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Determining the Barriers to Prenatal Care Entry within the First Trimester by Evaluation of
Prenatal Care Surveys and Questionnaires

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Abstract

Background: Prenatal care (PNC) within the first trimester is associated with improved fetal and maternal health outcomes. Improved PNC is necessary to prevent negative birth outcomes such as low birth weight and infant mortality, which have significant impact on birth outcome rates. Improving access to PNC in the first trimester involves removing barriers to care. A brief survey distributed to expectant mothers is a simple way to define these barriers. Many small community health centers do not use surveys to gather patient information. By reaching this population, barriers to PNC can be better understood and mitigated using community resources decreasing infant mortality rates, low birth weight figures, and other preventable causes of negative birth outcomes.

Objective: Evaluate existing PNC surveys and provide recommendations for a future survey to identify barriers to PNC for smaller communities, such as Clark County, Ohio.

Methods: A literature review was conducted to search for existing prenatal care surveys using search terms surrounding socio-demographic factors, maternal barriers, and structural barriers to PNC. Surveys were evaluated on five criteria: socio-demographic variables, length, quantitative measures, languages offered, and distribution methods.

Results: Sixteen surveys were identified, none met all five criteria. After analysis model surveys include the Prenatal Care Coordination Pregnancy Questionnaire, the Kaiser Permanente Prenatal Questionnaire, and the PNC Satisfaction and Resilience Survey- Maricopa County.

Conclusions: Combining tactics utilized by surveys that met at least four of the five criteria can produce a valid and useful survey to gather information to improve maternal and fetal health outcomes.

Keywords: maternal outcomes, fetal health, mixed methods, birth outcomes, FQHC

Determining the Barriers to Prenatal Care Entry within the First Trimester by Evaluation of
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Prenatal care (PNC) is one of the most important factors that lead to healthy birth outcomes and better maternal health. Underutilization of PNC contributes to many pregnancy-related complications and increased infant mortality rates (Centers for Disease Control and Prevention [CDC], 2017a).

The Healthy People 2020 initiative has a focus on pregnancy and health behaviors with one of its objectives being an increase in the amount of women receiving PNC in the first trimester of pregnancy (Healthy People 2020, n.d.). In 2007 the total was 70.8% of women receiving PNC nationwide. The goal of Healthy People 2020 is to increase that statistic to 77.9% (Healthy People, 2016) in the effort to improve the quality of life for women and children.

Through the Surgeon General, the federal government also lists the improvement of reproductive and sexual health as a national initiative. One strategy is to improve the access to and use of PNC. This is the number one recommendation made by the National Prevention Council in 2014 (National Prevention Strategy, 2014).

The heterogeneity of the American population requires an understanding of each patient population and a plan specifically tailored to accomplish a goal such as this on a national scale. Fortunately, many public health departments have begun setting health objectives in the form of Community Health Implementation Plans that focus on their own communities, the population's needs, and their health concerns.

In Clark County, Ohio access to and use of PNC within the first trimester is also a main objective. According to the Ohio Department of Health (ODH, 2016), only 57.2% of pregnant women got PNC within the first trimester in 2015. The Healthy Births/Sexuality Task Force of

Clark County Combined Health District (2016) made an increase from 57% to 73% of women receiving PNC within the first trimester their goal by 2019. In order to reach this goal, the population of expectant mothers must be understood in terms of what stops one from getting access to PNC in the first trimester. One method to do this is to survey expectant mothers regarding their barriers to prenatal services.

Statement of Purpose

The goal of this initial project is to compare and contrast existing surveys currently used to identify barriers, facilitators, and other factors that impact PNC. From this evaluation, recommendations will be provided for a PNC survey that can be used with expectant mothers in smaller, rural communities such as Clark County, Ohio. This project will answer two research questions:

- What would be the most appropriate method of surveying to detect PNC barriers in smaller communities?
- Are there any existing surveys, compilations, and/or question sets that set any precedent for gathering PNC data specific to a small community/select community?

Addressing these research questions will aid in the development of a survey instrument that can easily be completed by mothers and expectant mothers in Clark County. Health clinics can then more rapidly identify the barriers to PNC within the first trimester in order to better understand the population and their needs, connect pregnant women to community resources, and improve access to and utilization of PNC within the first trimester. Identification of barriers to PNC will be the first step in improving birth outcomes and reducing infant mortality in the Clark County population.

Literature Review

According to Planned Parenthood (2018), the premier provider of women's health information and affordable care, PNC is defined as the medical care a woman receives while pregnant. This care is usually carried out by a certified medical professional and is to monitor the health of both the mother and baby during the gestational period. PNC can begin as soon as the mother knows she's pregnant and can schedule her first PNC appointment. A mother in good health will have a PNC appointment every four to six weeks until she is eight months along. After that period appointments will increase to every two to three weeks until she reaches full term at 37 weeks. At that point, monitoring will increase to weekly appointments until the woman gives birth (Planned Parenthood, 2018).

PNC within the first trimester is the most opportune time to get a mother the resources she needs to maintain/improve her health and keep the fetus developing appropriately. These visits may include physical exams, urinalysis, imaging and blood testing (National Institute of Child Health Development, 2017). In that first trimester a woman receives the appropriate health screenings, counseling, and connection to community resources if necessary. Programs like Centering Pregnancy and Women, Infants, and Children (WIC) are designed to support women in learning about the pregnancy process and make informed decisions about their health and nutrition and that of their baby.

Benefits of Early Identification and Intervention

Appropriate birth weight is one of the beneficial outcomes of PNC. The average newborn infant weighs approximately eight pounds. Low birth weight in a newborn is defined as a baby weighing less than 5.5 pounds (Schubert Center for Child Studies, 2007; Stanford Children's Health, 2018). A very low birth weight baby weighs less than 3.3 pounds (Schubert Center for

Child Studies, 2007). Both of these categories pose considerable risk to the newborn, placing them at a higher risk of having cognitive deficits, developmental delays, and neurological and health issues (Schubert, 2007). Introduction to PNC early in the course of pregnancy decreases the chances of an infant being born at a low birth weight (Committee to Study the Prevention of Low Birth Weight, 1985).

Low birth weight is primarily caused by pre-term births. Many early studies show that birth weight increases directly with the length of gestation given good health of the mother (Committee to Study the Prevention of Low Birth Weight, 1985). The World Health Organization (WHO, 2018) defines preterm as any infant born before 37 weeks of age.

Infant mortality is another outcome linked to both birth weight and PNC. According to the Centers for Disease Control and Prevention (CDC, 2017c), birth weight is the primary factor affecting infant mortality. It is the second leading cause of infant mortality across the United States (US), after birth defects (CDC, 2016; Bryant, Worjolah, Caughey, & Washington, 2010). As a nation, the United States of America (USA) has the highest infant mortality rate of 5.8 per 1,000 live births when compared to other developed countries like Canada, Switzerland and Japan, which have rates of 4.8, 3.9, and 2.1 per 1,000 live births respectively (Kaiser Family Foundation Analysis of Data from OECD, 2017; Sawyer, & Gonzales, 2017). The rate of decline of US infant mortality rates has also declined more slowly than other comparable developed countries (Kaiser Family Foundation Analysis of Data from OECD, 2017; Sawyer, & Gonzales, 2017). As of 2016, Ohio's infant mortality rate was 7.4 per 1,000 live births as compared to the overall US rate of 5.8 per 1,000 live births and, along with Indiana, is one of two mid-western states with infant mortality rates in the 7.4-9.1 per 1,000 range (CDC, 2017b). Of the 10 states with infant mortality rates within this range the majority are southern states like Oklahoma,

Georgia, Arkansas, and Tennessee (CDC, 2017b). This translates to Ohio ranking 40th in infant mortality as of 2017 (ODH, 2017).

Within Clark County, a rural-urban fringe community in central Ohio, the infant mortality rate is 6.8 per 1,000 live births which is lower than Ohio's infant mortality rate, yet not lower than the nations rate and drastically higher than other developed countries infant mortality rates (ODH, 2016). With birth weight and infant mortality having such a large impact on birth outcomes and outcome rates, improved PNC is necessary to decrease these rates, preventing unnecessary negative birth outcomes.

Socio-Demographic Factors and Prenatal Care

A multitude of socioeconomic factors contribute to inadequate PNC including race, education, and income level.

Race/Ethnicity. Minority populations often experience poorer health outcomes stemming from various causes including lack of access to education, health care, and subjection to discrimination (Mays, Cochran, & Barnes, 2007; Egede, 2006; Gee & Ford, 2011). These disparities effect health outcomes such as PNC and are part of the reason why African-Americans and other minorities have PNC rates much lower than the nationwide rate. Between 2013 and 2015, African-American pregnant women in Ohio had higher rates of inadequate PNC (28%) when compared to Hispanics (25.1%) and Caucasian people (14.1%) (March of Dimes, n.d.).

As of 2015, the infant mortality rate for African-American babies in Ohio was 15.1 deaths per 1,000 babies, while the Caucasian rate was 5.5 deaths per 1,000 babies (ODH, 2016). This latter rate is actually below the Healthy People 2020 goal and drives the need to determine the reasons for these disparities and the further upstream factors that contribute.

African-Americans have been shown to have higher preterm birth rates as well across the majority of the socioeconomic brackets, except those containing equally poor Caucasian and African-American women (Braveman et al., 2015). Preterm births are the leading cause of the infant mortality disparity between African-Americans and Caucasians (Bryant et al., 2010). Even when adjusting for different socioeconomic groups, and measuring all women who had access to and utilized PNC, women in minority populations (African-American and Hispanic) have higher rates of obstetric complications such as preterm birth, very preterm birth, and intrauterine growth restriction (Healy, Malone, & Sullivan, 2006).

The link between PNC, preterm birth, and infant mortality is very strong. PNC involves access and quality, which can vary based on institution, level of education, and level of income (Committee to Study the Prevention of Low Birth Weight et al., 1985). In addition to these variables, there is a cultural and/or societal component that varies in each community (Kang, 2014; Coast, Jones, Portela, & Lattof, 2014; Coast, Jones, Lattof, & Portela, 2016). These variables all have an influence, the extent and complexity of which still needs to be determined for each community in order to provide adequate PNC.

Education and income level. Education and income are two closely tied factors that contribute to PNC and its downstream effects. The WHO states that maternal educational attainment directly allows women to access, obtain, and process health information and indirectly empowers them to communicate concerns, and play an active role in their healthcare (Karlsen et al., 2011).

Education often increases socioeconomic status and income. Beginning very early in life, household income has profound effects on physical and developmental health. Infants and children of lower income statuses tend to have poorer health than those of higher incomes and

have more difficulties with access to and continuity of care (Larson & Halfon, 2010). Education improves health through improved work conditions and opportunities, an increase in resources, and an improved health lifestyle (Ross & Wu, 1995). Among these resources is PNC; rates improve at higher maternal education levels and lead to better health outcomes in children (Cochrane, Ohara, & Leslie, 1980).

Not only does education level have the potential to increase personal income level, it also can increase neighborhood income level. Low levels of both maternal education and residence in low-income neighborhoods predict higher rates of preterm births, stillbirths, neonatal, and postnatal death in these populations; even within higher income neighborhoods, minority women also experienced higher rates of poorer infant health outcomes (Luo, Wilkins, & Kramer, 2006). Women in these lower socioeconomic positions or of minority status are at higher risk for poorer health outcomes in their babies, which further contributes to the high infant mortality rates and preterm birth rates.

Education has been considered one of the most important factors that determine health and the high rates of neighborhood segregation account for some of the larger disparities seen in infant health outcomes (Luo et al., 2006). While it is impossible to correct for different educational levels and the resulting income inequality, it is possible to mitigate some of the associated health disparities. Reducing disparities requires improving access to care and standardizing care. In order to do this, we must first understand some of the major barriers to care, especially within lower socioeconomic statuses.

Barriers to Prenatal Care

Maternal barriers. Maternal health encompasses the emotional and mental health of a mother, as well as physical health. Mental health status, as well as disease can have a positive or

negative impact on infant health and the ability of the mother to seek PNC. Psychiatric conditions such as anxiety, depression, and posttraumatic stress disorder (PTSD) have been linked with poor birth outcomes like preterm birth and low birth weight (Accortt, Cheadle, & Dunkle-Schetter, 2015; Ding et al., 2014; Bell & Seng, 2013). However, pregnant women who were in mental health treatment or counseling for PTSD were actually more likely to take advantage of PNC (Bell & Seng, 2013) and counseling strategies and preventative programs to reduce maternal stress and depression can improve birth outcomes related to preterm birth and low birth weight (Feinberg et al., 2015). Conditions and/or substances that alter the emotions and mental state of a mother are also important factors to consider. Substance abuse with drugs such as methamphetamine, cocaine, heroin, and inhalants pose incredible risk to the fetus and profoundly affect utilization of PNC (Wu et al., 2012; Shieh, & Kravitz, 2006; Kuczkowski, 2007) as does alcohol use and abuse (Bhuvaneswar, Chang, Epstein, & Stern, 2007). Domestic violence as well has a negative effect on birth outcomes like low birth weight and preterm birth (Hill, Pallitto, Mccleary-Sills, & Garcia-Moreno, 2016).

Culture is a maternal factor that can either act as a facilitator or barrier of PNC. Despite PNC mainly involving a mother and her baby, it is important to remember the social environment. Different families and communities have different and at times opposing views when it comes to PNC and attitudes towards pregnancy (Brown, 1988).

Structural barriers. Structural barriers can be described as community or environmental elements out of the primary control of the mother. These include transportation, insurance, and the clinical setting among others.

Transportation limitations were among the first barriers identified with difference in access to healthcare. Often linked to socioeconomic status, the manner of transport, distance to

healthcare, and utilization of resources can affect access to medical care (Roozbeh, Nahidi, & Hajiyan, 2016). Reducing this barrier is still of utmost importance because the easier it is to physically get to medical care, the easier it will be to maintain PNC and other healthcare appointments.

Insurance coverage is another factor strongly linked with poor access to healthcare and poverty. The timeliness and adequacy of PNC (when defined in terms of number of visits) has a direct relationship with insurance coverage (Egarter, Braveman, & Marchi, 2002). Financial support through private and public insurance increases access to care by offsetting costs and thereby reducing stress associated with medical care (Roozbeh et al., 2016).

More recently, comfort with medical personnel and in the medical care setting has been a factor integral to utilization of PNC. Research has expounded upon the necessity of a positive and trusting patient-provider relationship and the benefits that derive from adherence to directives and continuity of care (Roozbeh et al., 2016; Sheppard, Zambrana, & O'Malley, 2004). Positive relationships with providers have been shown to correlate with positive pregnancy experiences and facilitate use of PNC (Mazul, Salm-Ward, & Ngui, 2017).

The 'adequacy' of PNC can be defined quantitatively or qualitatively. While observing a set number of PNC visits during a pregnancy can be useful, it is important to consider the quality of care as well. Flexible care of the patient, understanding their beliefs and their background can facilitate increased access to and utilization of PNC (Downe, Finlayson, Tunçalp, & Gülmezoglu, 2015). In addition to the blood draws, prenatal screens, and monitoring, content of care is another measure that can act as a barrier if not correctly tailored to the patient (Beeckman, Louckx, Downe, & Putman, 2013).

These factors are all important considerations when trying to change the health outcomes of this select patient population. Establishing which of these are barriers in the pregnant women of Clark County, Ohio is the first step to modifying and correcting these issues in order to facilitate PNC in the first trimester.

Demographic Profile of Clark County

The following information is from the currently available 2016 US Census data. The population of Clark County is 134, 557, a 2.7% decrease from 2010. The 2013 Clark County Community Health Assessment attributes this continued declining trend occurring in many mid-western cities where the population is moving out and towards other major cities. Clark County is:

- 51.6% female
- 86.9% White, 9% African American, and 3.3% Hispanic or Latino
- 6.8% of people under 65 years have no health insurance

While 87.2% of the population 25 and over has a high school education or higher only 18% of the population 25 and over have a bachelor's degree or higher. The civilian work force consists of 60.4% of the population aged 16 and older, of that number 56.4% of the civilian work force 16 and over are female. The median household income is \$44,154, with a per capita income of \$23,992, and 15.7% of the population in poverty. This makes the majority of Clark County a rural area, with smaller communities and sizeable vulnerable populations. The Robert Wood Johnson Foundation has collected local data for the counties within each state centered on health outcomes and health factors since 2010 in partnership with the University of Wisconsin Population Health Institute. The health outcome measure evaluates length and quality of life and the health factor measure evaluates health behaviors, clinical care, social and economic factors,

and physical environment. Current 2018 data ranks Clark County 70th out of the 88 counties in Ohio for health outcomes and 69th for health factors (University of Wisconsin Population Health Institute, 2018).

The Role of Federally Qualified Health Centers (FQHCs)

Federally Qualified Health Centers (FQHCs) are clinical sites placed in underserved communities to provide primary care with the aid of federal funds (Health Resources and Services Administration, 2018). Over the 2005 to 2014 time period, the amount of Americans seeking health care from an FQHC increased from 5% to 7% or approximately eight million new patients, with the uninsured being served at the highest rates, persons below the federal poverty line being seen more by FQHCs, and higher proportions of minority racial groups showing higher rates of growth than other racial groups (Nath, Costigan, & Hsia, 2016).

In 2013 the Clark County Community Health Assessment identified areas with populations that displayed vulnerability factors such as speaking limited English, being a minority, having no high school diploma, being a single mother, being uninsured, among other risk factors and mapped the most vulnerable populations discovered on a map. The Spanish speaking population of Clark County, at 3.3% of the population, represents approximately 5,000 individuals who all may have varying levels of English fluency and so may be an overlooked population in surveys.

Figure 1 provides the vulnerable population areas in Clark County, Ohio. The most vulnerable population areas are color coded in red, the least vulnerable population areas in green (Clark County Community Health Assessment, 2013).

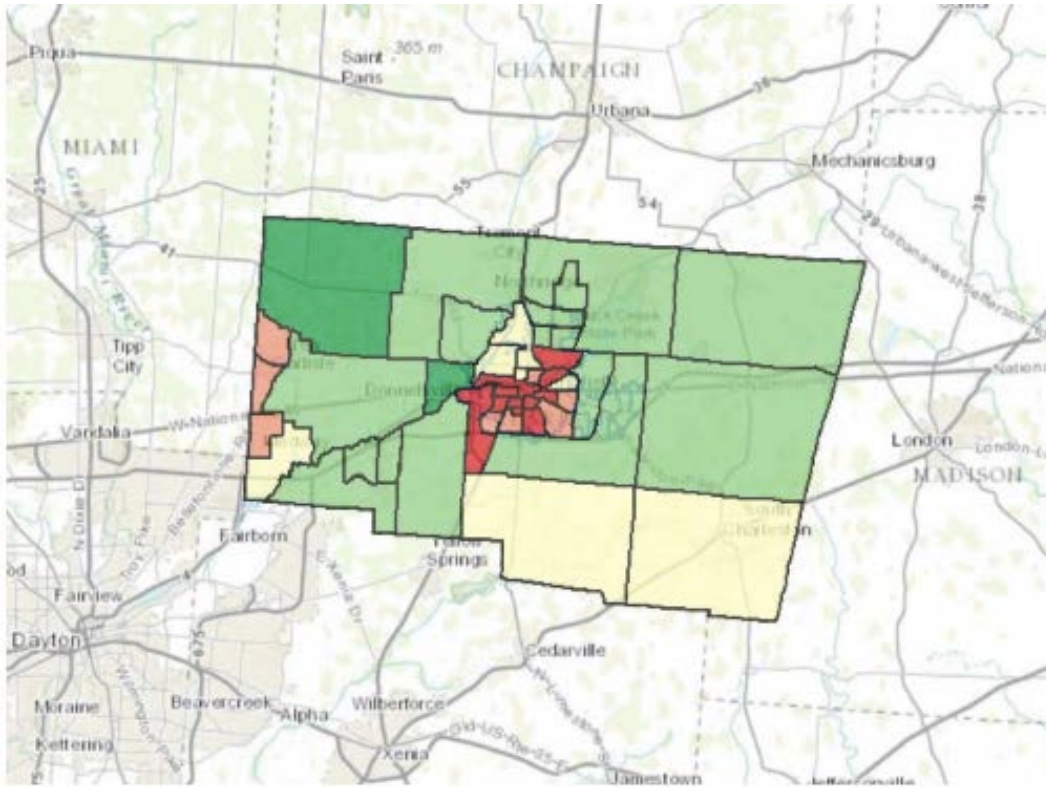


Figure 1. Vulnerable populations in Clark County, Ohio. Image copied from Clark County Community Health Assessment, 2013.

The most vulnerable population areas overlay the city of Springfield, Ohio. While it is helpful to know the general factors that influence vulnerability, what is unknown is the effect the nature of being a vulnerable population or being in such an area effects PNC.

Rocking Horse is a FQHC in Clark County that functions to serve in underserved areas that include vulnerable populations. Its service area is shown in Figure 2 (Health Resources and Administration, 2016).

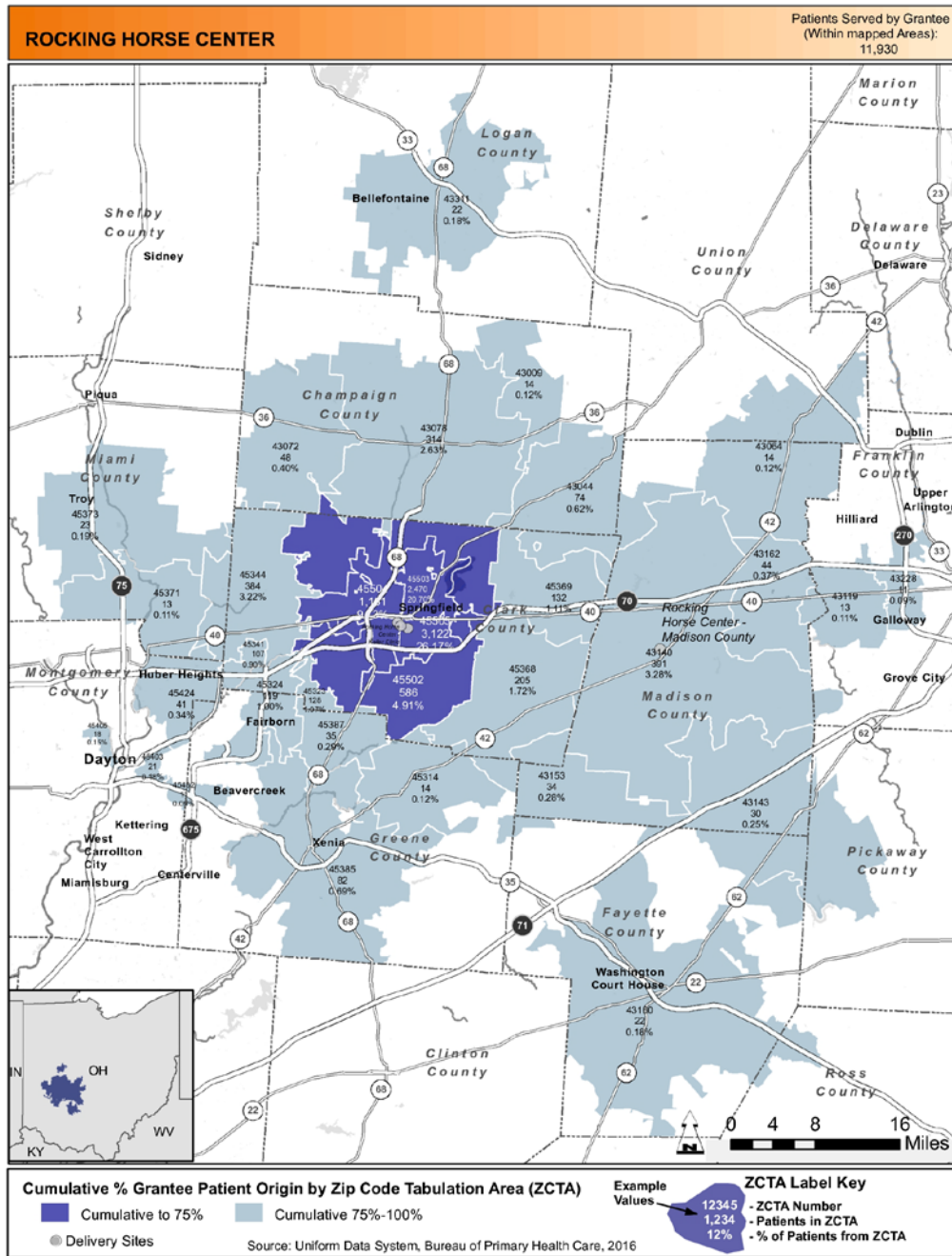


Figure 2. Service area for Rocking Horse Center. Image copied from Health Resources and Services Administration, 2016.

Because the service area of Rocking Horse overlaps with the marked areas of vulnerable populations, this enables this FQHC to take advantage of the patients that come in for healthcare

and gather information more specific to certain conditions, diseases, or public health initiatives like improved PNC. By reaching these local underserved and vulnerable populations, the barriers to PNC can possibly be better understood on the smaller scale and mitigated using community resources. This could then cause a cascade effect decreasing the high infant mortality rates, low birth weight figures, and other preventable aspects of negative birth outcomes.

What Constitutes a Good Survey?

A smaller community such as Clark County, Ohio served by one main health clinic like Rocking Horse would be an ideal primary site to test how a tailored survey would work to identify barriers in a target population of expectant women. Currently, Rocking Horse does not use a formal investigative method like a PNC survey to understand more about barriers in their obstetric population. The healthcare providers are knowledgeable and passionate about their patients, and incorporating a timely and efficient method to provide more information would allow them to deliver better care and make use of the community resources they may be unaware patients need.

In general, a survey usually comprises a list of questions and/or statements that participants are asked to answer or give their thoughts on in order to gather information about a particular topic from said participants (Ponto, 2015). Through this method, data can be collected in a quantitative and/or qualitative manner that allows interpretation and analysis.

The primary advantage of survey as a research method is its potential to gather a large amount of data at one time and without the expense of a large amount of resources (Kelley, Clark, Brown, & Sitzia, 2003). By sampling a subset of a population it can also provide results that are readily generalizable and specific to the larger population (Ponto, 2015). The two main disadvantages to survey research are the potential to select questions inadequately targeted for

the research question and the inability to guarantee an acceptable response rate (Kelley et al., 2003).

Methods of survey include mail, phone, in-person interviews, electronic methods, and others that all have advantages and disadvantages in terms of data gathering and analysis (Ponto, 2015; Kelley et al., 2003). Mail surveys allow for sampling over a larger geographical area, telephone surveys eliminate the need for transportation and time costs, in-person interviews allow for clarification of confusion, and electronic methods allow participants to participate at their convenience (Ponto, 2015; Kelley et al., 2003; Boland, Sweeney, Scallan, Harrington, & Staines, 2006). The major disadvantage of all of these survey types is again, the possibility of a low response rate.

Selection of survey method is dependent on the understanding of the selected population. Populations served by FQHCs like Rocking Horse have changed over the last ten years increasing in patients that classify as low-income populations who rely on Medicaid or are uninsured (Nath et al., 2016). These are populations that often have restricted access to computers or phone lines that are regularly in service (Pew Research Center, 2018; Anderson, 2017; Office of Policy Development and Research, 2016). For this reason, mixed methods may be the best method to effectively and efficiently gather information from this population (Ponto, 2015).

Question selection should come from existing questionnaires since these are already established surveys that have been piloted and accepted for research purposes. These surveys must have been psychometrically tested to show acceptable measures of validity and reliability as well as use and interpretation of any scales developed therein (Kelley et al., 2003).

To maximize responses, the survey should be kept brief and the survey method(s) chosen with care (Jones, Baxter, & Khanduja, 2013). What constitutes a short versus long survey is subjective in nature. There are conflicting studies in the literature where survey length does not make a significant difference in response rates, however other studies show a significant change in response. For instance, a survey of five pages receives more of a response than a survey that is seven pages long (Iglesias & Togerson, 2000). This is all subjective and dependent on subject matter and respondents investment.

There is no national standard for quantitatively assessing the pregnancy outcome risk in a mother based on socio-demographic factors. However, there are several risk-scoring tools that have been trialed based on obstetric factors to predict obstetric risk with a range of accuracy and other trials utilizing risk scores based on social determinants that show limited functionality and applicability in the clinical and public health realm (Goyal, Hall, Greenberg, & Kelly, 2015). In any case, a risk assessment tool utilized on the small scale would be helpful in stratifying levels of risk in the expectant population.

Immigration and the prevalence of significant Spanish-speaking communities nationwide have the potential to effect survey response rates. In not offering a survey in a language that is spoken by a significant portion of a population, a language barrier is created that then decreases survey response rate and is an inaccurate reflection of the target population (Tolonen et al., 2017; Gayet-Ageron, Agoritsas, Schiesari, Kolly, & Perneger, 2011).

In this case, to construct a survey that gathers more information about a specific community like Clark County and the possible barriers to early initiation and continuity of PNC, the survey would need to contain questions that address socio-demographic and economic factors and target specific possible barrier areas such as maternal health and structural obstacles. The

survey response rate will be variable regardless of survey method so employment of mixed methods will be most advantageous in this scenario. Mailing out the survey and then also having it in paper format (for patients to fill in the waiting room) and as phone interview would take advantage of multiple methods of data gathering to increase participation rate.

Clark County would benefit from a survey identifying barriers to PNC in the effort to decrease the preventable portion of higher infant mortality rates in vulnerable populations, as well as negative birth outcomes due to low birth weight, low socioeconomic status, and/or hazardous lifestyle choices. Currently Rocking Horse has no such survey even though it is the FQHC serving much of the vulnerable populations of Clark County. Utilizing a survey for the population served by this facility would likely yield specific results to the community and allow for targeted problem solving and public health care solutions.

Methods

Survey Gathering

All state departments of health were searched in order to locate pre-existing surveys being used to collect data on PNC at the federal level. A majority states use the Pregnancy Risk Assessment and Monitoring System (PRAMS) questionnaire; however, there are some states and/or counties within states that have developed their own secondary surveys.

Then, a literature review was done to search for existing PNC surveys using search terms surrounding socio-demographic factors, maternal barriers, and structural barriers to PNC. A PubMed search using terms *race AND prenatal care AND survey* returned two survey tools, the Listening to Mothers Survey (Childbirth Connection, 2011) and the LA Mommy and Baby Project (not used, see Appendix A). Another PubMed search using search terms *income AND*

prenatal care AND survey returned one survey tool, the Canadian Maternal Experiences Survey (Mumtaz, O’Brien, & Higginbottom, 2014).

In total 19 surveys were gathered, 12 from federal, state, or local government health department issued surveys, three from the Pubmed literature review, and four findings from healthcare related webpage review. These 19 surveys can be found in Table 1. (See Appendix A for website links.)

Table 1

Survey Sources

Source	Survey
Federal, State, or Local health Department Surveys	Pregnancy Risk Assessment Monitoring System
	Ohio Pregnancy Assessment Survey (OPAS)
	Listening to Mothers- National Survey
	Prenatal Care Satisfaction and Resilience Survey- Maricopa County
	California’s Maternal and Infant Health Assessment
	Healthy Mothers Colorado Prenatal Care Survey
	Woman Infant Survey Health
	Pregnancy Risk and Tracking System of Idaho
	Adequacy of Prenatal Care Utilization Index
	Revised- Graduated Prenatal Care Utilization Index
	Chippewa County Maternal- Client Satisfaction Survey
	Iowa's Barriers to PNC Project
Pubmed Literature Review	Listening to Mothers- California
	Canadian Maternity Experiences Survey
	The LA Mommy and Baby Project
Healthcare Related Webpage Review	Kaiser Permanente Prenatal Questionnaire
	Prenatal Care Coordination Pregnancy Questionnaire
	Amerigroup Pregnancy Survey
	Quality of Prenatal Care Questionnaire (QPCQ)

Of these 19 surveys, 16 were evaluated due to three surveys (The LA Mommy and Baby Project, Iowa's Barriers to PNC Project, and Quality of PNC Questionnaire) requiring permissions for access that were requested but not given.

Selection Criteria

In total, the remaining 16 surveys were evaluated based on the five criteria depicted in Table 2. These criteria were selected for several reasons including the previously discussed socio-demographic, maternal, and structural barriers to PNC, the unique needs of expectant mothers in smaller communities such as Clark County, Ohio, and extensive research defining what constitutes a good survey.

Table 2

Five Survey Criteria

Survey Criteria	Purpose
Addressed socio-demographic factors, maternal barriers, and/or structural barriers	Uses piloted and accepted questions to evaluate variables
Amount of time needed to complete	Requiring a minimum time commitment (less than 5 pages or approximately 20 minutes)
Use of quantitative scales	Rapidly provide a quantitative measure to identify major barriers, pregnant women at risk, etc.
Offered in both English and Spanish	To accommodate two major languages spoken in Clark County
Adaptability to multiple survey formats (mail, in-person, telephone)	To take advantage of mixed methods of surveillance and increase response rate

Each survey was evaluated individually on these criteria and surveys or sections of appropriate surveys were selected for recommendations on developing a tailored survey for a community such as Clark County.

Results

Evaluation of Selected Surveys

The following table (Table 3) contains PNC surveys found during survey gathering and the survey criterion each addresses. A reference table of each survey and survey source is provided in Appendix A.

Table 3

Survey Criteria Addressed by Each Survey

Survey	Addresses Socio-demographic Variables	Time Conscious Survey	Use of quantitative Scale	Offered in English and Spanish	Adaptable to Multiple Formats
Kaiser Permanente Prenatal Questionnaire	Yes	No	Yes	Yes	Yes Email, mail
Prenatal Care Coordination Pregnancy Questionnaire (Wisconsin)	Yes	Yes 3 pages, 22 Questions	Yes	Yes	No In person only
Ohio Pregnancy Assessment Survey (OPAS)	Yes	No	No	Yes	Yes Mail, online, telephone
Listening to Mothers-California	Yes- Very Little	Yes Pause and continue option	No	Yes	Yes Email compatible with multiple modalities, telephone interview, in person
Listening to Mothers-National Survey	Yes- Very Little	Yes Pause and continue option	No	No	Yes Telephone or in person interview only

Survey	Addresses Socio-demographic Variables	Time Conscious Survey	Use of quantitative Scale	Offered in English and Spanish	Adaptable to Multiple Formats
Canadian Maternity Experiences Survey	Yes	No	No	No	No Telephone interview only
Prenatal Care Satisfaction and Resilience Survey- Maricopa County	Yes	No	No	Yes	No In person interview only
California's Maternal and Infant Health Assessment	Yes	No	No	Yes	No Mail only
Healthy Mothers Colorado Prenatal Care Survey	No	Yes 15 minutes	No	No	No Only online survey
Woman Infant Survey Health	Yes	No	No	Yes	Yes Email, mail
Pregnancy Risk and Tracking System of Idaho	Yes	No	No	Yes	Yes Mail, telephone interview
Amerigroup Pregnancy Survey	Yes	Yes 3 pages, 26 Questions	No	Yes	Yes Mail, online
Adequacy of Prenatal Care Utilization Index	No	-	Yes	No	- From hospital data
Revised- Graduated Prenatal Care Utilization Index	No	-	Yes	No	- From hospital data
Chippewa County Maternal- Client Satisfaction Survey	No	Yes Brief online survey	No	No	No Only offered in computer format
Pregnancy Risk Assessment and Monitoring System	Yes	No	No	Yes	Yes Mail, telephone, online survey

Surveys Meeting Four of Five Criteria

There were no surveys that met all five selection criteria; however, those that met at least four criteria are examined below.

Kaiser Permanente Prenatal Questionnaire. The benefits of this survey are that it addresses socio-demographic variables, uses a quantitative scale, is offered in both English and Spanish, and is offered in more than one survey format. It is not conscious of time required to complete; however, at nine pages long and approximately 90 questions.

Prenatal Care Coordination Pregnancy Questionnaire (Wisconsin). This survey fulfilled almost all survey criteria. It addresses socio-demographic variables, uses a quantitative scale, is offered in both English and Spanish, is conscious of time required to complete at three pages long and approximately 25 questions. The only criterion it does not fit is being offered in multiple formats. It was a requirement of the administering facility to have this survey offered only in person and as an interview by a healthcare provider.

Listening to Mothers- California and Listening to Mothers- National Survey. Both surveys exist under the National Partnership for Women and Families Childbirth Connection initiative. While the Listening to Mothers- National Survey meets only three of the five criteria, it is included here for the sake of comparison to the California state survey.

The Listening to Mothers- National survey began in 2002 and has collected data on maternal experiences at the national level (National Partnership for Women and Families, 2018). Thus, it addresses socio-demographic variables, but more so focuses on the birthing and maternity care experience during hospital stays for delivery. It requires 30 min to complete, but does not use a quantitative scale and is not offered in multiple languages.

The Listening to Mothers- California survey began in 2016 and is currently in progress,

sampling the population of new mothers in the State of California. It too does not focus as much on socio-demographic variables and does not use a quantitative scale. It is also conscious of time required to complete and is offered in both English and Spanish.

A big difference between the two is the method of survey delivery. The national survey is only offered by telephone or in-person interview format, whereas the California version is offered in multiple methods and modalities. This is important to highlight because it may have an effect on response rates. The California survey was distributed in an email format that was then compatible with iPad, cellular phone, and laptop interfaces and allows completion of the survey in multiple sessions.

Amerigroup Pregnancy Survey. As part of the claims and insurance coverage process Amerigroup developed a pregnancy survey that focused on clinical factors surrounding the pregnancy such as expectation of multiples, previous episodes of pre-term labor and history of diabetes and other chronic diseases. It is conscious of time required to complete at three pages and 26 questions long, is offered in both English and Spanish and in multiple formats. It does not use a quantitative scale.

Surveys Meeting Three of Five Criteria

The Pregnancy Risk Assessment and Monitoring System (PRAMS). The PRAMS does address socio-demographic variables and is offered in multiple languages and formats. It is a very in depth survey and so does not satisfy time constraints and does not use a quantitative scale.

Ohio Pregnancy Assessment Survey (OPAS). Ohio stopped participating in PRAMS in 2016 and introduced OPAS as its monitoring tool. It is very similar to PRAMS in that it addresses the socio-demographic factors discussed in previous sections but also collects and

trends data to monitor Ohio's broader health initiatives. It is not conscious of time required to complete and is, like the PRAMS, very extensive. It does not use a quantitative scale but is offered in multiple languages and formats.

Pregnancy Risk and Tracking System of Idaho. Idaho is the third and final state that does not use PRAMS and instead uses a similar questionnaire format. It does address socio-demographic variables discussed in previous sections, and like PRAMS and OPAS, is not conscious of time required to complete and does not use a quantitative scale. It is offered in both English and Spanish and via mail and telephone interview.

Woman Infant Survey Health. This survey initially focused directly on clinically relevant maternal health questions like pre-pregnancy weight, fertility, and oral hygiene and then addressed socio-demographic variables previously discussed relating to PNC followed by questions about the labor and delivery process. It was not conscious of time required to complete at 14 pages and 47 questions and did not use a quantitative scale. It is offered in both English and Spanish and in mail and email formats.

Surveys Meeting Two of Five Criteria

Prenatal Care Satisfaction and Resilience Survey- Maricopa County. This survey addressed socio-demographic factors discussed in previous sections but then delved deeper into other factors like family dynamics, religion/spirituality, community atmosphere, personal feelings towards pregnancy, social support and more. These are all very important factors that often cannot be addressed due to a variety of constraints, but weigh heavily on attitudes towards PNC and ability to initiate and continue PNC. This survey also addresses maternal and birth experiences and PNC quality of care. Because of the extensive array of topics covered by this survey, it is significantly longer in length and does not meet the time criteria established for this

review. It also does not use a quantitative scale, and is only offered as an in-person interview only. It is offered in English and Spanish.

California's Maternal and Infant Health Assessment. The California Department of Health provides the California Maternal and Infant Health Assessment in place of PRAMS. It very closely resembles PRAMS and surveys the maternal population specific to the state of California, monitoring and trending their data. It is distributed annually and only by mail. It does not use a quantitative scale and is not conscious of time required to complete. It is offered in both English and Spanish.

Surveys Meeting One of Five Criteria

Canadian Maternity Experiences Survey. This survey is highlighted here because it focused on immigrant experiences and how that can effect PNC initiation and continuity. It addresses many important socio-demographic variables such as those discussed in previous sections and other variables like communication, language, country/culture immigrated from, and perception of ideas about PNC. It provides examples of how to approach immigrant populations and may be useful since Clark County has a large population of Hispanic immigrants. Unfortunately it is not offered in Spanish, is not conscious of time required to complete (85 pages), does not use a quantitative scale and is only offered as a telephone interview.

Healthy Mothers Colorado Prenatal Care Survey. This survey is actually for providers to pregnant mothers. It focuses on insurance coverage providers accept, patient population insurance coverage, location of patients, and patient socio-economic status. It is conscious of time required to complete (15 minutes) but does not use a quantitative scale, is not offered in both English and Spanish and is only offered as an online survey.

Adequacy of Prenatal Care Utilization Index and Revised- Graduated Prenatal Care Utilization Index. Both of these tools gathered information from hospital data on trimester PNC was initiated, total number of PNC visits, and gestational age of infant in order to determine the adequacy of PNC use and services. It does use a quantitative scale, however, does not survey the mothers, address socio-demographic variables directly or get offered in English and Spanish.

Chippewa County Maternal- Client Satisfaction Survey. This survey was developed by the Chippewa County Health Department to determine patient satisfaction with the PNC services provided. It does not address socio-demographic variables, does not use a quantitative scale, is not offered in both English and Spanish, and is only offered online. It is conscious of time to complete (one page, 13 questions).

Table 5 summarizes the results of all the survey criteria met and by which surveys.

Table 5

Survey Criteria Summary

Number of Criteria Met (out of five)	Surveys	Specific Criteria
Four Criteria	Kaiser Permanente Prenatal Questionnaire	<ul style="list-style-type: none"> • Addresses socio-demographic variable • Use of quantitative scale • English and Spanish • Multiple formats
	Prenatal Care Coordination Pregnancy Questionnaire (Wisconsin)	<ul style="list-style-type: none"> • Addresses socio-demographic variables • Time conscious • Use of quantitative scale • English and Spanish
	Listening to Mothers-California	<ul style="list-style-type: none"> • Addresses socio-demographic variables • Time conscious • English and Spanish • Multiple formats
	Amerigroup Pregnancy Survey	<ul style="list-style-type: none"> • Addresses socio-demographic variables • Time conscious • English and Spanish • Multiple formats

Number of Criteria Met (out of five)	Surveys	Specific Criteria
Three Criteria	Pregnancy Risk Assessment and Monitoring System	<ul style="list-style-type: none"> • Addresses socio-demographic variables • English and Spanish • Multiple formats
	Ohio Pregnancy Assessment Survey (OPAS)	<ul style="list-style-type: none"> • Addresses socio-demographic variables • English and Spanish • Multiple formats
	Pregnancy Risk and Tracking System of Idaho	<ul style="list-style-type: none"> • Addresses socio-demographic variables • English and Spanish • Multiple formats
	Woman Infant Survey Health	<ul style="list-style-type: none"> • Addresses socio-demographic variables • English and Spanish • Multiple formats
	Listening to Mothers- National Survey	<ul style="list-style-type: none"> • Addresses socio-demographic variables • Time conscious • Multiple formats
Two Criteria	Prenatal Care Satisfaction and Resilience Survey- Maricopa County	<ul style="list-style-type: none"> • Addresses socio-demographic variables • English and Spanish
	California’s Maternal and Infant Health Assessment	<ul style="list-style-type: none"> • Addresses socio-demographic variables • English and Spanish
One Criteria	Canadian Maternity Experiences Survey	<ul style="list-style-type: none"> • Addresses socio-demographic variables
	Healthy Mothers Colorado Prenatal Care Survey	<ul style="list-style-type: none"> • Time conscious
	Adequacy of Prenatal Care Utilization Index	<ul style="list-style-type: none"> • Use of quantitative scale
	Revised- Graduated Prenatal Care Utilization Index	<ul style="list-style-type: none"> • Use of quantitative scale
	Chippewa County Maternal-Client Satisfaction Survey	<ul style="list-style-type: none"> • Time conscious

Discussion

The majority of health programs and initiatives seem to be based on national surveys, which understandably provide a large sample size and buffer for low response rates and gives a national snapshot of the health of the nation. The Pregnancy Risk Assessment and Monitoring System or PRAMS, is a nationwide surveillance tool developed in 1987 by the CDC (2018) to gather information about barriers to PNC among other areas such as content and quality of care,

socioeconomic factors, maternal stress, and more. Almost all states and territories participate except Idaho, California, and Ohio (CDC, 2018). Idaho utilizes the Pregnancy Risk Assessment Tracking System (PRATS) (Idaho Department of Health and Welfare, 2018), California utilizes a Maternal and Infant Health Survey (California Department of Public Health, 2018), and Ohio utilizes the Ohio Pregnancy Assessment Survey (OPAS) (ODH, n.d.a).

The Ohio Pregnancy Assessment Survey was implemented in 2016, as a separate surveillance system from the CDC's PRAMS (ODH, n.d.b). This survey tool monitors improvement of maternal and infant health goals at the state level and does this by utilizing a similar sampling method as PRAMS and oversampling select Ohio counties where infant mortality and racial disparity issues are rampant and use of public health programs have been implemented to track progress in removing these issues (ODH, n.d.b; Ohio Equity Institute, 2018).

While very helpful in achieving long-term goals of decreasing infant mortality and improving infant and maternal outcomes, and initiation of PNC, this survey and the PRAMS survey rely on random sampling of large populations that may not be catching all the barriers to care found in smaller communities or niches of communities. Additionally, because these surveys focus more on long-term goals and population numbers, the individual mother and infant are over looked. By developing surveys specifically tailored to communities served by individual clinics, more rapid results that are immediately applicable and generalizable to the selected community can be generated and a survey such as this can also help immediately identify women at risk for factors that impact maternal health and access to community resources. This can further streamline the healthcare and PNC appointment process making it more efficient and helpful to improving early initiation and continuity of PNC.

Many public health initiatives rely on this data from PRAMS at the national level or OPAS, PRATS, or MIHA at the state level to approach from the top down instead of targeting smaller populations, making a difference there, and having small results reflect on the larger scale. In fact, it may be more effective to work from both the large and small scale to see improvements in complex public health initiatives like PNC thereby attacking both upstream and downstream factors tailored to individual populations (Williams, Costa, Odunlami, & Mohammed, 2008; Smith, 2015). Local and community level surveys are few and far between in the literature but they do exist and provide various examples that can be applied to form a tailored survey for specific populations and sub-populations with considerations that may promote an increased response rate.

Perhaps most important, are the factors predicting barriers to PNC that can be found in the socio-demographic information. These questions should comprise the majority of the survey and go in depth about maternal factors, structural factors, and socio-economic information to determine what are barriers specific to Clark County mothers. The Kaiser Permanente Prenatal Questionnaire, Prenatal Care Coordination Pregnancy Questionnaire, and Prenatal Care Satisfaction and Resilience Survey- Maricopa County provide appropriate examples of questions and concepts that would help determine barriers and facilitators to getting PNC. These surveys also contain examples of questions that also deal with comfort in the medical setting, culture/environment, and attitudes towards PNC.

The lifestyle of the respondents is another consideration. The Listening to Mothers-California survey was the only survey to explicitly state that it was designed for mothers with young children that may not be able to complete a survey in one sitting and so designed their survey to be completed in one or multiple sessions. Another appropriate and considerate feature

is the multiple technological interfaces the survey is made compatible with including phone, tablet, and laptop through email, by telephone, and in person. In the age of technology, increased access and convenience of access are important factors that may encourage responses (McGeeney, 2015).

Simply being time conscious is an important factor to consider when choosing and/or designing a survey. The Prenatal Care Coordination Pregnancy Questionnaire and Listening to Mothers- California surveys are appropriate examples of surveys the approach PNC and a good amount of its socio-demographic complexities in a format that does not require an inordinate amount of time. While the Healthy Mothers Colorado, Amerigroup Pregnancy Survey, and Chippewa County Survey were conscientious of time required to complete, they did not address the socio-demographic factors most important to determining barriers to PNC.

The use of a quantitative measure will not only be useful on the smaller scale to paint a picture of the maternal population of the community, but will also be useful immediately in a FQHC such as Rocking Horse when pregnant women show up, fill the survey out and are rapidly identified with a score for having a certain level of risk for any number of variables. It may also be helpful to receive surveys that are scored from community members in order to facilitate social work, home visits, community benefit arrangements, etc. that can help a pregnant mother have a better birth outcome. While not essential, the scoring system may help quantify the amount of women at risk for lack of continuity of PNC as well. The Kaiser Permanente Prenatal Questionnaire and the Prenatal Care Coordination Questionnaire provide scoring systems. While the Adequacy of Prenatal Care Index and the Revised- Adequacy of Prenatal Care Index also use scoring systems, it is not applicable to building a foundational survey since these surveys do not gather data directly from mothers but rather via hospital records.

A great majority of surveys found offered the material in both English and Spanish, which is important due to the large Spanish Speaking population here in the USA and in pockets of Clark County, Ohio. This allows surveillance of the entire population to achieve generalizable results applicable to the larger community population. It also allows researchers to not miss any niches or pocket populations that could benefit from facilities and resources that can improve birth outcomes and PNC initiation and continuity.

The final crucial criteria is the use of multiple distribution methods which allows women who may not be enrolled in PNC or go to a FQHC such as Rocking Horse to be sampled. Offering the survey in more than one distribution method would be ideal. In theory, the FQHC can be a main hub of the survey offered in the paper and/or interview format and more surveys can be mailed and emailed out along with phone interviews for any non-responders. This would hopefully help achieve an effective response rate so that information and data collected can be applied to the community at large. Many surveys found in the literature were offered in at least two distribution methods and after evaluation many of those offered with only one distributive method can be easily modified to offer in multiple methods. Listening Mothers- California is a great example of using distribution methods that work with the respondent, not only taking into consideration time but also convenience.

Recommendations

For these reasons my recommendations for model surveys include the Prenatal Care Coordination Pregnancy Questionnaire (Wisconsin) and the Kaiser Permanente Prenatal Questionnaire. The Prenatal Care Coordination Pregnancy Questionnaire (Wisconsin) fulfills four of the five criteria and can be modified to multiple distribution methods with review of the

questionnaire and formatting. The Kaiser Permanente survey while not conscious of time required to complete, does utilize a scoring system and is offered in two distribution formats.

While the Listening to Mothers- California does meet four of the five criteria, it has a limited selection of socio-demographic questions that do very little to understand a population besides baseline information. The Amerigroup Pregnancy survey is similar in that its socio-demographic questions also do not attempt to learn more than baseline information that then can be used to assess coverage risk.

Some of the surveys, while not meeting a majority of survey criteria, did address a survey criteria or survey methodology in a way that does deserve honorable mention. As stated previously, the Listening to Mothers- California survey utilized an open survey format that allowed mothers to complete it in multiple sessions and using multiple devices. The Maricopa County Survey is not time conscious; however, this is because of the detail the socio-demographic concepts go into that highlight the complex factors that influence PNC and birth outcomes. This survey review also was not available with specific questions. A possible solution to surveys with such depth is to split survey questions over a series or allow respondents to complete in multiple sessions (perhaps at follow-up PNC visits if in a FQHC or online) and in multiple formats. Finally, the Canadian Maternity Experiences Survey may serve as a good example of surveying a niche population. While it only fit the criteria of addressing socio-demographic variables, it did so in populations of recent Canadian immigrants and Canadian immigrants that had recently been pregnant or given birth. This could be a useful example for communities that have large populations of immigrants.

Rocking Horse can use a combination of the Kaiser Permanente Prenatal Questionnaire and the Prenatal Care Coordination Pregnancy Questionnaire (Wisconsin) depending on their

preference of questions addressing socio-demographic concerns between the two. It may be easier to just use the Prenatal Care Coordination Pregnancy Questionnaire (Wisconsin) alone since it is time conscious (whereas the Kaiser Permanente survey is not) and the survey format can easily be modified to online formats and mailed formats in addition to the original interview format. This gives an additional bonus of possible use in clinic at initial PNC visits as well as reaching women in the community who may not be showing up at the FQHC. I would also recommend employing the technological options of survey use on multiple modalities and interfaces, as well as the pause and resume option the Listening to Mothers- California survey used in order to maximize response rate potential. This collection of data may require multiple phases to truly understand the intricacies surrounding barriers to PNC in the community while keeping each survey time conscious. I would recommend the Maricopa County survey review as a tool to inspire research and development of survey questions targeting the breadth and depth of socio-demographic factors that impact PNC for any future phases.

Limitations

This evaluation does have limitations associated. The primary limitation of this evaluation is that some of the literature like the Prenatal Care Satisfaction and Resilience Survey of Maricopa County did not offer the actual questionnaire, only a review, so there are no illustrative questions to sample. The results are displayed in tables and in discussion, with only analysis of the results and no actual questions from the survey. It would be up to future researchers to find psychometrically tested questions in other surveys or from question banks like the General Social Survey or Polling the Nations (Harrison, 2007).

Another limitation involves surveys that were found in the literature but that required permissions that were requested but never received for access to the survey. These results are

shown in Appendix A. A final possible limitation in the future may occur if smaller surveys such as these have to rely on large community health care centers like FQHCs to distribute surveys. Not only do these centers have limited financial resources and personnel but they also are not able to sample the pregnant women who are not getting PNC by coming into clinic, thereby eliminating a large and necessary part of the respondent population.

Conclusion

The purpose of this evaluation was to determine what examples of PNC surveys exist in established literature and if those surveys are capable of elucidating barriers to care in select populations. This was done to provide a foundation for the formation of a survey that can be tailored to a specific community like Clark County, Ohio. Eventually the use of the survey would help identify barriers to initiation and continuity of PNC and immediately counteract those factors, facilitate solutions, and/or connect patients to community resources they need immediately there by working to decrease rates of infant mortality, low birth weight, and increase the percentage of women utilizing PNC consistently. It is possible to create a survey or use an existing survey such as the Prenatal Care Coordination Pregnancy Questionnaire to gather information about target populations. This approach, coupled with the larger public health initiatives, may work to combat poor maternal and fetal health outcomes in certain populations by improving PNC initiation and utilization.

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Appendix A: Survey Websites

Survey	Website
Kaiser Permanente Prenatal Questionnaire	https://thrive.kaiserpermanente.org/care-near-you/southern-california/womens-health/wp-content/uploads/sites/20/2016/01/75e5c1683017b9c88450.pdf
Prenatal Care Coordination Pregnancy Questionnaire (State of Wisconsin, Department of Health Services)	https://www.dhs.wisconsin.gov/forms/f0/f01105.pdf https://www.forwardhealth.wi.gov/WIPortal/Subsystem/KW/Print.aspx?ia=1&p=1&sa=54&s=4&c=13&nt=Prenatal+Care+Coordination+Pregnancy+Questionnaire
Ohio Pregnancy Assessment Survey (OPAS)	https://odh.ohio.gov/wps/portal/gov/odh/know-our-programs/ohio-pregnancy-assessment-survey-opas/questionnaires/
Listening to Mothers-California	http://transform.childbirthconnection.org/reports/listeningtomothers/
Listening to Mothers- National Survey	http://www.nationalpartnership.org/research-library/maternal-health/listening-to-mothers-iii.pdf
Canadian Maternity Experiences Survey	https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3890634/
Prenatal Care Satisfaction and Resilience Survey- Maricopa County	http://www.asu.edu/xed/resilience/images/PrenatalPhxMaryvale%20Report.pdf
California's Maternal and Infant Health Assessment	https://www.healthypeople.gov/2020/data-source/californias-maternal-and-infant-health-assessment
Healthy Mothers Colorado Prenatal Care Survey	https://www.questionpro.com/a/TakeSurvey?id=1166023
Woman Infant Survey Health	http://www.floridahealth.gov/statistics-and-data/survey-data/woman-infant-survey-health/index.html http://www.floridahealth.gov/statistics-and-data/survey-data/woman-infant-survey-health/_documents/questionnaire-en.pdf
Pregnancy Risk and Tracking System of Idaho	https://healthandwelfare.idaho.gov/AboutUs/DHWSurveys/tabid/1835/Default.aspx
Amerigroup Pregnancy Survey	https://www.myamerigroup.com/ia/iaia_ob_screener_eng.pdf
Adequacy of Prenatal Care Utilization Index	https://www.ncemch.org/databases/HSNRCPDFs/Overview_APCUIndex.pdf
Revised- Graduated Prenatal Care Utilization Index	http://mchp-appserv.cpe.umanitoba.ca/viewConcept.php?printer=Y&conceptID=1360
Chippewa County Maternal- Client Satisfaction Survey	https://www.chippewahd.com/Page/286
The LA Mommy and Baby Project*	http://publichealth.lacounty.gov/mch/LAMB/lambsurvey.html
Iowa's Barriers to PNC Project*	https://idph.iowa.gov/family-health/maternal-health/barriers-project
QPCQ- Quality of Prenatal Care Questionnaire*	https://milo.mcmaster.ca/questionnaires/request-for-a-quality-of-prenatal-care-questionnaire-qpcq
Pregnancy Risk Assessment Monitoring System	https://www.cdc.gov/prams/aboutprams.htm

* Surveys required permissions and/or request by email. Permissions not given and/or no email response.

Appendix B: List of Competencies Met in Integrative Learning Experience

Wright State Program Public Health Competencies

Identify and describe the 10 Essential Public Health Services that serve as the basis for public health performance.
Apply behavior theory and disease prevention models to develop community health promotion and intervention programs.
Describe how policies, systems, and environment affect the health of populations.
Communicate public health information to lay and/or professional audiences with linguistic and cultural sensitivity.
Address population diversity when developing policies, programs, and services.
Make evidence-informed decisions in public health practice.
Evaluate and interpret evidence, including strengths, limitations, and practical implications.
Demonstrate ethical standards in research, data collection and management, data analysis, and communication.
Explain public health as part of a larger inter-related system of organizations that influence the health of populations at local, national, and global levels.

Concentration Specific Competencies Checklist

Population Health Concentration
Explain a population health approach to improving health status
Use evidence-based problem solving in the context of a particular population health challenge.
Demonstrate application of an advanced qualitative or quantitative research methodology.
Demonstrate the ability to contextualize and integrate knowledge of a specific population health issue.
Evaluate population health programs or policies that are designed to improve the health of the population, reduce disparities, or increase equity.