

# Engaging Community Members in Evaluations of Healthy Marriage and Responsible Fatherhood Programs

White Paper for the Fatherhood, Relationships, and Marriage – Illuminating the Next Generation of Research (FRAMING Research) Project

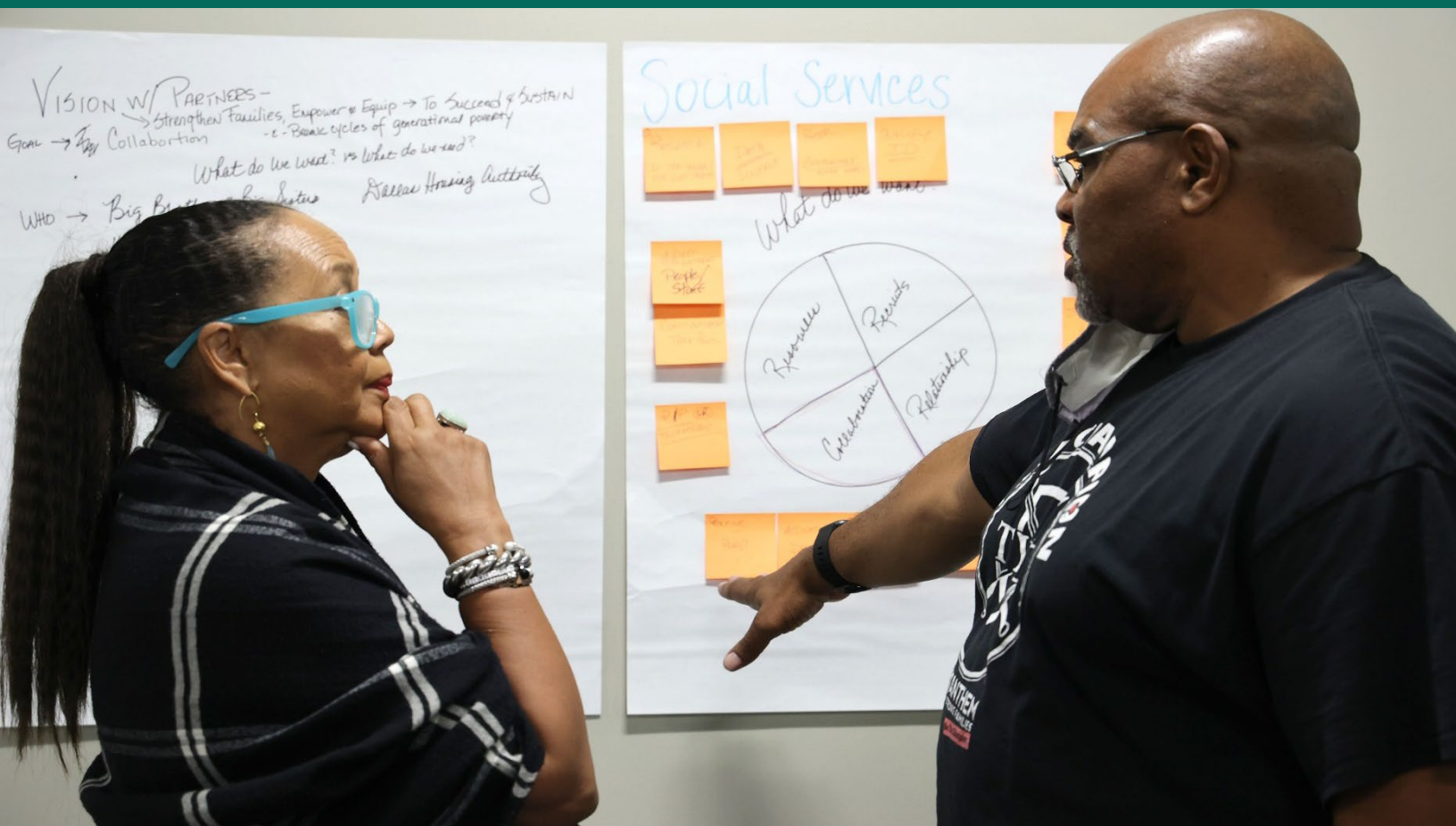


Photo Credit: Rich Clement for the Strengthening the Implementation of Marriage and Relationship Services (SIMR) project

March 2022

OPRE Report Number 2022-55

**This page has been left blank for double-sided copying.**

**OPRE Report Number:**  
2022-55

**Contract Number:**  
HHSP233201500035I

**Submitted to:**  
Kriti Jain, Project Officer  
Office of Planning Research and Evaluation  
Administration for Children and Families  
U.S. Department of Health and Human Services

**Submitted by:**  
Robert Wood, Project Director  
Mathematica  
P.O. Box 2393  
Princeton, NJ 08543-2393  
Telephone: (609) 799-3535  
Facsimile: (609) 799-0005

**Engaging Community  
Members in Evaluations of  
Healthy Marriage and  
Responsible Fatherhood  
Programs: White Paper for  
the Fatherhood,  
Relationships, and Marriage –  
Illuminating the Next  
Generation of Research  
(FRAMING Research) Project**

March 2022

Danielle Whicher  
Julia Alamillo  
Lexi Ouellette  
Breyon Williams

This report is in the public domain. Permission to reproduce is not necessary. Suggested citation: Whicher, Danielle, Julia Alamillo, Lexi Ouellette, and Breyon Williams (2022). *Engaging Community Members in Evaluations of Healthy Marriage and Responsible Fatherhood Programs*. OPRE Report 2022-55. Washington, DC: Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services.

**Disclaimer**

The views expressed in this publication do not necessarily reflect the views or policies of the Office of Planning, Research, and Evaluation, the Administration for Children and Families, or the U.S. Department of Health and Human Services.

This report and other reports sponsored by the Office of Planning, Research, and Evaluation are available at [www.acf.hhs.gov/opre](http://www.acf.hhs.gov/opre).



[Sign up for the OPRE Newsletter](#)



Follow OPRE  
on Twitter  
[@OPRE\\_ACF](#)



Like OPRE's  
page on  
Facebook  
[OPRE.ACF](#)



Follow  
OPRE on  
Instagram  
[@opre\\_acf](#)



Connect on  
LinkedIn  
[company/opreacf](#)



**This page has been left blank for double-sided copying.**

## Contents

Overview.....	vii
I. Introduction.....	1
II. Frameworks for engaging community members in research.....	3
Engagement frameworks.....	3
Community-based participatory research (CBPR).....	3
Culturally responsive evaluation (CRE).....	4
Engagement continuums.....	5
III. Strategies for engaging community members in evaluations of HMRF programs.....	7
Step 1: Laying the groundwork for engaging community members in the evaluation.....	7
Cultivate a deep understanding of the community context.....	8
Practice cultural humility.....	8
Assemble a team of researchers with diverse backgrounds and characteristics.....	9
Step 2: Planning for the evaluation.....	9
Identify community members and organizations to partner with.....	9
Work with community partners to determine how to engage them in the evaluation.....	10
Step 3: Formulating the study’s research questions.....	10
Take time to understand the community’s priorities.....	11
Select research questions that are relevant and feasible for the program and evaluation context.....	11
Be upfront with community partners about any preexisting evaluation requirements.....	11
Step 4: Designing the study.....	12
Partner with community members to select an appropriate study method.....	12
Work with community members to choose the approach to data collection.....	13
Work with community members to design data collection instruments.....	13
Build on relationships in the community to identify and recruit study participants.....	14

Step 5: Collecting and analyzing data .....	14
Consider how contextual factors and incentives may influence response rates .....	14
Train community data collectors to administer surveys or facilitate focus groups and interviews .....	15
Consider involving community members in the process of analyzing study data .....	15
Step 6: Interpreting and disseminating findings .....	16
Get feedback from community members on preliminary research findings.....	16
Include community members in decisions around disseminating findings.....	16
Leverage research findings to support changes in service delivery that address the needs of community members .....	17
IV. Additional considerations for HMRF evaluations .....	19
References .....	21
Appendix A: Literature search parameters and procedures.....	27
Appendix B: Healthy Marriage and Responsible Fatherhood Program Participant Focus Group Guide.....	31

### Overview

This white paper explores frameworks and strategies for engaging community members when evaluating healthy marriage and responsible fatherhood (HMRF) programs. The objective of engaging community members is to strengthen the evaluation’s design and its ability to address the community’s needs. Designing evaluations that meet the community’s needs can ultimately help to improve equity. We use the term “community member” to refer to “anyone experiencing the issues that researchers are interested in” (Andrews et al. 2019). In the HMRF context, community members could include program participants, program staff, and other interested parties in the communities served by these programs.

The paper begins by summarizing common frameworks and concepts for engaging community members in research activities (Chapter II). The first framework we describe is community-based participatory research (CBPR). CBPR emphasizes the importance of building partnerships with community members, empowering them to participate in decision making about the evaluation, and using the evaluation’s results to improve equity in the community. The second framework is culturally responsive evaluation (CRE), which highlights the importance of accounting for the cultural context of a program when evaluating it. A key step to understanding a community’s culture is engaging community members in the evaluation process. Other important steps include assembling diverse study teams, asking team members to consider their own biases, using culturally appropriate data collection instruments, and examining study outcomes for marginalized subgroups. We also describe the concept of an engagement continuum, which illustrates that engagement can range from informing people about an evaluation to empowering them to make decisions. When choosing an engagement approach, researchers should consider the needs of the evaluation, the available resources, and community members’ interest in being involved.

Chapter III describes strategies HMRF researchers can use to engage community members in each of six steps of the research process. The strategies were identified through a literature review of empirical studies that used community-engaged research methods in settings similar to those of HMRF programs, or with populations that resembled HMRF program participants. We found that:

1. To **lay the groundwork for engaging community members**, researchers can collect information on the community context and assemble a diverse study team.
2. When **planning for the evaluation**, researchers can identify community members to partner with and understand what they want their role to be.
3. When **formulating research questions**, researchers can partner with community members to understand community priorities and incorporate those priorities into the research questions. Researchers should be transparent about preexisting evaluation requirements in this process.
4. When **designing the study**, researchers can partner with community members on decisions such as selecting an appropriate study method, identifying a data collection approach and data collection instruments, and understanding how to effectively recruit study participants.
5. When **collecting data**, researchers can discuss factors that could influence response rates with community members. They could also train community members to collect data. When the data have been collected, researchers can involve community members in data analysis.
6. When **interpreting and disseminating findings**, researchers can ask community members for feedback on preliminary research findings, on approaches to disseminating findings in the community, and on using those findings to address community needs.

The paper concludes by highlighting challenges that could impact the ability of researchers to implement these engagement strategies, and some possible solutions to those challenges (Chapter IV).

### I. Introduction

Healthy marriage and responsible fatherhood (HMRF) programs are designed to support the well-being of children and families in communities throughout the United States. Funded by the Office of Family Assistance (OFA) in the Administration for Children and Families (ACF) within the U.S. Department of Health and Human Services, these programs aim to develop skills related to forming and maintaining healthy romantic relationships, parenting responsibly, and improving a family's economic stability (ACF 2020a, 2020b, 2020c). Programs work to achieve this through group-based workshops for couples, fathers, or other individuals. These workshops are sometimes accompanied by individualized case management, employment, or financial planning services and referrals to other related services.

To generate knowledge to improve future programming, ACF supports many research efforts related to HMRF programs. As a condition of their federal funding, all HMRF grantees are required to collect data on the characteristics and outcomes of their clients and the services provided through the grant (ACF 2020a, 2020b, 2020c). Most HMRF grantees also conduct grantee-specific evaluations called "local evaluations" to assess the effectiveness of their local program. OFA has funded and the Office of Planning, Research, and Evaluation (OPRE) within ACF has also supported several large-scale evaluations involving multiple grantees to test the effectiveness of federally funded HMRF programs (Avellar et al. 2018; Lundquist et al. 2014; Moore et al. 2018; Wood et al. 2012; Wood et al. 2018).

Traditional approaches to research have emphasized the need for researchers to remain at a distance from those being evaluated to maintain their objectivity. However, there is growing recognition among policymakers and researchers that engaging community members in evaluation activities has the potential to produce more equitable research that addresses communities' needs more effectively (Andrews et al. 2019). In January 2021, the federal government issued an executive order underscoring this priority by asking all federal agencies to "consult with members of communities that have historically been underrepresented in the federal government and underserved by, or subject to discrimination in, federal policies and programs" in their work (White House 2021). In research, "community members" can refer to "anyone experiencing the issues that researchers are interested in" (Andrews et al. 2019). In the HMRF context, community members often include current and former program participants, program staff, and other interested parties in the communities HMRF programs are designed to serve, such as community organizations who refer program participants. By engaging community members in the research process, HMRF researchers can build trust within that community, ensure that their work addresses community priorities, and increase the likelihood that research findings are used to improve future programming and outcomes in the community (Andrews et al. 2019).

This paper explores how community members can serve as co-creators in the research process to strengthen evaluations of HMRF programs and what is learned from these evaluations. We begin the paper with an overview of common frameworks for engaging community members in research (Chapter II). We then describe practical strategies that HMRF researchers can use to apply these frameworks to their evaluations (Chapter III). Constraints stemming from project timelines, funding requirements, and other factors can pose challenges to researchers interested in enhancing the role of community members in their evaluations. In the final chapter of the paper, we address these challenges and other issues that HMRF researchers, funders, and policymakers might consider when adopting these strategies (Chapter IV).



**This page has been left blank for double-sided copying.**

## II. Frameworks for engaging community members in research

Over the past few decades, several conceptual frameworks have emerged that describe ways to engage community members in research activities to generate results that can address social problems and ultimately improve equity. In this chapter, we summarize two common frameworks for engaging community members: (1) community-based participatory research (CBPR) and (2) culturally responsive evaluation (CRE). We also describe the concept of an “engagement continuum”, which highlights that the ways community members are involved in evaluations can differ and should reflect the needs of both the community members and the evaluation.

To identify these frameworks and concepts, we worked with outside experts to develop (1) a list of key authors who have published papers on the topic of engaging the community in research, and (2) a list of common frameworks and terms. (Details on the process for identifying literature are in Appendix A.) We searched the literature for articles and books by those key authors that describe existing frameworks and concepts for community engagement. We also searched the websites of organizations focused on community engagement for information to supplement what we found in the literature. The goal of this review was not to describe all the community engagement frameworks that exist. Instead, we aimed to identify frameworks that evaluators of HMRF or other similar programs have used or could use, as evidenced by our conversations with experts and our review of the empirical literature, which is described further in Chapter III.

### Engagement frameworks

#### Community-based participatory research (CBPR)

CBPR is a widely applied framework that offers “a collaborative approach to research that equitably involves, for example, community members, organizational representatives, and researchers in all aspects of the research process” (Israel et al. 1998). In addition to strong partnerships, CBPR emphasizes that researchers should share decision making authority over important aspects of the evaluation with community members and commit to contributing to the community through the evaluation process. Contributing to the community is accomplished by strengthening community members’ capacity to conduct evaluations, generating research findings that are relevant to the community, and using those findings to make positive changes that improve equity in the community over the long term (Wallerstein and Duran 2006; Wallerstein and Duran 2010; Springer and Skolarus 2019).

Specifically, the CBPR framework emphasizes seven key components (Israel et al. 2013):

- **Forming a partnership**, which involves researchers establishing relationships and building trust with community members as well as defining and being transparent about how researchers and community members will work together and share decision making power.
- **Understanding community strengths and dynamics**, which involves assessing the various cultural, racial and ethnic, class, and other differences that exist within a community and being inclusive when forming partnerships by reaching out to people with different backgrounds and positions.
- **Identifying priority concerns** of community members and translating those concerns into specific research questions and goals.

- **Designing and conducting evaluation activities** with community members. Researchers and community members should ideally work together to determine the most appropriate evaluation methods and implement those methods to collect data that can help answer the research questions.
- **Interpreting research findings** with community members by sharing evaluation results with everyone on the research team and working as a team to understand what may have contributed to those results.
- **Disseminating and translating evaluation findings**, which involves identifying which findings are most important to share with the community and determining how community members want to receive information. This component also involves using the findings to make positive changes that can benefit the community and potentially improve equity.
- **Maintaining and evaluating the partnership** between researchers and community members, ideally through an ongoing process that starts after a partnership is formed and continues alongside the other key components. There should be regular discussions among researchers, community members, and others about how the partnership is working and how it can be improved and sustained over the longer term.

The CBPR framework does not define a specific approach or set of methods that researchers should use to engage community members; instead, researchers have used a range of approaches to implement CBPR (Israel et al. 2013; Viswanathan et al. 2004; Wallerstein and Duran 2006). One common approach is to establish a community advisory council that provides guidance to the research team on the evaluation design and implementation and on disseminating findings. Another common approach is for researchers to engage community members as equal partners on the evaluation steering committee (Viswanathan et al. 2004).

Several other conceptual frameworks that overlap substantially with CBPR are often referred to in the literature. These include “transformative evaluation,” “participatory action research,” “action research,” “participatory evaluation,” and “empowerment research” (Israel et al. 2013; Minkler and Wallerstein 2008; Mertens 2007; Bradbury 2015; Fetterman 1994). Like CBPR, these frameworks emphasize the importance of partnering with the community, sharing decision-making authority, and generating knowledge that can be used to make positive community changes.

### **Culturally responsive evaluation (CRE)**

The central element of CBPR is the formation and maintenance of a collaborative partnership. In contrast, the central element of CRE is explaining and accounting for the cultural context of the program being evaluated in the evaluation approach. The cultural context includes factors such as the shared beliefs, behaviors, values, and customs of a community (Frierson et al. 2002).

CRE suggests that before designing an evaluation, researchers should spend time understanding the culture and history of the community affected by the program being evaluated. Once researchers understand this context, CRE describes steps for ensuring that evaluations account for these factors. One critical step is to give community members a voice in the evaluation process. Like CBPR, CRE highlights the need to partner with a group of community members who are heterogeneous in terms of relevant characteristics such as life experience, culture, race, gender, ethnicity, and class throughout the evaluation—from identifying appropriate research questions to interpreting the results (Frierson et al. 2002; Bryan and Lewis 2019; Anderson and Matri 2021). CRE also emphasizes the importance of sharing decision-making authority and ensuring the community benefits from the evaluation findings.

However, in the CRE framework, engagement alone is not enough to ensure that evaluations account for the cultural context of the community. Other steps that are important to account for the cultural context are:

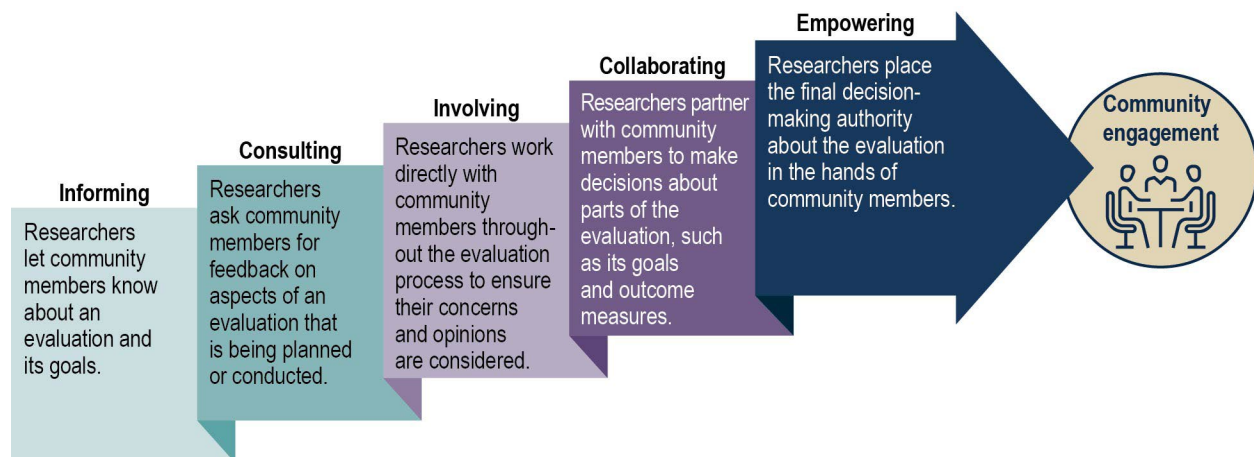
- **Assembling a diverse research team when preparing for the evaluation.** CRE stresses that it is not enough to consider whether the racial and ethnic backgrounds of researchers are similar to those of the community. Instead, research teams should ideally include people from similar cultural backgrounds and people who have similar lived experience to community members. In situations where it is not feasible to include team members from similar backgrounds as a result of the lack of cultural and racial diversity among trained research staff, researchers should at least ensure that everyone on the team has a strong understanding of the community culture (Frierson et al. 2002; Bryan and Lewis 2019; Andrews et al. 2019).
- **Having researchers examine their own backgrounds and biases.** This process requires informing researchers about the culture in which they are conducting an evaluation and asking them to reflect on any preconceived ideas they may have about that community. Being aware of these biases can help researchers limit the undue influence the biases may have on the evaluation (Public Policy Associates 2015a; Andrews et al. 2019; Nelson-Barber et al. 2005).
- **Developing data collection instruments that are culturally sensitive and appropriate for the local context.** To help ensure data collection instruments are culturally appropriate, researchers should pre-test the instruments with a small group of community members. Following the pre-test, the instruments should be refined based on the feedback from that group (Frierson et al. 2002).
- **Examining outcomes for marginalized subgroups.** To address inequities, it is important to understand the different effects a program is or is not having on different types of people in the community (Anderson and Matri 2021; Frierson et al. 2002). To improve the program, it is also important to try to understand the reasons why it might have a different effect on different types of people (Andrews et al. 2019).

The thinking behind CRE suggests that by engaging with community members and taking these extra steps to incorporate the cultural context into an evaluation, researchers can generate results and take actions that are more meaningful and useful to a given community.

### Engagement continuums

Engagement continuums illustrate that community engagement can range from simply informing community members that an evaluation is being conducted to empowering them to be active participants or decision makers in the evaluation (International Association for Public Participation 2018; Arnstein 1969). The International Association for Public Participation's Spectrum of Public Participation describes five levels of engagement, as shown in Exhibit 1.

### Exhibit 1. International Association for Public Participation's Spectrum of Public Participation



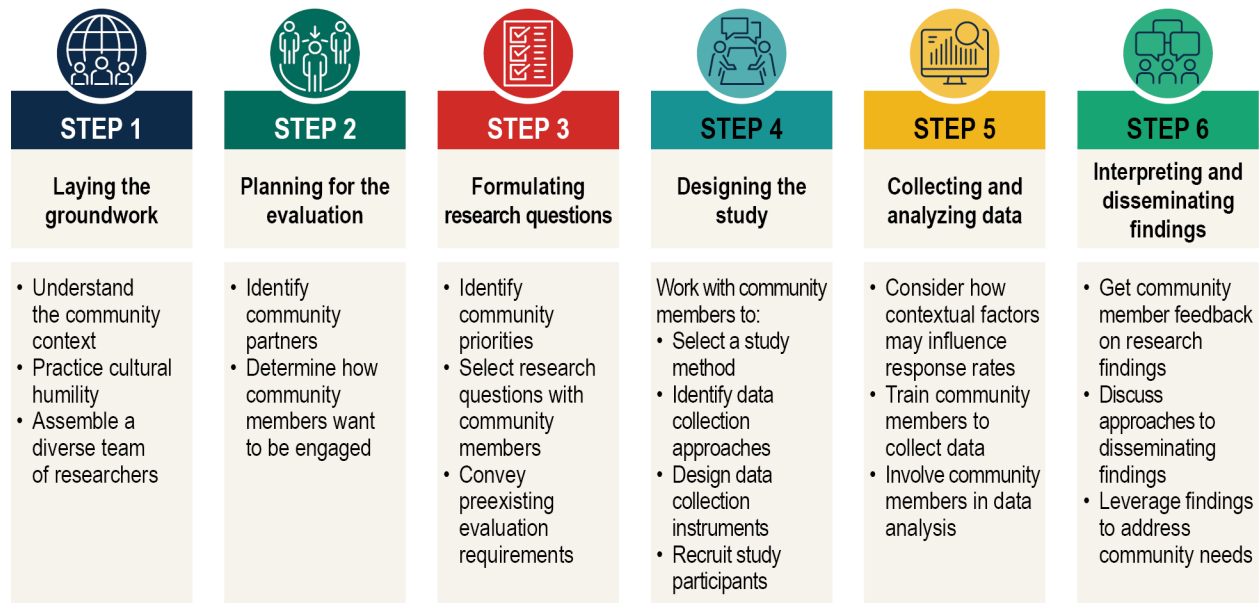
Although both CBPR and CRE are frameworks that espouse the importance of active collaboration and empowerment, the Spectrum of Public Participation demonstrates that there are a variety of ways to engage community members and that the approach to engagement needs to align with the needs of an evaluation, the available time and resources, and the community members' desire to be involved (Stern et al. 2019). In some cases, researchers may have formed partnerships with community members during the process of designing the program being evaluated, and they might be able to build on those partnerships and empower the community members to make decisions related to the evaluation. In other cases, evaluations may need to be completed quickly to inform a time-sensitive policy decision, limiting researchers' ability to engage community members in all aspects of the evaluation (Stern et al. 2019). There could also be instances where community members tell researchers they are not interested, or do not have the time to collaborate on specific aspects of the evaluation. Ideally, in these situations, researchers would work with community members to define a role on the research team that aligns with their interests and available resources. This approach may ultimately lead researchers to focus on consulting with community members on certain parts of the evaluation, such as getting their feedback on the research questions or evaluation outcomes, and informing them about other aspects, such as the evaluation findings. Although it may not always be feasible to engage and share decision-making authority with community members in all aspects of the evaluation, researchers should carefully consider how their approach to engagement will help ensure the evaluation accounts for community needs and how the results can be used to improve the community.

### III. Strategies for engaging community members in evaluations of HMRF programs

This chapter features strategies HMRF researchers can use to engage community members in program evaluations. To identify these strategies, we conducted a structured review of the literature to find empirical studies that used community-engaged research methods in settings that were similar to HMRF programs or with populations that resembled HMRF program participants. We reviewed 63 articles that met our screening criteria; none of these empirical studies involved evaluations of HMRF programs specifically. Appendix A has more details on our literature search and screening process.

In addition to reviewing the literature, we met with several researchers with expertise in community-engaged research methods and HMRF program evaluation to discuss promising approaches and potential barriers to engaging community members in each step of the research process. We also hosted three focus groups with people who had recently participated in a healthy marriage and relationship education (HMRE) or responsible fatherhood (RF) program and in the program’s evaluation. We aimed to get their perspectives on being asked to share information for research purposes and on how evaluators could do better at engaging program participants in research. (Appendix B has additional details on the focus groups and a copy of the focus group guide.) Below, we highlight six key steps in the research process and strategies that HMRF evaluators can use to engage community members in each step (Exhibit 2).

**Exhibit 2. Strategies for engaging community members in the research process**



#### Step 1: Laying the groundwork for engaging community members in the evaluation

Laying the groundwork can involve cultivating a deep understanding of the community landscape as it relates to a proposed evaluation. It can also involve practicing cultural humility by reflecting on proposed evaluation plans through an equity lens and assembling a diverse research team. Building in this step before formally conducting an evaluation can set community partnerships and researcher teams up for success. Ultimately, it may improve the quality of the research and the likelihood that it benefits the

community. While it may be best to implement these strategies before evaluations begin, they can also be introduced and revisited throughout the evaluation.

### **Cultivate a deep understanding of the community context**

One of the first things HMRF researchers can do to set the stage for successfully engaging community members is to familiarize themselves with available information about the community of interest. This process can involve learning about the community’s racial and ethnic makeup, the languages spoken in it, and its history and politics, including current or past policies and practices that could have contributed to discrimination of certain groups within that community (Andrews et al. 2019; Community Tool Box 2021, Chapter III). HMRF researchers can also learn about relevant cultural aspects of the community, such as how members conceptualize healthy relationships and parenting norms.

To gather this information, research teams can conduct a landscape analysis or needs assessment, which is a practice used to identify the assets, needs, and priorities in a particular community (García et al., 2020). As part of this assessment, researchers can interview key informants or have informal conversations with community members. They can also review regional statistics and administrative data, websites and social media pages of community-based organizations, and prior studies conducted in the community (García et al. 2020). For example, in one study we reviewed, evaluators conducted two-hour focus groups with low-income, African American women in Philadelphia to identify barriers and motivators to seeking prenatal health care (Edmonds 2015). The goal was to use this feedback to inform the development of patient-centered models of maternity care.

### **Practice cultural humility**

Although engaging community members in research aims to narrow the power differential between researchers and community members, these methods can inadvertently replicate the power differential if they only superficially engage the community, and community members do not feel they have a say in evaluation decisions (Nygreen 2009). To combat this, researchers can practice cultural humility (Shalowitz 2009), an ongoing process in which “individuals continually engage in self-reflection and self-critique” in order to “maintain mutually respectful and dynamic partnerships with communities” (Tervalon et al.

#### **Box 1**

Below are example items from a self-assessment developed by Public Policy Associates (2015b) to assess cultural responsiveness in evaluation activities. Response options range from 1 = Never to 5 = Always.

#### **Cultural competency of the evaluator**

- I seek information to better understand the cultural context of a program and its stakeholders at the start of a new evaluation.
- I seek feedback from clients and other evaluation stakeholders about how I relate to others with different cultural identities.
- I pay attention to the similarities and differences of life experiences between the evaluation team and members of the target population, and consider how those dynamics might impact the evaluation.

#### **Cultural competency of the evaluation**

I engage community members, consumers, and stakeholders in:

- Formulating the evaluation questions to show equitable results
- Conducting interviews, surveys, and other primary data collection activities
- Defining criteria for “success”
- Interpreting data and informing the analysis
- Disseminating and applying findings to the community ▲

2021). By practicing cultural humility, researchers can better understand the power dynamics at play within the community and create a setting that can empower community members to be decision-makers in the research process (Jurkowski et al. 2015). This strategy may be particularly helpful when engaging communities where mistrust of researchers stems from harms committed by past research studies and research institutions (Okazaki 2017).

One way that HMRF researchers can practice cultural humility is to complete a self-assessment of planned evaluation activities. A self-assessment approach developed by Public Policy Associates is in Box 1. The assessment is designed to help researchers identify strengths and weaknesses of their evaluation. Research teams may use the results of the self-assessment to update the evaluation plan to include additional practices that equitably engage communities. Using these strategies can help HMRF researchers demonstrate a commitment to equity in their evaluations and can help address community members' concerns about the evaluation.

### **Assemble a team of researchers with diverse backgrounds and characteristics**

A diverse research team can help bring a strong understanding of the community culture to HMRF evaluations (Frierson et al. 2002; Bryan and Lewis 2019; Andrews et al. 2019). Our conversations with experts in community-engaged research methods highlighted how research teams that are homogenous in terms of their culture, racial and ethnic background, education, and class are more likely to impose their own biases on the design of the study and to prioritize outcomes and perspectives that are not shared by the community. In line with the CRE framework, these experts also emphasized that researchers should think beyond just racial and ethnic diversity when assembling their team. For example, HMRF researchers should consider assembling a team of people who are not only diverse in terms of their racial and ethnic backgrounds but also in terms of their family backgrounds and relationship histories to enrich the design of the study and better align its priorities with the needs of the community. In several studies we reviewed, researchers noted that hiring research staff whose backgrounds aligned with those in the community being evaluated, or who had a strong understanding of the community context, helped establish effective community partnerships and enhanced feelings of trust among potential study participants (Flores 2017; Kaiser 2015; Okazaki 2017).



### **Step 2: Planning for the evaluation**

Engaging community members in the planning stages is an essential step in implementing an evaluation that shares decision-making authority with community members and helps improve outcomes in the community (Israel 2013). The first step that researchers can take in this planning process is to identify community stakeholders to partner with, including organizations, leaders, and other community members. Researchers and community members can then work together to define the community's role in the evaluation.

### **Identify community members and organizations to partner with**

Building relationships with relevant community members and organizations at the outset of the evaluation can help position HMRF researchers for success later (Payne 2017). Strong partnerships with the community can bridge the divide between the research team and the community. These partnerships can also help the research team develop valuable insights into the community that can inform the evaluation (May 2003). The first step in building these relationships is identifying organizations, and leaders at those organizations, who are invested in supporting the target population of the HMRF program (Flores 2017).



Researcher teams can reach out to relevant organizations identified through a landscape analysis or needs assessment, for example (García et al. 2020). In the HMRF context, relevant organizations may include high schools and colleges, job and career service providers, counselors or mental health providers, religious organizations, and other community organizations that focus on providing resources to support parents and families. Evaluators working with existing HMRF programs can also connect with program staff and former program participants to either engage with the research study themselves or direct evaluators to other relevant organizations in the community. For example, during a focus group with mothers who recently completed an HMRE program, participants suggested several local community health centers that might be interested in referring mothers to an upcoming HMRE program or evaluation.

### **Work with community partners to determine how to engage them in the evaluation**

As the concept of an engagement continuum suggests, there are a variety of ways for community members to engage in the research process (International Association for Public Participation 2018; Arnstein 1969). HMRF researchers should work with their community partners to co-create and define the roles that each will play in the evaluation. Researchers can propose roles for community members based on their landscape analysis or needs assessment, and community members can propose roles based on their own expertise in and relationship to the focus of the evaluation. Regardless of the level of involvement, the expectations for the community members should be clearly communicated at the outset of their participation (Okazaki 2017; Nygreen 2009). Clear communication can build trust with community members by conveying the degree of responsibility and authority they will hold during the evaluation. For example, a request to join a one-time advisory meeting should be distinct from a request to formalize a partnership for multiple steps of the evaluation.

HMRF researchers and funders may also need to build in structural supports to effectively engage community members in the research process. For example, researchers should budget for compensating community members for their work on the evaluation. Compensation could include gift cards, stipends, or a salary, depending on the planned level of engagement (Goodkind and Bay-Cheng 2021; Chambers et al. 2020; Jurkowski et al. 2015; Payne 2008). Researchers and funders should also build time into the planning stage to offer training for community members to improve their competency and comfort level with research activities (Community Tool Box 2021, Chapter 3). Investing this time can enhance community members' skills and prepare them to contribute their wealth of knowledge and expertise to the evaluation (Community Tool Box 2021, Chapter 3).



### **Step 3: Formulating the study's research questions**

Making sure an evaluation's research questions resonate with the needs of the community is a critical component of culturally responsive research (Frierson et al. 2002). Federally funded evaluations of HMRF programs tend to focus broadly on questions related to how the program was implemented and whether the program achieved its intended effects (ACF 2020a, 2020b, 2020c). There is flexibility, however, in the specific research questions that evaluations address about program implementation or impacts. To decide what those questions should be, evaluators should carve out time to understand the community's priorities and what is feasible in the program context. Researchers should also be upfront with their community partners about any preexisting requirements related to the research questions.

### **Take time to understand the community's priorities**

Incorporating community perspectives and experiences when developing an evaluation's research questions can help study teams identify topics that are relevant and meaningful to evaluation participants (Cyril 2015). HMRF researchers can work with program staff, former program participants, or members of the community at large to discuss potential questions (Chopel 2019). For example, in a focus group that we hosted with fathers who had recently participated in an RF program, they expressed concern that existing evaluations of RF programs focused on outcomes that were more relevant for fathers who had regular contact with their children. They suggested that future evaluations include outcomes that better reflect the relationships between nonresident fathers and their children, such as measures that assess the strength of the bond between fathers and children, rather than the amount of time fathers spend with their children.

As in the evaluation planning step, community members may need more time to learn about norms and expectations for the research process and the types of questions evaluations may explore (Shalowitz 2009). To support community members' ability to fully engage in generating research questions, researchers should clearly define key terms such as "outcome measures" or "program and comparison groups," using language and materials that are accessible to community members (Flores 2017).

### **Select research questions that are relevant and feasible for the program and evaluation context**

For any evaluation, it is important for the research questions to align with outcomes the program is designed to change—and can reasonably be expected to change given the program model and evaluation time frame. Researchers should work with community members to select research questions that are both relevant to the community and the program, and feasible to address (Andrews et al. 2019; Frierson et al. 2002; Raber et al. 2016). Defining research questions will likely need to be an iterative process as it may take time to address conflicting opinions among community members and to formulate the ideas from community members into addressable research questions (Frierson et al. 2002; Raber et al. 2016). For instance, community members may be interested in examining the long-term impacts of an HMRF program on participants, such as whether program services made participants more likely to form stable romantic relationships or whether the program improved the outcomes of participants' children. This inquiry may require long periods of follow-up data collection that might not be feasible given the evaluation's time frame and budget. In such situations, HMRF researchers could work with community members to identify more proximal measures to address study questions of importance to them. They could also work to build their capacity to monitor the longer-term outcomes that are a priority to the community but beyond the scope of the evaluation.

### **Be upfront with community partners about any preexisting evaluation requirements**

Researchers who have secured funding for their evaluation before engaging community members may already have determined the evaluation research questions (Andrews et al. 2019). For example, the funding opportunity announcements for HMRF grants released in 2020 called for research questions at the time of grant submission (ACF 2020a; 2020b; 2020c). Some grantees may have leveraged existing relationships with community members to inform their research questions, but others may have decided on the research questions before forming these relationships. The experts in HMRF research we consulted emphasized the importance of being upfront with community members about which elements of the evaluation cannot be changed and which are open to input. Even if the research team has already

submitted research questions, there may be opportunities after the funding award to add or reframe questions to reflect community members' priorities (Andrews et al. 2019).



### Step 4: Designing the study

After deciding on research questions, the next step in the research process is developing the study design. Four important considerations for this step are: (1) selecting an appropriate evaluation method, (2) choosing a data collection approach, (3) developing the data collection tools, and (4) identifying and recruiting participants. Engaging community members in decisions about each of these elements of the evaluation design can greatly strengthen the evaluation's implementation and ability to generate findings of relevance to the community.

#### Partner with community members to select an appropriate study method

To address the research questions, research teams need to identify a study method that will provide rigorous results and that is feasible to implement within the community. For impact studies of HMRF programs, this often means choosing between a randomized controlled trial (RCT) or quasi-experimental design (QED).<sup>1</sup> Because community members may be unfamiliar with study methods, researchers could train community members on these methods so they can participate in decision making (Chambers et al. 2020; Box 2). Alternatively, researchers could present the study method they believe to be most appropriate for addressing the research questions,

describe why it is preferable to alternatives, and ask community members for their advice on whether and how the proposed method could be implemented in their community. When presenting, researchers should give community members enough information about study methods to allow them to actively participate in discussions of their relative benefits and drawbacks. For example, researchers who want to implement an RCT might explain why studies of HMRF programs use random assignment, ask community members to share their concerns about this

method, and then talk about approaches to mitigating those concerns (Buchanan 2019). This could include compensating all study participants (program and control group members) for participating in data collection, offering alternative programming for the control group, giving the control group the opportunity to participate in the

#### Box 2

##### Training in research and data analysis methods can create employment and educational opportunities for community members.

In their study about trust in police among Black men and women, Chambers et al. (2020) engaged 15 community members over the course of the research. The research team trained community members on research methods, data analysis, reading, writing, and formal presentations; and actively engaged them in the research process. Community members put this experience on their resumes and leveraged it to find jobs and educational opportunities outside the project. As a result, all community members "received employment making US\$15–US\$20 per hour, and six [community members] enrolled in college." (Chambers et al. 2020)▲

---

<sup>1</sup> In an RCT, study participants are placed randomly into research groups, with one group offered participation in the program and other groups offered alternate programming or the existing services available in the community. In a QED, researchers use statistical techniques to match program participants to similar individuals who did not participate in the program. In both RCTs and QEDs, researchers compare average outcomes of the research groups to measure program effects.

HMRF program at a later date, or telling control group members they are eligible for all other services available in the community.

### **Work with community members to choose the approach to data collection**

In addition to considering the overall study method, research teams need to decide how to collect data from participants. Different approaches are useful for eliciting different types of information. Surveys of evaluation participants can yield structured insights into participants' perceptions, attitudes, and behaviors, whereas surveys of program staff can provide information about staff perceptions of how the program was delivered and participants' engagement in the program. Focus groups provide the opportunity for participants to build on each other's responses, whereas individual interviews allow participants to respond to personal questions without fear of judgement from other participants (Mammen 2019). In addition to these more traditional data collection approaches, research teams could consider alternatives like Photovoice or windshield surveys, which could yield nuanced information about respondents' environment and culture (Budig et al. 2018; Jurkowski et al. 2013; Kovacic 2014; Hennessy et al. 2010). Photovoice involves asking participants to take pictures of their day-to-day life and describe what is in the pictures (Budig et al. 2018). Windshield surveys allow respondents to narrate observations and answer questions about their community as they drive around with a data collector (Jurkowski et al. 2013). Some respondents may be more comfortable engaging in these activities than they would answering direct questions in a survey or interview.

To maximize the quality of data collected, HMRF researchers can work with their community partners to determine which approaches are most likely to yield the information necessary to answer the research questions (Shetgiri et al. 2009). Researchers should give community members enough information about alternative data collection approaches to allow them to actively engage in decisions about what approaches could be most successful in their community. This will allow community members to both consider the strengths and weaknesses of different approaches and share their insight into the approach program participants would be most comfortable with.

### **Work with community members to design data collection instruments**

Data collection instruments must be easy for respondents to understand and respond to (Lile 2018; Tchouankam et al. 2021). If respondents do not understand the meaning of survey or interview questions, or do not think the answer choices apply to them, it will be difficult to collect accurate information. To avoid this scenario, HMRF researchers can work with community members to develop questions for a survey or interview protocol. Asking community members for input can also help ensure data collection instruments cover topics that are relevant to the community (Lile 2018; Woods-Jaeger et al. 2018). When feasible, HMRF researchers and community members should consider using validated and reliable measures and associated questionnaires or scales as part of program evaluations. When using existing measures, researchers should include all questions associated with that measure as part of the data collection instrument. Additionally, researchers could consider having community members pilot their data collection instruments with individuals who are like the ones who will participate in the evaluation, such as former participants or even program staff (Vecchiarellu 2005). Building in time for a pilot can help research teams determine, for example, how long it might take respondents to complete a survey and whether the questions are easy to understand.

### **Build on relationships in the community to identify and recruit study participants**

HMRF programs often partner with agencies in the community to deliver services. For instance, an HMRE program for youth might partner with local high schools; an HMRE program for expectant or new parents might partner with local hospitals; or an RF program might partner with a local employment service provider. Working with these community organizations can be critical to ensuring a large enough group of potential program participants and reaching the target sample size of the evaluation. Including these partners in regular meetings of the research team can help them feel invested in the evaluation and its importance in the community.

Additionally, working with community members—such as former program participants, program staff, or staff at partner organizations—to conduct outreach on behalf of an HMRF program or evaluation can help convince eligible individuals to participate (Tajik and Minkler 2006; Ouellette 2004). Hearing about a program from someone who has already participated and can attest to its benefits can be an effective recruitment strategy. Community members may also have specific knowledge about the population of interest—such as where they tend to live and what stores and establishments they frequent—which can help make outreach more effective. Moreover, some populations that are the focus of HMRF programs tend to be distrustful of both research and government-funded programming (Levine 2013; Okazaki 2017). Seeing trusted community members endorse the HMRF program and evaluation can reduce skepticism among potential participants. For example, during a focus group we conducted with fathers who had recently participated in an RF program, several said they had reservations about attending a fatherhood program at first, and by the end they were so enthusiastic about the program that they told friends and family about it if they thought the friends and family could benefit from participating.

HMRF programs may also use written materials or advertisements on the radio or social media to attract potential participants to the program. The more these materials resonate with these individuals, the easier recruiting will be for HMRF programs (Lile 2018). One way to ensure they resonate is for HMRF researchers to partner with community members when designing advertisements or writing scripts to use when conducting outreach (Tchouankam et al. 2021; Woods-Jaeger et al. 2018).



### **Step 5: Collecting and analyzing data**

Engaging community members in the data collection process can help boost response rates and data quality. Community members can also offer valuable insights about contextual factors that researchers should consider when analyzing the data, which can ultimately lead to more meaningful findings.

### **Consider how contextual factors and incentives may influence response rates**

Community members can share their insights into contextual factors that can improve or undermine response rates, as well as solutions to potential barriers to data collection. By working with community partners to identify the challenges program participants face and the solutions to those challenges, research teams can make better decisions about when, where, and how to collect data (Jurkowski et al. 2015; Gravlee et al. 2014). For example, many HMRF program participants have childcare responsibilities or jobs with unpredictable schedules. To address these factors, research teams could offer childcare, give participants more than one chance to complete surveys or attend focus groups, or provide transportation to and from these data collection activities.

HMRF researchers can also work with their community partners to decide which incentives to offer participants in exchange for participating in data collection activities. In our review of the empirical

literature, several studies compensated participants for completing surveys, interviews, and focus groups, often offering cash incentives or gift cards (Chambers et al. 2020; Chopel 2019; Sexton et al. 2018; Flores et al. 2017; Payne 2017; Friesen 2015; Hennessy et al. 2010; Payne 2008). When choosing an incentive, care should be taken to determine an appropriate dollar amount or value. Offering too little might not persuade people to participate but offering too much could be coercive. Consulting with community members, such as program staff or former program participants, can help determine an appropriate value. In addition to or instead of offering cash or gift cards in exchange for participating in data collection, HMRF researchers can offer to connect participants with community resources that could be of value. In a few of the studies we reviewed, researchers worked with community partners to learn about the economic, educational, and health barriers that program participants were facing. They used this information to compile resource packets listing relevant employment, educational, and health services in the community, which they offered to participants after the study was completed (Chambers et al. 2020; Payne 2017; Payne 2008).

### **Train community data collectors to administer surveys or facilitate focus groups and interviews**

Traditionally, researchers have viewed the use of external data collectors as a way to increase objectivity and reduce bias in studies (May 2003). However, even third-party data collectors come to a study with their own perspectives that can introduce bias. In addition, participants in HMRF evaluations may be hesitant to disclose personal information about their romantic or parenting relationships on surveys or in interviews with someone who seems like an outsider. Training community members to serve as data collectors for an evaluation can be an effective way to build trust and rapport between evaluation participants and researchers and yield more honest answers from participants. People from the same community are more likely to draw on similar contexts when communicating with one another. Communicating in this way enhances understanding without the need for additional explanation (May 2003). Providing training for community members can also benefit those individuals by increasing their capacity to contribute to future research or by developing their knowledge and experience, which they can leverage to find jobs or educational opportunities (Chambers et al. 2020; Box 2).

Several of the studies we reviewed had community members administer surveys and conduct focus groups and interviews (Chambers et al. 2020; Goodkind and Bay-Cheng 2021; May 2003). Community members can also serve as field locators for follow-up surveys, which involves engaging with the respondent and then passing them on to a member of the research team to conduct the survey. Having this “warm hand-off” with someone whom respondents trust can make it more likely for them to participate in data collection activities and improve the quality of the data.

### **Consider involving community members in the process of analyzing study data**

The way the data are analyzed can be important to discerning the meaning behind the findings. Although community members may not have the technical skills required to provide input on statistical models, there are still meaningful ways that they can contribute to data analysis. First, community members can help provide information about contextual factors or subgroups to consider (Catlett and Beck 2007). For example, program staff may be able to comment on why an HMRE program appeared to resonate more with women than men, or more with English speakers than Spanish speakers. This type of information could help inform the way researchers structure their data analysis. Second, having community members review early responses to data collection can be a useful way to determine if the data collection process successfully captured the perspectives of participants. Third, community members could work with researchers to code and extract themes from qualitative data (Chopel 2019; Payne 2017). Several of the

studies we reviewed also tasked community members with helping to interpret themes emerging from qualitative and survey data (Sexton et al. 2016; Kirshner 2011). Because community members are often more familiar with the local culture than researchers are, they may be able to identify themes in qualitative data that researchers may miss or may have a unique perspective on emerging themes.



### Step 6: Interpreting and disseminating findings

Research findings can have major implications for community members. These findings help to shape new interventions and programming in the community as well as future policy directions. Involving community members at the stage of interpreting findings helps to ensure those findings are useful given the context and perspectives of community members. In addition, community partners can use their platform to circulate research findings to interested community members and leverage their connections in the community to ensure those findings are translated into actions that promote equity and serve the community's needs.

#### **Get feedback from community members on preliminary research findings**

It is important to get feedback from different groups—including program staff, current and former program participants, and community leaders—on preliminary research findings. This gives HMRF evaluators an opportunity to validate their interpretations of the results with the communities served by the programs. Community members may also appreciate being asked to give input on preliminary findings (Catlett and Beck 2007). Given their knowledge of the HMRF program and community, these individuals are in a unique position to put research findings in context and share any concerns about their face validity (Woods-Jaeger et al. 2018). For example, program staff or participants may be able to shed light on seemingly counterintuitive findings, such as when an HMRE program leads more couples to break up than stay together or when an RF program with intensive employment services does not raise employment rates. Community input can also help HMRF researchers understand how issues with program implementation may have contributed to the findings. For instance, by talking to program facilitators, HMRF researchers may learn that issues with program implementation—such as low attendance or lack of fidelity to the intended curriculum—may have limited program impacts.

There are several ways to solicit feedback from community members. HMRF researchers could consider providing preliminary findings to community members by, for example, sending them a preliminary draft of a report, conducting a formal presentation, or holding a panel discussion. Given that community members may have varying preferences, HMRF researchers may want to consider multiple ways of sharing findings.

#### **Include community members in decisions around disseminating findings**

Community partners can help connect researchers to organizations who may be interested in learning about the implementation or the effectiveness of an HMRF program being delivered in their community. These organizations can, in turn, work to disseminate findings, thereby amplifying their reach. Community partners can also give input on the most effective formats for disseminating findings (Raber 2016). Although many HMRF grantees are required to produce a final report of their evaluation findings, a report is unlikely to be the most effective format for highlighting relevant research findings for community members (Catlett and Beck 2007). In focus groups with couples who had recently participated in an HMRE program, we heard that program participants would prefer to learn about study findings on the social media platforms they frequent. They also recommended using text messages or email to alert

participants to evaluation findings. Program staff or community members who have a deeper knowledge of the program and evaluation might prefer a research brief, infographic, or website that provides more details about the findings and the analyses that generated them. Other ideas for disseminating findings in a community include panel discussions, webinars, or press releases (Catlett and Beck 2007).

### **Leverage research findings to support changes in service delivery that address the needs of community members**

Ultimately, the goal of engaging community members in the research process is to use research findings to support the community's needs going forward. In the HMRF context, at the conclusion of an evaluation, HMRF researchers should work with their community partners to consider how the findings can be used to better support the needs of the community, including future program participants and their families (Chambers et al. 2020; Shetgiri et al. 2009). If an evaluation demonstrates that a program met or exceeded its intended goals, researchers and program practitioners can work together to identify additional funding opportunities to sustain the program, and they can highlight the findings from the impact study in funding applications. In contrast, if an evaluation reveals that certain factors prevented a program from achieving its intended goals, this information can be used to reshape future programming (Payne 2017). For example, an implementation study of an RF program may find that fathers in the program did not build strong connections with program facilitators or the other fathers in the program—and strong connections have been shown to support program effectiveness (Avellar et al. 2018). This finding could spur the program to support the formation of these relationships perhaps by building in more time for staff and fathers to socialize before and after program sessions.



**This page has been left blank for double-sided copying.**

## IV. Additional considerations for HMRF evaluations

The frameworks and strategies presented in this paper give researchers, funders, and policymakers ideas about how to engage with community members to design and implement evaluations of HMRF programs that promote equity and community improvement. However, implementing these strategies can be challenging for many reasons (Anderson and Mastri 2021). The literature we reviewed, and our conversations with experts on community-engaged research methods and HMRF program evaluations, highlighted several issues that could influence researchers' ability to use these strategies. These include:

- **Strict project timelines and budgets.** The most recent federal funding opportunity announcement allotted HMRF grantees a set evaluation budget and a six-month planning period to finalize their plans for implementing their program and evaluation. During this period, research teams were expected to hire and train staff, develop their plans for recruiting and enrolling participants, design their data collection tools and analytic methods, and obtain approval from an institutional review board. This planning period is likely not long enough for evaluators to engage in all the types of relationship building and dialogues with community members discussed in this paper. This timeline constraint means that evaluators ideally need to be working to build relationships with community partners and engaging in conversations around community needs long before applying for a grant and receiving funding. In scenarios where this is not feasible—because of a lack of funding, for example—researchers should at least identify community organizations they could partner with and the role individuals from those organizations could potentially play in the evaluation. That would make the research team more prepared to immediately begin the process of engaging community members if the evaluation were funded.
- **Grant requirements related to the evaluation.** Various elements of an evaluation may need to be implemented as specified in a grant application or funding announcement. For example, HMRF researchers may be required to administer specific survey items to research participants and to include specific performance measures that are valuable at the national level, even if they receive feedback from community members that those survey items or measures are not important to them. In these instances, researchers could consider whether they can add additional survey items or measures that capture topics of importance to community members or that can help to provide additional context for interpreting the required survey items. Funders could also encourage research teams to add questions or measures that align with the interests and needs of the community. In addition, funders could support qualitative data collection designed to provide information about the community context that can inform the interpretation of the research results and how those results can be used to make improvements in the community.
- **Discomfort with relinquishing control.** Not only does the process of engaging community members as partners in research activities take time, it can also require researchers and funders to give up some authority over decisions related to key aspects of the evaluation. It can be frustrating and uncomfortable for researchers to go through the process of coming to consensus with people who do not necessarily share the same priorities (Trull 2015). As stated by one expert we spoke with, “Most people are proponents of equity until they feel their power slipping away.” Researchers and funders generally design studies in ways that address the questions they consider most important for understanding if a program achieved its goals. When engaging community members, researchers may learn that these questions do not align with the concerns and needs of the community. Providing information that is useful to the community is what will ultimately lead to improvements in equity.

Learning about this misalignment can be difficult for both researchers and funders and require them to revise their thinking of what it means for a program to be successful.

To help address feelings of discomfort, the entire research team, including community partners, should be clear and transparent about how decisions related to the evaluation design, implementation, and dissemination will be made. Researchers should be clear about any areas where they intend to retain authority and avoid creating false expectations. Researchers could also ask community members if there are specific aspects of the evaluation over which they believe it is most important for them to have decision-making authority. To support this effort, funders could clarify which aspects of the evaluation can be changed or expanded on in response to feedback from community members. Finally, to the extent possible, the team should work to ensure there is enough time dedicated to discussing key aspects of the study and making collaborative decisions about those key aspects.

- **Lack of HMRF researchers and evaluators from underserved communities and minority groups.** When evaluators share the lived experience or culture of the community being studied, they may be more likely to reflect the needs and interests of the community in the evaluation design. Often, however, there are a limited number of trained researchers who share the culture of the communities that are the focus of the evaluation. Addressing this discrepancy requires long-term investments in education to build a strong pipeline of researchers from diverse communities and cultures (Institute of Medicine 2011). This long-term goal requires engaging many public sectors—including K–12 education, higher education, and community development—but it is achievable if there is a continued focus on equity.

These issues will ultimately affect the success of efforts to engage community members in evaluations of HMRF programs and to promote equity in the communities that HMRF programs serve. However, addressing these issues is beyond the scope of any single HMRF evaluation. Although HMRF evaluators may not be able to solve these broad issues, they should consider what is feasible in terms of engaging community members and accounting for cultural context in evaluation activities, while acknowledging these challenges exist. For each evaluation, researchers and community members will need to work together to identify appropriate approaches to partnering that account for the interests of the community, the availability of time and resources, and the needs of an evaluation, recognizing that no single approach will be appropriate across all HMRF evaluations.

## References

- Administration for Children and Families. “Family, Relationship, and Marriage Education Works – Adults (FRAMEWorks).” Washington, DC: Office of Family Assistance, Administration for Children and Families, U.S. Department of Health and Human Services, 2020a.
- Administration for Children and Families. “Relationships, Education, Advancement, and Development for Youth for Life (READY4Life).” Washington, DC: Office of Family Assistance, Administration for Children and Families, U.S. Department of Health and Human Services, 2020b.
- Administration for Children and Families. “FY2020 Healthy Marriage and Responsible Fatherhood Grantees: 2020–2025.” Washington, DC: Office of Family Assistance, Administration for Children and Families, U.S. Department of Health and Human Services, 2020c.
- Anderson, M.A., and A. Matri. “Culturally Responsive and Equitable Evaluation for Federal Evaluation Staff.” Issue brief. Washington, DC: Mathematica, 2021. Available at <https://mathematica.org/publications/culturally-responsive-and-equitable-evaluation-for-federal-evaluation-staff>. Accessed October 25, 2021.
- Andrews, Kristine, Jenita Parekh, and Shantai Peckoo. “How to Embed a Racial and Ethnic Equity Perspective in Research: Practice Guidance for the Research Process.” Child Trends Working Paper, 2019. Washington, DC: Child Trends. Available at [https://www.childtrends.org/wp-content/uploads/2019/09/RacialEthnicEquityPerspective\\_ChildTrends\\_October2019.pdf](https://www.childtrends.org/wp-content/uploads/2019/09/RacialEthnicEquityPerspective_ChildTrends_October2019.pdf). Accessed October 25, 2021.
- Arnstein, Sherry. “A Ladder of Citizen Participation.” *Journal of the American Institute of Planners*, vol. 35, 1969, pp. 216–224.
- Avellar, Sarah, Reginald Covington, Quinn Moore, Ankita Patnaik, and April Wu. “Parents and Children Together: Effects of Four Responsible Fatherhood Programs for Low-Income Fathers.” OPRE Report Number 2018-50. Washington, DC: Office of Planning, Research, and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services, 2018.
- Bradbury, Hilary, editor. *The SAGE Handbook of Action Research* (3rd edition). Lost Angeles, CA: SAGE reference, 2015.
- Bryan, Michelle, and Ashlee Lewis. “Culturally Responsive Evaluation as a Form of Critical Qualitative Inquiry.” *Oxford Research Encyclopedia, Education*. New York: Oxford University Press USA, 2019.
- Buchanan, D. R. “Community-Based Participatory Research: Ethical Considerations.” *The Oxford Handbook of Public Health Ethics*, September 9, 2019. <https://doi.org/10.1093/oxfordhb/9780190245191.013.30>.
- Budig, K., J. Diez, P. Conde, M. Sastre, M. Hernán, and M. Franco. “Photovoice and Empowerment: Evaluating the Transformative Potential of a Participatory Action Research Project.” *BMC Public Health*, vol. 18, no.1, 2018, pp. 1–9.
- Catlett, B., and I. Beck. “Participatory Action Research and the University Classroom.” In *Pedagogies of Praxis. Course-Based Action Research in the Social Sciences*, edited by N. Hofman and H. Rosing. Bolton, MA: Anker Publishing, 2007.

- Chambers, Darryl L., Yasser A. Payne, and Ivan Sun. "Predicting Trust in Police: The Impact of Instrumental and Expressive Concerns in Street-Identified Black-American Men and Women." *Policing: An International Journal*, vol. 3 no. 6, 2020, pp. 917–933.
- Community Tool Box. "Developing and Using Criteria and Processes to Set Priorities," Chapter 3, Section 23, n.d. Available at <https://ctb.ku.edu/en/table-of-contents/assessment/assessing-community-needs-and-resources/criteria-and-processes-to-set-priorities/main>. Accessed October 26, 2021.
- Chopel, A., D. Soto, B. Joiner, T. Benitez, R. Konoff, L. Rios, and E. Castellanos. "Multilevel Factors Influencing Young Mothers' Breastfeeding: A Qualitative CBPR Study." *Journal of Human Lactation*, vol. 35, no. 2, 2019, pp. 301–317. <https://doi.org/10.1177/0890334418812076>.
- Edmonds, Brownsyne Tucker, Marjie Mogul, and Judy A. Shea. "Understanding Low-Income African American Women's Expectations, Preferences, and Priorities in Prenatal Care." *Family & Community Health*, vol. 38, no. 2, 2015, pp. 149–157.
- Fetterman, David M. "Empowerment evaluation." *Evaluation Practice*, vol.15, no. 1, 1994, pp. 1–15.
- Flores, Glenn, Candy Walker, Hua Lin, Michael Lee, Marco Fierro, Monica Henry, Alberto Portillo, and Kenneth Massey. "An Innovative Methodological Approach to Building Successful Community Partnerships for Improving Insurance Coverage, Health, and Health Care in High-Risk Communities." *Progress in Community Health Partnerships: Research, Education, and Action*, vol. 11, no. 2, 2017, pp. 203–213.
- Friesen, B. J., T.L. Cross, P. Jivanjee, A. Thirstrup, A. Bandurraga, L.K. Gowen, and J. Rountree. "Meeting the Transition Needs of Urban American Indian/Alaska Native Youth Through Culturally Based Services." *The Journal of Behavioral Health Services & Research*, vol. 42, no.2, 2015, pp. 191–205.
- Frierson, Henry, Stafford Hood, and Gerunda Hughes. "Strategies That Address Culturally-Responsive Evaluation." In *The 2002 User-Friendly Handbook for Project Evaluation*, edited by J. Frechtling (pp. 63–73). Arlington, VA: National Science Foundation. 2002.
- García, J. J., C. Grills, S. Villanueva, K.A. Lane, C. Takada-Rooks, and C.D. Hill. "Analyzing the Landscape: Community Organizing and Health Equity." *Journal of Participatory Research Methods*, vol.1, no 1, 2020. <https://doi.org/10.35844/001c.13196>.
- Goodkind, Sara, and Laina Bay-Cheng. "Are My Pants Lowering Your Test Scores? Blaming Girls and Girls' Empowerment for the 'Boy Crisis' in Education." *Youth & Society*, vol. 53, no 5, 2021. <https://doi.org/10.1177/0044118X19892357>.
- Gravlee, C. C., P.Q. Boston, M.M. Mitchell, A.F. Schultz, and C. Betterley. "Food Store Owners' and Managers' Perspectives on the Food Environment: An Exploratory Mixed-Methods Study." *BMC Public Health*, vol. 14, no.1, 2014, pp. 1–14.
- Hennessy, E., V.I. Kraak, R.R. Hyatt, J. Bloom, M. Fenton, C. Wagoner, and C.D. Economos. "Active Living for Rural Children: Community Perspectives Using PhotoVOICE." *American Journal of Preventive Medicine*, vol. 39, no. 6, 2010, pp. 537–545.
- Institute of Medicine. *Expanding Underrepresented Minority Participation: America's Science and Technology Talent at a Crossroads*. Washington, DC: The National Academies Press, 2011. Available at: <https://www.nap.edu/catalog/12984/expanding-underrepresented-minority-participation-americas-science-and-technology-talent-at>. Accessed November 9, 2021.

- International Association for Public Participation. "IAP2 Spectrum of Public Participation." IAP2 International Federation. 2018. Available at [https://cdn.ymaws.com/www.iap2.org/resource/resmgr/pillars/Spectrum\\_8.5x11\\_Print.pdf](https://cdn.ymaws.com/www.iap2.org/resource/resmgr/pillars/Spectrum_8.5x11_Print.pdf). Accessed October 26, 2021.
- Israel, Barbara, Eugenia Eng, Amy J. Schulz, and Edith A. Parker, editors. *Methods for Community-Based Participatory Research for Health* (2nd edition). San Francisco, CA: John Wiley and Sons, Inc., 2008.
- Israel, Barbara, Amy J. Schulz, Edith A. Parker, and Adam B. Becker. "Review of Community-Based Research: Assessing Partnership Approaches to Improve Public Health." *Annual Review of Public Health*, vol. 19, 1998, pp. 173–202.
- Jurkowski, Janine M., Lisa L. Green Mills, Hal A. Lawson, Mary C. Bovenzi, Ronald Quartimon, and Kirsten K. Davison. "Engaging Low-Income Parents in Childhood Obesity Prevention from Start to Finish: A Case Study." *Journal of Community Health*, vol. 38, no. 1, 2013, pp. 1–11.
- Kaiser, L., J. Martinez, M. Horowitz, C. Lamp, M. Johns, D. Espinoza, and M. Byrnes, et al. "Adaptation of a Culturally Relevant Nutrition and Physical Activity Program for Low-Income, Mexican-Origin Parents with Young Children." *Preventing Chronic Disease*, vol. 12, 2015. doi: 10.5888/pcd12.140591.
- Kirshner, B., and K. Pozzoboni. "Student Interpretations of a School Closure: Implications For Student Voice in Equity-Based School Reform." *Teachers College Record*, vol. 113, no. 8, 2011, pp. 1633–1667.
- Kovacic, Melinda B., Sara Stigler, Angela Smith, Alexis Kidd, and Lisa M. Vaughn.. "Beginning a Partnership with PhotoVoice to Explore Environmental Health and Health Inequities in Minority Communities." *International Journal of Environmental Research and Public Health*, vol. 11, no. 11, pp. 11132-51. doi: 10.3390/ijerph111111132.
- Levine, Judith. *Ain't No Trust: How Bosses, Boyfriends, and Bureaucrats Fail Low-Income Mothers, and Why It Matters*. Berkeley, CA: University of California Press, 2013.
- Lile, J., and L. Richards. "Youth as Interviewers: Methods and Findings of Participatory Peer Interviews in a Youth Garden Project." *Journal of Adolescent Research*, vol. 33, no. 4, 2018, pp. 496–519.
- Lundquist, E. J., A.E. Hsueh, K. Lowenstein, D. Faucetta, C. Gubits, C. Michalopoulos, and V. Knox. "A Family-Strengthening Program for Low-Income Families: Final Impacts from the Supporting Healthy Marriage Evaluation." OPRE Report 2014-09A. Washington, DC: U.S. Department of Health and Human Services, Office of Planning, Research and Evaluation, Administration for Children and Families, 2014.
- Mammen, S., Y. Sano, B. Braun, and E.F. Maring. "Shaping Core Health Messages: Rural, Low-Income Mothers Speak Through Participatory Action Research." *Health Communication*, vol. 34, no. 10, 2019, pp. 1141–1149.
- May, M.L., G.L. Bowman, K.S. Ramos, L. Rincones, M.G. Rebolgar, M.L. Rosa, J. Sandana, et al. "Embracing the Local. Enriching Scientific Research, Education, and Outreach on the Texas-Mexico Border Through a Participatory Action Research Partnership." *Environmental Health Perspectives*, vol. 111, no. 13, 2003, pp. 1571–1576.

- Mertens, D.M. “Transformative Paradigm: Mixed Methods and Social Justice.” *Journal of Mixed Methods Research*, vol. 1, no. 3, 2007, pp.212–225.
- Moore, Quinn, Sarah Avellar, Ankita Patnaik, Reginald Covington, and April Wu. “Parents and Children Together: Effects of Two Healthy Marriage Programs for Low-Income Couples.” OPRE Report Number 2018-58. Washington, DC: Office of Planning, Research, and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services, 2018.
- Minkler, Meredith, and Nina Wallerstein, editors. *Community-Based Participatory Research for Health: From Process to Outcomes* (2nd edition). San Francisco, CA: John Wiley and Sons, Inc., 2008.
- Nelson-Barber, Sharon, Joan LaFrance, Elise Trunball, and Sofia Aburto. “Promoting Culturally Reliable and Valid Evaluation Practice.” In *The Role of Culture and Cultural Context: A Mandate for Inclusion, the Discovery of Truth, and Understanding in Evaluation Theory and Practice*, edited by S. Hood, R. Hopson, and H. Frierson (pp. 61–85). Charlotte, NC: Information Ag Publishing Inc., 2005.
- Nygreen, Kysa. “Critical Dilemmas in PAR: Toward a New Theory of Engaged Research for Social Change.” *Social Justice*, vol. 36, no. 4, 2009.
- Okazaki, Sumie, Stephanie N. Wong, and Benjamin L. Kaplan. “Strategic Collaborative Partnerships to Improve Immigrant Chinese Community Health: A Case Study.” *Asian American Journal of Psychology*, vol. 8, no. 4, 2017, pp. 339–350.
- Ouellette, P. M., R. Briscoe, and C. Tyson. “Parent-School and Community Partnerships in Children's Mental Health: Networking Challenges, Dilemmas, and Solutions.” *Journal of Child and Family Studies*, vol. 13, no. 3, 2004, pp. 295–308.
- Payne, Yasser Arafat. “‘Street Life’ as a Site of Resiliency: How Street Life–Oriented Black Men Frame Opportunity in the United States.” *Journal of Black Psychology*, vol. 34, no. 1, 2008, pp. 3–31.
- Payne, Y. A., B.K. Hitchens, and D.L. Chambers. “‘Why I Can't Stand Out in Front of My House?’ Street-Identified Black Youth and Young Adults' Negative Encounters With Police.” *Sociological Forum*, vol. 32, no. 4, December 2017, pp. 874–895.
- Public Policy Associates, Incorporated. *Considerations for Conducting Evaluation Using a Culturally Responsive and Racial Equity Lens*. Lansing, MI: Public Policy Associates, Incorporated, 2015a. Available at <https://publicpolicy.com/wp-content/uploads/2017/04/PPA-Culturally-Responsive-Lens.pdf>. Accessed October 25, 2021.
- Public Policy Associates, Incorporated. *Is My Evaluation Practice Culturally Responsive?* Lansing, MI: Public Policy Associates, Incorporated, 2015b. Available at [https://publicpolicy.com/wp-content/uploads/2020/06/REL\\_Self\\_Assessment\\_rev\\_Sept\\_2015.pdf](https://publicpolicy.com/wp-content/uploads/2020/06/REL_Self_Assessment_rev_Sept_2015.pdf). Accessed December 21, 2021.
- Raber, M. P., K.K. Lopez, M. Pomeroy, A. Mody, C. Markham, and S.V. Sharma. “Brighter Sights: Using Photovoice for a Process Evaluation of a Food Co-Op Style Nutrition Intervention.” *Journal of Health Disparities Research and Practice*, vol. 9, no. 3, 2016, p. 2.
- Shalowitz, M. U., A. Isacco, N. Barquin, E. Clark-Kauffman, P. Delger, D. Nelson, A. Quinn, and K.A. Wagenaar. “Community-Based Participatory Research: A Review of the Literature with Strategies For Community Engagement.” *Journal of Developmental and Behavioral Pediatrics*, vol. 30, no. 4, 2009, pp. 350–361. <https://doi.org/10.1097/DBP.0b013e3181b0ef14>.

- Shetgiri, R., S.H. Kataoka, G.W. Ryan, L.M. Askew, P.J. Chung, and M.A. Schuster. "Risk and Resilience in Latinos: A Community-Based Participatory Research Study." *American Journal of Preventative Medicine*, vol. 37 no. 6S1, 2009, pp. S217–S224.
- Springer, Melanie V., and Lesli E. Skolarus. "Community-Based Participatory Research: Partnering with Communities." *Stroke*, vol. 50, 2019, pp. e48–e50.
- Stern, Alexis, Sarah Guckenbug, Hannah Persson, and Anthony Petrosino. "Reflections on Applying Principles Of Equitable Evaluation." San Francisco, CA: WestEd. 2019. Available at <https://www.wested.org/wp-content/uploads/2019/07/resource-reflections-on-applying-principles-of-equitable-evaluation.pdf>. Accessed October 25, 2021.
- Tajik, M., and M. Minkler. "Environmental Justice Research and Action: A Case Study in Political Economy and Community-Academic Collaboration." *International Quarterly of Community Health Education*, vol. 26, no. 3, 2006, pp. 213–231.
- Tchouankam, Tatiana, Paul Estabrooks, Anthony Cloyd, Maxine Notice, Maria Teel-Williams, Ann Smolsky, and Paul Burnett, et al. "Recruiting Low-Income African American Men in Mental Health Research: A Community-Based Participatory Research Feasibility Study." *American Journal of Men's Health*, vol. 15, no. 3, 2021.
- Tervalon, Melanie, and Jann Murray-García. "Cultural Humility Versus Cultural Competence: A Critical Distinction in Defining Physician Training Outcomes in Multicultural Education." *Journal of Health Care for the Poor and Underserved*, vol. 9, no. 2, May 1998, pp.117–125.
- Vecchiarelli, S., M. Prelip, W. Slusser, H. Weightman, and C. Neumann. "Using Participatory Action Research to Develop a School-Based Environmental Intervention to Support Healthy Eating and Physical Activity." *American Journal of Health Education*, vol. 36, no. 1, 2005, pp. 35–42.
- Viswanathan, M., A. Ammerman, E. Eng, G. Garlehner, K.N. Lohr, D. Griffith, S. Rhodes, et al. "Community-Based Participatory Research: Assessing the Evidence." Summary, Evidence Report/Technology Assessment: Number 99. AHRQ Publication Number 04-E022-1. Rockville, MD: Agency for Healthcare Research and Quality, August 2004. Available at [https://www.ncbi.nlm.nih.gov/books/NBK11852/#\\_NBK11852\\_pubdet](https://www.ncbi.nlm.nih.gov/books/NBK11852/#_NBK11852_pubdet) . Accessed October 25, 2021.
- Wallerstein, Nina, and Bonnie Duran. "Using Community-Based Participatory Research to Address Health Disparities." *Health Promotion Practice*, vol. 7, 2006, pp. 312–323.
- Wallerstein, Nina, and Bonnie Duran. "Community-Based Participatory Research Contributions to Intervention Research: The Intersection of Science and Practice to Improve Health Equity." *American Journal of Public Health*, vol. 100, 2010, pp. S40–S46.
- Woods-Jaeger, B. A., B. Cho, C.C. Sexton, L. Slagel, and K. Goggin. "Promoting Resilience: Breaking the Intergenerational Cycle of Adverse Childhood Experiences." *Health Education & Behavior*, vol. 45, no. 5, 2018, pp. 772–780.
- White House. *Executive Order on Advancing Racial Equity and Support for Underserved Communities Through the Federal Government*. January 20, 2021. Available at <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/20/executive-order-advancing-racial-equity-and-support-for-underserved-communities-through-the-federal-government/>. Accessed March 10, 2021.



Wood, Robert G., Brian Goesling, and Diane Paulsell. “Design for an Impact Study of Five Healthy Marriage and Relationship Education Programs and Strategies.” OPRE Report # 2018-32, Washington, DC: Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services., 2018.

Wood, R., S. McConnell, Q. Moore, A. Clarkwest, and J. Hsueh. “The Effects of Building Strong Families: A Healthy Marriage and Relationship Skills Education Program for Unmarried Parents.” *Journal of Policy Analysis and Management*, vol. 31, 2012, pp. 228–252.

## **Appendix A**

### **Literature search parameters and procedures**

**This page has been left blank for double-sided copying.**

To structure our literature review, the study team worked with four experts in the field of community engagement to compile a list of key authors and frameworks. These experts were Michelle Johnston-Fleece, senior program officer, Patient-Centered Outcomes Research Institute; Dr. Latrice Rollins, assistant professor of community health and preventative medicine, Morehouse School of Medicine; Dr. Shiv Darius Tandon, co-director of the Institute for Public Health and Medicine, Northwestern University; and Dr. Tanisha Tate Woodson, senior advisor of culturally responsive and equitable evaluation, Education Northwest. The team then conducted a theoretical literature search to identify books and articles that were written by the key authors or that synthesized the engagement frameworks. The list of authors and frameworks included in this search, along with the databases we searched, can be found in Table A.1. The study team also examined the reference lists of the books and articles they identified to find additional publications for review. They reviewed all articles for descriptions of engagement frameworks and related concepts, and for information about the similarities and differences between existing frameworks. This information formed the basis of the frameworks described in Chapter II of the paper.

The study team conducted a separate empirical literature search to identify studies that used community-engaged research methods with adults who resembled adults in the populations served by HMRF programs or in a context that was similar to HMRF programs. The parameters for this search can be found in Table A.2. The study team identified 63 sources in this search that also met the screening criteria of being published in the last 20 years (since 2001); available in English from a peer-reviewed source; and conducted in the United States, its territories or tribal entities, or its military bases. The team used a review protocol to extract information from these sources about the details of the study design and study findings, how the researchers engaged community members in the research process, and key takeaways or lessons learned about the engagement process. The team then mapped the ways researcher engaged community members to each of the five major steps of the research process (preparing for the evaluation, formulating the study's research questions, designing the study, collecting and analyzing data, and interpreting and disseminating findings). Additionally, the team found that there were several activities that research teams undertook to prepare to engage community members. As a result, we included an additional step of "laying the groundwork for engaging community members in the study". This information formed the basis of the community engagement strategies identified in Chapter III of the paper.

**Table A.1. Theoretical literature search parameters**

<b>Databases searched</b>	Academic Search Premier; EconLit; Education Research Complete; E-Journals; ERIC; PsycINFO; SAGE Journals Online; Scopus; SocINDEX; WorldCat	
<b>Authors</b>	Barbara Israel David Fetterman Dominica McBride Donna Mertens Karen Kirkhart Kristin Carman	Kristine Andrews Meredith Minkler Nina Wallerstein Rodney Hopson Sherry Arnstein Stafford Hood
<b>Frameworks</b>	Empowerment research Equitable evaluation Community based participatory research Community engaged research Collaborative evaluation	Culturally responsive evaluation Ladder of citizen participation Participatory action research Transformative research

**Table A.2. Empirical literature search parameters**

<b>Databases searched</b>	Academic Search Premier; EconLit; Education Research Complete; E-Journals; ERIC; PsycINFO; SAGE Journals Online; Scopus; SocINDEX; WorldCat
<b>Date range</b>	2001 to 2021
<b>Research terms</b>	participatory research OR action research OR ((community participatory) n2 (method* OR approach* OR project or study)) OR participant centered research OR equitable research OR empowerment research OR community engaged research OR transformative research OR culturally responsive and equitable evaluation OR culturally responsive evaluation OR participation ladder OR equitable evaluation OR co-designing research
<b>Population terms</b>	(couples OR marriage OR parent* OR father* OR men OR family OR families) AND low-income
<b>Other key parameters</b>	Study conducted in the United States, its territories, or tribal entities. Report is available in English, from peer-reviewed source, non-duplicate, complete, and most recent version.

## **Appendix B**

### **Healthy Marriage and Responsible Fatherhood Program Participant Focus Group Guide**

**This page has been left blank for double-sided copying.**

To learn directly from HMRF program participants about their perceptions of whether and how to engage community members in program evaluations, we hosted three focus groups with recent participants of HMRE or RF programs. The OFA's National Technical Assistance Provider for HMRE and RF grantees selected the program sites from which we recruited participants. All program sites met the following criteria: 1) high performance, as determined through OFA's established benchmarks, 2) sufficient capacity to recruit racially and ethnically diverse program participants, and 3) a program design that includes an evaluation component. We held one focus group in person in Oklahoma City to engage respondents in-person. As a result of the COVID-19 public health emergency and to accommodate additional geographically diverse participants, we held another focus group virtually using videoconference technology. For the third focus group, we used a hybrid model where most respondents participated in-person while others joined by videoconference. Each focus group had between 2 and 14 participants. We provided focus group participants with \$25 gift cards to thank them for their time. Below is the semi-structured guide we used during these focus groups.

### Focus group guide

#### I. Welcome and Overview of Agenda (7 min)

- i. Thank you all for joining us this evening. We're here to learn from you all as former participants of Healthy Marriage (HM)/Responsible Fatherhood (RF) programs. As you might have heard from the staff person who talked with you, we are representing a project called FRAMING (Fatherhood, Relationships and Marriage – Illuminating the Next Generation of Research). One very important part of the work we're doing is happening today – we want to hear your opinions about the research study each of you participated in and hear your ideas for getting participants more involved in future studies of HM/RF programs. There are no wrong answers to any of the questions we plan to ask so feel free to share openly and honestly. We also will be recording our discussion. The recording only will be used to capture notes and concepts. Is everyone comfortable with this?
- ii. Let's do some quick introductions – name and when you participated in [program name]

#### II. **Participant Perceptions of Program** (overall alignment of content with interests and needs) (12 min) \*This section addresses priority areas of satisfaction and initial motivations

- i. We assume based on your presence here that you found participation in [program name] useful and you had a high level of interest. Think back to the time before you started. Why did you choose to participate in the program? Or what did you want to get out of it?

<This is a transition to the next section where we will identify if their needs and motivations align with what they think the program's goals were. >

#### III. **Participant Perceptions of Program Goals and What Success Looked Like to Them** (12 min) \*This section provides information about evaluation measures and/or disconnects between research goals and participant goals

- i. Did you have a clear understanding of what [program name] was trying to accomplish, either for you individually or the community in which it is offered?
- ii. Do you think that what you wanted to get out of the program matched up with what the program said it was trying to accomplish?

#### IV. **Participant Perceptions of Research** (25 min) \*This section assesses awareness of research and interest in understanding it better and/or being involved



- i. You participated in [program name] to receive the programming. But, in addition, the program was also being researched to learn about how effective it was in reaching its goals. You might remember filling out surveys before you started the program and after the program that asked you all kinds of things about yourself as a part of that research project. How did you feel about completing those surveys?

*Facilitator probe: How comfortable did you feel to be completely open and honest in the information you provided?*

- ii. What was your impression about how the information was going to be used? How do you hope your feedback will be used?

*Facilitator Note: The next three questions are the most critical for the purpose of producing the white pater. Be sure to make time for these.*

- iii. Do you have ideas about ways researchers could better involve participants in the research process? For instance, do you think participants could be helpful for recruiting new participants for the program and research study? Developing survey items? Thinking about which outcomes to focus on? Understanding results? Anything else?
  - iv. What are possible challenges or barriers to engaging program participants in the research process? Are there things that researchers or programs could do to overcome these challenges?
  - v. Would you be interested in hearing more about what was learned through the research you participated in? Where would you go for this kind of information and how would it best be packaged? (dissemination ideas)
- V. Wrap up, thank you, and details about gift cards (5 min)

---

**Mathematica Inc.**

Princeton, NJ • Ann Arbor, MI • Cambridge, MA  
Chicago, IL • Oakland, CA • Seattle, WA  
Tucson, AZ • Woodlawn, MD • Washington, DC

**EDI Global, a Mathematica Company**

Bukoba, Tanzania • High Wycombe, United Kingdom



[mathematica.org](https://mathematica.org)

Mathematica, Progress Together, and the “spotlight M” logo are registered trademarks of Mathematica Inc.