that Zika virus presented a major risk to pregnant women but only 20% though that Zika virus presented any threat to them or their family (26). There is clearly an education gap that needs to be filled. We found that aside from getting information about Zika virus through conversations with their prenatal providers, women are turning primarily to the Internet. They are accessing the CDC website or other pregnancy-related websites, a behavior which aligns with previous studies reporting Internet usage among pregnant women. As many as 97% reportedly use the Internet to

find information related to pregnancy (16, 18, 19, 21, 22, 27-30). Furthermore, the qualities of Zika virus-related content that women valued most mirrored their information-seeking behavior; evidence-based information followed by endorsement by the CDC. The predominant use of verified, evidence-based sources like the CDC website is encouraging, however, that alone may not satisfy women's information needs. Women also rated endorsement by their own provider as a very important characteristic of educational content. This desire to have public health messages validated by their personal provider makes intuitive sense and is congruent with the numerous studies that report women value their own provider's insights most (22-25, 31, 32).

Providers should consider all of these factors when determining what secondary communication modalities to use. For example, in this study, we found that only 19.2% of women are currently using their provider's practice website as a source for information on Zika virus, yet over 40% indicated a desire to be able to find Zika virus information there. Additionally, significantly greater proportions of women (38.1% and 35.4%) reported already going to their providers' websites for information on safe medications and maternal vaccines, respectively. Despite women's interest in finding health information on their provider's practice website and specifically their interest in finding Zika virus information there, information on Zika virus is not available on obstetric practice websites. A national review of over 900 obstetric practice websites conducted in January 2016 found that only 25% of obstetric care websites had any information about Zika virus on their websites and only an additional 10% had posted information when the review was conducted again in August 2016 following localized transmission in the United States (33). The lack of information about Zika virus on a provider-sponsored,

patient-focused resource like a website may inadvertently leave women with the perception that Zika virus is not of the utmost importance. Since more than 85% of prenatal care providers are affiliated with practices that have websites in the United States, posting information to this resource would fill this gap in information provision in a way that takes advantage of an existing platform that is a direct extension of the provider's own reach (34).

Other communication modalities can also be used to convey evidence-based, verified information to pregnant women. Preferred even more than their provider's website were brochures and emails. The CDC and other public health organizations (e.g. state health departments) have produced and continue to produce useful provider and patient-focused resources for download and circulation. What providers should consider doing when they use these resources developed by public health is to explicitly assure patients that they have reviewed and endorse the information themselves. This capitalizes on their patients' preference for information that is endorsed by their prenatal care provider as well as evidence-based.

As providers consider utilizing secondary communication modalities, it is also important to note, "one-size may not fit all." Certain women may prefer specific modalities over others, as evidenced in this study. Women with higher levels of education were significantly more likely to desire Zika virus information on their provider's website or through e-mails than women who have attained less education. While providers may consider polling their own patient populations to determine the best ways to relay information to them, during the outset of a public health emergency, it may be just as effective and ultimately more beneficial to provide information on all existing

communication outlets including the website, patient portal, social media accounts and phone systems.

In addition to having been based on responses from a highly educated patient population, this study has some other important limitations. The sample was older, with the majority of pregnant women over the age of 30, and it was also almost exclusively white and African-American; only 4.9% of those surveyed were Hispanic. The Kaiser Family Foundation Health Tracking poll found that a greater proportion of Hispanic women were concerned about Zika virus than African-American or White women (Hispanic: 52%, African-American: 36%, White: 10%) (26). We did not find that Hispanic women were significantly more interested in information about Zika virus, but we did find that Hispanic women were more likely to have discussed Zika virus with their provider. Because of differences in perceived or real risk of Zika virus disease among different racial and ethnic groups, it is important to further investigate the communication preferences of Hispanic women. No information was collected on whether the discussion with providers were initiated by the patient or the provider, although an attempt was made to control for differences in provider interest and awareness in Zika virus by controlling for practice location during the analysis. No significant differences were found when the unadjusted results were compared to the results adjusted for practice. However, it would be valuable in future investigations to differentiate between patient-initiated and provider-initiated discussion of topics like Zika virus.

Additionally, all practices included in study were located in the greater Atlanta area (where the CDC is located), therefore women in the study may have been more

aware of the CDC and the role that the CDC plays than women in other parts of the United States. Because of this and the fact that adoption of preventative measures reportedly differs by region, it would be valuable to investigate whether communication preferences for Zika virus may differ by locale (35). However, previous studies have not found significant differences in the information-seeking preferences of pregnant women by region or country, leading the authors to believe that the results of this study are applicable beyond the metro-Atlanta area (20, 29).

To our knowledge, this is the first study to explicitly examine pregnant women's preferences for receiving communications from their prenatal care providers at the outset of a public health emergency that disproportionately affects the unborn children of pregnant women. If providers take advantage of alternative communication avenues that align with women's communication preferences and their existing health-seeking behaviors there is an opportunity for more comprehensive and impactful communication between pregnant women and their providers.

References

1. CDC. Case Counts in the US. In; 2016.
2. Monaghan AJ, Morin CW, Steinhoff DF, Wilhelmi O, Hayden M, Quattrochi DA, et al. On the Seasonal Occurrence and Abundance of the Zika Virus Vector Mosquito Aedes Aegypti in the Contiguous United States. PLoS Curr 2016;8.
3. WHO. Zika virus fact sheet. In; 2016.
4. de Araujo TV, Rodrigues LC, de Alencar Ximenes RA, de Barros Miranda-Filho D, Montarroyos UR, de Melo AP, et al. Association between Zika virus infection and microcephaly in Brazil, January to May, 2016: preliminary report of a case-control study. Lancet Infect Dis 2016.
5. Cauchemez S, Besnard M, Bompard P, Dub T, Guillemette-Artur P, Eyrolle-Guignot D, et al. Association between Zika virus and microcephaly in French Polynesia, 2013-15: a retrospective study. Lancet 2016;387(10033):2125-32.
6. de Oliveira WC-E, J; De Oliveira, WTGH; Do Carmo, GMI; Henriques, CMP; Coelho, GE; de Franca, GVA; . Increase in Reported Prevalence of Microcephaly in Infants Born to Women Living in Areas with Confirmed Zika Virus Transmission During the First Trimester of Pregnancy - Brazil, 2015. Morbidity and Mortality Weekly Report 2016;65(9):242-247.
7. Rasmussen SAJ, D. J.; Honein, M. A.; Peterson, L. R. Zika Virus and Birth Defects - Reviewing the Evidence for Causality. N Engl J Med 2016;374(20):1981-1987.
8. CDC. Pregnancy. In; 2016.

9. Petersen EE SJ M-DD, Fischer M, Ellington SR, Callaghan WM, Jamieson DJ. Guidelines for Pregnant Women During a Zika Virus Outbreak - United States, 2016. MMWR Morb Mortal Wkly Rep 2016;65(2):30-33.

10. Petersen EE; Polen KM-D, D; Ellington, SR; Oduyebo, T; Cohn, A; Oster, Am; Russell, K; Kawwass, JF; Karwowski, MP; Powers, AM; Bertolli, J; Brooks, JT; Kissin, D; Villanueva, J; Munos-Jordan, J; Kuehnert, M; Olson, CK; Honein, MA; Rivera, M; Jamieson, DJ: Rasmussen, SA; . Update: Interim Guidance for Health Care Providers Caring for Women of Reproductive Age with Possible Zika Virus Exposure - United States, 2016. Morbidity and Mortality Weekly Report 2016;65(12):315-322.

11. Oduyebo TP, EE; Rasmussen, SA; Mead, PS; Meaney-Delmna, D; Renquist, CM; Ellington, SR; Fischer, M; Staples, JE; Powers, AM; Villanueva, J; Galang, RR: Dieke, A; Munoz, JL: Honein, MA; Jamieson, DJ; . Update: Interim Guidelines for Healthcare Providers Caring for Pregnant Women and Women of Reproductive Age with Possible Zika Virus Exposure. Morbidity and Mortality Weekly Report 2016;65(5):122-127.

12. Oduyebo T II, Petersen E, Polen KND, Pillai S, Ailes E, Vallanueva J, Newsome K, Fischer M, Gupta P, Powers A, Lampe M, Hills S, Arnold KE, Rose LE, Shapiro-Mendoza CK, Beard CB, Munos JL, Rao CY, Meaney-Delman D, Jamieson DJ, Honein MA. Update: Interim guidelines for health care providers caring for pregnant women with possible Zika Virus expose - United States, July 2016. MMWR Morb Mortal Wkly Rep 2016;65.

13. SMFM; A. Practice advisory: Interim guidance for care of obstetric patients during a Zika virus outbreak. In; 2016.

14. Whittemore K TA, Illescas A, Saffa A, Collins A, Varma JK, Vora NM. Zika virus knowledge among pregnant women who were in areas with active transmission. Emerging Infectious Diseases 2017.

15. Grimes HA, Forster DA, Newton MS. Sources of information used by women during pregnancy to meet their information needs. Midwifery 2014;30(1):e26-33.

16. Lagan BMS, M.; Kernohan, W.G. Internet use in pregnancy informs women's decision making: A web-based survey. Birth 2010;37(2):106-115.

17. McArdle A, Flenady V, Toohill J, Gamble J, Creedy D. How pregnant women learn about foetal movements: sources and preferences for information. Women Birth 2015;28(1):54-9.

18. Kraschnewski JL, Chuang CH, Poole ES, Peyton T, Blubaugh I, Pauli J, et al. Paging "Dr. Google": does technology fill the gap created by the prenatal care visit structure? Qualitative focus group study with pregnant women. J Med Internet Res 2014;16(6):e147.

19. Rodger D, Skuse A, Wilmore M, Humphreys S, Dalton J, Flabouris M, et al. Pregnant women's use of information and communications technologies to access pregnancy-related health information in South Australia. Aust J Prim Health 2013;19(4):308-12.

20. Lagan BM, Sinclair M, Kernohan WG. What is the impact of the Internet on decision-making in pregnancy? A global study. Birth 2011;38(4):336-45.

21. Huberty J, Dinkel D, Beets MW, Coleman J. Describing the use of the internet for health, physical activity, and nutrition information in pregnant women. Matern Child Health J 2013;17(8):1363-72.

22. Asiodu IV, Waters CM, Dailey DE, Lee KA, Lyndon A. Breastfeeding and use of social media among first-time African American mothers. J Obstet Gynecol Neonatal Nurs 2015;44(2):268-78.

23. Blanchard-Rohner G, Meier S, Ryser J, Schaller D, Combescure C, Yudin MH, et al. Acceptability of maternal immunization against influenza: the critical role of obstetricians. J Matern Fetal Neonatal Med 2012;25(9):1800-9.

24. Bodeker B, Walter D, Reiter S, Wichmann O. Cross-sectional study on factors associated with influenza vaccine uptake and pertussis vaccination status among pregnant women in Germany. Vaccine 2014;32(33):4131-9.

25. Healy CM, Rench MA, Montesinos DP, Ng N, Swaim LS. Knowledge and attitiudes of pregnant women and their providers towards recommendations for immunization during pregnancy. Vaccine 2015;33(41):5445-51.

26. Krizinger AS, E.; Brodie, M Kaiser Health Tracking Poll: June 2016: The Henry J. Kaiser Family Foundation; 2016 June 30, 2016.

27. Hearn L, Miller M, Lester L. Reaching perinatal women online: the Healthy You, Healthy Baby website and app. J Obes 2014;2014:573928.

28. Larsson M. A descriptive study of the use of the Internet by women seeking pregnancy-related information. Midwifery 2009;25(1):14-20.

29. Sayakhot P, Carolan-Olah M. Internet use by pregnant women seeking pregnancy-related information: a systematic review. BMC Pregnancy Childbirth 2016;16:65.

30. O'Higgins AM, OC; Egan, A; Mullaney, L; Sheehan, S; Turner, MJ; . The use of digital media by women using the maternity services in a developed country. Irish Medical Journal 2015;107(10):313-315.

31. Mak DB, Regan AK, Joyce S, Gibbs R, Effler PV. Antenatal care provider's advice is the key determinant of influenza vaccination uptake in pregnant women. Aust N Z J Obstet Gynaecol 2015;55(2):131-7.

32. Wiley KE, Massey PD, Cooper SC, Wood NJ, Ho J, Quinn HE, et al. Uptake of influenza vaccine by pregnant women: a cross-sectional survey. Med J Aust 2013;198(7):373-5.

33. Lehnert JD EM, Goryoka GW, Kasturi R, Maier E, Chamberlain AT. Use of Obstetric Practice Websites to Distribute Zika Virus Information to Pregnant Women During a Zika Virus Outbreak. Journal of Public Health Management & Practice 2017;Epub ahead of print.

34. Chamberlain AT, Koram AL, Whitney EA, Berkelman RL, Omer SB. Lack of Availability of Antenatal Vaccination Information on Obstetric Care Practice Web Sites. Obstet Gynecol 2016;127(1):119-26.

35. Kirzinger AW, B.; Brodie, M. Kaiser Health Tracking Poll: September 2016: The Henry J. Kaiser Family Foundation; 2016 September 29, 2016.

Table 1. Patient and provider characteristics of pregnant women surveyed (n=408)

Patient Characteristics	Total	
	N	%
Age		
18 - 29	132	32.3
30 - 34	159	38.9
35+	112	27.4
Missing	5	1.2
Education		
High School Degree or less	70	17.4
Some college	48	11.9
Bachelor Degree	117	28.6
Graduate Degree	168	41.2
Missing	5	1.2
Race		
African American/Black	151	37.0
Hispano/Latino/Chicano	20	4.9
Caucasian/White	165	40.4
Asian	48	11.8
Other	17	4.2
Missing	7	1.7
First pregnancy		
Yes	177	43.4
No	224	54.9
Missing	7	1.7
Trimester		
First	53	13.0
Second	140	34.3
Third	206	50.5
Missing	9	2.2
Type of primary prenatal care provider		
Ob-Gyn	325	79.6
Midwife	47	11.5
Both	13	3.2
Don't Know	18	4.4
Missing	5	1.2
Sex of primary prenatal care provider		
Female	335	82.1
Male	46	11.3

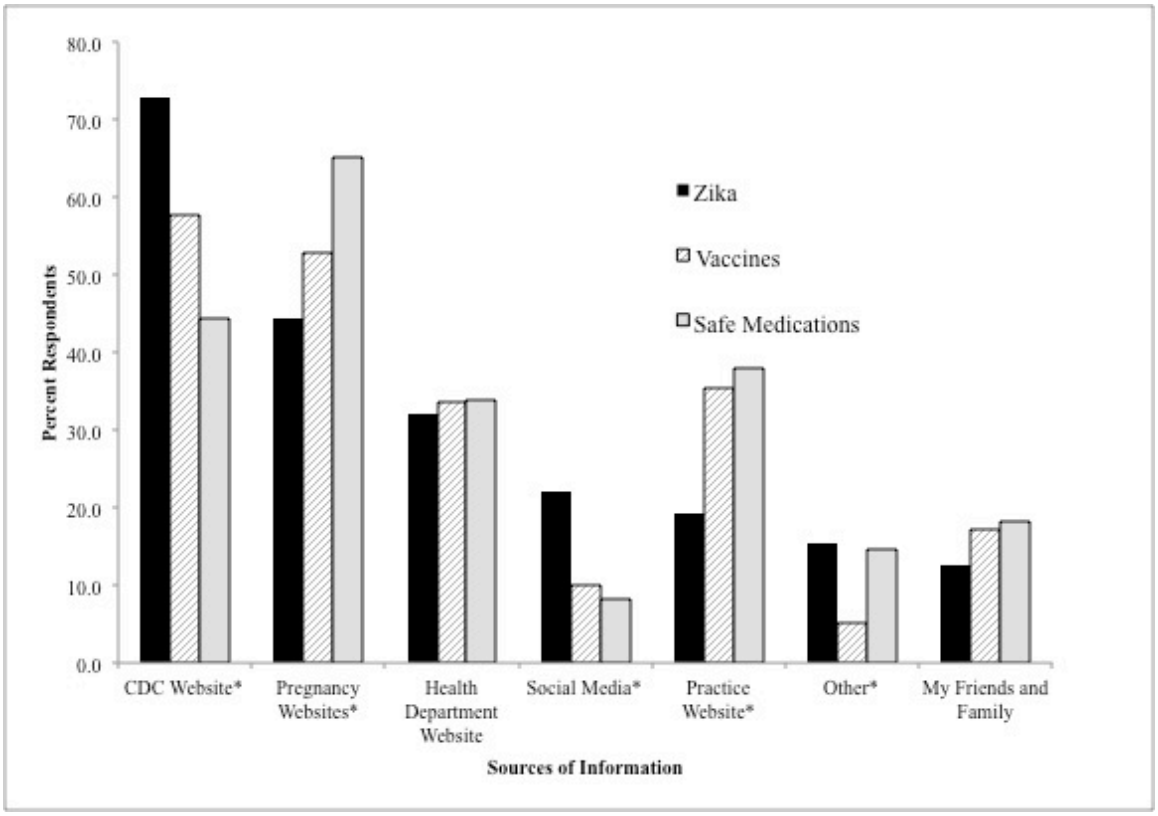
Both	11	2.7
Don't know	1	0.3
Missing	15	3.7
Considers prenatal care provider their primary provider[a]		
Yes	138	33.8
No	265	65.0
Missing	7	1.7

Table 2. Provider discussion of Zika virus by race/ethnicity of pregnant women surveyed

Race/ Ethnicity	Already discussed Zika virus with provider				
	n	**%**	**OR[a]**	**95% CI**	**p-value[b]**
African American/Black	45	31.3	1.00	REF	REF
Hispano/Latino/Chicano	12	63.2	3.81	(1.41-10.32)	0.0085
Caucasian/White	79	46.7	2.14	(1.34-3.42)	0.001
Asian	15	31.3	1.15	(0.56-2.35)	0.70
Other	8	47.1	1.98	(0.71-5.45)	0.19

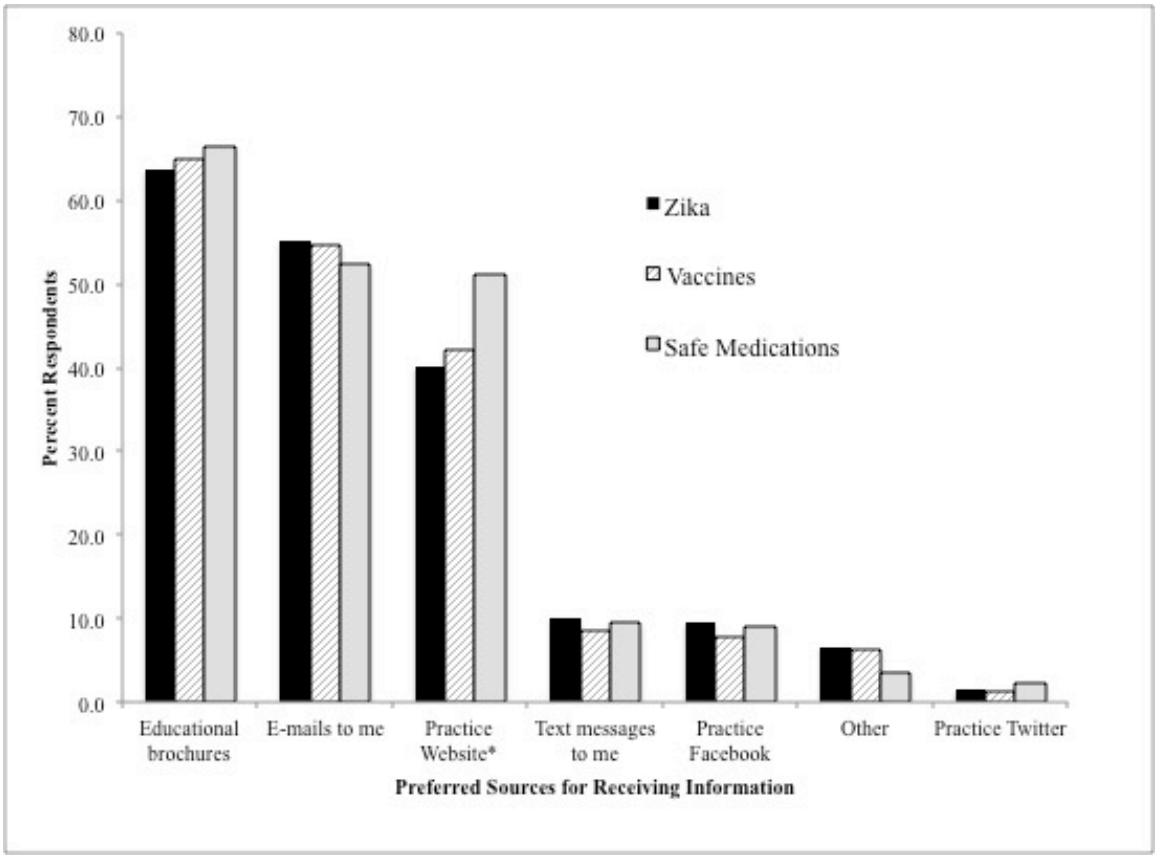
[a]Odds ratios calculated using unadjusted logistic regression
[b]Wald chi-square tests were applied to determine statistical significance

Figure 1. Sources used by pregnant women surveyed for obtaining information on selected prenatal care topics.



*Proportion of respondents statistically significantly differed between the three prenatal healthcare topics using a chi-square test.

Figure 2. Preferred ways of receiving information about selected prenatal care topics among pregnant women surveyed.



*Proportion of respondents statistically significantly differed between the three prenatal healthcare topics using a chi-square test.

EMORY UNIVERSITY | Institutional Review Board

Date: April 28, 2016

Mallory Ellingson
Principal Investigator
*SPH: Global Health

RE: **Exemption of Human Subjects Research**
IRB00088210
Evaluating Pregnant Women's Preferences for Receiving Public Health-Related Information from Their Providers

Dear Principal Investigator:

Thank you for submitting an application to the Emory IRB for the above-referenced project. Based on the information you have provided, we have determined on **4/27/2016** that although it is human subjects research, it is exempt from further IRB review and approval.

This determination is good indefinitely unless substantive revisions to the study design (e.g., population or type of data to be obtained) occur which alter our analysis. Please consult the Emory IRB for clarification in case of such a change. Exempt projects do not require continuing renewal applications.

This project meets the criteria for exemption under 45 CFR 46.101(b)(2). Specifically, this study seeks to evaluate how pregnant women prefer to receive educational information from their prenatal care providers about routine public health topics. To obtain this information, you will distribute a brief survey to approximately 100 pregnant women who are visiting their prenatal care provider for an obstetric care visit. No personally identifying information will be collected in the survey.

The following documents were reviewed with this application:

- Protocol (Revised) Evaluating Pregnant Women’s Preferences for Receiving Public Health-Related Information from Their Providers (Version date, 4/15/2016)
- Survey (Uploaded 4/15/2016)
- Survey Cover Letter (Uploaded 4/15/2016)
- 88210 Verbal Consent and Information Sheet (4.28.2016) Final (Version date, 4/28/2016)

Please note that the Belmont Report principles apply to this research: respect for persons, beneficence, and justice. You should use the informed consent materials reviewed by the IRB unless a waiver of consent was granted. Similarly, if HIPAA applies to this project, you should use the HIPAA patient authorization and revocation materials reviewed by the IRB unless a waiver was granted. CITI certification is required of all personnel conducting this research.

Unanticipated problems involving risk to subjects or others or violations of the HIPAA Privacy Rule must be reported promptly to the Emory IRB and the sponsoring agency (if any).

In future correspondence about this matter, please refer to the study ID shown above. Thank you.

Sincerely,

ENTER NAME OF LETTER SIGNATORY
Title
This letter has been digitally signed

CC: Chamberlain Allison *SPH: Epidemiology

Emory University
1599 Clifton Road, 5th Floor - Atlanta, Georgia 30322
Tel: 404.712.0720 - Fax: 404.727.1358 - Email: irb@emory.edu - Web: http://www.irb.emory.edu/

Public Health Communication Preferences of Pregnant Women Survey

Return this survey to the nurse/receptionist when complete

Today's Date (MM/DD/YYYY): _____

Section 1. Healthcare experience

1) Is your main prenatal provider an OB/GYN or a midwife?
a) _____OB/GYN
b) _____Midwife
c) _____Don't know

2) Is your main prenatal provider:
a) _____Male
b) _____Female

3) Do you consider your prenatal provider to be your primary care doctor?
a) _____Yes
b) _____No

4) Is this your first pregnancy?
a) _____Yes
b) _____No

5) What trimester of pregnancy are you in now?
a) _____First (0 – 12 weeks)
b) _____Second (13 – 27 weeks)
c) _____Third (27 – 40+ weeks)
d) _____Don't know

Section 2. Zika and pregnancy

6) Have you heard of Zika virus?
a) _____Yes b) _____No

7) Has your prenatal care provider talked with you about Zika virus yet?
a) _____Yes b) _____No c) _____Don't know

8) How interested are you in information about Zika infection and pregnancy?

Not interested at all	A little interested	Neutral	Interested	Very interested
□	□	□	□	□

9) Other than talking with your prenatal provider, where would you most likely go to find more information about Zika and pregnancy? Check all that apply.
a) _____Social Media (Facebook, Twitter, etc.)
b) _____My OB/GYN's practice website
c) _____CDC Website
d) _____Health department website
e) _____My friends and family
f) _____Other pregnancy-related websites (e.g. BabyCenter, What To Expect, etc.)
g) _____Other (specify)_____

10) If your prenatal provider wanted to give you more information about Zika during pregnancy, how would you like to get that information? Check all that apply.
a) _____A "Zika virus" section on their practice website
b) _____Useful links posted on their practice Facebook page
c) _____Useful links distributed on their Twitter feed
d) _____Text messages to me
e) _____Emails to me
f) _____Educational brochures
g) _____Other (specify)_____

Section 3. Vaccinations during pregnancy

11) Has your prenatal provider talked with you about vaccinations during pregnancy yet?
a) _____Yes b)_____No c)_____Don't know

12) How interested are you in information about vaccines during pregnancy?

Not interested at all	A little interested	Neutral	Interested	Very interested
□	□	□	□	□

13) Other than talking with your prenatal provider, where would you most likely go to find more information about vaccines during pregnancy? Check all that apply.
a) _____Social Media (Facebook, Twitter, etc.)
b) _____My OB/GYN's practice website
c) _____CDC Website
d) _____Health department website
e) _____My friends and family
f) _____Other pregnancy-related websites (e.g. www.BabyCenter.com, www.whattoexpect.com etc.)
g) _____Other (specify)_____

14) If your prenatal provider wanted to give you more information about vaccines during pregnancy, how would you like to get that information? Check all that apply.
a) _____A "vaccines" section on their practice website
b) _____Useful links posted on their practice Facebook page
c) _____Useful links distributed on their Twitter feed
d) _____Text messages to me
e) _____Emails to me
f) _____Educational brochures
g) _____Other (specify)_____

Section 4. Safe medications and pregnancy

15) Have you talked to your prenatal provider about safe medications during pregnancy?
a) _____Yes b) _____No c) _____Don't know

16) How interested are you in information about safe medications during pregnancy?

Not interested at all	A little interested	Neutral	Interested	Very interested
□	□	□	□	□

17) Other than talking with your prenatal provider, where would you most likely go to find more information about safe medications during pregnancy? Check all that apply.

a) _____Social Media (Facebook, Twitter, etc.)
b) _____My OB/GYN's practice website
c) _____CDC Website
d) _____Health department website
e) _____My friends and family
f) _____Other pregnancy-related websites (e.g. BabyCenter, What To Expect, etc.)
g) _____Other (specify)_____

18) If your prenatal provider wanted to give you more information about safe medications during pregnancy, how would you like to get that information? Check all that apply.

a) _____A "Safe medications" section on their practice website
b) _____Useful links posted on their practice Facebook page
c) _____Useful links distributed on their Twitter feed
d) _____Text messages to me
e) _____Emails to me
f) _____Educational brochures
g) _____Other (specify)_____

Section 5. Practice website & social media knowledge

19) Do you have any social media accounts? Please check all that apply.

a) _____Facebook
b) _____Twitter
c) _____Instagram
d) _____Other (specify)_____

20) Do you know if your prenatal provider has a practice website?

a) _____Yes, and I visit it regularly
b) _____Yes, but I don't visit often
c) _____Yes, but I have never visited it
d) _____No, I don't know

21) Do you know whether your prenatal provider has a practice-sponsored Facebook page?

a) _____Yes, and I have followed/liked it
b) _____Yes, but I have not followed/liked it
c) _____No, I don't know

22) Do you know whether your prenatal provider has a practice-sponsored Twitter account?

a) _____Yes, and I follow it
b) _____Yes, but I do not follow it
c) _____No, I don't know

23) If your prenatal provider started a text message service to provide you with information about prenatal health topics, how frequently would you want to get those texts?

a) _____ Twice per week
b) _____ Once per week
c) _____ Twice per month
d) _____ Once per month
e) _____ Never, I don't want that service

Section 6. Qualities of content

24) When reading information about pregnancy-related topics, how important do you find the following qualities?

	Not important	Somewhat important	Very important
That it's endorsed or approved by the CDC	□	□	□
That it's endorsed or approved by my own prenatal care provider	□	□	□
That it's evidence-based	□	□	□
That it's brief	□	□	□
That it's important to other mothers	□	□	□

Section 7. Demographic information

25) How old are you?

a) _____18 – 24 years old
b) _____25 – 29 years old
c) _____30 – 34 years old
d) _____35 – 39 years old
e) _____40+ years old

26) What is the highest level of school that you have completed?

a) _____K-8 grade
b) _____9-11 grade
c) _____High school graduate/GED
d) _____Technical/Vocational or Associates
e) _____Bachelor Degree
f) _____Master's Degree
g) _____Doctorate

27) How would you describe your ethnic background?

a) _____African American/Black
b) _____Hispano/Latino/Chicano
c) _____Caucasian/White
d) _____Asian
e) _____Other (please specify)_____

THANK YOU FOR COMPLETING OUR SURVEY!

PLEASE RETURN YOUR SURVEY TO THE FRONT DESK