USING BEHAVIORAL INTERVENTIONS TO IMPROVE SERVICE ACCESS FOR MEDICAID-ELIGIBLE PREGNANT PATIENTS IN BALTIMORE

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Background

Infant mortality. The United States infant mortality rate was approximately 5.9 deaths per 1,000 live births in 2016.1 Baltimore City has historically had one of the highest infant mortality rates in the country, and though progress has been made in recent years, there is still a considerable gap with national averages: In 2009, 13.5 infants died per 1,000 live births in Baltimore. That year the City launched B’more for Healthy Babies (BHB), a strategy to improve birth outcomes in the City, and by 2016, the rate had declined by 35% and the racial disparity between black and white babies dying by over 50%. In spite of this progress, black infants are still nearly twice as likely to die than white infants, indicating continuing sizable racial disparities in birth outcomes.2

A multitude of factors contribute to infant mortality. In Baltimore, the three leading causes of infant mortality are preterm birth, low birth weight, and sleep-related infant deaths. One way to address issues like these is to provide preventative care and support services for expectant and new parents outside clinical settings—particularly in expectant parents’ homes and neighborhoods. Baltimore does so through a single-point-of-entry care coordination system that uses the state-required Maryland Prenatal Risk Assessment (PRA) to identify pregnant women in prenatal care and connect these families to additional services. When this form is sent by a prenatal care provider and received by the Health Department’s care coordination partner, HealthCare Access Maryland (HCAM), patients are triaged into risk levels and contacted with an offer of services appropriate to their risks. For example, young first-time mothers may be eligible for Nurse Family Partnership home visits through the Family League of Baltimore, while others may benefit from other models of home visiting or specialty services supporting their behavioral health needs. All patients referred through a PRA are eligible for Moms Club3 meetings, assistance enrolling in or using health insurance, education about other programs such as the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), and more.

Maryland requires providers to fill out the one-page PRA form for all pregnant patients eligible for Medicaid at their first prenatal visit. Across the state, the information is used by the provider to identify health conditions that may negatively impact birth outcomes, by local health departments to identify those that may benefit from local programs and services, and by Managed Care Organizations to link

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1 https://www.cdc.gov/reproductivehealth/MaternalInfantHealth/InfantMortality.htm
3 Moms Club is a support and education group for pregnant women.
patients to care coordination and case management. According to epidemiological analysis by the Baltimore City Health Department (BCHD), Medicaid eligible patients who did not have a PRA submitted on their behalf were 5 times more likely to experience a fetal or an infant death, compared to patients whose provider submitted a prenatal risk assessment. While there are potential confounding factors in this relationship, it is likely that the supportive services available to patients who are referred via the PRA contribute to improved birth outcomes.

Even though providers are legally required to complete PRAs, completion rates are below 80% for Medicaid-enrolled patients in Baltimore. The goal of the collaboration described below was primarily to increase this rate, with a secondary aim to improve the quality of the data collected on the form.

**Partners and project overview.** ideas42 partnered with the B'more for Healthy Babies initiative, including BCHD, the Johns Hopkins Center for Communication Programs, Family League of Baltimore, and HCAM, to research, design, and test solutions to increase provider submission of PRAs. The partnership commenced in late 2016 and continues today. The interventions developed were fielded for six months, from early March through early September 2018 (hereafter referred to as the “study period”). Due to complexities in data infrastructure and processing, the project team has not yet analyzed the outcomes from the study period.

**Hypotheses and qualitative research.** Prior to intervention design, we conducted semi-structured, hypothesis-driven observational walk-throughs and interviews with prenatal care providers and BCHD stakeholders to identify potential causes of suboptimal PRA completion behavior. Walk-throughs and interviews were arranged with a non-representative sample of approximately 10 providers with relatively firm existing relationships with BCHD. The providers involved in qualitative research included physicians, nurses, office managers, prenatal care coordinators, and other practice staff members.

We generated a large set of hypotheses concerning why providers may not complete the PRA, which informed our observation and interview protocols. We used the information from both research processes to eliminate some of these initial hypotheses and add new ones that emerged from the inquiry. Ultimately, we arrived at the following broad hypothesis categories:

While providers may be aware of the PRA’s importance in principle, they do not perceive its impact on individual patients. Providers usually do not think about the effects of PRA completion on a patient’s health. In some cases, they don’t know what happens to the form after it leaves the practice. One nurse we interviewed knew that the PRA would go to BCHD, but didn’t know that BCHD used the information to provide any services or benefits to patients. Echoing this, another nurse in charge of PRAs was surprised at HCAM’s high success rate at reaching and providing patients with services. Across multiple practices, we heard that response letters, which HCAM issues to providers to apprise them of their patients’ PRA

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referral outcomes, often fail to reach the individuals within each practice who are responsible for PRA completion. This leaves providers unsure of the outcomes and benefits associated with the PRAs they complete for their patients. When providers don’t think about the benefits of the form concretely, they are naturally unlikely to fill it out.

Providers’ comments about the PRA reveal that there is psychological distance between the form and its impact. This distance can be felt over time (when the impact won’t happen for a while), over distance (when the impact happens far away), across social boundaries (when the impact is happening to someone else, or someone dissimilar from yourself), and in various other dimensions. When the impact of a concrete action feels psychologically distant to someone, they may be less motivated to act. In this case, the distant consequences—expert triage, community services, and ultimately child survival—may fail to motivate staff to take the concrete action of filling out PRAs.

In addition, if providers do not regularly see or understand the impact, the form’s health benefits may not come to mind when deciding whether to fill out the PRA. Two frequently observed psychological phenomena may help us understand this. People often make decisions that seem disproportionately influenced by commonly or recently encountered examples, a cognitive shortcut psychologists term “the availability heuristic.” In outreach efforts to prenatal care practices, BCHD had previously found that describing the services that BHB offers—such as home visiting—captured the attention and interest of staff, rather than talking about the PRA’s importance. Methods like this that provide vivid examples help redirect heuristic cognition in a positive direction, allowing providers to imagine patient-specific benefits when deciding whether or not to fill out the PRA.

Staff see their primary duty as providing care. Filling out a form does not feel like part of their identity. Physicians and nurses we spoke to described doing paperwork as one of the most tedious tasks they must complete, or as something they do simply because someone told them to. They viewed paperwork as costly to their work as medical professionals, not as part of that work.

This suggests that care providers have a particular mental model, or stereotype, of forms and their consequences. If a provider holds a mental model that all forms are administrative tasks with little or no medical benefit, form completion would naturally fail to conform to her concept of her identity or most important duties.

This specific mental model may have negative consequences due to a related bias, sometimes referred to as “the law of the instrument” or “Maslow’s hammer”: Experts often heavily rely on and believe in the tools of their own trade, rather than solutions that are less familiar, intuitive, or identity-resonant. Prenatal care providers may not consider non-medical solutions such as the PRA to be important because these solutions feel “non-medical” in nature.

Providers’ mental models and misaligned identity may exacerbate the consequences of psychological distance between the form and its health benefits, described above. The mental model that paperwork is a trivial, obnoxious addition to staff’s clinical workload deepens providers’ perceptions that forms are unlikely to have real benefits. With regard to identity misalignment, staff perceives their own work as having a clear and present impact, while work that occurs outside the clinic seems dissimilar and disconnected from their own.
Making the positive effects of the PRA more cognitively available may reduce these follow-on effects. Other methods, such as describing form completion and HCAM’s service provision in language consistent with providers’ core identities as medical professionals, may also alter this pattern.

PRAs are required by law for certain patients. Providers focus on compliance, which obscures some situations in which a PRA is required, and—crucially—others in which PRA-referred services could provide valuable support. Many practices interpret the Medicaid PRA requirement as an indication that they should never complete PRAs for non-Medicaid patients, and that the PRA is essentially a duplicative part of intake for Medicaid patients, serving no other role in their care. This conclusion does patients a disservice: Providers who do not accept patients on Medicaid have no process in place for PRA completion, and a broader set of providers lack a process to submit a PRA for patients who switch to Medicaid as their primary insurer late in pregnancy. Patients whose risks seem low in early pregnancy, and whose PRAs reflect these low risks, essentially never have a second PRA completed on their behalf if their risk profile changes. Consultative providers, such as maternal and fetal medicine specialists, may be particularly likely to diagnose pregnancy-related conditions, but are particularly unlikely to submit PRAs: They view the form solely as part of obstetric intake, and do not conceive of themselves as having the responsibilities of patients’ primary OB/GYN provider.

Organizations of all types are prone to focusing on mere compliance instead of utilizing a policy-related tool to the best possible effect. This occurs partially through the cognitive process of heuristic substitution, wherein a difficult question—“How should we complete PRAs so that they help our patients?”—is posed, but we unconsciously put that question aside and answer a simpler substitute, such as “What must we do to comply with the law?” The aforementioned perceptions that PRAs are non-medical in nature or do not obviously help individual patients may make this substitution seem costless to many prenatal care practices. Heuristics such as substitution may be embedded within organizational structures and procedures, or occur without conscious awareness.

We attempted to directly address the heuristic and provide an alternative mental model to practices that currently complete PRAs, especially with the checklist intervention component and in-person outreach described below. Practices who do not currently view themselves as required to complete any PRAs are in the minority of all prenatal care practices, and changing their behavior would require addressing a distinct set of barriers. We did not design or field interventions specifically geared toward those barriers. As we’ll describe later, these practices were not receptive to moderately altered outreach originally designed for practices that currently complete at least some PRAs.

When staff rely solely on their memory to complete the PRA, they are likely to forget—especially because they have limited time and cognitive bandwidth. PRA completion practices vary widely between prenatal

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6 Late-pregnancy insurance changes occur for multiple reasons. First, labor and delivery costs on private high-deductible insurance plans are very high, and usually are not salient to patients until late in pregnancy. The high cost may prompt patients to seek Medicaid coverage or switch to Medicaid as their primary insurer. Second, the Maryland Children’s Health Program (MCHP) provides for a higher-income Medicaid eligibility threshold for pregnant women (https://www.marylandhealthconnection.gov/shop-and-compare/medicaid-basics-and-benefits/). Some women may not be aware that they are newly eligible until after their first prenatal care appointment.
care practices in Baltimore—and, sometimes, within practices. Certain families of practices had clear protocols for when and how forms would be completed and faxed, while others lacked those protocols. Very often, onboarding for new staff does not include any training about PRA form completion, so process learning occurs in an organic, peer-to-peer fashion. Overall, many staff members responsible for PRA completion rely not on well formed processes or habits, but on their prospective memory, cognitive control, and incidental cues to remember and follow through on completing PRAs. Due to the fast-paced nature of medical care, especially in high-throughput clinic environments, these resources may be in short supply.

We witnessed some examples of self-cueing behavior that helped staff members remember to complete the form in the absence of formal structure. One experienced nurse writes the patient’s social security number (SSN) and dental history on the PRA during intake, because the SSN is obscured in the electronic health record (EHR) for security reasons and dental history is not collected on other paperwork. She then continues with the practice’s primary intake process, and places the form in a locked cabinet. In addition to securing sensitive patient information, this cabinet serves as the nurse’s “to-do list.” Objects and forms stored in the cabinet serve as physical reminders to complete the relevant tasks. This behavior is, unfortunately, the exception rather than the rule among on-site PRA completers. Another nurse in the same practice said that she does not really have a specific time, place, or process to complete PRA forms—she simply gets around to them when and if she remembers.

Reminders have been shown to be effective tools in aiding prospective memory in conditions of limited bandwidth and frequent interruptions, including within medical environments. Creating a more standardized process for form completion builds reminders directly into the practice’s workflow; alternatively, staff members who use self-designed reminders can be exemplars and champions of their methods. In either case, due to variation in processes between practices, effective recommendations and solutions must be tailored to each practice and, ideally, originate from a person of authority within the relevant healthcare organization.

Staff may not order new PRA forms frequently enough because there are no rules—or inconsistent rules—about when, how, and how many forms to order. PRA forms must be ordered from HCAM, not printed or photocopied. Not only does the process for filling out forms vary between practices and people: so does the process of ordering new forms. The official PRA-ordering process involves completing an order form and faxing it to HCAM; the forms are then mailed to the practice. Some practices order forms via phone

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7 Some practices do not require on-site staff to complete PRAs. Instead, a designated person—often with a title such as “perinatal coordinator”—completes all PRAs based on information in the EHR. Designating this role clearly to one person reduces the chance of forgetting to complete the form, but entails trade-offs with provider knowledge about the PRA, patient learning about the PRA, ability to complete PRAs if the patient’s risks change, and the nuance of information conveyed on each patient’s form.

8 Historically, forms have included unique ID numbers that Medicaid and other organizations have used for tracking purposes. During the study, these ID numbers were removed from the form by state-level Medicaid authorities, but practices are still required to order forms from the relevant jurisdiction’s health department. With this change and electronic PRA trials underway, it is possible that uniquely identified paper PRAs and the barriers to their completion will soon be replaced with different forms—and, potentially, different barriers.
or email instead. One nurse we spoke to explained that over many years, she has gained an intuition for when she should re-order forms. However, there is no standard guideline about when to do so. Even with her foresight, she reported occasionally having trouble restocking forms before running out. If the hassles this nurse reported are commonplace, some clinics may run out of the uniquely identified forms and therefore cannot complete a PRA for each patient in a timely fashion.

A task such as ordering forms, which can be easily simplified into a set of rules, has the potential for habit formation. Through habit formation—which requires repetition of a behavior and feedback on that behavior—previously effortful decisions become fast and automatic. Insofar as form-ordering processes have been inconsistent, both in requirements and results, staff members have not formed constructive form-ordering habits.

Solutions could support prenatal care staff habit formation, provide heuristics or reminders for staff, better communicate or simplify the ordering process, or any combination of the above. Ultimately, if paper forms are not phased out, HCAM could collect data on how many forms each location requests and automate form distribution accordingly. However, based on our assessment from conversations with practice staff, this is a less common hurdle than the other barriers we witnessed; we therefore did not focus on it during the study period.

**Interventions.** We designed a suite of interventions aimed at addressing the barriers to consistent PRA completion. Note that we created and fielded some interventions as opt-in programs, rather than opt-out, randomly assigned treatments. These interventions seemed best suited to address the heterogeneous practices of prenatal care staff and reach the depth of engagement most helpful to address mental-model-based barriers, but due to the channels they employed, it was not feasible to randomly assign treatment. Other interventions were better suited to random assignment. We have marked interventions as opt-in or randomly assigned below. We describe assignment and promotion strategies in greater detail in “Methods.”

In addition to and in combination with the below-described interventions, we visited most treatment practices in person in late April or early May of 2018. This outreach was incorporated as part of BHB’s annual “Rattle & Roll Day,” wherein staff and volunteers bring BHB printed, patient-facing outreach material to locations throughout the city, including but not limited to OB/GYN offices. We aimed to collect several specific pieces of information from practices during the visit, captured in a 2-page protocol document that we completed for practices we visited. Due to limited time and the fluid nature of the conversations with practice staff, we did not collect the same information for every practice.

The format of the visit developed over time as we learned which messages appeared to resonate with practice staff. Ultimately, the printed outreach materials served both as a foot in the door and as a helpful tool to highlight the breadth, value, and complexity of services accessible through PRA referrals. We framed the printed outreach materials—especially a small poster describing the maternal-child health safety net in Baltimore—as a window into the menu of services available to pregnant patients in Baltimore, and subsequently framed the PRA as a way to outsource triage and referrals to help their patients access these services. We have described below how we incorporated other intervention content into on-site outreach.

**Quarterly Track Record (Randomly Assigned).** We hypothesized that providers’ foggy understanding of the PRA process after they faxed it to HCAM contributed to a low assessment of the form’s value and,
therefore, inconsistent PRA submission. We additionally found that most practices kept PRAs on file in patient charts, but did not comprehensively track their rate of PRA completion for eligible patients. We created a feedback report intervention, branded as the Prenatal Risk Assessment Track Record, to demonstrate that BHB was aware of practices’ PRA submission behavior, to inform practices of how many PRAs HCAM received from them, and to prompt practices to consider whether they were completing PRAs for all women who needed them.

Additionally, the Track Record showed how many PRAs an office completed in comparison to offices like it. It provided a visual image (smiley face or exclamation point) to indicate whether the office was submitting more or fewer PRAs than its peers. Normative comparisons have been effective in other provider behavior change efforts. We hypothesized that if practice staff viewed PRA submission as a valuable, identity-consistent behavior, they would also want to meet or exceed standards set by peer practices. Two to three peer practices were selected for each treatment practice based on size, engagement, and number of PRAs submitted. Peer practices were updated between Track Records.

The report also included the office’s site NPI number (to assist in data collection), two best practices (which were selected based on each practice’s circumstances), and frequently asked questions. Track Records were sent approximately quarterly through all available channels: email, paper mail, fax, and at in-person outreach meetings scheduled with each treatment practice in late April or early May 2018. The first Track Record, which was delivered to treatment practices in March 2018, included information about PRAs submitted throughout 2017; subsequent Track Records covered only the previous quarter.

When we conducted in-person outreach, we introduced the Track Record after providing patient-facing outreach materials to the staff member we were meeting with. Specifically, we brought a copy of the 2017 Track Record, originally delivered in March via email, paper mail, and/or fax. We began by asking if staff had seen the Track Record before. If they had seen it, we discussed their impressions and questions. If not, we briefly explained the information that the Track Record showed, which led to a similar discussion.

**Checklist (Randomly Assigned).** To help practices without firm PRA submission processes, and to help shift perceptions of PRAs as an extension of care, we created the PRA checklist and provided it to practices at the same time as the first Track Record. This intervention component includes execution notes for the 3 steps to successfully completing a PRA: talking points for speaking with a patient about the PRA, instructions and NPI numbers for filling out the PRA, and a reminder and fax number to fax the PRA. The steps overall are intended to assist staff members who are less habituated to submitting PRAs, and/or who are new to the practice. The first step frames the PRA to the patient as an extension of care. Through providing this explanation to each patient, providers may grow familiar and comfortable with it such that their mental model of the form—and their confidence in its—should improve over time.

We introduced the checklist along with the Track Record during in-person outreach. We tended to spend the most time discussing the first talking point; most providers said they did not talk to patients about the PRA. We explained that proactively telling the patient that they may receive a follow-up call from another phone number helped patients anticipate the phone call, trust its legitimacy, and access the services HCAM would offer them. We also asked practices if they believed they would use the checklist.

**Testimonials (Randomly Assigned).** To address the psychological distance between form submission and patients’ health, we sourced and curated content from home visiting patients and HCAM direct service
staff about the effects that PRA-referred programs have on patients’ and infants’ well-being. Content vividly described the effects that the interviewee perceived PRA-referred programs to have, either on their own lives or the lives of the people they serve. Each testimonial also specifically noted that patients could access the relevant program via PRA referral. Testimonial content was sent to email addresses on file for treatment practice staff three times during the six-month study period.

**PRA Grade Quiz and Best Practice Website (Randomly Assigned).** Especially for practices without clear PRA completion processes, and for practices that viewed PRAs as legally required but not medically helpful, we set out to design an intervention to help practices assess themselves against a clear standard and receive tailored feedback. We created a website that includes a “PRA Grade” quiz that includes a limited set of questions about standard PRA procedures, so practices can learn about procedures that they are not following. The website also has a list of behaviorally informed best practices that we developed as a result of observations on our site visits and advice from BHB. These best practices—which constitute the complete set of tips that were drawn upon for Track Records—are intended to be generative, helping practices consider their circumstances and develop their own solutions, rather than prescriptive or one-size-fits-all.

During in-person outreach in late April and early May 2018, we introduced practices to the website and walked them through the PRA Grade quiz. The URL for the website was also referenced in two of the three Quarterly Track Record reports.

**PRA Champions Program (Opt-In).** Because most practices faced idiosyncratic challenges with the PRA, and many exhibited low degrees of standardized processes and support for PRA-completing staff members, we designed the PRA Champions program to provide practice-specific advice and support. A PRA Champion is a prenatal care practice staff member who spearheads efforts in the office to increase PRA completion rates. ideas42 and BHB provide support to this person via regular phone calls. Additionally, we planned to organize champions into cohorts that would meet occasionally (i.e., monthly or bimonthly). Cohort meetings were intended to build a sense of PRA completion’s compatibility with a medical professional identity, as well as provide a venue for champions to network and learn from each other. However, enrollment in the program did not reach the necessary levels to organize cohorts.

**Meet-and-Greet Events (Opt-In).** Pursuant to our hypotheses that prenatal care practice staff did not perceive beneficial health effects of PRAs on their patients, and did not think of completing the PRA as compatible with their identity as medical professionals, we set out to create a social context in which downstream healthcare workers—e.g., HCAM employees, visiting nurses, and others—would be identified as peers on a distributed healthcare team, sharing a common goal of providing the best care to pregnant patients. Events also served to reinforce the epidemiology-based message from BHB that PRAs were valuable to patient, fetal, and infant health, and to make stakeholders in different parts of the PRA process accessible to ask questions and clarify aspects of the process that providers identified as confusing.

We hosted two meet-and-greet events over the course of the study, both on weeknight evenings and including dinner. Diverse healthcare stakeholders attended, coming from OB/GYN practices, WIC, home visiting programs, MCOs, HCAM, and other institutions. The first meet-and-greet included a presentation from a high-ranking BHB official on the initiative’s success, opportunities, and future strategic plans; an overview of the electronic PRA pilot; and a call-to-action to enroll in the PRA Champions program. The second meet-and-greet included content about smoking cessation programs and two PRA Champion
presentations about practices’ methods of completing PRAs, including ongoing challenges. Both events included structured networking sessions to encourage interaction and care provider identity expansion across role- and employer-based boundaries: as they signed in, attendees marked their nametags with colored stickers indicating their role in prenatal care. During structured networking, they were asked to find someone with a different-colored sticker to discuss the PRA.

**Methods**

**Sample.** Stakeholders at BCHD provided ideas42 with a sample of 53 prenatal care practice sites in the greater Baltimore area. Throughout the qualitative research, design, and implementation phases of the project, the initial sample was clarified in several ways. For example, some practices previously believed to operate separately were revealed to operate together, or descriptions of practices were duplicates of each other; some practices that previously existed appeared to have moved or been absorbed into other practices; and some practices that were not in the original sample surfaced as significant sources of PRAs for patients living in Baltimore. We ultimately removed or consolidated some practices from the original sample and did not add any practices that we discovered at later dates to the intervention sample, resulting in a final sample size of 49 practices.

We structured our sample in terms of practices, rather than providers, because we found in early project stages that processes for completing PRAs tended to be constructed at the practice level. Providers (i.e., physicians, nurse practitioners, and midwives) often practiced at multiple locations and were rarely responsible for preparation and submission of the PRA. While nurses and medical assistants occasionally worked at multiple locations, perinatal coordinators and client service representatives—the other staff positions that were frequently responsible for PRAs—generally did not work at multiple locations.

**Randomization.** We randomly assigned practices to either treatment or control. Treatment practices received all four randomized interventions: the Track Records, checklist, testimonials, and exposure to the “PRA Grade” and best practice website. Control practices did not receive any interventions. Treatment and control groups were approximately equally sized.

In order to account for potential spillover effects due to practices sharing knowledge, processes, or personnel relevant to the PRA, and to maximize power, we both clustered and stratified assignment. Practices were sorted into clusters according to known administrative commonalities. For example, all practices in the sample affiliated with St. Agnes were designated as one cluster. We stratified by practice size (small, medium, or large), a descriptive variable provided by BCHD that roughly correlated with number of PRAs a practice submitted. There was a small number of practices with substantially higher PRA volume than others, and we wanted to ensure that not every especially large practice would be assigned into either the treatment or control condition.

Notably, we learned that some practices were duplicative or affiliated with each other after intervention administration had begun. Several complications could arise from these late learnings. For example, some relationships that ideally would’ve been reflected in cluster sorting were not appropriately identified before randomization, and any resulting covariance is not controlled for by randomization alone.

**Data.** We will perform our primary analysis on administrative data describing PRAs submitted during the study period and over the year preceding the study period (March 2017 - February 2018). This data is collected during normal operations of HCAM and BCHD. The administrative data set is structured at the
PRA level, and includes the practice-level contact information and patient-level demographic information on the original PRA, in addition to information about the outcome of HCAM triage and outreach for each PRA. For example, a given row of data notes whether the applicable patient as successfully contacted, and if so, whether they accepted or refused referrals.

Notably, which practice submitted a PRA is not consistently obvious based on the available administrative data. This is partially due to practice staff’s inconsistent use of NPI numbers, and partially due to manual error introduced through data entry of the paper forms’ contents into HCAM’s database. We will infer which practice submitted each documented PRA through matching common typos to practice identifiers, particularly NPI numbers and phone numbers. In limited cases, we may exclude PRAs that are unidentifiable from our analysis. We will exclude all PRAs from practices not in our original sample from our analysis.

Additionally, we will perform a qualitative assessment of pre- and post-intervention survey data and data collected during in-person outreach. All survey and outreach data were collected at the practice level.

**Analysis plan.** We intend to investigate the treatment’s effect on quantity of PRAs submitted, the speed with which PRAs are submitted after prenatal care appointments, and HCAM’s success rate at contacting patients and referring them to services. We expect that the treatment effect on PRA quantity may be especially pronounced after the in-person outreach visit, and intend to conduct graphical analysis to assess the magnitude of the effect over time. We will also investigate effect heterogeneity across type of normative feedback provided (i.e., whether practices were submitting more or fewer PRAs than their peer practices), as well as patient race, educational history, and primary language spoken.

**Discussion**

**Comparison to MSI Nepal study.** In this panel discussion, my colleague will also present information about ideas42’s collaboration with Marie Stopes International (MSI) in Nepal to increase provider communication to patients about long-acting reversible contraception (LARC). There are several relevant differences between the MSI Nepal LARC study and the Baltimore PRA study, and in balance, these differences suggest that our expected impact in Baltimore will be substantially lower and more difficult to ascertain.

MSI Nepal is a centrally organized network of clinic locations, while prenatal care providers in Baltimore are not centrally organized. Nor does BHB, or BCHD, have the same authority over any specific OB/GYN office in Baltimore that the central MSI Nepal office has over any given clinic location. This afforded the MSI Nepal project team several valuable opportunities: Their normative feedback intervention was accompanied by a required training for clinic staff, increasing salience; as a mandate from their parent organization, complying with the call-to-action of the intervention may have been naturally aligned with professional identity and job roles; and peer clinics were listed individually and named, increasing the potential to perceive the comparison as relevant to the target clinic. Were a PRA submission intervention to be administered by a large, multi-site healthcare organization in the Baltimore area, such as Medstar, Johns Hopkins, Kaiser Permanente, Ascension, or the University of Maryland, some of these advantages might be similarly available to the relevant organization. However, such a pilot may not be attractive to healthcare organizations at the jurisdiction or state level: even large organizations only have a handful of relevant sites, and the benefit that accrues to such healthcare organizations for public-health-driven policy is limited. It may be more practical for Medicaid and Maryland’s Department of Health to hold
providers accountable for PRA completion directly, since as statewide authorities, they could achieve favorable economy of scale as well as improve self-interested attention to the PRA on the part of healthcare organizations and their employees.

**Automation and patient communication.** Baltimore City has begun to experiment with electronic PRA submission. These efforts are still in their early stages, such that paper PRA submission processes will continue to be relevant for some time—possibly several years. However, it is fairly certain, due to the provisions of the Health Information Technology for Economic and Clinical Health (HITECH) Act and prevailing trends in healthcare, that the PRA will eventually be digitized.

Based on our findings, we welcome the automation of PRA data transmission from EHRs to HCAM or other relevant care coordination entities. It is clear that many healthcare professionals are less able to establish trusting and substantial relationships with patients, and to maintain healthy work-life relationships, because of the disjoint and highly manual nature of medical recordkeeping. Further, typographical errors, human data entry, and other paper-form-induced costs impose unnecessary burden on the limited resources of care coordination systems. We hope that as EHR products develop to more wisely utilize providers’ scarce attention, these products will direct some of that attention to patient interactions that will prepare patients to best utilize services available to them and interact with care coordinators outside of the clinical setting.

**Scaling potential.** If the intervention proves effective to increase PRA submission rates, we will confer with stakeholders about the potential for replication or scaling efforts in other jurisdictions or at the state level. The jurisdictional boundaries constraining this study do not similarly constrain the behavior of pregnant patients in the Baltimore metropolitan area: our selection of practices to include in the study sample was therefore fairly arbitrary. There may be significant operational and analytical benefits of administering an intervention such as this one at the state level rather than the county or city level.

Because we randomized which practices received treatments intended to increase PRA completion, if there is evidence for the hypothesized increases in PRA completion and appropriate outcome data is available from the BCHD and/or the Maryland Department of Health, we may be able to conduct a rigorous assessment of whether the links between PRA submission and birth outcomes are coincidental or causal. Favorable results would encourage us to explore opportunities for replication or scaled deployment. PRAs are required by law throughout Maryland, so increasing submission rates has some value in its own right. Additionally, while HCAM’s care coordination process is unique to Baltimore City, other jurisdictions and managed care organizations (MCOs) run their own care coordination processes across the state. We therefore speculate that the PRA may have the same relationship to improved birth outcomes across jurisdictions, and if results warrant it, we will confer with other jurisdictions to investigate this relationship.