PROTOCOL TITLE:

"Comparing the Effectiveness of Clinicians and Paraprofessionals to Reduce Disparities in Perinatal Depression."

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1.0 Purpose of the Study:

There is considerable evidence that most perinatal women at risk for postpartum depression do not engage in mental health services, even when referred by home visiting (HV) programs, primary care physicians, obstetricians, or gynecologists (Zittel-Palamara et al., 2008). Thus, interventions that can be delivered via alternative settings—e.g., HV programs—are essential to prevent the onset of major depression and worsening of depressive symptoms among perinatal women. This PCORI funded project aims to evaluate whether the Mothers and Babies (MB) intervention, when led by paraprofessional home visitors, is more efficacious than usual care (i.e., home visiting without the MB enhancement). It will also examine if MB, when led by paraprofessional home visitors, is not inferior to MB delivered by mental health professionals. The results of this study will inform decision-making by HV programs regarding provision of MB to perinatal women at risk for developing major depression.

Study Aims:

Aim #1 is to conduct a superiority trial that compares the efficacy of MB delivered by paraprofessional home visitors versus usual care (i.e., home visiting without MB) on patient-reported outcomes, including depressive symptoms, quality of life, parenting practices, engagement in pleasant activities, and relationship with one's partner.

Aim #2 is to conduct a non-inferiority trial that compares the effectiveness of MB delivered by (a) mental health clinicians versus (b) paraprofessional home visitors.

Aim #3 is to evaluate whether effectiveness of the two versions of MB (clinician led vs. paraprofessional home visitor led) varies according to patient characteristics (e.g., race, ethnicity, first-time mother, and/or geographic type of home visiting (HV) program (i.e., urban vs. rural).

Aim #4 is to examine the feasibility and acceptability of MB delivered by paraprofessional home visitors and mental health clinicians.

2.0 Background / Literature Review / Rationale for the study:

Postpartum depression is a serious mental health disorder that poses significant health and mental health risks for mothers and their infants (Gaynes et al., 2005; National Research Council & Institute of Medicine, 2009). Research suggests that prevalence rates of postpartum depression are higher among low-income women than among middle-or high-income women (O'Hara & Swain, 1996; Rich-Edwards et al., 2006). There is also consistent evidence that low-income women are less likely to receive mental health services in the perinatal (i.e., pregnancy until child's first birthday) period than their more affluent counterparts due to a variety of factors including stigma related to mental health service use and lack of access to community-based mental health providers (Abrams et al., 2009; Leis et al., 2011). Postpartum depression is a particularly serious problem for low-income women, as it has

the potential to create two generations of suffering, for both mother and child. It is estimated that over 10% of low-income infants have a mother who has major depression and more than 50% have a mother with some depressive symptoms (Vericker et al., 2010). Postpartum depression has negative consequences for maternal parenting practices. Compared with women not suffering from postpartum depression, depressed women tend to be less positive, less spontaneous, and less responsive with their infants (e.g., VanDoesum, et al, 2007). Postpartum depression has been linked to developmental delays among infants of depressed mothers, including social interaction difficulties, attachment insecurity, and cognitive impairments (e.g., Grace, Evindar, & Stewart, 2003; Sohr-Preston & Scaramella, 2006).

Home visiting (HV) programs that provide services to perinatal women are one of the largest avenues through which perinatal women come to the attention of service providers, making HV a unique and viable setting for delivering mental health services. Although professional HV models exist (e.g., Nurse-Family Partnership), most HV programs in the United States use paraprofessionals. Previously, study investigators have established the efficacy of a group-based intervention —the Mothers and Babies (MB) Course—in preventing the onset of postpartum depression and reducing depressive symptoms when led by mental health professionals. However, to date there are no interventions led by non-health or non-mental health professionals that have demonstrated efficacy in preventing the onset and worsening of postpartum depression among low-income women. This project attempts to fill this notable gap.

We will conduct a cluster randomized trial in which HV clients receive either a) MB delivered by mental health professionals, b) MB delivered by paraprofessional home visitors, or c) usual home visiting services. This study design will allow us to conduct a **superiority trial** that compares the efficacy of MB delivered by paraprofessional home visitors versus usual care. A superiority trial will allow us to generate efficacy data on MB delivered by paraprofessional home visitors. Our study design will also allow us to conduct a **non-inferiority trial** that compares the effectiveness of MB delivered by mental health professionals versus paraprofessional home visitors. Should we find that paraprofessional home visitors are not inferior to mental health professionals in delivering the intervention, HV programs throughout the United States will be able to implement the MB Course with paraprofessional home visitors—an approach that is considerably more efficient and cost-effective than employing mental health professionals.

This study was born out of community stakeholders' need and desire for a low-cost intervention that could prevent the onset and worsening of depression among low-income women enrolled in HV programs. Maternal depression is an enormous challenge facing HV programs. However, there is consistent evidence that low-income women exhibiting depressive symptoms—including women enrolled in HV programs—do not access mental health treatment in the community (Abrams et al., 2009). Lack of available mental health professionals, stigma in seeking mental health services, and logistical challenges (e.g., childcare, transportation) are a few of the barriers faced by perinatal women seeking mental health services. For those clients who do access services, most perinatal women are likely to receive pharmacological treatments (Huybrechts et al., 2013), despite the fact that the vast majority of perinatal women prefer non-pharmacologic interventions (Leis et al., 2011).

HV programs are ideal settings for delivering mental health care to perinatal women because their mission is not stigmatizing and HV programs tend to be trusted entities in the communities they serve. However, there is not yet an evidence-based intervention that can be delivered by paraprofessionals (such as home visitors), thereby limiting HV programs' capacity to meet the needs of their clients needing mental health services.

3.0 Inclusion and exclusion criteria:

The study population consists of 1722 individuals. Of this total, 1680 will be HV clients, 24 will be home visitors, and 18 will be mental health professionals. The HV client study population consists of 1680 individuals recruited from 42 home visiting (HV) programs across Illinois and adjacent states. We will enroll these women as part of a randomized controlled trial, where 720 women will be enrolled at 18 HV programs randomized to Mothers and Babies group facilitation by paraprofessionals, 720 women will be enrolled at 18 HV programs randomized to Mothers and Babies group facilitation by mental health professionals, and 240 women from 6 HV programs will receive usual care home visiting services. The 42 HV programs participating in this project enroll clients via referrals from prenatal care clinics, Women, Infants, and Children (WIC) programs and other settings working with perinatal women; home visiting programs implementing the MB Course will implement five MB cohorts per site, over the course of the project. These women will be recruited ≤ 33 weeks gestation upon referral.

Vulnerable Populations
Among our 1680 HV clients we are enrolling, we will enroll only pregnant women in this study, given that our Mothers and Babies Course is delivered prenatally as a postpartum depression prevention intervention. We will offer participation to prenatal home visiting clients, ages 16 and older, knowing the client base for home visiting programs includes pregnant teens. In many states these young women are considered emancipated minors. The Mothers and Babies Course has been used in home visiting programs and other prenatal care settings, with high ratings of acceptability and no ill effects detected. Please refer to the protections against risk description for study procedures in which observations of concern arise.

Study participants: We will work with 42 home visiting throughout the state of Illinois and adjacent states on this project. The population to be studied is pregnant women enrolling in HV programs≤33 weeks gestation upon referral, who are at-risk for major depression. Women ≥16 years old enrolled in HV programs who are ≤33 weeks gestation upon referral, will be eligible for enrollment; across the 42 HV programs ~80% of women receive a HV service ≤33 weeks gestation, making them eligible for study participation.

Several met-analyses of risk factors for postpartum depression have been conducted (Beck 2001, O'Hara & Swain, 1996; Robertson et al., 2004). The findings from these meta-analyses suggest that the following risk factors have the strongest association with developing postpartum depression: a) history of depression, b) elevated depressive symptoms during pregnancy, c) poor social support, d) stressful life events, e) poor marital relationship, and f) low socioeconomic status. Our previous research with HV programs suggest that nearly all HV clients exhibit one of these risk factors, with most clients exhibiting multiple risk factors. This is due to the fact that eligibility criteria for inclusion

in HV programs mirror these risk factors for postpartum depression—particularly, low SES, low social support, and stressful life events. As such, we will not limit our inclusion criteria for this study to onlyi ndividuals exhibiting elevated depressive symptoms, as this would potentially exclude women at risk for postpartum depression. Moreover, there is the potential for underreporting of depressive symptoms on screening instruments, which would lead to under enrollment of women at risk for developing major depression.

Women with high-risk medical and pregnancy conditions will be excluded since this may preclude women from regularly attending intervention sessions. We will not exclude women based on race/ethnicity or based on demographic characteristics other than the ability to speak English or Spanish.

Clinicians: 18 HV programs will receive the MB intervention delivered by clinicians. We will train approximately 18 clinicians to deliver MB. Although there will be variability in the expertise among clinicians, all clinicians will have a minimum of a Master's Degree and at least five years' experience working with children < 5 and their families. The clinicians will live and work in the three different regions of Illinois where this study will be conducted: Chicago, downstate Illinois, and western Illinois as well as adjacent states who are participating in the study

Paraprofessionals: 18 HV programs will receive the MB intervention delivered by paraprofessional home visitors. We will train ~72 home visitors from the 18 HV programs in this study arm, or ~4 home visitors per program; HV programs participating in this study currently employ between 3-8 home visitors, with most employing 4-5.All of the HVs will currently be a staff member of one of the participating study sites.

Home Visiting Supervisors/Managers/Directors: We will also be consenting approximately 15 home visiting supervisors/managers/directors from HV programs outside of the state of IL, to participate in a 5-10 minute survey about their experiences with the Mothers and Babies Program from their perspective as a home visiting program manager/director. The survey responses will help guide improvements and innovations as we continue to support the integration of Mothers and Babies into home visiting!

4.0 Procedures Involved:

Program Implementation: This project is a cluster randomized trial to be conducted in 42 HV programs across Illinois and adjacent states. Cluster allocation by HV program minimizes contamination between study groups that would likely occur if randomization were conducted at the home visitor level. Recruitment of women from throughout Illinois and adjacent states will allow us to increase study generalizability by enrolling a more geographically and demographically diverse sample than could be obtained by working in solely one part of the state. We will randomize 18 HV programs to implement MB with mental health professionals, 18 HV programs to implement MB with paraprofessional home visitors, and 6 HV programs to implement usual home visiting services.

Each HV program delivering MB (both the clinician- and home visitor-led arms), will implement five MB groups/cohorts. Each cohort will have approximately 8 women, which will allow us to reach our target of 40 study participants per program. This cohort size is consistent with previous MB trials. One

month prior to implementation, we will train home visitors and mental health professionals on MB. We will stagger implementation in two waves so that only half the sites are implementing at once. This will allow our Intervention Coordinator to focus her efforts on ensuring attendance at intervention groups and fidelity to intervention protocols. Study recruitment and implementation of all prenatal MB sessions will be completed by the 4th quarter of Year 2. This recruitment schedule will allow us to complete all postnatal MB sessions and follow-up data collection by the middle of Year 3, allowing study investigators to analyze data and prepare to disseminate study findings to both academic and community stakeholders.

Participant Screening: Participants will initially be screened for eligibility criteria by their home visiting program sites. Upon permission from the potential study participant, program sites will fill out a referral form, which will include the potential study participants name and contact information, and send it to the research team. Once the program sites refer potential study participants, a member of the study team will call the participant using the "Phone Script for Referrals" to screen the potential study participant for eligibility criteria and move forward with the consent process either via telephone or REDCap survey link.

Participant Outcomes Surveys: Participant outcomes will be collected at four time points—baseline, post-intervention, 12 weeks postpartum, and 24 weeks postpartum. Participants will receive $20 remuneration at the baseline, 12-week and 24-week assessments. The MMS and EPDS will be administered to all clients during their baseline surveys. This information will be used for data analytics but not as an exclusion criteria. Data will only be collected from study participants who have consented to participate in the study.

The post-intervention assessment consists of one depressive symptom measure, so no remuneration will be provided. Baseline and follow-up data will be collected and managed using REDCap (Research Electronic Data Capture), a secure web-based application designed to support data capture for research studies, hosted and supported by Northwestern's Clinical and Translational Science Institute. Once research staff enters participant contact information, REDCap will generate emails or texts containing web-based survey links at scheduled time points. Baseline data will be collected within 2-3 weeks of establishing client eligibility and participation agreement. Women who do not complete the web-based baseline assessment in this timeframe will be contacted by phone by the Research Coordinator to complete the assessment either by phone or online, ensuring that baseline data are collected prior to the first MB group. Informed consent will be obtained prior to administering the baseline assessment. If a study participant decides that they do not want to consent to participate in this study, no data will be collected from this participant. For the post-intervention, 12-week postpartum, and 24-week postpartum assessments, study participants who do not complete web-based assessments within one week of the web link being sent to them will be contacted by the research team to complete the assessments by phone.

Table 4 describes this study's outcome indicators, measures, and data collection timelines.

Outcome Indicator	Measure	Baseline	Post-Intervention	12 weeks postpartum	24 weeks postpartum
Depressive Symptoms	Edinburgh Postpartum Depression Scale	X			
Current & Lifetime Major Depressive Episode	Maternal Mood Screener (MMS)	X		X	X

DEPRESSION					
Depressive Symptoms*	Quick Inventory of Depressive Symptomatology	X	X	X	X
PROXIMAL OUTCOMES					
Behavioral Activation	Behavioral Activation	X		X	X
Pleasant Activities	Pleasant Activities Schedule	X		X	X
Mood Regulation	Negative Mood Regulation Scale	X		X	X
Social Support	MOS Social Support Survey	X		X	X
Decentering	Experiences Questionnaire	X		X	X
Relationship w/Partner	Dyadic Adjustment Scale	X		X	X
Responsive and Reactive Parenting	Parental Cognitions and Conduct toward the Infant Scale			X	X
Subjective Well-Being	Flourishing Scale	X		X	X
Perceived Stress	4-item Perceived Stress Scale	X		X	X
PRENATAL HEALTH BEHAVIORS	Developed by Investigators	X		X	X
DEMOGRAPHICS	Developed by Investigators	X		X	X
INTERVENTION SKILL USE	Developed by Investigators			X	X
INVOLVEMENT IN PRENATAL SERVICES	Developed by Investigators	X		X	X

Facilitator Assessments:

Outcome Indicator	Measure	Baseline	After Each Cohort
DEMOGRAPHICS	Developed by Investigators	X	
MB GROUP FACILITATOR SURVEY	Developed by Investigators		X

The study surveys will be conducted using web-based surveys, created using REDCap, which is supported by Northwestern University IT.

Training: All home visitors from the 18 HV programs randomized to the home visitor-led MB Course and mental health professionals will attend a 1.5 day training on MB led by Dr. Tandon. These 1.5 day

trainings will be held in different parts of Illinois and adjacent states and we anticipate conducting

multiple trainings for home visitors and clinicians. Holding multiple trainings for home visitors allows for smaller numbers of home visitors per training; we anticipate no more than 30 home visitors will attend a MB training based on the number of home visitors employed by participating programs.

Home visiting supervisors from each of the HV programs and the mental health professional coordinator, Ms. Delimata, will also attend the 1.5-day training. Supervisors and Ms. Delimata will receive an additional half-day of training preparing them to provide supervision to home visitors delivering MB. Home visitors will receive supervision from Dr. Tandon the first time they deliver MB. However, to promote the sustainability of MB at HV sites, the clinical supervisors and Ms. Delimata will assume the supervisory role—with support from the research team—after home visitors have delivered the MB curriculum for the first time.

During the first six months of the project, home visitors and mental health professionals will also receive technical assistance from Co-Investigator Gollan and PI Tandon by web conference to ensure mastery and adherence to MB materials. Specifically, these technical assistance sessions will be designed to strengthen competency in the specific techniques using case illustrations and provide competency ratings to home visitors and mental health on how they are delivering core MB concepts professionals.

The plan for supervision was carefully developed to ensure a sufficient level of supervision while not placing undue time commitments on home visitors and clinicians implementing MB. Initially, supervision for home visitors and mental health professionals will be conducted via one hour weekly Skype sessions with Dr. Tandon. During these sessions, Dr. Tandon will first debrief the completed MB session and will then help the home visitors and mental health professionals plan for the subsequent group session. Accordingly, our Intervention Coordinator will schedule Skype sessions that consist of 2-3 individuals who are implementing on the same schedule. This will allow home visitors and clinicians to benefit from both Dr. Tandon's supervision and the perspectives of colleagues implementing MB at the same time. Following the initial supervision, group facilitators will complete a brief survey after the completion of each cohort they facilitate, in order to reflect on the frequency and types of supervision utilized during a specific cohort.

Program Intervention: Study participants will be randomly selected to participate in one of three study arms; Groups led by paraprofessional home-visiting staff, groups led by Mental Health Consultants, or a control group. Women who participate in the group sessions will attend a two hour session, once a week, for six weeks at their home-visiting program site. The group facilitators will administer a short survey at the end of each group session, to obtain the study participant's feedback on the group session. Each group facilitator will be trained on the Mothers and Babies curriculum prior to beginning group implementation.
The Mothers and Babies Group Curriculum has been used in home visiting (HV) programs and has demonstrated positive outcomes for women who receive MB. The curriculum is comprised of 6 sessions. Mothers and Babies is divided into three overall sections, one on each of the following Cognitive Behavioral Theory components; Pleasant Activities, Thoughts, and Contact with Others. In each of these sections, participants are first taught to understand how the component influences her mood. This teaching of the relationships between CBT components and mood is referred to as

psychoeducation. In addition to psychoeducation, participants also receive concrete skills in each of the three sections (pleasant activities, thoughts, contact with others). These skills are intended to provide participants with a "toolkit" of approaches they can use to improve their mood.

We will randomly select 20% of the Mothers and Babies group sessions to be audio-recorded using a portable audio-recording device for purposes of examining intervention fidelity. While audiotapes will be used primarily to review fidelity of intervention implementation, we anticipate conducting exploratory analyses examining whether implementation fidelity affects clinical outcomes (e.g., depressive symptoms). The audio-recordings will be transferred back to the NU Research team by the group leader (i.e. Mental Health Clinician or Home Visitor) within 24 hours following the completion of each individual session. The group leader will email the file to the NU Research Team's secured NU email address. Upon receipt, audio-recordings will be uploaded onto our research project shared drive, which is password protected and accessible only by our authorized study personnel. Should space become an issue, recordings will be burned onto DVDs, which will be stored in a locked file cabinet in our locked office location. Once the research team receives the audio-files, group facilitators will be instructed to immediately delete the recordings from the audio-device.

Participant Outreach and Contact: Recruitment procedures will emphasize the importance of participating in all MB sessions and remaining in the study through the 24-week assessment. We will obtain ample tracking information at baseline which would include the participants name, email, home and cell phone numbers, mailing address, home-visiting site, and secondary contact denoted by the participant. We will update the contact information at each follow-up, including contact information for two people who will always know how to reach a participant and each participant's preferred mode of communication (e.g., phone, text, Facebook). We will allow participants to complete follow-up surveys by phone or in person for those who are unable (i.e., no internet access via computer, tablet, or smartphone) or less comfortable completing surveys electronically. We will conduct intensive follow-up with participants throughout the study via weekly communication from the Research/Intervention Coordinator using the participant's preferred modes of contact; the Intervention Coordinator and RA are both bilingual and, therefore, able to communicate with both English- and Spanish-speaking participants. We will follow all study participants through the 24-week postpartum assessment regardless of their attendance at intervention sessions.

Study participants will be contacted at the following time points throughout the study:

1. Upon referral into the study. This contact will be from a member of the research team in order to conduct eligibility screening and review the study and next steps for consent and assessments
2. To schedule and/or conduct assessements by phone or REDCap survey link at baseline, post-intervention, 12 and 24 weeks postpartum
3. To remind study participants about attending their weekly group sessions
4. To check in with the study participants to make sure the study team has up to date contact information for the participant, as well as to stay engaged and build a rapport with the participant

5. If the study participant is selected for a semi-structured interview, research staff will call and schedule the interview and conduct the interview via phone at a time mutually agreed upon by the parties
6. Congratulation cards will be sent to each study participant after the birth of their baby

Please note that communication with study participants will be based on participant preference and can be administered by phone, email, or text communication channels. We anticipate that it will take about 10-15 minutes for item #1 above. For items 2-5, we anticipate that these outreach efforts will take less than five minutes per participant, with many of our study participants being contacted for item #4 via text message.

Completed intervention sessions: Will be collected by mental health professionals and home visitors delivering MB on an attendance form created for use in this study. Fidelity of intervention implementation will be assessed by reviewing a random sample of audiotaped sessions. Dr. Gollan, research staff, and the Project Coordinator will perform independent ratings using fidelity checklists developed and used in previous trials by the PI to assess fidelity to MB. Retraining will be triggered for adherence <90%.

Acceptability: We will collect data on MB acceptability via three data collection activities. First, we will conduct brief semi-structured interviews with 90 intervention participants—45 who received MB led by mental health professionals and 45 who received MB led by paraprofessional home visitors. To ensure representativeness of this sample, the 45 participants per group will be stratified across the three regions of Illinois—Chicago, downstate Illinois, and adjacent states. Second, we will conduct brief semi-structured interviews with 24 home visitors who delivered MB. Again, we will divide respondents equally across the three regions (n=8 home visitors from Chicago, downstate Illinois, adjacent states, respectively). We will also conduct semi-structured interviews with all ~18 mental health professionals delivering MB. Third, all participants will complete brief paper and pencil checklists immediately after receiving a MB session. Home visitors and mental health professionals will collect these checklists. We will ask each intervention participant to rate each session using three questions used in previous MB studies: “how much did you enjoy today’s group session?”, “how well did you understand what we talked about during today’s group session?”, and “how often do you think you will use the skills and information that you were given during today’s group session?”

5.0 Multiple sites:

N/A

6.0 Incomplete Disclosure or Deception:

N/A

7.0 Recruitment:

Home Visitors: We will recruit 72 home visitors from 42 participating HV programs throughout the state of Illinois and adjacent states. All HV programs recruit women at high risk for poor pregnancy and/or parenting outcomes via referrals from prenatal care clinics, community outreach, and current program participation. We will be training all of the 72 home-visitors who are being recruited through the participating home-visiting sites. Out of those 72 home-visitors, we anticipate 24 of them to implement the intervention groups and in turn be our study participants being asked to complete a semi-structured interview after the completion of their cohorts.

Study Participants: We will recruit 40 study participants from each of the 42 participating HV programs. These 40 participants per program will be recruited in five cohorts. Each cohort will be recruited for approximately one month at a participating HV program; as such, each month we recruit at a participating HV program we will only need to enroll 8 study participants (40 participants/5 cohorts).

Clinicians: We will also recruit and train ~18 clinicians to deliver MB; each clinician will deliver MB at one or more HV programs across the duration of the project. All of the clinicians who are implementing the intervention will be invited to participate in the semi-structured interviews after the completion of their cohorts. The 18 clinicians will live and work in the three different regions of Illinois where this study will be conducted: Chicago, downstate Illinois, and western Illinois, as well as adjacent states. A description of the study as well as the clinician role was sent out to the Illinois Association for Infant Mental Health (ILAIMH) listserv and the consultant email list at Illinois Children's Mental Health Partnership (ICMHP). Linda Delimata, MS, the Consultation Coordinator at the Illinois Children's Mental Health Partnership (ICMHP) and coordinator of the Infant Mental Health Consultant network in Illinois, has identified clinicians from the three regions of the Illinois where this study will be conducted. We have also sent a description of the study to the Home Visiting Research Network (HVRN) to recruit adjacent states participation for wave 2 of recruitment.

Home Visiting Supervisors/Managers/Directors: We will also be consenting approximately 15 home visiting supervisors/managers/directors from HV programs outside of the state of IL, currently participating in the parent study, to participate in a 5-10 minute survey about their experiences with the Mothers and Babies Program from their perspective as a home visiting program manager/director.

Recruitment Procedures/Attrition: Recruitment procedures will be identical to those used in a previous RCT of MB in HV programs conducted by Dr. Tandon. A postcard and/or flyer will be provided to the participating HV sites and the potential eligible study participants prior to NU research staff calling the study participants. The postcard/flyer will explain the purpose and overview of the study. The postcard/flyer will include a link on NU REDCap database to be able to consent to participate in the program and complete a baseline assessment. The surveys will be available in both English and Spanish. The NU research team will also email the survey link to the study participants using email addresses provided by the HV sites.

Prior to beginning program implementation, potential study participants contact information will be obtained by the participating trained HV sites. The Research Coordinator, Intervention Coordinator,

and Research Assistant, will share responsibility for calling each woman receiving HV services ≤ 32 weeks gestation to tell them more about the recruitment and consenting process. A recruitment letter will be sent to the participants by the RA asking them to participate in the research study if the research team is unable to reach them by phone or email.

We will obtain names, phone numbers, and addresses of women ≤ 33 weeks gestation upon referral. Individuals who meet our criteria for study eligibility but who are not interested in participating in our research activities will still be able to participate in the MB intervention. Based on previous research, we expect that fewer than 5% of eligible participants will opt out of research activities.

The Research Coordinator, Intervention Coordinator, and RA will introduce women meeting eligibility criteria to the study, answer questions they have about participation, and ascertain their interest in participating in the research study. For women in HV programs that will implement MB, they will tell women expressing interest in MB the anticipated date and time for the first MB group session. The Research/Intervention Coordinator and/or RA will call to remind women of the date and time of their first MB group. We expect there will be no longer than four weeks' time between the Research/Intervention Coordinators' initial recruitment call and the first MB group, during which time the Research/Intervention Coordinator and/or RA will call participants at least once a week as well as daily in the two days prior to the first session.

We anticipate that 80% of eligible women will agree to participate (n = 1976; 80% of 2470 meeting eligibility criteria); in our previous RCTs in Baltimore and Hawaii, only 2% of eligible women declined. Thus, this is a very conservative estimate of the number of women who will decline study participation. We also conservatively estimate that 15% of women who agree to participate in the study will be lost to follow-up prior to the first MB session, resulting in 1680 study participants (85% of 1976). The 15% lost to follow-up estimate is due to the transient nature of many HV participants.

8.0 Consent Process

All recruitment and consent procedures will be performed in accordance with guidelines of the Northwestern University Institutional Review Board. Women enrolling in the 42 home visiting programs during recruitment periods will complete the screening administered by phone by the Research or Intervention Coordinator. We request a waiver of written documentation of consent in order to administer this study online, or over the telephone if client participants do not have easy access to web-based resources. Online study implementation will decrease the time required to complete study assessments, and is more feasible to implement given that home visiting programs and clients across the State of Illinois and adjacent states will be participating, and our resources are limited.

Regardless of whether or not the study participant consents to the study online or over the phone, NU Research staff will offer the participant a copy of the consent form. If the study participant would like a copy of the consent, Research staff will either email or mail a copy of the consent form to the participant per their preferred method of contact.

If the enrollee meets eligibility criteria and is interested in participating in the study, the Research or Intervention Coordinator will indicate that a web-link with instruction on completing the baseline assessment via REDCap will be emailed or texted to them within the next two weeks. Consent will

be conducted using online administration at the time of the first web-based survey. A preamble to the consent form will appear in REDCap on the screen prior to the participant reviewing the consent. This preamble will be an introduction to the consent form clearly explaining the participant's role as a research participant in the study. The preamble will read: "The purpose of this study is to learn how well the Mothers and Babies program* works to help pregnant women and new mothers manage stress and reduce depression, when delivered by different types of facilitators. We are asking you to take part in this research study because you are receiving services from a home visiting program or an early childhood program and you are in your 2nd or 3rd trimester of pregnancy. Your participation in this study will last approximately 6-12 months after you complete your first survey. You will be asked to complete surveys that ask about your mood, stress, social supports, and involvement in prenatal services. Surveys will take approximately 45 minutes to complete, and will be conducted at the beginning of the study, immediately following completion of the 6-week group sessions, 3-months after the birth of your child, and 6-months after the birth of your child. You can complete these surveys on the internet or by phone. You may also be asked to participate in a brief interview about your experience with the Mothers and Babies program. The interview will be conducted over the phone and will last approximately 30-60 minutes."

*The Mothers and Babies program intervention is described fully to the participant during the screening process prior to consenting into the research study. The preamble will be available in both English and Spanish.

A brief questionnaire will follow the consent form in order to ensure the participant understands that (1) their participation is voluntary, and (2) they may withdraw or refuse participation at any time without consequence to their home visiting services. Both the online consent form and the study surveys for home visiting clients will be available in English and Spanish. Each time a study participant fills out a survey, the survey will include a prompt to the participant asking if they wish to continue their participation by completing the next survey.

We are requesting a waiver of parent permission in order to wave the signature of parents of children who are participants (Pregnant women >16years old; < 18 years old). This research involves minimal risk to the participants by only requiring the administration of online surveys and/or telephone interviews in order to collect data. Guidance from the U.S. Department of Health and Human Services Office of Research Protections (OHRP) indicates that individuals < 18 years of age can consent to study participation without parental consent if the study procedures for which they are consenting are such that they could provide consent outside of the research context. The waiver of parent permission will not adversely affect the rights and welfare of the minor subjects. This is a low-risk study. We will assess the Minor's ability to consent to participate by asking them a series of questions at the end of the informed consent process to ensure they understand 1) the main points of the study, including the research requirements, 2) the main risks of the study (in our case, feeling uncomfortable about some of the mental health questions, and 3) understanding that they can refuse to answer any questions on assessments and/or opt out of the study at any time w/o adversely affecting their relationship with their HV program.

This research could not practicably be carried out without the waiver of parent permission. Home-Visiting Program protocol is that parent/guardian consent is not required for a client under 18 to be able to enroll in a home-visiting program. The minors who we anticipate enrolling into the study have fractured relationships with their parents given the predominately low-income populations we are working with. This will result in difficulties tracking down the parent/guardian for informed consent.

The Intervention Coordinator and RA are bilingual and, therefore, able to communicate with both

English- and Spanish-speaking participants. All of the surveys and assessments provided to the participants will be in either English or Spanish and administered either orally or written in the language in which the participants are most comfortable speaking.

The Research/Intervention Coordinators and the RA will conduct the semi-structured interviews. All home visitors and mental health professionals will be asked to provide informed consent prior to participating in their semi-structured interview. Consent forms will clearly indicate that some study participants will be asked to participate in this additional data collection activity.

For the home visiting supervisors/managers/directors who are interested in participating in the survey, the Research Coordinator will email the web-link with instruction on completing the survey via REDCap within one week of interest in completing the survey. Consent will be conducted using online administration at the time of the survey.

9.0 Process to Document Consent:

We request a waiver of written documentation of consent in order to administer this study online, or over the telephone. Online consenting will take place in Northwestern University's secure REDCap Database. There will be a continuous prompt to participants when filling out surveys regarding their current willingness to continue participation.

Instructions to the REDCap assessments will provide rationale for the use of certain survey questions. Research team members administering assessments via phone or in person will be instructed to make sure this rationale is provided to study participants who do not see this rationale on the web-based REDCap system. Participants will be informed via informed consent and during all assessments that they may choose to not answer any question at any time for any reason and that not answering questions will not affect their relationship with their HV programs or ability to keep receiving the MB intervention (for those enrolled in the two intervention arms). Research assistants will consult with the Research Coordinator and PI, Dr. Tandon, if necessary, to resolve any questions they are unsure how to handle.

10.0 Risks to Participants:

There are no major risks to study participation. A participant in the study may experience some psychological discomfort while answering questions that may be considered of a sensitive nature about herself, her child, or her family. Study participants randomized to the MB intervention group may also experience some discomfort discussing stressful life events. Facilitators leading MB intervention groups will be specifically trained on protocols to handle such situations. Should a participant wish to withdraw from the study for any reason, at any time, her access to home visiting program services will not be affected. It is within reason to expect there may be participants who experience and endorse some level of suicidality during the study. Any study participant who expresses suicidal thoughts on assessment instruments (including baseline screening) or during intervention activities will be referred to the supervisor at the home visiting program. The supervisor, who is trained in responding to and addressing suicidal ideation, will use their agency's protocol to make a determination regarding whether the study participant is in danger of harming herself or others and will determine necessary steps to ensure the safety of the study participant. Other psychosocial concerns that may be raised among study participants during study intervention activities (i.e. substance abuse and domestic violence, will be closely monitored) per usual home visiting program protocols. Should home visitors become aware of these psychosocial risks, referrals will be made to an appropriate social service agency using protocols used by their home visiting program.

We do not anticipate any circumstances under which subjects will be withdrawn from the research without their consent. If a subject withdraws from the research, we will no longer collect survey data, but we will use data already collected unless the subject submits a written request to withdraw their data.

11.0 Potential Benefits to Participants:

There may be no direct and immediate benefits for individuals participating in the research component of this study. We believe that women randomized to the MB Course will exhibit greater reductions in depression symptoms, perceived stress and improved parenting.

12.0 Financial Compensation:

Participant outcomes will be collected at four time points—baseline, post-intervention, 12 weeks postpartum, and 24 weeks postpartum. Participants will receive $20 remuneration at the baseline, 12-week and 24-week assessments. They will also receive $20 if they are randomly selected for a qualitative interview post-intervention. The post-intervention assessment consists of one depressive symptom measure, so no remuneration will be provided.

Both the participants who complete the surveys online via the unique link sent to them by Research staff from the NU REDCap Database and those participants who decide to take the surveys verbally by phone, will receive their gift cards by mail once the survey has been completed.

There are no costs to participate in the study. We have budgeted for childcare and transportation for study participants requiring assistance in these areas. HV stakeholders involved in developing this project strongly supported the inclusion of transportation and childcare reimbursement.

13.0 Provisions to Protect the Privacy Interests of Participants:

We will use several procedures to secure data to maintain its confidentiality. Only authorized persons will be granted access to study data. Currently, this includes the PI (Dr. Tandon), Project Manager (Jessica Jensen) and Study Coordinators (Melissa Segovia and Alicia Diebold). Only authorized persons will be allowed to enter and view study data. Passwords and system ID's for the REDCAP system will not be shared with other team members. Additionally, the physical security of the workstations and files where REDCAP data are stored will be maintained by study personnel. All data collected will be de-identified using a study ID. The only document with identifying information is the consent form.

14.0 Confidentiality and Data Management:

Only the research team will have access to individually identifiable private information about human subjects, for the purpose of tracking recruitment and retention, as well as participation payments. All data will be de-identified in study databases.

To safeguard confidentiality and anonymity, all data collection instruments will identify participants only by study ID number. Logs linking information to study numbers will be kept locked in a file cabinet in the Project Manager's office. Data analysis staff will not have access to identifying information. We will inform participants of the areas to be covered in the surveys prior to their administration. Study participants will be told that if they experience any discomfort while participating in the data collection procedures they can ask to be removed from the study. Also,

participants will be told that they do not have to respond to any questions that make them feel uncomfortable. Individuals will be told that their refusal to answer any question will not jeopardize their relationship with their home visiting program and will not affect their receipt of home visiting services.

We believe that the use of the REDCAP data collection system will allow us to collect high quality data from all study participants and will not require the need for additional procedures to monitor data quality.

Power Analysis: For our **superiority analyses** (Aim 1) comparing MB led by home visitors vs. usual care, we have assumed a standard deviation of ~6.0 points on the QIDS-16—our measure of depressive symptoms. We anticipate over 95% power to detect a five-point difference between study arms (HV- led MB vs. usual care) with ICC's up to .01; thus, the planned sample size and anticipated dropout rate provide adequate power to detect meaningful differences across arms for our superiority analysis. We have also conducted power and sample size calculations that take into consideration the possible loss of clusters (i.e., HV programs) within each study arm. Even with a loss of two clusters implementing MB and one cluster providing usual care, we will have over 90% power to detect a five-point difference between study arms on the QIDS-16. Previous published prevalence data and previous MB data illustrate a 15% reduction in incidence of depressive episodes, and again, we anticipate minimal ICC. We expect power >95% to detect an absolute risk reduction of 15% in the intervention arm for ICCs no larger than 0.01.

For our **non-inferiority (NI) analyses** (Aim 2) comparing MB led by home visitors vs. MB led by mental health clinicians, we used similar assumptions of a 6.0 SD on the QIDS-16. We will have >85% power to detect a difference in mean QIDS-16 scores of two points between the two arms with 1224 analyzable participants' data (i.e., 612 in each arm, or 18 clusters in each group with 34 participants on average) with an ICC no larger than .01. We have taken into consideration the potential loss of up to two clusters in each study arm for our NI analyses. Even with a loss of two clusters, which would leave us with 1064 analyzable participants' data (i.e., 532 in each arm), we will have >80% power to detect a difference in mean QIDS-16 scores of two points between study arms with an ICC no larger than .01. Since we recognize that power to claim NI will depend heavily on the magnitude of any ICC, we will perform several ICC calculations within each arm to assess power assumptions post hoc. We do not anticipate adequate power to claim NI regarding the incidence of new cases of major depression. If we assume 15% incidence in the professional arm versus 20% in the paraprofessional arm (i.e., a margin of NI of 5%), a sample size of 1224 participants would have 64% power and a sample size of 1064 would have >50% power at the 5% level of significance without accounting for any ICC. Thus, we will statistically compare the two arms with respect to MDD incidence, but do not anticipate the ability to claim NI.

15.0 Data Monitoring Plan to Ensure the Safety of Participants:

Any study participant who endorses thoughts of self-harm will be referred to the supervisor at the home visiting program, by the study coordinator. The supervisor, who is trained in responding to and addressing suicidal ideation, will use their agency's protocol to make a determination regarding whether the study participant is in danger of harming herself or others and will determine necessary steps to ensure the safety of the study participant. The Principal Investigator will be notified

immediately of any such referrals made by study staff. In addition, should administration of depression scale indicate the participant is experiencing severe depressive symptoms, the supervisor at the home visiting program will be notified in order to provide appropriate referrals for their client's mental health treatment linkage.

We will administer the Maternal Mood Screener (MMS) (Le & Muñoz, 1998) to assess for history of MDD and current MDD. The MMS is a self-report checklist that assesses MDD using DSM-V criteria. Previous research supports the MMS as a valid instrument for MDD screening (Vasquez et al., 2008). Women meeting MDD criteria who are not currently in treatment will be referred to the supervisor at their HV agency.

During any of the research assessments, if the participant endorses current thoughts of harming herself or others, the following protocol should be followed, and documented on an Incident Report.

Maternal Mood Screener (MMS), Question 9d
→ *In the past 2 weeks, subject endorses she has attempted suicide in the past two weeks*

The Quick Inventory of Depressive Symptomatology (QIDS), Question 12
→ *In the past week, subject selects answer #3 (I thought of suicide or death several times a day in some detail, or I made specific plans for suicide or actually tried to take my life)*
The Edinburgh Postnatal Depression Scale (EPDS), Question 10
→ *In the past week, subject endorses thoughts of harming herself quite often*

When assessments are completed over the phone or online during regular business hours the following protocol will be completed within 24 hours.

Within 24 hours of the study participant's completion of their assessments a member of the Research team will call the study participant and will let the participant know that he/she will be contacting their home visiting program to let them know about the difficulties they are having with thoughts about death/suicide/hurting yourself/others, so they can reach out and offer support. The research team member will ask the study participant the following questions:

- "Are you thinking about killing yourself?"
- "Have you ever tried to hurt yourself before?"
- "Have you thought of ways that you might hurt yourself?"
- "Do you have pills/weapons in the house?"
- "Do you think you might try to hurt yourself today?"
    - *If her response is Yes, then call 911 and stay on the phone with her until help arrives*

All individuals that complete the above surveys will receive the following resources immediately upon answering the above answer choices on the noted assessments

- ✓ Home Visiting Program Office phone number
- ✓ National Suicide Prevention Hotline (24/7)
    - 1-800-273-8255 (1-800-273-TALK)
    - http://www.suicidepreventionlifeline.org/ (online chat available 24/7: "Lifeline Chat")
- ✓ Postpartum Support International (outside of Illinois)
    - 1-800-944-4773
- ✓ NorthShore Perinatal Support, 24-hour Crisis Hotline (in Illinois)
    - 1-866-364-MOMS (866-364-6667)

All of these resources (except the home visiting program office number) will also be shared with all study participants, regardless of answers to assessment questions, at the end of each assessment.

The research team member will stay on the phone with those individuals who endorse the possibility of imminent self-harm. After the research team member ends the call with the study participant, they will call the Program Manager with relevant details, reporting what the client said and endorsed, as well as the information they gathered during the assessment and call with the participant. The research team member will then follow up with an email to the home visitor, supervisor, Project Manager, as well as the PI with relevant details.

If the survey is completed outside of regular business hours (i.e. weekends/holidays) the research team will follow-up with the participant no later than the following business day. As noted above, the risk would be acknowledged in real time as the participant would still receive resources immediately following their answer selection to the above survey questions.

We believe this to be a reasonable expectation in regards to protecting human subjects and the role of the research team. Previous Mothers and Babies studies conducted by the PI, as well as other nationally representative studies of perinatal women have shown that less than 1% of study participants will endorse the most "severe" response choice on survey items related to suicidality. As such, we anticipate that the number of study participants who endorse the most severe response related to suicidality outside of regular business hours over the course of this study will likely be < 10 individuals. As such, we believe our approach to handling this potential risk to study participants—i.e., immediate provision of 24/7 resources and follow-up by the study team no later than the next business day—is reasonable given its likelihood of occurrence. Moreover, women receiving the Mothers and Babies intervention (~86% of the sample) will be receiving information on modifying harmful thought patterns that may contribute to decreased thoughts about self-harm.

16.0 Data and if applicable, Specimen Banking:

The study surveys will be conducted using web-based surveys, created using REDCap, which is supported by Northwestern University IT. We do not plan to share individual study results with subjects. However, aggregate data findings will be shared with home visiting programs.

17.0 Qualifications to Conduct Research and Resources Available:

Pregnant and postpartum women are the client base of home visiting programs, and are the intended recipients of our postpartum depression prevention intervention Dr. Darius Tandon, the Principal Investigator, is an associate professor and nationally recognized expert in the fields of maternal depression and home visiting. For example, Dr. Tandon is the lead faculty expert for a federally-funded Home Visiting Maternal Depression Collaborative Improvement and Innovation Network aimed at improving the ability of home visiting programs around the country to address maternal depression among their clients. This project builds on work he has conducted over the last 7 years integrating mental health services and interventions into home visiting. Alongside of Dr. Tandon, we also have three community stakeholders with strong relationships with the home visiting programs in the community, thereby enhancing the likelihood of this project's success.